DS9908R

Hands-Free Imaging Scanner

Product Reference Guide Supplement

ZEBRA

MN-003377-01

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Revision History

Changes to the original guide are listed below:

Change	Date	Description
-01 Rev A	5/2019	Initial Release

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About This Guide

Introduction

The DS9908R Hands-Free Imaging Scanner Product Reference Guide Supplement provides the unique reading and programming procedures for the DS9908R (DS9908 with RFID) imager. This guide is intended as an addendum to the DS9908 Hands-Free Imaging Scanner Product Reference Guide, p/n MN-003185-xx. Refer to the Product Reference Guide for information and procedures common to the DS9900 Series of imagers.

IMPORTANT: RFID CANNOT operate until you scan an RFID Country of Operation on page 44. This is the country in which the product is used.

Configurations

This guide covers the configurations listed in Table 1 and Table 2.

NOTE: The DS9908R is not available in all countries. Contact your local Zebra representative regarding availability in your region.

Table 1 DS9908R Configurations for Retail

Configuration	Description	TAA Compliant
DS9908-DLR0004ZCUS	Presentation Area Imager, Standard Range with DL Parsing, Corded, RFID, Midnight Black, Checkpoint EAS, 902-928 MHZ	No
DS9908-DLR0004ZZUS	Presentation Area Imager, Standard Range with DL Parsing, Corded, RFID, Midnight Black, 902-928 MHZ	No
DS9908-SRR0004ZCUS	Presentation Area Imager, Standard Range, Corded, RFID, Midnight Black, Checkpoint EAS, 902-928 MHZ	No
DS9908-SRR0004ZZIN	Presentation Area Imager, Standard Range, Corded, RFID, Midnight Black, India Only	No
DS9908-SRR0004ZZEU	Presentation Area Imager, Standard Range, Corded, RFID, Midnight Black, 865 – 868 MHZ	No
DS9908-SRR0004ZZIL	Presentation Area Imager, Standard Range, Corded, RFID, Midnight Black, Israel Only	No

Table 1 DS9908R Configurations for Retail (Continued)

Configuration	Description	TAA Compliant
DS9908-SRR0004ZZJP	Presentation Area Imager, Standard Range, Corded, RFID, Midnight Black, Japan Only	No
DS9908-SRR0004ZZUS	Presentation Area Imager, Standard Range, Corded, RFID, Midnight Black, 902-928 MHZ	No
DS9908-TTR0004ZZJP	Presentation Area Imager, Standard Range With Toshiba TEC, Corded, RFID, Midnight Black, Japan Only	No
DS9908-SRR0004ZTUS	Presentation Area Imager, Standard Range, Corded, RFID, Midnight Black, 902-928 MHZ	Yes

Table 2 DS9908R Configurations for Labs

Configuration	Description	TAA Compliant
DS9908-HD5000WZTUS	Presentation Area Imager, High Density, Corded, RFID, White Illumination, Alpine White, 902-928 MHZ	Yes
DS9908-HD5000WZZUS	Presentation Area Imager, High Density, Corded, RFID, White Illumination, Alpine White, 902-928 MHZ	No
DS9908-HL5000WZZUS	Presentation Area Imager, High Density with DL Parsing, Corded, RFID, White Illumination, Alpine White, 902-928 MHZ	No

Accessories

NOTE: Check Solution Builder for additional information regarding all available accessories, and the latest available configurations.

The imager ships with the DS9908R Quick Start Guide. The following required accessories must be ordered:

- Interface cable for the appropriate interface. For example, a shielded connector cable when connecting via USB.

  IMPORTANT: If you already have existing non shielded cables from legacy products they can be reused. However, be aware that the shielded cables provide improved ESD performance.

- Universal power supply, if the interface requires this.

The product configurations related to the DS9908R imager are listed in Table 3.

Table 3 DS9908R Accessories

Product Type	Part Number	Description
Cables	For information about cables, cable compatibility, and the full list of supported cables go to the Zebra Partner Portal at: https://partnerportal.zebra.com/PartnerPortal/product_services/downloads_z/barcode_scanners/Universal-Cable-Guide-Bar-Code-Scanners.xlsx.	

Table 3 DS9908R Accessories (Continued)

Product Type	Part Number	Description
Power Supplies (if required)	PWR-WUA5V4W0US	Power Supply, 5VDC, 100 - 240VAC, US/CA/MX/JP/TW
	PWR-WUA5V4W0BR	Power Supply, 5VDC, 100 - 240VAC, KR (Korea)
	PWR-WUA5V4W0EU	Power Supply, 5VDC, 100 - 240VAC, EU/UK
	PWR-WUA5V4W0CN	Power Supply, 5VDC, 100 - 240VAC, CN
	PWR-WUA5V4W0AU	Power Supply, 5VDC, 100 - 240VAC, HK/AU

Chapter Descriptions

Topics covered in this guide are as follows:

- Getting Started provides a product overview, unpacking instructions, and cable connection information.
- Data Capture describes parts of the RFID imager, beeper and LED definitions, and how to use the imager to read tags.
- RFID User Preferences describes RFID preference features and provides programming barcodes for selecting these features.
- Maintenance, Technical Specifications, Troubleshooting provides information on how to care for the RFID imager, troubleshooting, and technical specifications.
- RFID Non-Parameter Attributes defines non-parameter attributes and how to use them for DS9908R readers.
- Numeric Barcodes includes the numeric barcodes to scan for parameters requiring specific numeric values.
- Parameter Defaults includes the defaults for all RFID parameters.

Notational Conventions

The following conventions are used in this document:

- 'DS9908R' refers to the DS9908 imager with RFID reading capability.
- **Bold** text is used to highlight the following:
  - Dialog box, window and screen names
  - Drop-down list and list box names
  - Check box and radio button names
  - Icons on a screen
  - Key names on a keypad
  - Button names on a screen.
- Bullets (•) indicate:
  - Action items
  - Lists of alternatives
  - Lists of required steps that are not necessarily sequential.
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

Related Documents and Software

The following documents provide more information about the DS9900 Series imager.

- DS9908 Hands-Free Imaging Scanner Product Reference Guide, p/n MN-003185-xx - provides detailed setup and programming information for the DS9908 imager.
- DS9908 Quick Start Guide, p/n MN-003189-xx, provides general information for getting started with the DS9908 imager, and includes basic set up and operation instructions.
- DS9908R Quick Start Guide, p/n MN-003342-xx - provides general information for getting started with the DS9908R imager, 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.
- Multicode Data Formatting and Preferred Symbol (MDF) User Guide, p/n MN-002895-xx, provides programming instructions for using MDF and Preferred Symbol on the DS9908 and DS9908R imagers.
- Plural Stage Programmer's Guide, p/n 72E-67113-xx, provides the barcodes necessary to program the DS9908 and DS9908R imagers to decode Plural Stage barcodes and enable Supplemental Recognition Characters.
- Toshiba TEC Programmer's Guide, p/n MN-002707-xx, provides the barcodes necessary to program the DS9908 and DS9908R imagers for the Toshiba TEC host.

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

Service Information

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

When contacting 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 email, telephone or fax within the time limits set forth in support agreements.

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

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

Provide Documentation Feedback

If you have comments, questions, or suggestions about this guide, send an email to EVM-Techdocs@zebra.com.

Getting Started

Introduction

The DS9908R builds off the DS9908 with the addition of an integrated UHF RFID reader/writer.

The DS9908R combines superior 1D and 2D barcode scanning, advanced imaging applications and superior RFID tag reading and transfer in a light-weight, hands-free/hand-held design. Its unique design offers the performance of a hands-free presentation imager and the flexibility of a hand-held. The DS9808R automatically switches between hands-free and hand-held modes seamlessly accommodating both presentation and hand-held triggered operation.

DS9908R for Retail

If you are already benefiting from RFID in your supply chain, you can close the RFID loop by capturing RFID-tagged merchandise at the POS with the RFID model. Checkouts are easier than ever, since associates can scan multiple items at once without line of sight. Capturing RFID tags provides the real-time inventory visibility needed for timely re-ordering and trending analysis.

In addition to reading RFID tags to complete a purchase, the DS9908R is capable of writing data to RFID tags - enabling staff to quickly commission tags on new inventory items and returned goods for faster processing.

DS9908R for Labs

Keep patients safe and avoid rising costs through effective lab management.

- Enhance productivity and work flow efficiency by enabling staff to spend more time on analysis and less time on capturing data.
- Improve patient safety by reducing the risk of misidentifying a sample.
- Improve traceability on time-sensitive blood samples by knowing when a sample was taken and when it is no longer usable.

Unpacking

Remove the imager from its packing and inspect it for damage. If the imager was damaged in transit, contact the Zebra Global Customer Support Center. See Service Information on page 12 for contact information. **KEEP THE PACKING**. It is the approved shipping container; use this to return the equipment for servicing.

