RING SCANNER

RS2100

Product Reference Guide

MN-004873-04EN Rev A

Zebra Technologies | 3 Overlook Point | Lincolnshire, IL 60069 USA
zebra.com

Copyright

2026/04/07

The Zebra wordmark and logo are trademarks of Zebra Technologies Corp., registered in many jurisdictions worldwide. All other trademarks are the property of their respective owners. ©2026 Zebra Technologies Corp. and/or its affiliates.

Information in this document is subject to change without notice. The software described in this document is furnished under a license agreement or nondisclosure agreement. The software may be used or copied only in accordance with the terms of those agreements.

For further information regarding legal and proprietary statements, please go to:

SOFTWARE: zebra.com/informationpolicy.
COPYRIGHTS: zebra.com/copyright.
PATENTS: ip.zebra.com.
WARRANTY: zebra.com/warranty.
END USER LICENSE AGREEMENT: zebra.com/eula.

Terms of Use

Proprietary Statement

This manual contains proprietary information of Zebra Technologies Corporation and its subsidiaries ("Zebra Technologies"). It is intended solely for the information and use of parties operating and maintaining the equipment described herein. Such proprietary information may not be used, reproduced, or disclosed to any other parties for any other purpose without the express, written permission of Zebra Technologies.

Product Improvements

Continuous improvement of products is a policy of Zebra Technologies. All specifications and designs are subject to change without notice.

Liability Disclaimer

Zebra Technologies takes steps to ensure that its published Engineering specifications and manuals are correct; however, errors do occur. Zebra Technologies reserves the right to correct any such errors and disclaims liability resulting therefrom.

Limitation of Liability

In no event shall Zebra Technologies or anyone else involved in the creation, production, or delivery of the accompanying product (including hardware and software) be liable for any damages whatsoever (including, without limitation, consequential damages including loss of business profits, business interruption, or loss of business information) arising out of the use of, the results of use of, or inability to use such product, even if Zebra Technologies has been advised of the possibility of such damages. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Contents

Getting Started **15**

Unpacking 15
Features 16
Status Indications 17
Activity Modes 19
Mounting the Scanner 19
Placing the Slim Mount on Your Hand 20
Powering On 21
Bluetooth Connection 21
Scanning 22
Scanning Barcodes 22
Aiming the Scanner 22
Resetting the RS2100 23
Scanner Storage 24

123Scan and Software Tools **25**

123Scan 25
123Scan Information 26
Scanner SDK, Other Software Tools, and Videos 26
Scanner Control App 27
Scan-To-Connect Utility 28
Advanced Data Formatting 28
Multicode Data Formatting 28
Multicode Data Formatting Use 28
MDF for Best Practices 29

Preferred Symbol 30

Radio Communications Host Types 32

Bluetooth Host Parameter Defaults 32
Keyboard Emulation (HID) 33
HID Bluetooth Classic 33
HID Bluetooth Low Energy (Discoverable) 34
HID Setup 34
HID Options 35
Simple Serial Interface (SSI) 39
SSI Bluetooth Classic (Non-discoverable) 40
SSI Bluetooth Classic (Discoverable) 40
SSI Bluetooth Low Energy 40
SSI Setup 41
Connecting to the STB3678 Cradle 42
Serial Port Profile (SPP) 43
SPP BT Classic (Non-discoverable) 43
SPP BT Classic (Discoverable) 44
SPP Bluetooth Connection to Windows 11 as Central 44
SPP Bluetooth Connection to Windows 11 as Peripheral 45
Special Characters 46
Bluetooth SPP Beep on <BEL> 46
Bell Indication Control 47

Bluetooth Communications 51

Bluetooth Communications Parameter Defaults 51
General Bluetooth Options 52
Default Bluetooth Friendly Name 53
Discoverable Mode 53
Bluetooth Security 54
Wi-Fi Friendly Mode 55
Radio Output Power 57
Link Supervision Timeout 57

