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

Warranty

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

Changes to the original guide are listed below:

<table>
<thead>
<tr>
<th>Change</th>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-01 Rev A</td>
<td>4/2010</td>
<td>Initial release</td>
</tr>
<tr>
<td>-02 Rev A</td>
<td>5/2012</td>
<td>Remove separate Canada / Mexico configurations</td>
</tr>
<tr>
<td>-03 Rev A</td>
<td>3/2015</td>
<td>Zebra rebranding</td>
</tr>
</tbody>
</table>
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Introduction

The DS9808-R Product Reference Guide Supplement provides the unique reading and programming procedures for the DS9808-R (DS9808 with RFID) digital scanner. This guide is intended as a supplement to the DS9808 Product Reference Guide, p/n 72E-112999-xx. For information and procedures common to the DS9808 series of products, refer to the Product Reference Guide.

Configurations

This guide addresses the following DS9808-R configurations.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Scan Range</th>
<th>DL Parsing</th>
<th>RFID</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS9808-SR00007C1WR</td>
<td>Standard</td>
<td>No</td>
<td>902 – 928 Mhz</td>
<td>United States, Canada, Mexico, Columbia, El Salvador, Guatemala</td>
</tr>
<tr>
<td>DS9808-DL00007C1WR</td>
<td>Standard</td>
<td>Yes</td>
<td>902 – 928 Mhz</td>
<td>United States</td>
</tr>
<tr>
<td>DS9808-LR20007C1WR</td>
<td>Long</td>
<td>No</td>
<td>902 – 928 Mhz</td>
<td>United States, Canada, Mexico, Columbia, El Salvador, Guatemala</td>
</tr>
<tr>
<td>DS9808-LL20007C1WR</td>
<td>Long</td>
<td>Yes</td>
<td>902 – 928 Mhz</td>
<td>United States</td>
</tr>
</tbody>
</table>
Availability

The DS9808-R is only available for the countries listed below.

**NOTE** This list may be updated if other countries are added. Check with your local Zebra sales representative for the latest information on availability in your country.

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Countries Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS9808-SR00007C1WR</td>
<td>United States, Canada, Mexico, Columbia, El Salvador, Guatemala</td>
</tr>
<tr>
<td>DS9808-DL00007C1WR</td>
<td>United States</td>
</tr>
<tr>
<td>DS9808-LR20007C1WR</td>
<td>United States, Canada, Mexico, Columbia, El Salvador, Guatemala</td>
</tr>
<tr>
<td>DS9808-LL20007C1WR</td>
<td>United States</td>
</tr>
</tbody>
</table>

Upgrading a DS9808 to DS9808-R

DS9808 customers in countries listed above can upgrade certain DS9808 models to DS9808-R. Zebra's repair centers perform the upgrades, ensuring like-new factory performance. Contact Zebra support at (800) 653-5350 for upgrade pricing and instructions.

The following DS9808 models can be upgraded to DS9808-R:

<table>
<thead>
<tr>
<th>DS9808 Model</th>
<th>Can be upgraded to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS9808-LR20007CRWR</td>
<td>DS9808-LR20007C1WR</td>
</tr>
<tr>
<td>DS9808-LL20007CRWR</td>
<td>DS9808-LL20007C1WR</td>
</tr>
</tbody>
</table>

Review the following differences between the DS9808 and the DS9808-R before deciding to upgrade.

<table>
<thead>
<tr>
<th>Feature</th>
<th>DS9808</th>
<th>DS9808-R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Interfaces Supported</td>
<td>USB, RS-232, RS-485 (port 9b, 5b, and 17b), keyboard wedge</td>
<td>USB, RS-232, RS-485 (port 9b and 5b), No keyboard wedge support.</td>
</tr>
<tr>
<td>Optional DC Power Supply</td>
<td>5 VDC power supply required for RS-232 and keyboard wedge only</td>
<td>12 VDC power supply required for USB (series A only), RS-232, and RS-485 (port 5b only)</td>
</tr>
<tr>
<td>Wall Mount Bracket</td>
<td>Supported</td>
<td>Not supported</td>
</tr>
<tr>
<td>Checkpoint EAS</td>
<td>EAS optional</td>
<td>EAS not supported</td>
</tr>
</tbody>
</table>
Chapter Descriptions

Topics covered in this guide are as follows:

- **Chapter 1, Getting Started** provides a product overview, unpacking instructions, and cable connection information.
- **Chapter 2, Data Capture** describes parts of the RFID digital scanner, beeper and LED definitions, and how to use the scanner to read tags.
- **Chapter 3, RFID Preferences** describes RFID preference features and provides programming bar codes for selecting these features.
- **Chapter 4, SSI Interface** describes how to set up the RFID digital scanner with a Simple Serial Interface (SSI) host.
- **Chapter 5, Advanced Data Formatting** briefly describes ADF, a means of customizing data before transmission to the host device, and includes a reference to the *ADF Programmer Guide*.
- **Chapter 6, Maintenance & Technical Specifications** provides information on how to care for the RFID digital scanner, troubleshooting, and technical specifications.
- **Appendix A, Numeric Bar Codes** includes the numeric bar codes to scan for parameters requiring specific numeric values.

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
Related Documents


- **DS9808-R Quick Start Guide**, p/n 72-125703-xx - provides general information for getting started with the DS9808-R digital scanner, and includes basic set up and operation instructions.

- **Advanced Data Formatting Programmer Guide**, p/n 72E-69680-xx - provides information on ADF, a means of customizing data before transmission to a host.

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

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: [http://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.
CHAPTER 1 GETTING STARTED

Introduction

The DS9808-R digital scanner combines 1D and 2D bar code scanning and superior RFID tag reading and transfer with a light-weight, hands-free/hand-held design. The digital scanner’s built-in stand seamlessly accommodates both counter-top and hand-held use. Whether in hands-free (presentation) or hand-held mode, the digital scanner ensures comfort and ease of use for extended periods of time.

Figure 1-1   DS9808-R Digital Scanner
Unpacking

Remove the digital scanner from its packing and inspect it for damage. If the scanner was damaged in transit, contact the Zebra Global Customer Support Center. See page x for contact information. KEEP THE PACKING. It is the approved shipping container; use this to return the equipment for servicing.

Interfaces

The DS9808-R digital scanner supports the following interfaces. Refer to the DS9808 Product Reference Guide for more information.

- USB
- Standard RS-232
- IBM 468X/469X
- Simple Serial Interface (SSI) (RFID configuration only)

Setting Up the Digital Scanner

Connecting the Interface Cable

NOTE Different interfaces require different cables. The connectors illustrated in the following sections are examples only. Connectors vary from those illustrated, but the steps to connect the digital scanner are the same.

1. Plug the interface cable modular connector into the cable interface port on the bottom of the digital scanner’s base.

![Interface cable port](image)

Figure 1-2  Installing the Interface Cable

2. Gently tug the cable to ensure the connector is secure.
Removing the Interface Cable

1. Press the cable’s modular connector clip through the access slot in the digital scanner’s base.

2. Carefully slide out the cable.

3. Follow the steps for Connecting the Interface Cable to connect a new cable.

Connecting to a USB Interface

1. Plug the USB interface cable series A connector in the USB host or hub, or plug the Plus Power connector into an available port on the IBM SurePOS terminal.