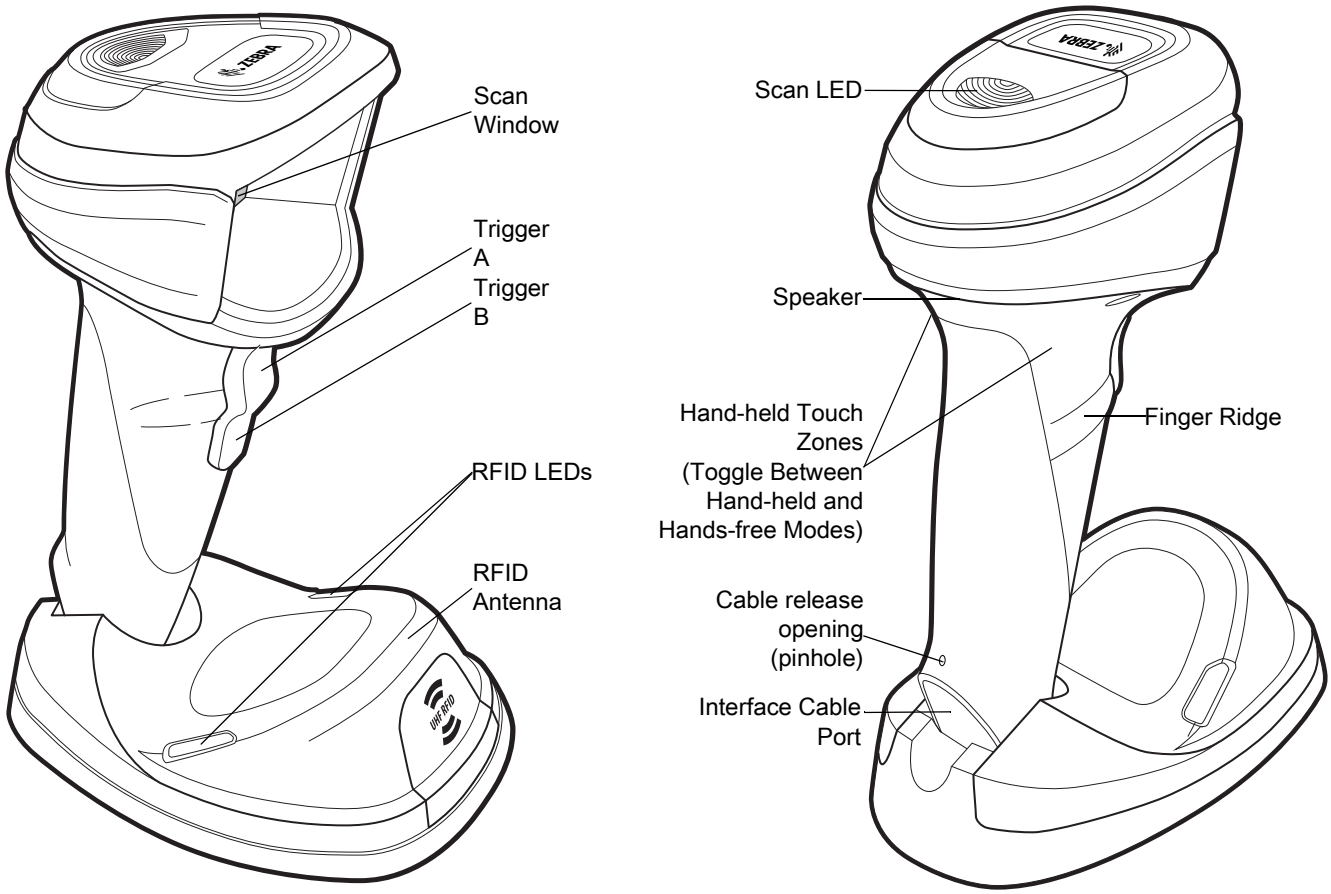
Interfaces

The DS9908R imager supports the following host interfaces. Refer to the DS9908 Hands-Free Imaging Scanner Product Reference Guide (p/n MN-003185-xx) for information about connecting host interfaces.

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

Features

Figure 1 Parts of the Imager



NOTE: The hand-held touch zones are touch sensitive areas that enable the imager to determine if it is sitting on the counter or picked up by the user. To activate the touch zones, fingers must be placed in the zone above the finger ridges on both sides of the imager. See Figure 5 on page 18 for proper finger placement.

Setting Up the Imager

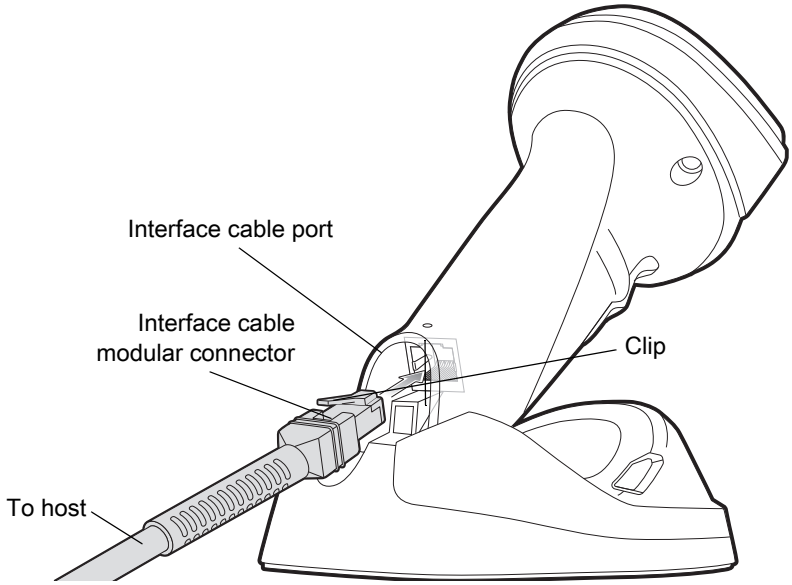
Inserting the Interface Cable

NOTE: Different hosts require different cables. The connectors illustrated in each host chapter are examples only. Connectors vary from those illustrated, but the steps to connect the imager are the same.

1. Plug the interface cable modular connector into the cable interface port on the bottom of the imager handle (see Figure 2). It is recommended to rotate/ratchet the imager all the way forward and then insert the cable.

IMPORTANT: If you already have existing non shielded cables from legacy products (such as the DS9808) they can be reused. However, be aware that the shielded cables provide improved ESD performance. For information about cables and cable compatibility, go to the Zebra Partner Portal at: https://partnerportal.zebra.com/PartnerPortal/product_services/downloads_z/barcode_scanners/Universal-Cable-Guide-Bar-Code-Scanners.xlsx.

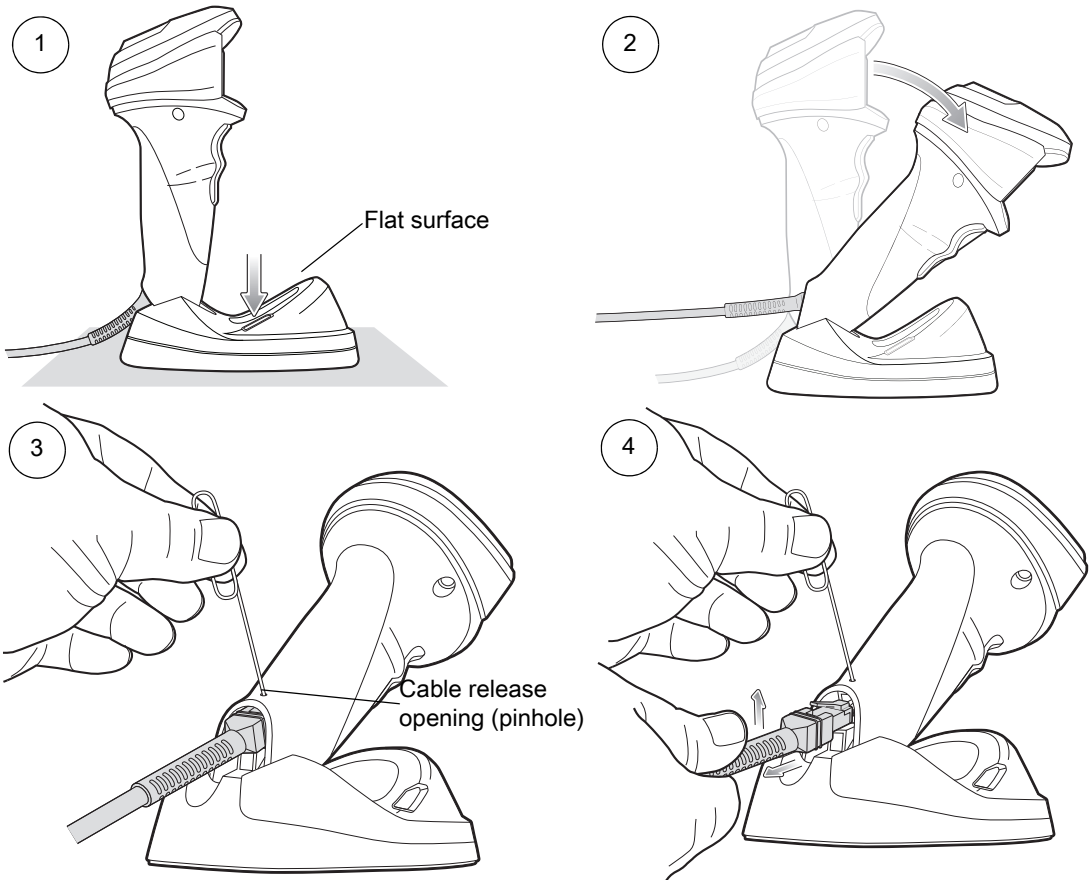
Figure 2 Inserting the Cable



2. Gently tug the cable to ensure the connector is secure.
3. Connect the other end of the interface cable to the host (see the specific host chapter for information on host connections).