Reconnecting....58
Toggle Pairing....61
Force Pairing Save....62
Auto Un-Pairing....62
Pairing Barcode Format....63
Unpairing....63
Batch Mode....63
Unique Identifier (SPP only)....65
Using Image Capture Mode....65
Battery Threshold....66
Bluetooth Friendly Name....66
BLE Beaconing....67

Accessories....71
Accessories List....71
Charging....72
Charging a Scanner....72
2-Slot Charger....72
20-Slot Charger....73
Slim Mount....74
Mounting Instructions....75
Placing the Slim Mount on Your Hand....75
Bluetooth Adapter....76
Pairing....76

RS2100 Configuration....78
DataWedge....78
123Scan....78
Real Time Logger....79
Retrieving the RS2100 Log File....79
RS2100 Firmware Update....80
Bluetooth Using 123Scan....80
Bluetooth Connected Zebra Device....80

User Preferences and Miscellaneous Options....81
Setting User Preference Parameters....81
User Preference Scanning Sequence Examples....81
User Preference Errors While Scanning....81
User Preferences/Miscellaneous Options Parameter Defaults....82
User Preferences....83
Default Parameters....83
Parameter Barcode Scanning....84
Beep After Good Decode....84
Beep on Insertion....85
Beeper Volume....85
Beeper Tone....86
Beeper Duration....86
Suppress Power Up Beeps....87
Low Battery Indication....87
Trigger Mode....87
Hand-held Decode Aiming Pattern....88
Picklist Mode....88
Continuous Barcode Read....89
Unique Barcode Reporting....90
Decode Session Timeout....90
Timeout Between Decodes, Same Symbol....90
Timeout Between Decodes, Different Symbols....91
Fuzzy 1D Processing....91
Decode Mirror Images (Data Matrix Only)....91
Mobile Phone/Display Mode....92
PDF Prioritization....92
PDF Prioritization Timeout....93
Decoding Illumination....93
Motion Tolerance....93
Battery Threshold....94
Miscellaneous Scanner Parameters....95
Enter Key....95
Tab Key....95

Transmit Code ID Character 95
Prefix Suffix Values 96
Scan Data Transmission Format 97
FN1 Substitution Values 98
Report Software Version 99
Transmit No Read Message 99
Low Power Mode 99

Symbologies 101
Symbology Parameter Defaults 101
Enable/Disable All Code Types 106
UPC/EAN/JAN 107
UPC-A 107
UPC-E 107
UPC-E1 108
EAN-8/JAN-8 108
EAN-13/JAN-13 108
Bookland EAN 109
Bookland ISBN Format 109
ISSN EAN 110
Decode UPC/EAN/JAN Supplementals 110
User-Programmable Supplementals 113
UPC/EAN/JAN Supplemental Redundancy 113
UPC/EAN/JAN Supplemental AIM ID Format 114
Transmit UPC-A Check Digit 114
Transmit UPC-E Check Digit 115
Transmit UPC-E1 Check Digit 115
UPC-A Preamble 116
UPC-E Preamble 116
UPC-E1 Preamble 117
Convert UPC-E to UPC-A 117
Convert UPC-E1 to UPC-A 118
EAN/JAN Zero Extend 118
UCC Coupon Extended Code 119

Coupon Report 119
UPC Reduced Quiet Zone 120
Digimarc Digital Watermarks 120
Code 128 121
Set Lengths for Code 128 121
GS1-128 (formerly UCC/EAN-128) 122
ISBT 128 122
ISBT Concatenation 123
Check ISBT Table 123
ISBT Concatenation Redundancy 124
Code 128 <FNC4> 124
Code 128 Security Level 125
Code 128 Reduced Quiet Zone 126
Code 128 Exclusive 126
Code 39 126
Trioptic Code 39 127
Convert Code 39 to Code 32 127
Code 32 Prefix 128
Set Lengths for Code 39 128
Code 39 Check Digit Verification 129
Transmit Code 39 Check Digit 130
Code 39 Full ASCII Conversion 130
Code 39 Security Level 131
Code 39 Reduced Quiet Zone 131
Code 39 Buffering - Scan and Store 132
Code 93 134
Set Lengths for Code 93 134
Code 11 135
Set Lengths for Code 11 135
Code 11 Check Digit Verification 135
Transmit Code 11 Check Digits 136
Interleaved 2 of 5 (I 2 of 5) 136
Set Lengths for Interleaved 2 of 5 (I 2 of 5) 137
Interleaved 2 of 5 (I 2 of 5) Check Digit Verification 138