2. If not using a PowerPlus cable, connect external power:
   a. Plug the power supply adapter cable into the power jack on the interface cable.
   b. Connect the other end of the power supply adapter cable to the power supply.
   c. Plug the power supply into an AC outlet.
3. Select the USB device type by scanning the appropriate bar code from the *DS9808 Product Reference Guide*.

4. On first installation when using Windows, the software prompts to select or install the Human Interface Device driver. To install this driver, provided by Windows, click **Next** through all the choices and click **Finished** on the last choice. The digital scanner powers up during this installation.

### Connecting to an RS-232/SSI Interface

1. Connect the RS-232/SSI interface cable to the serial port on the host.

2. Connect the power supply adapter cable to the serial connector end of the interface cable.

3. Connect the other end of the power supply adapter cable to the power supply.

4. Plug the power supply into an AC outlet.

![RS-232 Direct Connection](image)

**Figure 1-5**  *RS-232 Direct Connection*

5. Select the RS-232 host type by scanning the appropriate bar code from the *DS9808 Product Reference Guide*, or if using SSI scan the appropriate baud rate bar code from *Baud Rate on page 4-3* that matches the host's baud rate setting.
Connecting to an IBM 468X/469X Interface

1. Connect the IBM 46XX interface cable to the appropriate port on the host (Port 9B or Port 5B).

2. If using Port 5B, connect power (Port 9B does not require a separate power supply):
   a. Connect the power supply adapter cable to the power jack on the interface cable.
   b. Connect the other end of the power supply adapter cable to the power supply.
   c. Plug the power supply into an AC outlet.

Figure 1-6  IBM 468X/469X Connection

3. Select the port address by scanning the appropriate bar code from DS9808 Product Reference Guide.
CHAPTER 2 DATA CAPTURE

Introduction

This chapter provides beeper and LED definitions, and techniques involved in reading RFID tags.

Figure 2-1  Parts
# Beeper Definitions

The digital scanner issues different beep sequences and patterns to indicate status. *Table 2-1* defines beep sequences that occur during both normal scanning and while programming the digital scanner.

<table>
<thead>
<tr>
<th>Beeper Sequence</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard Use</strong></td>
<td></td>
</tr>
<tr>
<td>Low/medium/high beeps</td>
<td>Power up.</td>
</tr>
<tr>
<td>Short high beep</td>
<td>A bar code symbol was decoded (if decode beeper is enabled).</td>
</tr>
<tr>
<td>4 long low beeps</td>
<td>Transmission error.</td>
</tr>
<tr>
<td>5 low beeps</td>
<td>Conversion or format error.</td>
</tr>
<tr>
<td>Low/low/low/extra low beeps</td>
<td>RS-232 receive error.</td>
</tr>
<tr>
<td>High beep</td>
<td>The digital scanner detected a &lt;BEL&gt; character over RS-232.</td>
</tr>
<tr>
<td><strong>RFID</strong></td>
<td></td>
</tr>
<tr>
<td>Medium-high (two-tone) beep</td>
<td>An RFID tag was read (if RFID read beeper is enabled).</td>
</tr>
<tr>
<td>High-medium/low/low beeps</td>
<td>Unexpected RFID indication.</td>
</tr>
<tr>
<td><strong>Image Capture</strong></td>
<td></td>
</tr>
<tr>
<td>Low beep</td>
<td>Snapshot mode started or completed.</td>
</tr>
<tr>
<td>High/low beeps</td>
<td>Snapshot mode timed out.</td>
</tr>
<tr>
<td><strong>Parameter Menu Scanning</strong></td>
<td></td>
</tr>
<tr>
<td>Low/high beeps</td>
<td>Input error; incorrect bar code, programming sequence, or <strong>Cancel</strong> scanned.</td>
</tr>
<tr>
<td>High/low beeps</td>
<td>Keyboard parameter selected. Enter value using numeric bar codes.</td>
</tr>
<tr>
<td>High/low/high/low beeps</td>
<td>Successful program exit with change in parameter setting.</td>
</tr>
<tr>
<td><strong>Code 39 Buffering</strong></td>
<td></td>
</tr>
<tr>
<td>High/low beeps</td>
<td>New Code 39 data was entered into the buffer.</td>
</tr>
<tr>
<td>3 long high beeps</td>
<td>Code 39 buffer is full.</td>
</tr>
<tr>
<td>High/low/high beeps</td>
<td>The Code 39 buffer was erased.</td>
</tr>
<tr>
<td>Low/high/low beeps</td>
<td>The Code 39 buffer was erased or there was an attempt to clear or transmit an empty buffer.</td>
</tr>
<tr>
<td>Low/high beeps</td>
<td>A successful transmission of buffered data.</td>
</tr>
<tr>
<td>Macro PDF</td>
<td>Indication</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2 low beeps</td>
<td>MPDF sequence buffered.</td>
</tr>
<tr>
<td>2 long low beeps</td>
<td>File ID error. A bar code not in the current MPDF sequence was scanned.</td>
</tr>
<tr>
<td>3 long low beeps</td>
<td>Out of memory. There is not enough buffer space to store the current MPDF symbol.</td>
</tr>
<tr>
<td>4 long low beeps</td>
<td>Bad symbology. Scanned a 1D or 2D bar code in a MPDF sequence, a duplicate MPDF label, a label in an incorrect order, or trying to transmit an empty or illegal MPDF field.</td>
</tr>
<tr>
<td>5 long low beeps</td>
<td>Flushing MPDF buffer.</td>
</tr>
<tr>
<td>Fast warble beep</td>
<td>Aborting MPDF sequence.</td>
</tr>
<tr>
<td>Low/high beeps</td>
<td>Flushing an already empty MPDF buffer.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Host Specific</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB only</td>
<td></td>
</tr>
<tr>
<td>4 short high beeps</td>
<td>The digital scanner has not completed initialization. Wait several seconds and scan again.</td>
</tr>
<tr>
<td>Low/medium/high beeps</td>
<td>Communication with the host must be established before the digital scanner can operate at the highest power level.</td>
</tr>
<tr>
<td>upon scanning a USB device type</td>
<td></td>
</tr>
<tr>
<td>Low/medium/high beeps</td>
<td>The USB host can put the digital scanner in a state where power to the scanner is cycled on and off more than once. This is normal and usually happens when the PC cold boots.</td>
</tr>
<tr>
<td>occur more than once</td>
<td></td>
</tr>
<tr>
<td>RS-232 only</td>
<td></td>
</tr>
<tr>
<td>1 short high beep</td>
<td>A &lt;BEL&gt; character is received and Beep on &lt;BEL&gt; is enabled.</td>
</tr>
</tbody>
</table>
LED Definitions

In addition to beep sequences, the digital scanner uses a two-color LED to indicate status. Table 2-2 defines LED colors that display during scanning.