Removing the Interface Cable

Figure 3 Removing the Cable



1. Place the imager on a flat surface.
2. Ratchet the imager all the way forward.
3. Insert a paper clip into the circular cable release opening (pinhole) to compress the modular connector clip.
4. Pull the cable/connector UP and OUT of the connection and carefully slide out the cable.
5. Follow the steps for Inserting the Interface Cable to connect a new cable.

Data Capture

Introduction

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

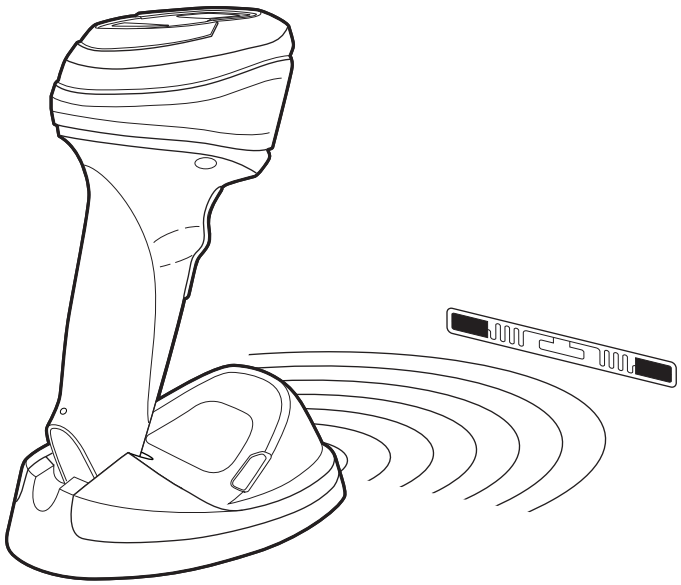
Reading RFID Tags

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

Hands-Free RFID

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

Figure 4 RFID in Hands-Free Mode



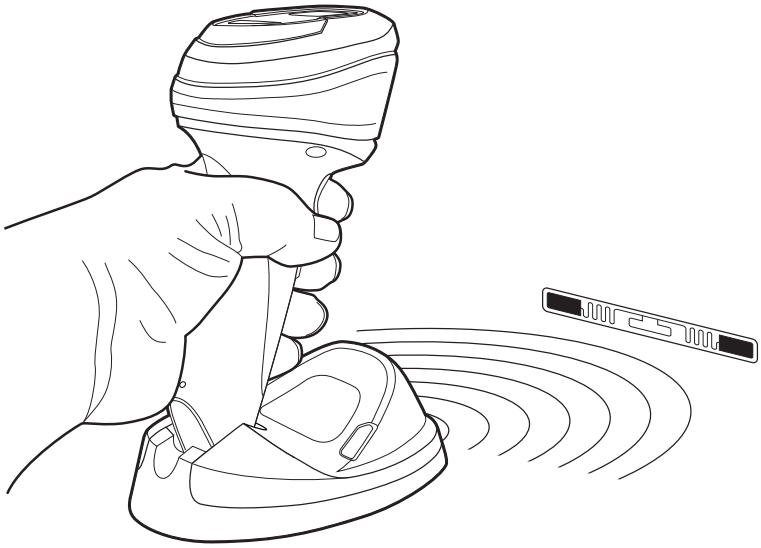
The imager beeps and the RFID LED momentarily turns off upon a tag read.

If the imager does not observe any new RFID tags within the RFID Hands-Free Idle Timeout on page 42, it reduces power consumption by polling for tags once a second.

Hand-Held RFID

In hand-held mode, there are two trigger switches for multifunction triggering. Scan the appropriate barcode to set the trigger mode (see Multifunction Mode Triggering on page 22). Press the appropriate trigger to scan a barcode or to read all RFID tags within the RF field of view. Release the trigger to stop reading tags.

Figure 5 RFID in Hand-Held Mode



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

RFID Reading Recommendations

- When holding the imager, 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 imager. While you can pass many items at a time by the imager, 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 imager is reading (as with barcode scanning).
- Never hold the RFID tag of the item the imager is reading. Instead, hold the item and let the tag hang free.
- Orient the tag toward the imager if it has difficulty reading the tag. Waving often helps.
- If all else fails, scan the item's barcode.

Speaker and LED Indicators

NOTE: Refer to the DS9908 Hands-Free Imaging Scanner Product Reference Guide, p/n MN-003185-xx, for the complete imager speaker and LED indications table that includes beeper and LED indications for standard use, image capture, parameter programming, host specific, and more.

In addition to beep sequences, the DS9908R uses a two-color LED in the head of the imager for barcode decode indications and two additional two-color LEDs in the base for the tag reading (RFID) indications. The LEDs in the base are synchronized and show the same information at the same time.

The imager uses a two-color LED to indicate status. One LED indicator is for system/decode indications and one is for RFID indications.

Table 4 defines the beep sequences and LED indicators for the DS9908R.

Table 4 Imager Speaker and LED Indications

Speaker Sequence	RFID LED	Indication
None	Green (solid)	LED on when RFID is active.
None	Green (slow blinking)	The reader is polling for new tags.
Medium/high (two tone) beeps	The Green LED flashes off momentarily when an RFID tag is read/reported.	An RFID tag was read/reported (if RFID read speaker is enabled).
High/medium/low/low beeps	Long red blink	Unexpected RFID indication or RFID error.
None	Short red blink	RFID module is not ready.
None	Solid red	RFID Country of Operation is not configured.

RFID Read Ranges

For all configurations of the DS9908R device the nominal read range is programmable up to ~18 in / ~45.7 cm.

NOTE: Several factors affect the read range of a passive ultrahigh-frequency (UHF) RFID system including the tag antenna's size and design, the amount of cable loss (a long cable between a reader and an antenna causes a loss of transmission energy) and environmental conditions, such as the presence of water or metal.

RFID User Preferences

Introduction

You can program the RFID reader to perform various functions, or activate different features. This chapter describes user preference features and provides programming barcodes for selecting these features for RFID models.

The reader ships with the settings shown in Table 5 on page 21 (also see Parameter Defaults for all defaults). If the default values suit requirements, programming is not necessary.

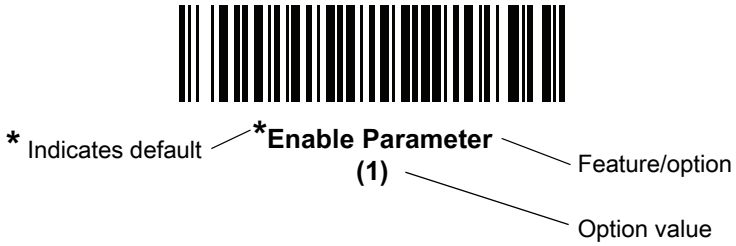
Setting Parameters

To set feature values, scan a single barcode or a short barcode sequence. The settings are stored in non-volatile memory and are preserved even when the imager powers down.

NOTE: Most computer monitors allow scanning barcodes directly on the screen. When scanning from the screen, be sure to set the document magnification to a level where you can see the barcode clearly, and bars and/or spaces do not merge.

If not using the default host, select the host type from the DS9908 Hands-Free Imaging Scanner Product Reference Guide (p/n MN-003185-xx) after the power-up beeps sound. This is only necessary upon the first power-up when connected to a new host.

To return all features to default values, see Parameter Defaults. Throughout the programming barcode menus, asterisks indicate (*) default values.



Scanning Sequence Examples

In most cases, scanning one barcode sets the parameter value. For example, to set the RFID beeper tone to high, scan the **High Tone** (beeper tone) barcode listed under RFID Beeper Tone on page 24. The reader issues a fast warble beep and the LED turns green, signifying a successful parameter entry.

Other parameters require scanning several barcodes. See the 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 User Preferences Parameter Defaults

Table 5 lists defaults for RFID user preferences parameters. Change these values in one of two ways:

- Scan the appropriate barcodes in this chapter. The new value replaces the standard default value in memory. To recall default parameter values, see Parameter Defaults.
- Configure the imager using the 123Scan configuration program. Refer to the DS9908 Hands-Free Imaging Scanner Product Reference Guide (p/n MN-003185-xx) for 123Scan information.

NOTE: See Parameter Defaults for all user preference, host, symbology, and miscellaneous default parameters.