Transmit I 2 of 5 Check Digit....139
Convert Interleaved 2 of 5 (I 2 of 5) to EAN-13....139
Interleaved 2 of 5 (I 2 of 5) Security Level....139
Interleaved 2 of 5 (I 2 of 5) Reduced Quiet Zone....140
Discrete 2 of 5 (D 2 of 5)....141
Set Lengths for Discrete 2 of 5 (D 2 of 5)....141
Codabar (NW - 7)....142
Set Lengths for Codabar....143
CLSI Editing....144
NOTIS Editing....144
Codabar Security Level....145
Codabar Upper or Lower Case Start/Stop Characters....146
Codabar Mod 16 Check Digit Verification....146
Transmit Codabar Check Digit....146
MSI....147
Set Lengths for MSI....147
MSI Check Digits....148
Transmit MSI Check Digit(s)....149
MSI Check Digit Algorithm....149
Chinese 2 of 5....150
Matrix 2 of 5....150
Set Lengths for Matrix 2 of 5....151
Matrix 2 of 5 Check Digit....152
Transmit Matrix 2 of 5 Check Digit....152
Korean 3 of 5....152
Inverse 1D....153
GS1 DataBar....154
GS1 DataBar Omnidirectional (formerly GS1 DataBar-14)....154
GS1 DataBar Limited....154
GS1 DataBar Expanded....154
Convert GS1 DataBar to UPC/EAN/JAN....155
GS1 DataBar Security Level....155
GS1 DataBar Expanded Security Level....156
GS1 DataBar Limited Security Level....157

Symbology-Specific Security Features 158
Redundancy Level 158
Security Level 159
1D Quiet Zone Level 160
Intercharacter Gap Size 160
Composite 161
Composite CC-C 161
Composite CC-A/B 161
Composite TLC-39 162
UPC Composite Mode 162
Composite Beep Mode 163
GS1-128 Emulation Mode for UCC/EAN Composite Codes 163
2D Symbologies 164
PDF417 164
MicroPDF417 164
Code 128 Emulation 164
Data Matrix 165
GS1 Data Matrix 166
Data Matrix Inverse 166
Maxicode 166
QR Code 167
GS1 QR 167
QR Inverse 168
MicroQR 168
Linked QR Mode 169
Aztec 169
Aztec Inverse 170
Han Xin 170
Han Xin Inverse 170
Grid Matrix 171
DotCode 171
DotCode Prioritize 172
DotCode Inverse 172
DotCode Mirrored 173

Macro PDF Features....173
Macro PDF User Indications....173
Flush Macro PDF Buffer....174
Abort Macro PDF Entry....174
Postal Codes....174
US Postnet....175
US Planet....175
Transmit US Postal Check Digit....175
UK Postal....176
Transmit UK Postal Check Digit....176
Japan Postal....176
Australia Post....177
Australia Post Format....177
Netherlands KIX Code....178
USPS 4CB/One Code/Intelligent Mail....178
UPU FICS Postal....179
Mailmark....179
Canada Post....179
Digimarc Barcode....180
Posti LAPA 4-State Code....180

OCR Programming....181
OCR Parameter Defaults....181
OCR Programming Parameters....182
OCR-A....182
OCR-A Variant....182
OCR-B....184
OCR-B Variant....184
MICR E13B....187
US Currency Serial Number....188
OCR Orientation....188
OCR Lines....189
OCR Minimum Characters....190
OCR Maximum Characters....190

OCR Subset....190
OCR Quiet Zone....191
OCR Template....191
OCR Check Digit Modulus....200
OCR Check Digit Multiplier....200
OCR Check Digit Validation....201
Inverse OCR....205
OCR Redundancy....206