Table 2-2  Standard LED Definitions

<table>
<thead>
<tr>
<th>LED</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hand-Held Scanning Standard Use</strong></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>A bar code was successfully decoded or an RFID tag was read.</td>
</tr>
<tr>
<td>Red</td>
<td>Transmission error, conversion or format error, or RS-232 receive error.</td>
</tr>
<tr>
<td>Off</td>
<td>No power is applied to the digital scanner, or the scanner is on and ready to scan.</td>
</tr>
<tr>
<td><strong>Hands-Free (Presentation) Scanning Standard Use</strong></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>The scanner is on and ready to scan.</td>
</tr>
<tr>
<td>Momentarily Off</td>
<td>A bar code was successfully decoded or an RFID tag was read.</td>
</tr>
<tr>
<td>Red</td>
<td>Transmission error, conversion or format error, or RS-232 receive error.</td>
</tr>
<tr>
<td>Off</td>
<td>No power is applied to the digital scanner, or the scanner is in low power mode.</td>
</tr>
<tr>
<td><strong>RFID LED (on the RFID module)</strong></td>
<td></td>
</tr>
<tr>
<td>Off</td>
<td>The RFID module is inactive.</td>
</tr>
<tr>
<td>On</td>
<td>The RFID module is ready to read tags.</td>
</tr>
<tr>
<td>Momentarily Off</td>
<td>The RFID module read a tag.</td>
</tr>
<tr>
<td>Slow blinking</td>
<td>The RFID module is polling for new tags.</td>
</tr>
<tr>
<td><strong>Parameter Programming</strong></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>Number expected. Enter value using numeric bar codes.</td>
</tr>
<tr>
<td></td>
<td>Successful program exit with change in parameter setting.</td>
</tr>
<tr>
<td>Red</td>
<td>Input error: incorrect bar code, programming sequence, or Cancel scanned.</td>
</tr>
<tr>
<td><strong>ADF Programming</strong></td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td>Enter another digit. Add leading zeros to the front if necessary.</td>
</tr>
<tr>
<td></td>
<td>Enter another alphabetic character or scan the End of Message bar code.</td>
</tr>
<tr>
<td></td>
<td>All criteria or actions cleared for current rule, continue entering rule.</td>
</tr>
<tr>
<td></td>
<td>Delete last saved rule. The current rule is left intact.</td>
</tr>
<tr>
<td></td>
<td>All rules deleted.</td>
</tr>
<tr>
<td>Blinking Green</td>
<td>Enter another criterion or action, or scan the Save Rule bar code.</td>
</tr>
<tr>
<td>Green after Blinking</td>
<td>Rule saved. Rule entry mode exited.</td>
</tr>
<tr>
<td></td>
<td>Cancel rule entry. Rule entry mode exited because of an error or the user asked to exit rule entry.</td>
</tr>
<tr>
<td>Red</td>
<td>Out of rule memory. Erase some existing rules, then try to save rule again.</td>
</tr>
<tr>
<td></td>
<td>Entry error, wrong bar code scanned, or criteria/action list is too long for a rule.</td>
</tr>
<tr>
<td></td>
<td>Re-enter criterion or action.</td>
</tr>
</tbody>
</table>
Reading RFID Tags

NOTE The top surface of the digital scanner base may feel slightly warm. This is normal and does not indicate a problem.

Hands-Free RFID

The digital scanner is in hands-free mode when it sits on a countertop. In this mode, the digital scanner operates in continuous (constant-on) mode by default, where it automatically reads RFID tags within the radio frequency (RF) field of view.

Figure 2-2 RFID in Hands-Free Mode

The digital scanner beeps and the RFID LED momentarily turns off upon a tag read.

If the digital scanner does not observe any new RFID tags within the RFID Hands-Free Idle Timeout on page 3-26, it reduces power consumption by polling for tags once a second.
Hand-Held RFID

In hand-held mode, press the trigger to read all RFID tags within the RF field of view. Release the trigger to stop reading tags.

![Figure 2-3   RFID in Hand-Held Mode](image)

The digital scanner beeps and the RFID LED momentarily turns off upon a tag read.

DS9808-LR/LL Multifunction Trigger

The DS9808-LR/LL digital scanner includes a multifunction trigger which you can program to quickly switch between imaging, laser scanning, and/or RFID reading. See Multifunction Mode Triggering on page 3-4 for more information.

RFID Reading Recommendations

- When holding the digital scanner, don’t allow your fingers to get any closer to the antenna structure (in the base) than necessary. This can shield the tag from the RFID reader and reduce performance.
- When reading multiple items, it is highly recommended to pass one item at a time past the digital scanner. While you can pass many items at a time by the digital scanner, it can be difficult to correlate multiple beeps to multiple items at once and errors can occur.
- Use care when reading metal items. The metals can reduce tag read range or in some cases shield the tag from the reader. Always correlate the read beep with the item the digital scanner is reading (as with bar code scanning).
- Never hold the RFID tag of the item the digital scanner is reading. Instead, hold the item and let the tag hang free.
- Orient the tag toward the digital scanner if it has difficulty reading the tag. Waving often helps.
- If all else fails, scan the item’s bar code.
CHAPTER 3 RFID PREFERENCES

Introduction

You can program the digital scanner to perform various functions, or activate different features. This chapter describes RFID preference features and provides programming bar codes for selecting these features. To program other features, refer to the DS9808 Product Reference Guide.

The digital scanner ships with the settings in RFID Preferences Parameter Defaults on page 3-2. If the default values suit requirements, programming is not necessary.

To set feature values, scan a single bar code or a short bar code sequence. The settings are stored in non-volatile memory and are preserved even when you power down the digital scanner.

**NOTE** The RFID module is not available in all countries. Contact a Zebra sales representative for more information.

If not using a USB cable, select a host type after the power-up beeps sound. Refer to the DS9808 Product Reference Guide for specific host information. This is only necessary upon the first power-up when connecting to a new host.

To return all features to default values, scan the Set Default parameter in the DS9808 Product Reference Guide. Throughout the programming bar code menus, asterisks (*) indicate default values.

* Medium to High Tone (2-Tone) (04h)
Scanning Sequence Examples

In most cases scanning one bar code sets the parameter value. For example, to turn the beeper off, scan the Off bar code under RFID Beeper Tone on page 3-11. The digital scanner issues a fast warble beep and the LED turns green, signifying a successful parameter entry.

Other parameters require scanning several bar codes. See these parameter descriptions for this procedure.

Errors While Scanning

Unless otherwise specified, to correct an error during a scanning sequence, just re-scan the correct parameter.

RFID Preferences Parameter Defaults

Table 3-1 lists the defaults for RFID preferences parameters. To change the default values, scan the appropriate bar codes in this guide. These new values replace the standard default values in memory. To recall the default parameter values, scan the Set Default parameter in the DS9808 Product Reference Guide.