Table 5 RFID User Preferences Parameter Defaults

Parameter	Parameter Number [1]	SSI Number [2]	Default	Page Number
RFID User Preferences				
Multifunction Triggering				
Trigger A	631	F1h 77h	Imager Decoding	23
Trigger B	632	F1h 78h	RFID Reading	23
Host Triggering	636	F1h 7Ch	Imager Decoding	24
RFID Beep Tone	639	F1h 7Fh	Medium to High Tone (2-Tone)	24
RFID Same Tag Timeout	640	F1h 80h	2 Seconds	27
RFID Automatic Presentation Mode	641	F1h 81h	Hands-Free Only	29
RFID Trigger Mode	642	F1h 82h	Continuous Re-Report	30
RFID Cache Management	1965	F8h 07h ADh	Flush by Group	31
RFID Data Transmission Format	643	F1h 83h	Raw	31
RFID Transmit Raw with PC Bytes	714	F1h CAh	Disable	36

1. Parameter number decimal values are used for programming via RSM commands.
2. SSI number hex values are used for programming via SSI commands.

Table 5 RFID User Preferences Parameter Defaults (Continued)

Parameter	Parameter Number [1]	SSI Number [2]	Default	Page Number
RFID Transmit Unknown Tag Data	709	F1h C5h	Transmit	37
RFID Antenna Selection	710	F1h C6h	Both	37
RFID Antenna Power in Hand-Held Mode	711	F1h C7h	Level 7	38
RFID Antenna Power in Hands-Free Mode	712	F1h C8h	Level 4	40
RFID Hands-Free Idle Timeout	713	F1h C9h	5 Minutes	42
RFID Country of Operation	1583	F8h 06h 2Fh	No Region Set	44

1. Parameter number decimal values are used for programming via RSM commands.
2. SSI number hex values are used for programming via SSI commands.

RFID User Preferences

Multifunction Mode Triggering

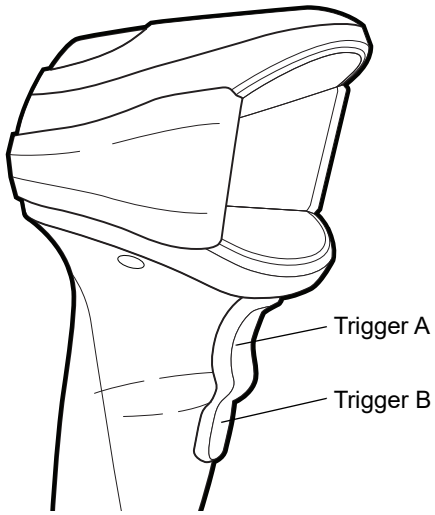
You can set trigger options for each of the imager's trigger positions. For example, set Trigger A to imager decoding and set Trigger B to RFID reading.

The default setting for Trigger A is imager decoding; the default for Trigger B is RFID reading.

Select one of the following functions for each trigger (A and B) using the barcodes on the next few pages:

- **Imager Decoding** - Programs the trigger to decode using the imager engine.
- **RFID Reading** - Programs the trigger to read RFID tags with the RFID engine.
- **Imager Plus RFID** - Programs the trigger to decode using the imager engine and read RFID tags with the RFID engine.

Figure 6 Trigger Locations



Trigger A

Parameter # 631

SSI # F1h 77h

***Imager Decoding**
(1)

RFID Reading
(2)

Imager Plus RFID
(3)

Trigger B

Parameter # 632

SSI # F1h 78h

Imager Decoding
(1)

***RFID Reading**
(2)

Imager Plus RFID
(3)

Host Triggering

Parameter # 636

SSI # F1h 7Ch

Set an option for host-initiated triggering:

- **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 RFID reader to read RFID tags.

***Imager Decoding**
(1)

RFID Reading
(2)

Imager Plus RFID
(3)

RFID Beeper Tone

Parameter # 639

SSI # F1h 7Fh

Scan one of the following barcodes to select a beep tone for audible feedback indicating a good decode. Select from the Standard Beep Tones below or from the Special Tones on page 26.

Scan **Disable Beep Tone** below to disable all tones.

Disable Beep Tone
(3)

Standard Beep Tones

Low Tone
(2)

Medium Tone
(1)

High Tone
(0)

***Medium to High Tone (2-Tone)**
(4)

Special Tones

Wood Block / Tone 1
(6)

Pulse / Tone 2
(7)

Chime / Tone 3
(8)

Zap / Tone 4
(9)

Triple Beep / Tone 5
(10)

User Programmable / Tone 6
(11)

Note: Refer to the DS9908 Hands-Free Imaging Scanner Product Reference Guide to download a custom tone.

RFID Same Tag Timeout

Parameter # 640

SSI # F1h 80h

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

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

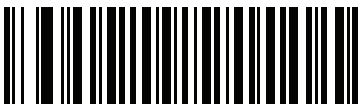
Disable
(00h)

***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 # 641

SSI # F1h 81h

Select one of the following options to configure the imager to continuously read tags (presentation mode) when you place the imager on the counter-top (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 # 642

SSI # F1h 82h

NOTE: To program the trigger for various functions, including RFID, see Multifunction Mode Triggering on page 22 and Host Triggering on page 24.

In hand-held operation, this parameter controls the behavior of a trigger programmed for RFID reading. When the trigger is pulled, the tag cache is maintained so that the tags are not re-reported during presentation mode (if enabled) after releasing the trigger. Each tag is reported once during a trigger session (while the trigger is pulled).

Key:

- Reading a tag - A tag is detected by the RFID antenna.
- Tag Cache - Scanner memory where tag data is temporarily stored after being read.
- Reporting a tag - The tag data is transmitted to the host.

Read types:

- Continuous - When the trigger is pulled the reader reads all tags within range and does not report tags already read.
- Continuous Re-Report - When the trigger is pulled the reader reads all tags within range and reports each tag once within this trigger session, regardless of whether it already reported it during a previous session.
- Continuous Flush - When the trigger is pulled the reader flushes the tag cache, reads all tags within range, and reports them as new tags.
- Single Tag Read - When the trigger is pulled the reader reads and reports only one tag and reports this tag once within this trigger session, regardless of whether it already reported it during a previous session. Once a single tag is read, the trigger session is terminated. Only one tag is expected to be seen. If more than one tag is present, an RFID error indication is given instead.

Continuous
(0)

***Continuous Re-Report**
(2)

Continuous Flush
(3)

Single Tag
(1)

RFID Cache Management

Parameter #1965

SSI # F8h 07h ADh

When configured for **Flush by Group**, the cache is cleared after all the tags in the group leave the reading range for the duration of the RFID Same Tag Timeout. When configured for **Flush by Individual**, the cache is cleared after a single tag leaves the reading range for the duration for the RFID Same Tag Timeout.

*** Flush by Group (1)**

Flush by Individual (0)

RFID Data Transmission Format

Parameter # 643

SSI # 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 barcode (as per the GS1 EPC Tag Data Standard version 1.11 available at www.gs1.org/standards/epcrfid-epcis-id-keys/epc-rfid-tds/1-11 or www.gs1.org/sites/default/files/docs/epc/GS1_EPC_TDS_i1_11.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 EPC Tag Data Standard version 1.11.

See Table 6, Table 7, and Table 8 for transmission format details for the various tag types, and samples for each. For more information, refer to EPC Tag Data Standard version 1.11.

RFID Data Transmission Format (continued)

***Raw**
(00h)

GS1-128
(01h)

EPC URI
(02h)

Table 6 GS1-128 Transmission Details by EPC Tag Type

EPC Tag Type	Transmission Format
GID	N/A
SGTIN	(01) GTIN (21) Serial Number
SSCC	(00) SSCC
SGLN	(414) GLN (254) GLN-Extension
GRAI	(8003) GRAI Serial Number
GIAI	(8004) GIAI Serial Number
GSRN	(8018) GSRN - Recipient
GSNRP	(8018) GSRN – Service Provider
GDTI	(253) GDTI
CPI	(8010) Company + Part (8011) Serial Number
SGCN	(255) GCN Serial Number
ITIP	(8006) GTIN Piece Total (21) Serial Number
US DoD	N/A
ADI	N/A
Unknown	N/A