Maintenance and Troubleshooting....207
Maintenance....207
Battery Safety Guidelines....207
Service Information....208
Troubleshooting the Scanner....208
Troubleshooting Cradles....209

Specifications....210
2-Slot Charger Technical Specifications....210
20-Slot Charger Technical Specifications....210
Bluetooth Adapter Technical Specifications....211
SE4770 Decode Distances....212

Programming Reference....213
Symbol Code Identifiers....213
AIM Code Identifiers....214

Numeric Barcodes....219
Cancel....220

Alphanumeric Barcodes....221
Cancel....221
Alphanumeric Barcodes....221

Contents

Sample Barcodes **232**
Sample Code 39 232
Sample Code 93 232
Sample UPC/EAN 232
Sample Code 128 234
Sample Interleaved 2 of 5 234
Sample Chinese 2 of 5 234
Sample Matrix 2 of 5 235
Sample Korean 3 of 5 235
Sample GS1 DataBar 235
Sample PDF417 236
Postal Codes 236
Sample US Postnet 236
Sample UK Postal 236

Country Codes **237**

Country Keyboard Types (Country Codes) **238**

Country Code Barcodes **239**

Country Code Pages **250**
Country Code Page Defaults 250
Country Code Page Barcodes 253

CJK Decode Control **259**
CJK Control Parameters 259
Unicode Output Control 259
CJK Output Method to Windows Host 259
Non-CJK UTF Barcode Output 261
Unicode/CJK Decode Setup with Windows Host 263
Setting Up the Windows Registry Table for Unicode Universal Output 263

Adding CJK IME on Windows....263
Selecting the Simplified Chinese Input Method on the Host....264
Selecting the Traditional Chinese Input Method on the Host....264

ASCII Character Sets....266

RSM Attributes....276

BLE Beaconing Parameter Defaults....277
BLE Beaconing Attributes....279
Model Number....279
Serial Number....279
Date of Manufacture....279
Firmware Version....279

Communication Protocol Functionality....281

Getting Started

This chapter describes the features of the RS2100 Wearable Scanner, including activity modes, beeper, and LED indications. It further describes how to place the scanner on your hand, capture data, and reset the scanner.

Unpacking

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

Ensure the shipping box contains the following items:

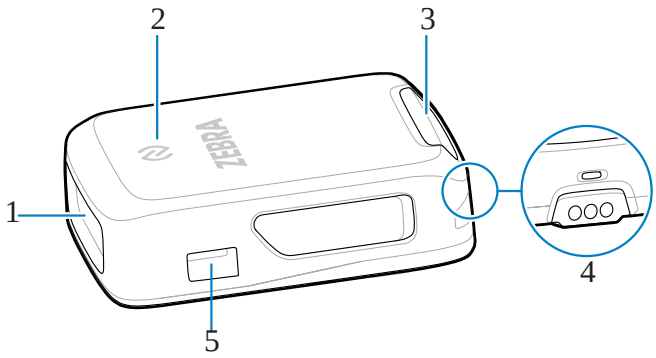
- RS2100
- Regulatory Guide

Inspect the equipment for damage. If you are missing any equipment or if you find any damaged equipment, contact Support immediately. See Service Information for contact information.

Features

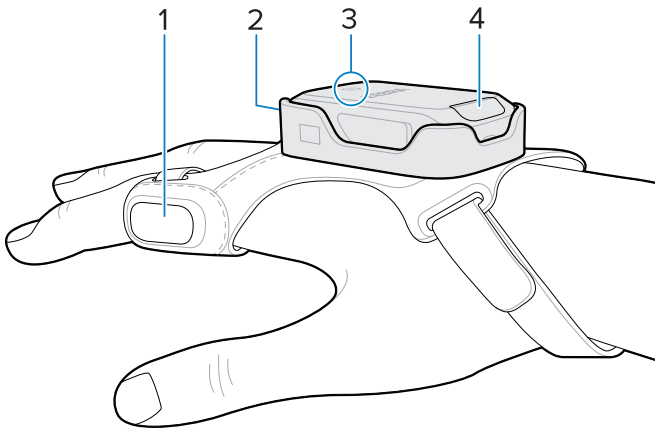
This section lists the features of the RS2100.