Table 3-1  RFID Preferences Parameter Defaults

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter Number</th>
<th>Default</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFID Preferences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multifunction Triggering</td>
<td></td>
<td>Single Trigger</td>
<td>3-4</td>
</tr>
<tr>
<td>Trigger A</td>
<td>F1h 77h</td>
<td>Laser Preferred Decoding</td>
<td>3-4</td>
</tr>
<tr>
<td>Trigger B</td>
<td>F1h 78h</td>
<td>RFID Reading</td>
<td>3-6</td>
</tr>
<tr>
<td>Trigger A + B</td>
<td>F1h 79h</td>
<td>Ignore</td>
<td>3-7</td>
</tr>
<tr>
<td>Laser Preferred Timeout</td>
<td>F1h 7Dh</td>
<td>1.5 seconds</td>
<td>3-8</td>
</tr>
<tr>
<td>Dual Trigger Debounce Timeout</td>
<td>F1h 7Ah</td>
<td>0.05 seconds</td>
<td>3-8</td>
</tr>
<tr>
<td>Dual Trigger Processing</td>
<td>F1h 7Bh</td>
<td>Wait</td>
<td>3-9</td>
</tr>
<tr>
<td>Host Trigger Mode</td>
<td>F1h 7Ch</td>
<td>Imager Decoding</td>
<td>3-9</td>
</tr>
<tr>
<td>RFID Beeper Tone</td>
<td>F1h 7Fh</td>
<td>Medium to High Tone (2-Tone)</td>
<td>3-11</td>
</tr>
<tr>
<td>RFID Same Tag Timeout</td>
<td>F1h 80h</td>
<td>5 Minutes</td>
<td>3-12</td>
</tr>
<tr>
<td>RFID Automatic Presentation Mode</td>
<td>F1h 81h</td>
<td>Hands-Free Only</td>
<td>3-14</td>
</tr>
<tr>
<td>RFID Trigger Mode</td>
<td>F1h 82h</td>
<td>Continuous</td>
<td>3-15</td>
</tr>
<tr>
<td>RFID Data Transmission Format</td>
<td>F1h 83h</td>
<td>Raw</td>
<td>3-16</td>
</tr>
<tr>
<td>RFID Transmit Raw with PC Bytes</td>
<td>F1h CAh</td>
<td>Disable</td>
<td>3-20</td>
</tr>
<tr>
<td>RFID Transmit Unknown Tag Data</td>
<td>F1h C5h</td>
<td>Transmit</td>
<td>3-20</td>
</tr>
<tr>
<td>RFID Antenna Selection</td>
<td>F1h C6h</td>
<td>Both</td>
<td>3-21</td>
</tr>
</tbody>
</table>
### Table 3-1  **RFID Preferences Parameter Defaults (Continued)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter Number</th>
<th>Default</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>RFID Antenna Power in Hand-Held Mode</td>
<td>F1h C7h</td>
<td>Level 5</td>
<td>3-22</td>
</tr>
<tr>
<td>RFID Antenna Power in Hands-Free Mode</td>
<td>F1h C8h</td>
<td>Level 5</td>
<td>3-24</td>
</tr>
<tr>
<td>RFID Hands-Free Idle Timeout</td>
<td>F1h C9h</td>
<td>5 Minutes</td>
<td>3-26</td>
</tr>
</tbody>
</table>
RFID Preferences

The parameters in this chapter control RFID behavior.

Multifunction Mode Triggering

You can set trigger options for each of the digital scanner’s trigger positions. For example, set Trigger A (pressed with your index finger) to imager decoding, set Trigger B (pressed with your middle finger) for laser decoding, and set Trigger A + B (pressed with both fingers) for RFID reading.

The default operation is single trigger, so if you do not assign values to each trigger option (or assign Trigger A only), Trigger B operates the same as Trigger A, and a dual trigger pull is ignored.

Select one of the following functions for each trigger using the bar codes on the next few pages:

- **Laser Preferred Decoding** - Programs the trigger for decoding using the laser engine first, then the imager if a decode does not occur. Refer to the DS9808 Product Reference Guide for more information. DS9808-SR/DL models do not support this option.

- **Imager Decoding** - Programs the trigger for decoding using the imager engine.

- **RFID Reading** - Programs the trigger for reading RFID tags.

- **Imager Plus RFID** - A trigger pull attempts decode using the imager engine, and turns on the optional RFID reader, if available, to read RFID tags.

- **Laser Preferred Plus RFID** - A trigger pull attempts decode using the laser engine first, then the imager if a decode does not occur, and also turns on the RFID reader to read RFID tags. DS9808-SR/DL models do not support this option.

- **Laser Only Decoding** - Programs the trigger for decoding using the laser engine only. DS9808-SR/DL models do not support this option.

- **Set to Trigger A Value** (Trigger B Only) - Sets Trigger B to the same value as Trigger A. This allows you to automatically program Trigger B upon selecting the function of Trigger A.

- **Ignore Dual Trigger Pull** (Trigger A+B Only) - Uses the mode of the first trigger pull only. This increases triggering efficiency when the dual trigger is not needed.
Trigger A
Parameter # F1h 77h

*NOTE* You cannot set Trigger A to **RFID Reading** if Trigger B is set to either **RFID Reading** or **Set to Trigger A Value**. In addition, laser options are not available for DS9808-SR/DL models.

* Default for DS9808-LR/LL
** Default for DS9808-SR/DL

- **Laser Preferred Decoding** (00h)
- **Imager Decoding** (01h)
- **RFID Reading** (02h)
- **Imager Plus RFID** (03h)
- **Laser Preferred Plus RFID** (04h)
- **Laser Only Decoding** (06h)
Trigger B
Parameter # F1h 78h

**NOTE** You cannot set Trigger B to RFID Reading or Set to Trigger A Value if Trigger A is set to RFID Reading. In addition, laser options are not available for DS9808-SR/DL models.
Trigger A+B
Parameter # F1h 79h

NOTE Laser options are not available for DS9808-SR/DL models.

- Laser Preferred Decoding (00h)
- Imager Decoding (01h)
- RFID Reading (02h)
- Imager Plus RFID (03h)
- Laser Preferred Plus RFID (04h)
- *Ignore Dual Trigger Pull (Use Mode of First Trigger Pull) (05h)
- Laser Only Decoding (06h)
Laser Preferred Timeout

Parameter # F1h 7Dh

If Multifunction Mode Triggering is set to Laser Preferred Decoding, use this parameter to set the time period that the laser remains on before using the imager if a decode does not occur.

To set the timeout, scan the bar code below, followed by two bar codes from Appendix A, Numeric Bar Codes that correspond to the desired time in the range of 0.1 to 9.9 seconds. To correct an error or change the selection, scan Cancel on <Blue><Italic>page A-2. The default is 1.5 seconds.

Dual Trigger Debounce Timeout

Parameter # F1h 7Ah

Set a time period in which both triggers must be pulled in order for the digital scanner to recognize this as a dual trigger pull. In other words, if you pull Trigger A, then Trigger B after this timeout expires, the digital scanner behaves as if you pulled Trigger A only.

To set the timeout, scan the bar code below, followed by two bar codes from Appendix A, Numeric Bar Codes that correspond to the desired time in the range of 0.00 to 0.99 seconds. Enter a trailing zero for single digit numbers. For example, to set a Debounce Timeout of 0.50 seconds, scan the bar code below, then scan the 5 and 0 bar codes. To correct an error or change the selection, scan Cancel on <Blue><Italic>page A-2.

The default is 0.05 seconds.
Dual Trigger Processing

Parameter # F1h 7Bh

Select whether the digital scanner processes the first trigger pull immediately, or waits until the Dual Trigger Debounce Timeout expires before processing. If the second trigger pull occurs within the timeout, the scanner switches to the combination function.

Host Triggering

Parameter # F1h 7Ch

Set an option for host-initiated triggering:

- Laser Preferred Decoding - Programs the host trigger for decoding using the laser engine first, then the imager if a decode does not occur.
- Imager Decoding - Programs the trigger for decoding using the imager engine.
- RFID Reading - Programs the trigger for reading RFID tags.
- Imager Plus RFID - A trigger pull attempts decode using the imager engine, and turns on the optional RFID reader, if available, to read RFID tags.
- Laser Preferred Plus RFID - A trigger pull attempts decode using the laser engine first, then the imager if a decode does not occur, and also turns on the optional RFID reader, if available, to read RFID tags.
- Laser Only Decoding - Programs the trigger for decoding using the laser engine only.
Host Triggering (continued)

NOTE Laser options are not available for DS9808-SR/DL models.