Table 7 EPC-URI Transmission Details by EPC Tag Type

EPC Tag Type	Transmission Format
GID	urn:epc:tag:gid-96:<generalMngr>.<objectClass>.<serno>
SGTIN-96	urn:epc:tag:sgtin-96:<filter>.<company>.<itemRef>.<serialNumber>
SGTIN-198	urn:epc:tag:sgtin-198:<filter>.<company>.<itemRef>.<serialNumber>
SSCC	urn:epc:tag:sscc-96:<filter>.<companyPrefix>.<serialReference>
SGLN-96	urn:epc:tag:sgln-96:<filter>.<companyPrefix>.<locationReference>.<extention>
SGLN-195	urn:epc:tag:sgln-195:<filter>.<companyPrefix>.<locationReference>.<extention>
GRAI-96	urn:epc:tag:grai-96:<filter>.<companyPrefix>.<assetType>.<serialNumber>
GRAI-170	urn:epc:tag:grai-170:<filter>.<companyPrefix>.<assetType>.<serialNumber>
GIAI-96	urn:epc:tag:giai-96:<filter>.<companyPrefix>.<individulAssetReference>
GIAI-202	urn:epc:tag:giai-202:<filter>.<companyPrefix>.<individulAssetReference>
GSRN	urn:epc:tag:gsrn-96:<filter>.<companyPrefix>.<serviceReference>
GSRNP	urn:epc:tag:gsrnp-96:<filter>.<companyPrefix>.<serviceReference>
GDTI-96	urn:epc:tag:gdti-96:<filter>.<companyPrefix>.<documentType>.<serialNumber>
GDTI-174	urn:epc:tag:gdti-174:<filter>.<companyPrefix>.<documentType>.<serialNumber>
CPI-96	urn:epc:tag:cpi-96:<filter>.<companyPrefix>.<partReference>.<serialNumber>
CPI-VAR	urn:epc:tag:cpi-var:<filter>.<companyPrefix>.<partReference>.<serialNumber>
SGCN-96	urn:epc:tag:sgcn-96:<filter>.<companyPrefix>.<coupontReference>.<serialNumber>
US DoD	urn:epc:tag:usdod-96:<filter>.<govManagedID>.<serialNumber>
ADI-VAR	urn:epc:tag:adi-var:<filter>.<govManagedID>.<partNumber>.<serialNumber>
ITIP-110	urn:epc:tag:itip-110:<filter>.<companyPrefix>.<itemRef>.<piece>.<total>.<serialNumber>
ITIP-212	urn:epc:tag:itip-212:<filter>.<companyPrefix>.<itemRef>.<piece>.<total>.<serialNumber>
Unknown	urn:epc:tag:raw:BitLength.Value
Unknown (non-EPC)	urn:epc:raw:BitLength.AFI.Value

Examples

Table 8 Transmission Format Examples

EPC Tag Type	Format	Example
GID	Raw	3500004D20004D20000004D2
	GS1-128	N/A
	EPC-URI	urn:epc:tag:gid-96:1234.1234.1234
Note: Parentheses appear in examples only for readability.		

Table 8 Transmission Format Examples (Continued)

EPC Tag Type	Format	Example
SGTIN-96	Raw	3018789004B5A1C0499602D2
	GS1-128	(01)11234562345675(21)1234567890
	EPC-URI	urn:epc:tag:sgtin-96:0.123456.1234567.1234567890
SGTIN-198	Raw	3674257BF6B7A659B2C2BF10000000000000000000000000000000
	GS1-128	(01) 70614141123451 (21) 32a/b
	EPC-URI	urn:epc:tag:sgtin-198:3.0614141.712345.32a%2Fb
SSCC	Raw	310C75BCD150BC614E000000
	GS1-128	(00)112345678923456787
	EPC-URI	urn:epc:tag:sscc-96:0.123456789.12345678
SGLN-96	Raw	320C0BC614E0180000003039
	GS1-128	(414)0123456780125(254)12345
	EPC-URI	urn:epc:tag:sgln-96:0.012345678.012.12345
SGLN-195	Raw	3974257BF46072CD9615F8800000000000000000000000000000
	GS1-128	(414) 0614141123452 (254) 32a/b
	EPC-URI	urn:epc:tag:sgln-195:3.0614141.12345.32a%2Fb
GRAI-96	Raw	33180C0E400C0E4000003039
	GS1-128	(8003)0012345012345412345
	EPC-URI	urn:epc:tag:grai-96:0.012345.012345.12345
GRAI-170	Raw	3774257BF40C0E59B2C2BF100000000000000000000
	GS1-128	(8003) 0061414112345232a/b
	EPC-URI	urn:epc:tag:grai-170:3.0614141.12345.32a%2Fb
GIAI-96	Raw	3400001D6F345400075BCD15
	GS1-128	(8004)000123456789123456789
	EPC-URI	urn:epc:tag:giai-96:0.000123456789.123456789
GIAI-202	Raw	3874257BF59B2C2BF1000000000000000000000000000000000000
	GS1-128	(8004) 061414132a/b
	EPC-URI	urn:epc:tag:giai-202:3.0614141.32a%2Fb
GSRN	Raw	2D00001D6F345404D2000000
	GS1-128	(8018)000123456789012343
	EPC-URI	urn:epc:tag:gsrn-96:0.000123456789.01234

Note: Parentheses appear in examples only for readability.

Table 8 Transmission Format Examples (Continued)

EPC Tag Type	Format	Example
GDTI-96	Raw	2C180C0E4060720000003039
	GS1-128	(253)012345012345412345
	EPC-URI	urn:epc:tag:gdti-96:0.012345.012345.12345
GDTI-174	Raw	3E74F4E4E7039B061438997367D0C18B266D1AB66EE0
	GS1-128	(253) 4012345987652ABCDefgh012345678
	EPC-URI	urn:epc:tag:gdti-174:3.4012345.98765.ABCDefgh012345678
CPI-96	Raw	3C74257BF400C0E680003039
	GS1-128	(8010) 061414198765 (8011) 12345
	EPC-URI	urn:epc:tag:cpi-96:3.0614141.98765.12345
CPI-VAR	Raw	3D74257BF75411DEF6B4CC00000003039
	GS1-128	(8010) 06141415PQ7/Z43 (8011) 12345
	EPC-URI	urn:epc:tag:cpi-var:3.0614141.5PQ7%2FZ43.12345
SGCN-96	Raw	3F74F4E4E612640000019907
	GS1-128	(255) 401234567890104711
	EPC-URI	urn:epc:tag:sgcn-96:3.4012345.67890.04711
US DoD	Raw	2F0414243313233000003039
	GS1-128	N/A
	EPC-URI	urn:epc:tag:usdod-96:0.ABC123.12345
ADI-VAR	Raw	3B0E0CF5E76C9047759AD00373DC7602E7200
	GS1-128	N/A
	EPC-URI	urn:epc:tag:adi-var:3.35962.PQ7VZ4.M37GXB92
ITIP-110	Raw	4074F4E4E40C0E40820000000F6C
	GS1-128	(8006) 040123451234560102 (21) 987
	EPC-URI	urn:epc:tag:itip-110:3.4012345.012345.01.02.987
ITIP-212	Raw	4174F4E4E40C0E4082DBDD8B3660000000000000000000000000000000
	GS1-128	(8006) 040123451234560102 (21) mw133
	EPC-URI	urn:epc:tag:itip-212:3.4012345.012345.01.02.mw133
Unknown	Raw	1234567890ABCDEF01234567
	GS1-128	N/A
	EPC-URI	urn:epc:raw:96.x1234567890ABCDEF01234567
Note: Parentheses appear in examples only for readability.		

Table 8 Transmission Format Examples (Continued)

EPC Tag Type	Format	Example
Unknown (non-EPC)	Raw with PC Bytes	31231234567890ABCDEF00000002
	EPC-URI	urn:epc:raw:96.x23.x1234567890ABCDEF00000002
Note: Parentheses appear in examples only for readability.		

RFID Transmit Raw with PC Bytes

Parameter # 714

SSI # 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 1.11 available at: www.gs1.org/standards/epcrfid-epcis-id-keys/epc-rfid-tds/1-11 or www.gs1.org/sites/default/files/docs/epc/GS1_EPC_TDS_i1_11.pdf, section 9.1 Gen 2 Tag Memory Map.

Enable
(01h)

***Disable**
(00h)

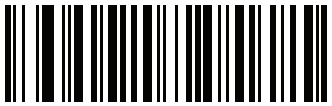
RFID Transmit Unknown Tag Data

Parameter # 709

SSI # F1h C5h

When transmitting RFID tags in GS1-128 format, if the imager 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
(0)



***Transmit in Raw Format**
(1)

RFID Antenna Selection

Parameter # 710

SSI # F1h C6h

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

***Both**
(0)

Horizontal
(1)

Vertical
(2)

RFID Antenna Power in Hand-Held Mode

Parameter # 711

SSI # F1h C7h

This parameter controls the antenna RF power when operated in hand-held mode. Table 9 and Table 10 list 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 9 Antenna Power (dBM) in Hand-Held Mode - EU

Level	Range (% of Baseline)	Horizontal Power (dBm)	Vertical Power (dBm)
1	13%	4	5
2	25%	6	7
3	38%	8	9
4	50%	11	11
5	63%	13	13
6	75%	15	16
*7	88%	18	18
8	100%	21	21
*** Hand-Held Default**			

Table 10 Antenna Power (dBM) in Hand-Held Mode - NA

Level	Range (% of Baseline)	Horizontal Power (dBm)	Vertical Power (dBm)
1	13%	3	4
2	25%	5	6
3	38%	7	8
4	50%	10	10
5	63%	13	12
6	75%	15	14
*7	88%	17	16
8	100%	22	21
*** Hand-Held Default**			

NOTE: Baseline can vary depending on environment, tag sensitivity, and orientation.