Figure 1 Side View



1	Imager window
2	NFC icon
3	Notification LED
4	IO contacts
5	Tab notch

Figure 2 Slim Mount Mounted Side View



1	Scan trigger
2	Imager window
3	NFC icon
4	Notification LED

Status Indications

The RS2100 notification LED on the back of the device indicates Bluetooth, battery, and decode status. The beeper emits beep sequences and patterns to indicate status.

The following table defines the notification LED and beep sequence status indications.

Category	LED Indication	Beep Indication	Description
Power Indication	Green	Low/medium/high	Device is powered on.
Scanning Indications	Green single flash	High	Successful barcode decode.
	Red	4x low	Transmission error.
	Red	5x low	Conversion or format error.
	Red	Low/high/low/high	Out of batch memory storage. Unable to store a new barcode.
Radio Indications	Red/Green blinking	6x short/high	Device in paging state.
	Blue double blink	High/low	Bluetooth communication is disconnected.

Category	LED Indication	Beep Indication	Description
	Blue slow blinking	None	Attempting to reconnect over Bluetooth.
	None	Low/high	Bluetooth connection established.
	None	Long low/long high	Bluetooth connection attempt failed.
	Blue during beep sequence	Long low/long high/long low/long high	Bluetooth connection attempt rejected.
	Blue slow blinking	5x high	Attempting to reconnect over Bluetooth (disabled by default).
	Blue blinking	3x high	Bluetooth disconnect indication (disabled by default).
Battery Indications[a] (hold trigger for three seconds to activate).	Red	4x high	Battery charge is low.
	Green	N/A	High
	Amber	N/A	Medium
	Red	N/A	Low
Charging Indications	Amber	N/A	Scanner is charging. Battery level is 0% - 98%.
	Green	N/A	Scanner is charged. Battery level is 98% - 100%.
	Red flash, then no illumination	N/A	Scanner temperature is too high. Charging is paused until scanner temperature decreases[b].
Parameter Programming	Red	Long low/long high	Input error, incorrect barcode or **Cancel** scanned, wrong entry, incorrect barcode programming sequence; remain in program mode.
	Green	High/low/high/low	Successful program exit with change in the parameter setting.
Maintenance Indications	Green slow blinking	N/A	Scanner connected to 123Scan.
	Red fast blinking	N/A	A file is transferring to the scanner (new configuration parameters or firmware) via 123Scan.
	Red slow blinking	N/A	Firmware installation.
	Green	N/A	Programming completed successfully (parameter changes or firmware updated) via 123Scan.

[a] The LED lights up for 3 seconds on the first scan after rebooting to show the battery charge level indication.

[b] Charging resumes automatically when scanner temperature reaches acceptable levels. The battery charges from 0 to 90% in less than two and a half hours at room temperature.

Activity Modes

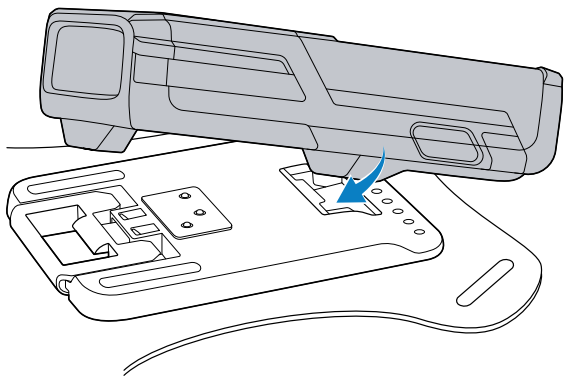
The scanner has four Activity Modes:

- Run Mode: The scanner is scanning or transferring data using Bluetooth.
- Low Power Mode: The scanner enters Low Power Mode (Standby Mode) when it is idle for more than 100 milliseconds. The scanner returns to Run Mode when one of the following events occurs:
  - You press the scan trigger.
  - A paired Bluetooth device sends data to the scanner.
  - The scanner detects an NFC field.
  - The scanner is inserted into a charging slot.
- Ship Mode: The scanner enters an extended period of inactivity and protects the battery from reaching 0%. The scanner returns to Run Mode when one of the following events occurs:
  - You press the scan trigger.
  - The scanner is inserted into a charging slot.
- OFF Mode: The scanner battery level reaches 0%.