- Laser Preferred Decoding (00h)
- *Imager Decoding (01h)
- RFID Reading (02h)
- Imager Plus RFID (03h)
- Laser Preferred Plus RFID (04h)
- Laser Only Decoding (06h)
RFID Beeper Tone

Parameter # F1h 7Fh

To select an RFID read beep tone, scan one of the following bar codes.

- Off (03h)
- Low Tone (02h)
- Medium Tone (01h)
- High Tone (00h)

*Medium to High Tone (2-Tone) (04h)
RFID Same Tag Timeout

Parameter # F1h 80h

If the digital scanner does not observe a group of tags within this timeout period, it removes the tags in the group from the tag cache. If the digital scanner later reads one of these tags, it reports this as a new tag.

Disable this timeout to report a tag every time the digital scanner sees it. This option is typically used for testing, and disables the tag cache, affecting both presentation and triggered operation.

- Disable (00h)
- 2 Seconds (02h)
- 10 Seconds (0Ah)
- 15 Seconds (0Bh)
- 30 Seconds (0Dh)
- 1 Minute (11h)
RFID Same Tag Timeout (continued)

*5 Minutes
(15h)

15 Minutes
(1Bh)

1 Hour
(21h)
RFID Automatic Presentation Mode

Parameter # F1h 81h

Select one of the following options to configure the digital scanner to continuously read tags (presentation mode) when you place the scanner on the countertop (hands-free), when you lift it (hand-held), or in both or neither situation. Note that triggered operation always overrides presentation mode.

- Disable (00h)
- *Hands-Free Only (01h)
- Hand-Held Only (02h)
- Always (03h)
RFID Trigger Mode

Parameter # F1h 82h

In hand-held operation, this parameter controls the behavior of a trigger programmed for RFID reading.

- Continuous - the reader reads all tags within range, maintaining the existing tag cache so it does not report tags already read.
- Single Tag Read - the reader reads and reports only one tag. It maintains the tag cache and reports this tag regardless of whether it already reported it.
- Continuous Re-Report - the reader reads all tags within range, maintaining the tag cache, and reports each tag once within this trigger session regardless of whether it already reported it.
- Continuous Flush - the reader flushes the tag cache, reads all tags within range, and reports them as new tags.

NOTE To program the trigger for various functions including RFID, see Multifunction Mode Triggering on page 3-4 and Host Triggering on page 3-9.
RFID Data Transmission Format

Parameter # F1h 83h

This parameter controls the format of the tag's EPC data sent after reading a new tag.

- Raw - the EPC buffer transmits as a hexadecimal string. This format can include the protocol control bytes.
- GS1-128 - for GS1 encoded tags, this option converts EPC data to a GS1-128 bar code (as per the EPCglobal Tag Data Standards Version 1.4 available at http://www.epcglobalinc.org/standards/tds/tds_1_4-standard-20080611.pdf). Otherwise, the tag optionally transmits in raw format or is ignored.
- EPC URI - the EPC data is represented as a Universal Resource Identifier (URI) as defined in the EPCglobal Tag Data Standards Version 1.4.

See Table 3-2, Table 3-3, and Table 3-4 for transmission format details for the various tag types, and samples for each. For more information, refer to EPCglobal Tag Data Standards Version 1.4.
Table 3-2  **GS1-128 Transmission Details by EPC Tag Type**

<table>
<thead>
<tr>
<th>EPC Tag Type</th>
<th>Transmission Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>GID</td>
<td>N/A</td>
</tr>
<tr>
<td>SGTIN</td>
<td>(01) GTIN (21) Serial Number</td>
</tr>
<tr>
<td>SSCC</td>
<td>(00) SSCC</td>
</tr>
<tr>
<td>SGLN</td>
<td>(414) GLN (254) GLN-Extension</td>
</tr>
<tr>
<td>GRAI</td>
<td>(8003) GRAI Serial Number</td>
</tr>
<tr>
<td>GIAI</td>
<td>(8004) GIAI Serial Number</td>
</tr>
<tr>
<td>GSRN</td>
<td>(8018) GSRN</td>
</tr>
<tr>
<td>GDTI</td>
<td>(253) GDTI</td>
</tr>
<tr>
<td>US DoD</td>
<td>N/A</td>
</tr>
<tr>
<td>Unknown</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 3-3  **EPC-URI Transmission Details by EPC Tag Type**

<table>
<thead>
<tr>
<th>EPC Tag Type</th>
<th>Transmission Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>GID</td>
<td>urn:epc:tag:gid-96:&lt;generalMngr&gt;.&lt;objectClass&gt;.&lt;semo&gt;</td>
</tr>
<tr>
<td>SGTIN</td>
<td>urn:epc:tag:sgtin-96:&lt;filter&gt;.&lt;company&gt;.&lt;itemRef&gt;.&lt;serialNumber&gt;</td>
</tr>
<tr>
<td>SSCC</td>
<td>urn:epc:tag:sscc-96:&lt;filter&gt;.&lt;companyPrefix&gt;.&lt;serialReference&gt;</td>
</tr>
<tr>
<td>SGLN</td>
<td>urn:epc:tag:sgln-96:&lt;filter&gt;.&lt;companyPrefix&gt;.&lt;locationReference&gt;.&lt;extention&gt;</td>
</tr>
<tr>
<td>GRAI</td>
<td>urn:epc:tag:grai-96:&lt;filter&gt;.&lt;companyPrefix&gt;.&lt;assetType&gt;.&lt;serialNumber&gt;</td>
</tr>
<tr>
<td>GIAI</td>
<td>urn:epc:tag:giai-96:&lt;filter&gt;.&lt;companyPrefix&gt;.&lt;individulAssetReference&gt;</td>
</tr>
<tr>
<td>GSRN</td>
<td>urn:epc:tag:gsrn-96:&lt;filter&gt;.&lt;companyPrefix&gt;.&lt;serviceReference&gt;</td>
</tr>
<tr>
<td>GDTI</td>
<td>urn:epc:tag:gdti-96:&lt;filter&gt;.&lt;companyPrefix&gt;.&lt;documentType&gt;.&lt;serialNumber&gt;</td>
</tr>
<tr>
<td>Unknown</td>
<td>urn:epc:tag:raw:BitLength.Value</td>
</tr>
<tr>
<td>Unknown (non-EPC)</td>
<td>urn:epc:raw:BitLength.AFI.Value</td>
</tr>
</tbody>
</table>
### Examples