RFID Antenna Power in Hand-Held Mode (continued)

Level 1
(1)

Level 2
(2)

Level 3
(3)

Level 4
(4)

Level 5
(5)

Level 6
(6)

***Level 7**
(7)

Level 8
(8)

RFID Antenna Power in Hands-Free Mode

Parameter # 712

SSI # F1h C8h

This parameter controls the antenna RF power when operated in hands-free mode. Table 11 and Table 12 list 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 11 Antenna Power (dBM) in Hands-Free Mode - EU

Level	Range (% of Baseline)	Horizontal Power (dBm)	Vertical Power (dBm)
1	13%	4	5
2	25%	6	7
3	38%	8	9
*4	50%	11	11
5	63%	13	13
6	75%	15	16
7	88%	18	18
8	100%	21	21
*** Hands-Free Default**			

Table 12 Antenna Power (dBM) in Hands-Free Mode - NA

Level	Range (% of Baseline)	Horizontal Power (dBm)	Vertical Power (dBm)
1	13%	3	4
2	25%	5	6
3	38%	7	8
*4	50%	10	10
5	63%	13	12
6	75%	15	14
7	88%	17	16
8	100%	22	21
*** Hands-Free Default**			

NOTE: Baseline can vary depending on environment, tag sensitivity, and orientation.

RFID Antenna Power in Hands-Free Mode (continued)

Level 1
(1)

Level 2
(2)

Level 3
(3)

***Level 4**
(4)

Level 5
(5)

Level 6
(6)

Level 7
(7)

Level 8
(8)

RFID Hands-Free Idle Timeout

Parameter # 713

SSI # F1h C9h

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

Disable
(0)

2 Seconds
(2)

10 Seconds
(10)

15 Seconds
(11)

30 Seconds
(13)

1 Minute
(17)

RFID Hands-Free Idle Timeout (continued)

***5 Minutes**
(21)

15 Minutes
(27)

1 Hour
(33)

RFID Country of Operation

Parameter # 1583

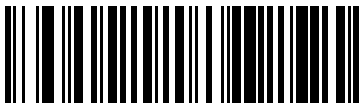
SSI # F8h 06h 2Fh

IMPORTANT: **RFID CANNOT operate until you scan a country of operation below. This is the country in which the product is used.**

For special fixed configuration, such as India, Japan, and Israel, this option does not need to be configured (changes will be ignored).

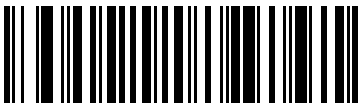
The RFID reader could be configured to operate in various countries using the options below. By default, the Country of Operation is set to No Region Set (0).

See Table 13 for the regions supported by each DS9908R configuration.



***No Region Set**

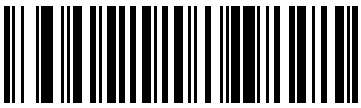
(0)



American Virgin Islands

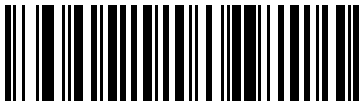
(56)

Anguilla
(108)



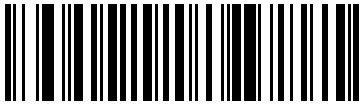
Argentina
(3)

RFID Country of Operation (Continued)



Australia
(4)

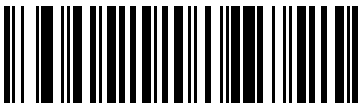
Austria
(62)



Bangladesh
(5)

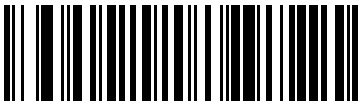
Barbados
(109)

Belarus
(105)

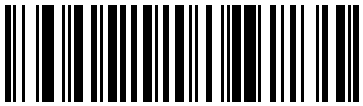


Belgium
(65)

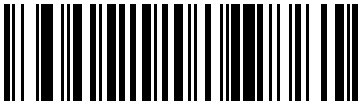
RFID Country of Operation (Continued)



Bolivia
(7)

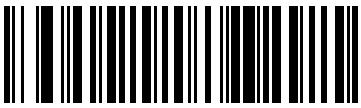


Bosnia and Herzegovina
(8)

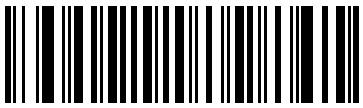


Brazil
(9)

British Virgin Islands
(107)

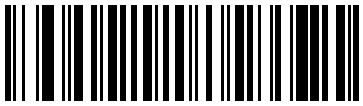


Bulgaria
(66)



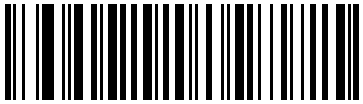
Canada
(10)

RFID Country of Operation (Continued)

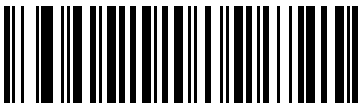


Cambodia
(11)

Cayman Islands
(110)

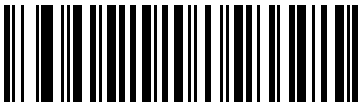


Chile
(12)



China
(13)

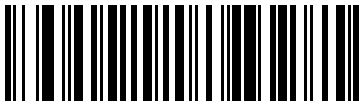
Christmas Island
(111)



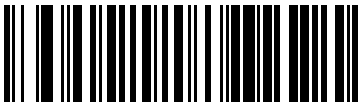
Colombia
(14)

Costa Rica
(67)

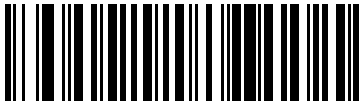
RFID Country of Operation (Continued)



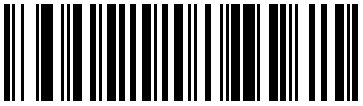
Croatia
(68)



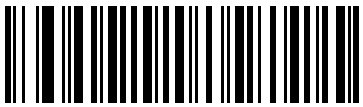
Cyprus
(69)



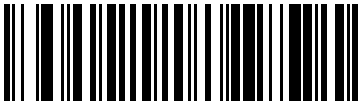
Czech Republic
(70)



Denmark
(71)



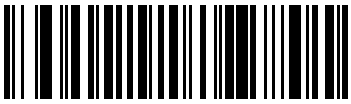
Dominican Republic
(15)



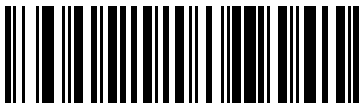
Ecuador
(16)

Egypt
(72)

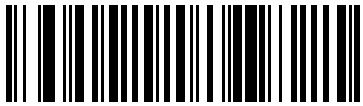
RFID Country of Operation (Continued)



El Salvador
(17)



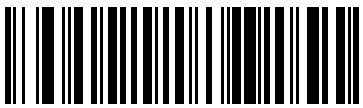
Estonia
(73)



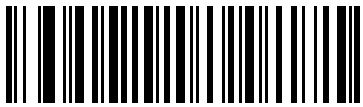
ETSI 302.208 Compliant Generic
(57)

Falklands Islands
(112)

French Guiana
(113)

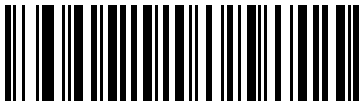


Great Britain (UK)
(18)



FCC Part-16 Compliant Generic
(58)

RFID Country of Operation (Continued)



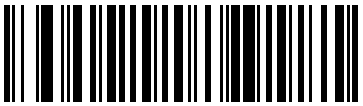
Finland
(74)

France
(75)

Germany
(77)

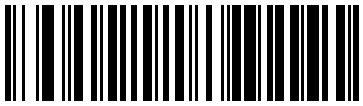
Greece
(78)

Guadeloupe
(114)



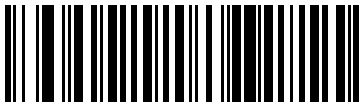
Guam
(20)

RFID Country of Operation (Continued)

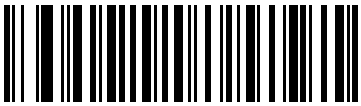


Guatemala
(19)

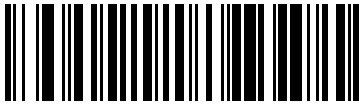
Honduras
(115)



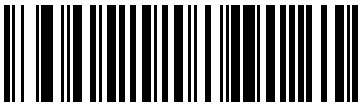
Hong Kong
(21)



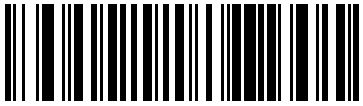
Hungary
(79)



Iceland
(80)

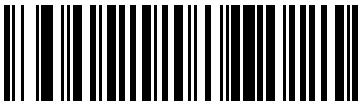


Indonesia
(23)



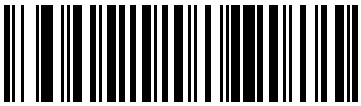
Ireland
(81)

RFID Country of Operation (Continued)



Italy
(82)

Jamaica
(116)



Japan
(24)

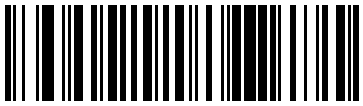
Kazakhstan
(84)

Latvia
(86)

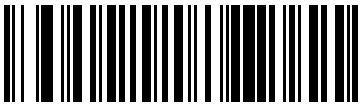
Lebanon
(117)

Liechtenstein
(106)

RFID Country of Operation (Continued)

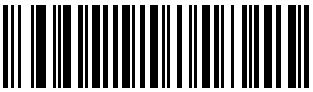


Lithuania
(87)

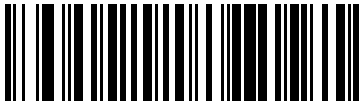


Luxembourg
(88)

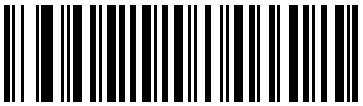
Macedonia
(29)



Macau
(28)



Malta
(89)

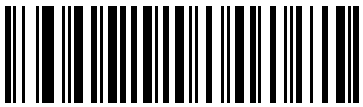


Malaysia
(30)

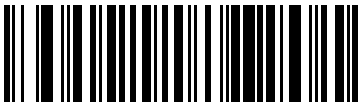
Mariana Islands
(118)

RFID Country of Operation (Continued)

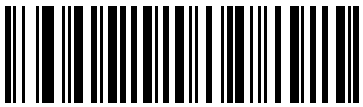
Martinique
(119)



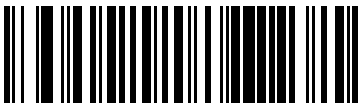
Mexico
(31)



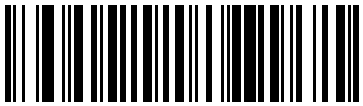
Montenegro
(33)



Netherlands
(90)



New Zealand EU
(35)



New Zealand FCC
(34)

Nicaragua
(120)

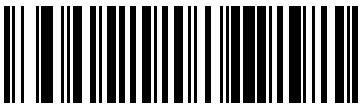
RFID Country of Operation (Continued)

Niue Islands EU
(122)

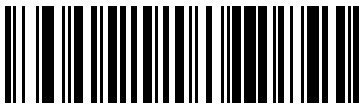
Niue Islands US
(121)

Norfolk Islands
(123)

Norway
(91)



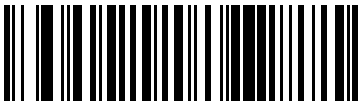
Pakistan
(36)



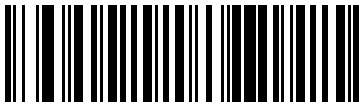
Panama
(37)

Paraguay
(38)

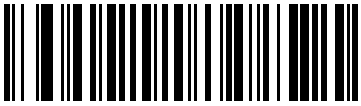
RFID Country of Operation (Continued)



Peru
(39)

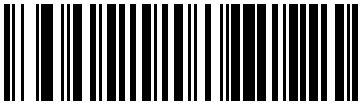


Philippines
(40)

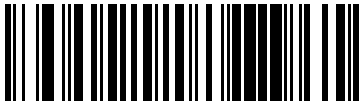


Poland
(93)

Portugal
(94)

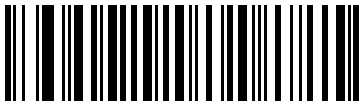


Puerto Rico
(41)



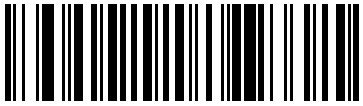
Romania
(96)

RFID Country of Operation (Continued)



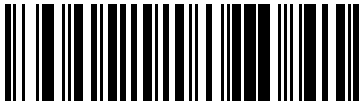
Russia
(42)

Saudi Arabia
(43)

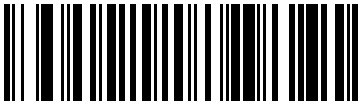


Serbia
(97)

Singapore
(44)

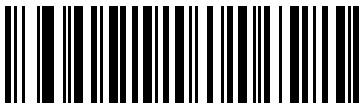


Slovakia
(98)

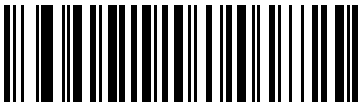


Slovenia
(99)

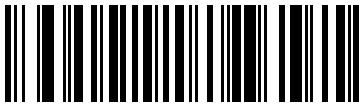
RFID Country of Operation (Continued)



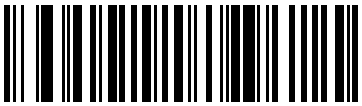
South Africa
(45)



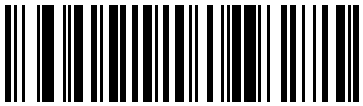
South Korea
(46)



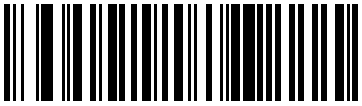
Spain
(100)



Sweden
(101)

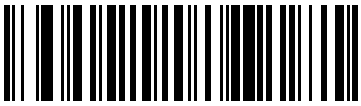


Switzerland
(102)



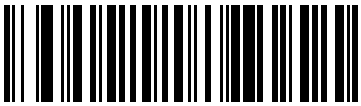
Taiwan
(48)

RFID Country of Operation (Continued)

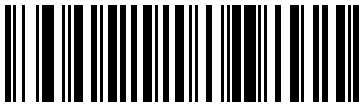


Thailand
(49)

Trinidad and Tobago
(124)

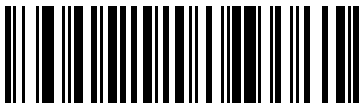


Turkey
(50)



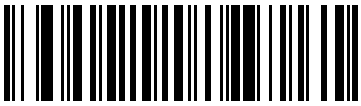
UAE
(51)

Ukraine
(104)

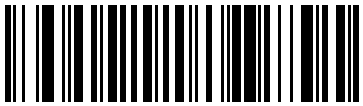


United States
(52)

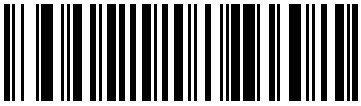
RFID Country of Operation (Continued)



Uruguay (53)



Venezuela (54)



Vietnam (55)

Table 13 Region Support

Region	Parameter Value	Europe	United States
No Region	0	No	No
Argentina	3	No	Yes
Australia	4	No	Yes
Bangladesh	5	No	Yes
Bhutan	6	Yes	No
Bolivia	7	No	Yes
Bosnia and Herzegovina	8	Yes	No
Brazil	9	No	Yes
Canada	10	No	Yes
Cambodia	11	Yes	No
Chile	12	No	Yes
China	13	No	Yes
Colombia	14	No	Yes
Dominican Republic	15	No	Yes
Ecuador	16	No	Yes

Table 13 Region Support (Continued)

Region	Parameter Value	Europe	United States
El Salvador	17	No	Yes
Great Britain (UK)	18	Yes	No
Guatemala	19	No	Yes
Guam	20	No	Yes
Hong Kong	21	No	Yes
Indonesia	23	No	Yes
Japan	24	No	No
Macau	28	No	Yes
Macedonia	29	Yes	No
Malaysia	30	No	Yes
Mexico	31	No	Yes
Montenegro	33	Yes	No
New Zealand FCC	34	No	Yes
New Zealand EU	35	Yes	No
Pakistan	36	Yes	No
Panama	37	No	Yes
Paraguay	38	No	Yes
Peru	39	No	Yes
Philippines	40	No	Yes
Puerto Rico	41	No	Yes
Russia	42	Yes	No
Saudi Arabia	43	Yes	No
Singapore	44	No	Yes
South Africa	45	Yes	No
South Korea	46	No	Yes
Taiwan	48	No	Yes
Thailand	49	No	Yes
Turkey	50	Yes	No
UAE	51	Yes	No
United States	52	No	Yes
Uruguay	53	No	Yes

Table 13 Region Support (Continued)

Region	Parameter Value	Europe	United States
Venezuela	54	No	Yes
Vietnam	55	No	Yes
American Virgin Islands	56	No	Yes
ETSI (302.208 compliant generic)	57	Yes	No
FCC Part-16 compliant generic	58	No	Yes
Israel	59	No	No
Austria	62	Yes	No
Belgium	65	Yes	No
Bulgaria	66	Yes	No
Costa Rica	67	No	Yes
Croatia	68	Yes	No
Cyprus	69	Yes	No
Czech Republic	70	Yes	No
Denmark	71	Yes	No
Egypt	72	Yes	No
Estonia	73	Yes	No
Finland	74	Yes	No
France	75	Yes	No
Germany	77	Yes	No
Greece	78	Yes	No
Hungary	79	Yes	No
Iceland	80	Yes	No
Ireland	81	Yes	No
Italy	82	Yes	No
Kazakhstan	84	Yes	No
Latvia	86	Yes	No
Lithuania	87	Yes	No
Luxembourg	88	Yes	No
Malta	89	Yes	No
Netherlands	90	Yes	No
Norway	91	Yes	No