Table 3-4  Transmission Format Examples

<table>
<thead>
<tr>
<th>EPC Tag Type</th>
<th>Format</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GID</strong></td>
<td>Raw</td>
<td>3500004D20004D200000004D2</td>
</tr>
<tr>
<td></td>
<td>GS1-128</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:tag:gid-96:1234.1234.1234</td>
</tr>
<tr>
<td><strong>SGTIN</strong></td>
<td>Raw</td>
<td>3018789004B5A1C0499602D2</td>
</tr>
<tr>
<td></td>
<td>GS1-128</td>
<td>(01)11234562345675(21)1234567890</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:tag:sgtin-96:0.123456.1234567.1234567890</td>
</tr>
<tr>
<td><strong>SSCC</strong></td>
<td>Raw</td>
<td>310C75BCD150BC614E0000000</td>
</tr>
<tr>
<td></td>
<td>GS1-128</td>
<td>(00)112345678923456787</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:tag:sscc-96:0.123456789.12345678</td>
</tr>
<tr>
<td><strong>SGLN</strong></td>
<td>Raw</td>
<td>320C0BC614E01800000003039</td>
</tr>
<tr>
<td></td>
<td>GS1-128</td>
<td>(414)0123456780125(254)12345</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:tag:sln-96:0.012345678.012.12345</td>
</tr>
<tr>
<td><strong>GRAI</strong></td>
<td>Raw</td>
<td>33180C0E400C0E40000003039</td>
</tr>
<tr>
<td></td>
<td>GS1-128</td>
<td>(8003)012345012345412345</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:tag:grai-96:0.012345.012345.12345</td>
</tr>
<tr>
<td><strong>GIAI</strong></td>
<td>Raw</td>
<td>3400001D6F345400075BCD15</td>
</tr>
<tr>
<td></td>
<td>GS1-128</td>
<td>(8004)000123456789123456789</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:tag:gai-96:0.000123456789.123456789</td>
</tr>
<tr>
<td><strong>GSRN</strong></td>
<td>Raw</td>
<td>2D00001D6F3454040D200000</td>
</tr>
<tr>
<td></td>
<td>GS1-128</td>
<td>(8018)000123456789012343</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:tag:gsrn-96:0.000123456789.012345</td>
</tr>
<tr>
<td><strong>GDTI</strong></td>
<td>Raw</td>
<td>2C180C0E4060720000003039</td>
</tr>
<tr>
<td></td>
<td>GS1-128</td>
<td>(253)012345012345412345</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:tag:gdti-96:0.012345.012345.12345</td>
</tr>
<tr>
<td><strong>US DoD</strong></td>
<td>Raw</td>
<td>2F041424331323330000003039</td>
</tr>
<tr>
<td></td>
<td>GS1-128</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:tag:usdod-96:0.ABC123.12345</td>
</tr>
</tbody>
</table>

**Note:** Parentheses appear in examples only for readability.
Table 3-4  Transmission Format Examples (Continued)

<table>
<thead>
<tr>
<th>EPC Tag Type</th>
<th>Format</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown</td>
<td>Raw</td>
<td>1234567890ABCDEF01234567</td>
</tr>
<tr>
<td></td>
<td>GS1-128</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:raw:96.x1234567890ABCDEF01234567</td>
</tr>
<tr>
<td>Unknown (non-EPC)</td>
<td>Raw with PC Bytes</td>
<td>31231234567890ABCDEF00000002</td>
</tr>
<tr>
<td></td>
<td>EPC-URI</td>
<td>urn:epc:raw:96.x23.x1234567890ABCDEF00000002</td>
</tr>
</tbody>
</table>

**Note:** Parentheses appear in examples only for readability.
RFID Transmit Raw with PC Bytes

Parameter # F1h CAh

When transmitting RFID tags in raw format, this parameter determines whether to include the Protocol Control (PC) bytes of the EPC data. This is useful when reading non-EPC encoded tags. Refer to EPCglobal Tag Data Standards Version 1.4 available at http://www.epcglobalinc.org/standards/tds/tds_1_4-standard-20080611.pdf, section 3.2.1 EPC Memory Contents.

Enable
(01h)

*Disable
(00h)

RFID Transmit Unknown Tag Data

Parameter # F1h C5h

When transmitting RFID tags in GS1-128 format, if the digital scanner can not translate the tag (i.e., it is not GS1 encoded), it can either report the tag in raw format or ignore it.

Ignore
(00h)

*Transmit in Raw Format
(01h)
RFID Antenna Selection

Parameter # F1h C6h

Use this parameter to select reading RFID tags using the horizontally oriented antenna, the vertically oriented antenna, or both.

*Both (00h)

Horizontal (01h)

Vertical (02h)
RFID Antenna Power in Hand-Held Mode

Parameter # F1h C7h

This parameter controls the antenna RF power when operated in hand-held mode. Table 3-5 lists the levels and the associated range as a percent of the baseline range. The baseline range is the range that results when the power level is set to the maximum level of 7, and can vary depending on the environment, tag sensitivity, and orientation.

Table 3-5  Antenna Power Levels in Hand-Held Mode

<table>
<thead>
<tr>
<th>Level</th>
<th>Power (dBm)</th>
<th>Range (% of Baseline)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>12%</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>18%</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>25%</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>35%</td>
</tr>
<tr>
<td>5</td>
<td>17</td>
<td>50%</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>67%</td>
</tr>
<tr>
<td>7</td>
<td>24</td>
<td>100%</td>
</tr>
</tbody>
</table>

**NOTE**  Baseline can vary depending on environment, tag sensitivity, and orientation.
RFID Antenna Power in Hand-Held Mode (continued)

Level 1
(01h)

Level 2
(02h)

Level 3
(03h)

Level 4
(04h)

*Level 5
(05h)

Level 6
(06h)

Level 7
(07h)
RFID Antenna Power in Hands-Free Mode

Parameter # F1h C8h

This parameter controls the antenna RF power when operated in hands-free mode. Table 3-6 lists the levels and the associated range as a percent of the baseline range. The baseline range is the range that results when the power level is set to the maximum level of 7, and can vary depending on the environment, tag sensitivity, and orientation.

Table 3-6  Antenna Power Levels in Hands-Free Mode

<table>
<thead>
<tr>
<th>Level</th>
<th>Power (dBm)</th>
<th>Range (% of Baseline)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>12%</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>18%</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>25%</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>35%</td>
</tr>
<tr>
<td>5</td>
<td>17</td>
<td>50%</td>
</tr>
<tr>
<td>6</td>
<td>20</td>
<td>67%</td>
</tr>
<tr>
<td>7</td>
<td>24</td>
<td>100%</td>
</tr>
</tbody>
</table>

*NOTE* Baseline can vary depending on environment, tag sensitivity, and orientation.
RFID Antenna Power in Hands-Free Mode (continued)

Level 1
(01h)

Level 2
(02h)

Level 3
(03h)

Level 4
(04h)

*Level 5
(05h)

Level 6
(06h)

Level 7
(07h)
RFID Hands-Free Idle Timeout

Parameter # F1h C9h

This parameter sets the idle timeout in hands-free mode. If the digital scanner does not observe any new RFID tags within this timeout, it reduces power consumption by polling for tags once a second.

- Disable (00h)
- 2 Seconds (02h)
- 10 Seconds (0Ah)
- 15 Seconds (0Bh)
- 30 Seconds (0Dh)
- 1 Minute (11h)
RFID Hands-Free Idle Timeout (continued)

*5 Minutes
(15h)

15 Minutes
(1Bh)

1 Hour
(21h)
CHAPTER 5 ADVANCED DATA FORMATTING

Introduction

Advanced Data Formatting (ADF) is a means of customizing data before transmission to the host device. Use ADF to edit scan data to suit requirements. Implement ADF by scanning a related series of bar codes which program the digital scanner with ADF rules.

For information and programming bar codes for ADF, including RFID code type criteria bar codes, refer to the Advanced Data Formatting Programmer Guide, p/n 72E-69680-xx.
CHAPTER 4 SSI INTERFACE

Introduction

When connected to a Simple Serial Interface (SSI) host, program the digital scanner via bar code menu or SSI host commands.

Throughout the programming bar code menus, asterisks (*) indicate default values.