Table 13 Region Support (Continued)

Region	Parameter Value	Europe	United States
Poland	93	Yes	No
Portugal	94	Yes	No
Romania	96	Yes	No
Serbia	97	Yes	No
Slovakia	98	Yes	No
Slovenia	99	Yes	No
Spain	100	Yes	No
Sweden	101	Yes	No
Switzerland	102	Yes	No
Ukraine	104	Yes	No
Belarus	105	Yes	No
Liechtenstein	106	Yes	No
British Virgin Islands	107	Yes	No
Anguilla	108	No	Yes
Barbados	109	No	Yes
Cayman Islands	110	No	Yes
Christmas Island	111	No	Yes
Falklands Islands	112	Yes	No
French Guiana	113	Yes	No
Guadeloupe	114	Yes	No
Honduras	115	No	Yes
Jamaica	116	No	Yes
Lebanon	117	Yes	No
Mariana Islands	118	No	Yes
Martinique	119	Yes	No
Nicaragua	120	No	Yes
Niue Islands US	121	No	Yes
Niue Islands EU	122	Yes	No
Norfolk Islands	123	No	Yes
Trinidad and Tobago	124	No	Yes

Maintenance, Technical Specifications, Troubleshooting

Introduction

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

Maintenance

Known Harmful Ingredients

The following chemicals are known to damage the plastics on Zebra scanners and should not come in contact with the device:

- Acetone
- Ammonia solutions
- Aqueous or alcoholic alkaline solutions
- Aromatic and chlorinated hydrocarbons
- Benzene
- Carbolic acid
- Compounds of amines or ammonia
- Ethanolamine
- Ethers
- Ketones
- TB-lysoform
- Toluene
- Trichloroethylene.

Approved Cleaners for the Scanner

- Isopropyl alcohol 70% (including pre-moistened wipes).

Cleaning the Scanner

- Routinely cleaning the exit window is required. A dirty window may affect scanning accuracy. Do not allow any abrasive material to touch the window.

To clean the scanner:

1. Dampen a soft cloth with one of the approved cleaning agents listed above or use pre-moistened wipes.
2. Gently wipe all surfaces, including the front, back, sides, top and bottom. Never apply liquid directly to the scanner. Be careful not to let liquid pool around the scanner window, trigger, cable connector or any other area on the device.
3. Be sure to clean the trigger and in between the trigger and the housing (use a cotton-tipped applicator to reach tight or inaccessible areas).
4. Do not spray water or other cleaning liquids directly into the exit window.
5. Wipe the scanner exit window with a lens tissue or other material suitable for cleaning optical material such as eyeglasses.
6. Immediately dry the scanner window after cleaning with a soft non-abrasive cloth to prevent streaking.
7. Allow the unit to air dry before use.
8. Scanner connectors:
   a. Dip the cotton portion of a cotton-tipped applicator in isopropyl alcohol.
   b. Rub the cotton portion of the cotton-tipped applicator back-and-forth across the connector on the Zebra scanner at least 3 times. Do not leave any cotton residue on the connector.
   c. Use the cotton-tipped applicator dipped in alcohol to remove any grease and dirt near the connector area.
   d. Use a dry cotton tipped applicator and rub the cotton portion of the cotton-tipped applicator back-and-forth across the connectors at least 3 times. Do not leave any cotton residue on the connectors.

Troubleshooting

NOTE: If after performing these checks the imager still experiences problems, contact the distributor or call Zebra support.

Table 14 Troubleshooting

Problem	Possible Causes	Possible Solutions
Imager emits 4 short high beeps during read attempt.	Imager has not completed USB initialization.	Wait several seconds and read again.
Imager reads the tag, but does not transmit the data to the host.	Imager is not programmed for the correct host type.	Scan the appropriate host type programming barcode. Refer to the DS9908 Hands-Free Imaging Scanner Product Reference Guide, p/n MN-003185-xx
	Interface cable is loose.	Re-connect the cable.
	If the imager emits 4 long low beeps, a transmission error occurred.	Set the imager's communication parameters to match the host's setting.

Table 14 Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
Host displays tag data incorrectly.	Imager is not programmed to work with the host.	Scan the appropriate host type programming barcode.
		For RS-232, set the imager's communication parameters to match the host's settings.
		For a keyboard wedge configuration, program the system for the correct keyboard type, and turn off the CAPS LOCK key.

Technical Specifications for the DS9908R

For a complete list of specifications, refer to the DS9908 Hands-Free Imaging Scanner Product Reference Guide, p/n MN-003185-xx.

Table 15 Technical Specifications

Item	Description
Physical Characteristics	
Dimensions	8.0 in. H x 3.9 in. W x 5.75 in. D 20.3 cm H x 9.9 cm W x 14.6 cm D
Weight	14.8 oz./420.0 g
Input Voltage Range	4.5 to 5.5 VDC Host Powered; 4.5 to 5.5 VDC External Power Supply
Operating current at nominal voltage (5.0V):	400 mA (typical)
Standby current (idle) at nominal voltage (5.0V)	135 mA (typical)
Data Capture Options	1D and 2D barcodes, RFID tags
Color	Midnight Black
Supported Host Interfaces	RS232, Keyboard Wedge, TGCS (IBM), 46XX over RS485
Keyboard Support	Supports over 90 international keyboards
Electronic Article Surveillance	Compatible with Checkpoint EAS deactivation system
User Indicators	Direct Decode Indicator, Good Decode LEDs, Speaker (adjustable tone and volume)
RFID Performance Characteristics	
RFID Engine	Zebra Proprietary Radio Technology

Table 15 Technical Specifications (Continued)

Item	Description
Nominal Read Range	~18 in. / ~45.7 cm
Frequency Range US	902 - 928 MHz
Frequency Range EU	865 - 868 MHz
Frequency Range JA	916 - 923 MHz
Standards Supported (Tag Type)	EPC Class 1 Gen2; EPC Gen2 V2; ISO-18000-63
RFID Power Output	3 dBm to 22 dBm
Environmental	
Operating Temperature	32º F to 122º F / 0º C to 50º C
Storage Temperature	-40.0° to 158.0° F / -40.0° to 70.0° C
Drop Specification	Designed to withstand multiple drops at 4.0 ft./1.2 m to concrete
Tumble Specification	Designed to withstand 2,000 tumbles in 1.5 ft. /0.5 m tumbler Note: 1 tumble = 0.5 cycles
Environmental Sealing	IP42
Humidity	5% to 95%, non-condensing
Ambient Light Immunity	0 to 10,000 Foot Candles / 0 to 107,600 Lux

RFID Non-Parameter Attributes

Introduction

This chapter defines non-parameter attributes and how to use them for DS9908R readers.

Attributes

RFID LAST TAG ID

Attribute #35001

The EPC tag ID of the last tag reported (size-encoded binary).

Type	A
Size (Bytes)	34
User Mode Access	R
Values	Variable

RFID TAG ID

Attribute #35002

The EPC tag ID of the tag to be operated upon (size-encoded binary).

Type	A
Size (Bytes)	34
User Mode Access	W
Values	Variable

RFID BANK

Attribute #35003

The desired tag bank.

Type	B
Size (Bytes)	1
User Mode Access	W
Values	0 = reserved 1 = EPC 2 = TID 3 = User

RFID DATA

Attribute #35004

Buffer for read, write, and lock (size-encoded binary).

Type	A
Size (Bytes)	66
User Mode Access	RW
Values	Variable

RFID OFFSET

Attribute #35005

Word offset into tag buffer.

Type	W
Size (Bytes)	2
User Mode Access	W
Values	Variable

RFID LENGTH

Attribute #35006

Words of data to read from tag buffer.

Type	W
Size (Bytes)	2
User Mode Access	W
Values	Variable

RFID PASSWORD

Attribute #35007

Binary password for privileged operations.

Type	A
Size (Bytes)	4
User Mode Access	W
Values	Variable

RFID COMMAND

Attribute #35008

Execute command.

Type	B
Size (Bytes)	1
User Mode Access	W
Values	1 = Read 2 = Write 3 = Lock 4 = Kill

RFID CMD STATUS

Attribute #35009

Resulting status from executing a command.

Type	W
Size (Bytes)	2
User Mode Access	R
Values	Variable

RFIDCmdStatus is two bytes defined in Table 16.

Table 16 RFIDCmdStatus Definitions

Bytes	Definition
0x0000	Success
0x0001	No RFID module
0x0002	Tag not found
0x0003	Timeout
0x0004	Tag CRC error
0x01xx	Tag backscatter error. LSB indicates the error code as per EPC protocol.

Table 16 RFIDCmdStatus Definitions (Continued)

Bytes	Definition
0x02xx	Tag access error. LSB indicates the error code.
0x03xx	Bad parameter. The LSB indicates which parameter: 1 = Command 2 = TagID 3 = Bank 4 = Data 5 = Offset 6 = Password 7 = Length

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