[Barcode Image]

* Indicates Default * Baud Rate 9600 (06h) Feature/Option
Option Hex Value for programming via SSI command

NOTE Most computer monitors allow scanning the bar codes directly on the screen. When scanning from the screen, be sure to set the document magnification to a level where you can see the bar code clearly, and bars and/or spaces are not merging.
Simple Serial Interface Default Parameters

Table 4-1 lists the defaults for the SSI host. There are two ways to change the default values:

- Scan the appropriate bar codes in this guide. These new values replace the standard default values in memory. To recall the default parameter values, scan the Set Default parameter in the DS9808 Product Reference Guide.

- Download data through the device’s serial port using SSI. Hexadecimal parameter numbers appear in this chapter below the parameter title, and options appear in parenthesis beneath the accompanying bar codes. See the Simple Serial Interface (SSI) Programmer’s Guide for detailed instructions for changing parameters using this method.

Table 4-1  SSI Interface Parameter Defaults

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Parameter Number</th>
<th>Default</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baud Rate</td>
<td>9Ch</td>
<td>9600</td>
<td>4-3</td>
</tr>
<tr>
<td>Parity</td>
<td>9Eh</td>
<td>None</td>
<td>4-4</td>
</tr>
<tr>
<td>Check Parity</td>
<td>97h</td>
<td>Enable</td>
<td>4-5</td>
</tr>
<tr>
<td>Software Handshaking</td>
<td>9Fh</td>
<td>ACK/NAK</td>
<td>4-5</td>
</tr>
<tr>
<td>Host RTS Line State</td>
<td>9Ah</td>
<td>Low</td>
<td>4-6</td>
</tr>
<tr>
<td>Decode Data Packet Format</td>
<td>EEh</td>
<td>Send Raw Decode Data</td>
<td>4-6</td>
</tr>
<tr>
<td>Host Serial Response Time-out</td>
<td>9Bh</td>
<td>2 sec</td>
<td>4-7</td>
</tr>
<tr>
<td>Host Character Time-out</td>
<td>EFh</td>
<td>200 msec</td>
<td>4-8</td>
</tr>
<tr>
<td>Multipacket Option</td>
<td>F0h 4Eh</td>
<td>Option 1</td>
<td>4-9</td>
</tr>
<tr>
<td>Interpacket Delay</td>
<td>F0h 4Fh</td>
<td>0 ms</td>
<td>4-10</td>
</tr>
</tbody>
</table>

**Event Reporting**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Task Code</th>
<th>Default</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decode Event</td>
<td>F0h 00h</td>
<td>Disable</td>
<td>4-11</td>
</tr>
<tr>
<td>Boot Up Event</td>
<td>F0h 02h</td>
<td>Disable</td>
<td>4-12</td>
</tr>
<tr>
<td>Parameter Event</td>
<td>F0h 03h</td>
<td>Disable</td>
<td>4-12</td>
</tr>
</tbody>
</table>

**NOTE**  SSI interprets Prefix, Suffix1, and Suffix2 values listed in the default table in the DS9808 Product Reference Guide differently than other interfaces. SSI does not recognize key categories, only the 3-digit decimal value. The default value of 7013 is interpreted as CR only.
SSI Host Parameters

Baud Rate

Parameter # 9Ch

Baud rate is the number of bits of data transmitted per second. Set the digital scanner's baud rate to match the data rate setting of the host device. Otherwise, data may not reach the host or may reach it in distorted form.

To enable the SSI host, scan the appropriate baud rate bar code that matches the baud rate setting of the host device.

NOTE: The digital scanner does not support baud rates below 9600.

*Baud Rate 9600 (06h)

Baud Rate 19,200 (07h)

38,400 (08h)

57,600 (0Ah)

115,200 (0Bh)

230,400 (0Ch)
Parity

Parameter # 9Eh

A parity check bit is the most significant bit of each ASCII coded character. Select the parity type according to host device requirements.

- Select **Odd** parity to set the parity bit to a value 0 or 1, based on data, to ensure that the coded character contains an odd number of 1 bits.
- Select **Even** parity to set the parity bit to a value 0 or 1, based on data, to ensure that the coded character contains an even number of 1 bits.
- If no parity is required, select **None**.
Check Parity

Parameter # 97h

Select whether or not to check the parity of received characters. Use the Parity parameter to select the type of parity.

Software Handshaking

Parameter # 9Fh

This parameter offers control of the data transmission process in addition to that offered by hardware handshaking. Hardware handshaking is always enabled and cannot be disabled by the user.

- **Disable ACK/NAK Handshaking**: If you select this option, the digital scanner neither generates nor expects ACK/NAK handshaking packets.
- **Enable ACK/NAK Handshaking**: If you select this option, after transmitting data, the digital scanner expects either an ACK or NAK response from the host. The digital scanner also ACKs or NAKs messages from the host.

  The digital scanner waits up to the programmable Host Serial Response Time-out to receive an ACK or NAK. If the scanner does not get a response in this time, it resends its data up to two times before discarding the data and declaring a transmit error.
Host RTS Line State

Parameter # 9Ah

This parameter sets the expected idle state of the Serial Host RTS line.

The SSI Interface is used with host applications which also implement the SSI protocol. However, you can also use the digital scanner in a "scan-and-transmit" mode to communicate with any standard serial communication software on a host PC (see Decode Data Packet Format on page 4-6). If transmission errors occur in this mode, the host PC may be asserting hardware handshaking lines which interfere with the SSI protocol. Scan the Host: RTS High bar code to address this problem.

---

Decode Data Packet Format

Parameter # EEh

This parameter selects whether to transmit decoded data in raw format (unpacketeted), or with the packet format defined by the serial protocol.

Selecting the raw format disables ACK/NAK handshaking for decode data.
Host Serial Response Time-out

Parameter # 9Bh

This parameter specifies how long the digital scanner waits for an ACK or NAK before resending. Also, if the digital scanner wants to send, and the host was already granted permission to send, the digital scanner waits for the designated time-out before declaring an error.

To set the delay period (options are 2, 5, 7.5, or 9.9 seconds), scan one of the following bar codes.

*NOTE* Other values are available via SSI command.
Host Character Time-out

Parameter # EFh

This parameter determines the maximum time the digital scanner waits between characters transmitted by the host before discarding the received data and declaring an error.

To set the delay period (options are 200, 500, 750, or 990 ms), scan one of the following bar codes.

✓ **NOTE** Other values are available via SSI command.

*Low - 200 ms (0Ah)*

Medium - 500 ms (32h)

High - 750 ms (4Bh)

Maximum - 990 ms (63h)
Multipacket Option

Parameter # F0h, 4Eh

This parameter controls ACK/NAK handshaking for multi-packet transmissions.

- **Multi-Packet Option 1**: The host sends an ACK / NAK for each data packet during a multi-packet transmission.

- **Multi-Packet Option 2**: The digital scanner sends data packets continuously, with no ACK/NAK handshaking to pace the transmission. The host, if overrun, can use hardware handshaking to temporarily delay digital scanner transmissions. At the end of transmission, the digital scanner waits for a CMD_ACK or CMD_NAK.

- **Multi-Packet Option 3**: Option 3 is the same as option 2 with the addition of a programmable interpacket delay.
Interpacket Delay

Parameter # F0h, 4Fh

This parameter specifies the interpacket delay when Multipacket Option 3 is selected.

To set the delay period (options are 0, 25, 50, 75, or 99 ms), scan one of the following bar codes.

\[\text{NOTE}\] Other values are available via SSI command.

1. **Minimum - 0 ms**
   - (00h)

2. **Low - 25 ms**
   - (19h)

3. **Medium - 50 ms**
   - (32h)

4. **High - 75 ms**
   - (4Bh)

5. **Maximum - 99 ms**
   - (63h)
**Event Reporting**

The host can request the digital scanner to provide certain information (events) relative to the digital scanner’s behavior. Enable or disable the events listed in *Table 4-2* and on the following pages by scanning the appropriate bar codes.

**Table 4-2  Event Codes**

<table>
<thead>
<tr>
<th>Event Class</th>
<th>Event</th>
<th>Code Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decode Event</td>
<td>Non parameter decode</td>
<td>0x01</td>
</tr>
<tr>
<td>Boot Up Event</td>
<td>System power-up</td>
<td>0x03</td>
</tr>
<tr>
<td>Parameter Event</td>
<td>Parameter entry error</td>
<td>0x07</td>
</tr>
<tr>
<td></td>
<td>Parameter stored</td>
<td>0x08</td>
</tr>
<tr>
<td></td>
<td>Defaults set (and parameter event is</td>
<td>0x0A</td>
</tr>
<tr>
<td></td>
<td>enabled by default)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number expected</td>
<td>0x0F</td>
</tr>
</tbody>
</table>

**Decode Event**

**Parameter # F0h, 00h**

When enabled, the digital scanner generates a message to the host when it successfully decodes a bar code. When disabled, no notification is sent.
Boot Up Event

Parameter # F0h, 02h

When enabled, the digital scanner generates a message to the host when power is applied. When disabled, no notification is sent.

Enable Boot Up Event (01h)

*Disable Boot Up Event (00h)

Parameter Event

Parameter # F0h, 03h

When enabled, the digital scanner generates a message to the host when one of the events specified in Table 4-2 on page 4-11 occurs. When disabled, no notification is sent.

Enable Parameter Event (01h)

*Disable Parameter Event (00h)
CHAPTER 6 MAINTENANCE & TECHNICAL SPECIFICATIONS

Introduction

This chapter provides suggested RFID digital scanner maintenance, troubleshooting, and technical specifications.

Maintenance

Cleaning the scan window is the only maintenance required. A dirty window can affect scanning accuracy.

- Do not allow abrasive material to touch the window.
- Remove any dirt particles with a damp cloth.
- Wipe the window using a tissue moistened with ammonia/water.
- Do not spray water or other cleaning liquids directly into the window.
## Troubleshooting

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Causes</th>
<th>Possible Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital scanner emits 4 short high beeps during read attempt.</td>
<td>Digital scanner has not completed USB initialization.</td>
<td>Wait several seconds and read again.</td>
</tr>
<tr>
<td>Digital scanner reads the tag, but does not transmit the data to the host.</td>
<td>Digital scanner is not programmed for the correct host type.</td>
<td>Scan the appropriate host type programming bar code. See the DS9808 Product Reference Guide.</td>
</tr>
<tr>
<td>Interface cable is loose.</td>
<td></td>
<td>Re-connect the cable.</td>
</tr>
<tr>
<td>If the digital scanner emits 4 long low beeps, a transmission error occurred.</td>
<td></td>
<td>Set the digital scanner's communication parameters to match the host's setting.</td>
</tr>
<tr>
<td>Host displays tag data incorrectly.</td>
<td>Digital scanner is not programmed to work with the host.</td>
<td>Scan the appropriate host type programming bar code.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For RS-232, set the digital scanner's communication parameters to match the host's settings.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>For a keyboard wedge configuration, program the system for the correct keyboard type, and turn off the CAPS LOCK key.</td>
</tr>
</tbody>
</table>

**NOTE** If after performing these checks the digital scanner still experiences problems, contact the distributor or call Zebra support. See <Blue><Italic>page x for the telephone numbers.
Technical Specifications

For a complete list of specifications, refer to the DS9808 Product Reference Guide.

Table 6-2  Technical Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>8.5 in. (max) H x 3.5 in. W x 6 in. L</td>
</tr>
<tr>
<td></td>
<td>21.6 cm (max) H x 8.9 cm W x 15.2 cm L</td>
</tr>
<tr>
<td>Weight</td>
<td>16.4 oz / 465 g</td>
</tr>
<tr>
<td>Voltage and Current</td>
<td>5 V +/- 5% VDC @ 1.2 A (nominal)</td>
</tr>
<tr>
<td>Data Capture Options</td>
<td>1D and 2D bar codes, RFID tags</td>
</tr>
<tr>
<td><strong>RFID Performance Characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>902-928 MHz (US, Canada, Mexico)</td>
</tr>
<tr>
<td>Tag Type</td>
<td>EPCglobal Class 1 Gen 2 (ISO 18000-6C)</td>
</tr>
<tr>
<td>RFID Read Range/RF Power</td>
<td>Adjustable from near contact up to 40 in. / 1 m depending on tag sensitivity and orientation</td>
</tr>
<tr>
<td><strong>User Environment</strong></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>32° F to 104° F / 0° C to 40° C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40° F to 158° F / -40° C to 70° C</td>
</tr>
<tr>
<td>Humidity</td>
<td>5% to 95%, non-condensing</td>
</tr>
<tr>
<td>Drop Specifications</td>
<td>Withstands multiple 4ft. / 1.22 m drops to concrete at operating temperature extremes.</td>
</tr>
<tr>
<td>Ambient Light Immunity</td>
<td>Sunlight - 8,000 ft. candles (86,000 Lux)</td>
</tr>
<tr>
<td></td>
<td>Incandescent - 150 ft. candles (1,600 Lux)</td>
</tr>
<tr>
<td></td>
<td>Fluorescent - 150 ft. candles (1,600 Lux)</td>
</tr>
<tr>
<td></td>
<td>Mercury Vapor - 150 ft. candles (1,600 Lux)</td>
</tr>
<tr>
<td></td>
<td>Sodium Vapor - 150 ft. candles (1,600 Lux)</td>
</tr>
<tr>
<td></td>
<td>Immune to normal or artificial light</td>
</tr>
</tbody>
</table>
APPENDIX A NUMERIC BAR CODES

Numeric Bar Codes

For parameters requiring specific numeric values, scan the appropriately numbered bar code(s).
Numeric Bar Codes (continued)

To correct an error or change a selection, scan the bar code below.
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Tell Us What You Think...

We’d like to know what you think about this Manual. Please take a moment to fill out this questionnaire and fax this form to: (631) 627-7184, or mail to:

Zebra Technologies Corporation
Lincolnshire, IL U.S.A.
Attention: Advanced Data Capture
Technical Publications Manager

Important: If you need product support, please call the appropriate customer support number provided. Unfortunately, we cannot provide customer support at the fax number above.

Manual Title: __________________________________________
(please include revision level)

How familiar were you with this product before using this manual?

☐ Very familiar    ☐ Slightly familiar    ☐ Not at all familiar

Did this manual meet your needs? If not, please explain.

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

What topics need to be added to the index, if applicable?

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

What topics do you feel need to be better discussed? Please be specific.

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

What can we do to further improve our manuals?

____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________
____________________________________________________________________________________

Thank you for your input—we value your comments.