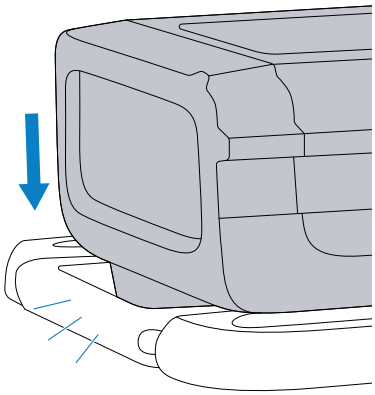
Mounting the Scanner

Mount the scanner onto the Slim Mount.

1. Push the LED-end of the scanner into the plastic slot.



2. Press the front end of the scanner into the slot. Push firmly until the tabs close around the scanner's tab notches.

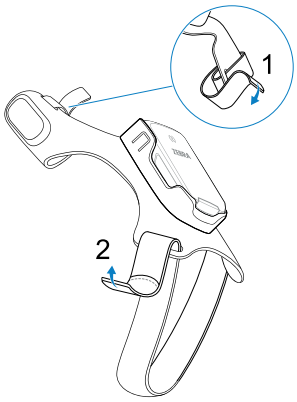


The scanner is ready for use.

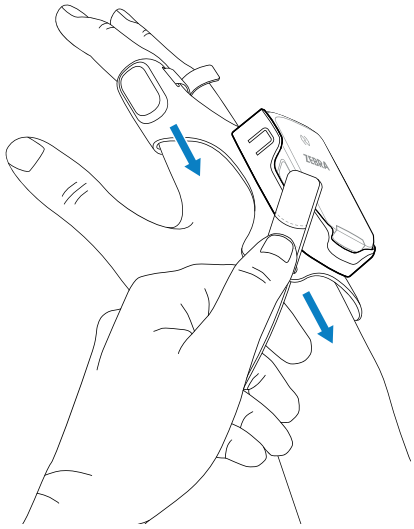
Placing the Slim Mount on Your Hand

Use the Slim Mount to mount the RS2100 onto your hand.

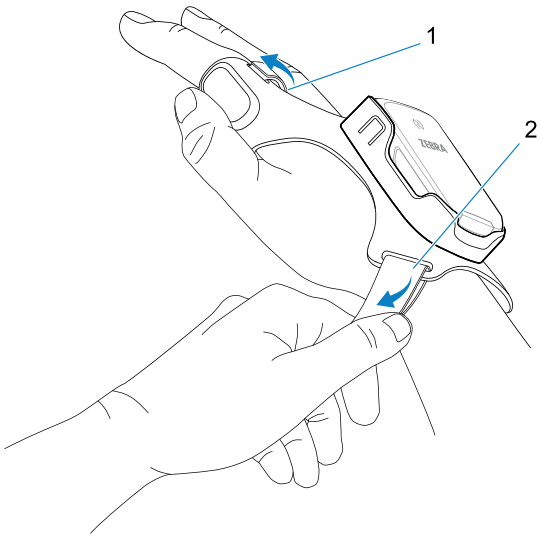
1. Loosen the finger strap (1) and wrist strap (2).



2. Slide your hand through the wrist strap and your index finger through the finger strap.



3. Pull the mount onto your hand until the wrist strap (1) sits comfortably on your wrist and the finger strap (2) is at the base of your finger.



4. Secure the wrist strap and finger strap.

Powering On

Press the trigger to power on the scanner.

Bluetooth Connection

The RS2100 sends decoded barcode data to Zebra mobile computers and other devices using Bluetooth.

Scanning

The scanner uses digital camera technology to take an image of a barcode, and software algorithms to extract barcode data from that image.

Scanning Barcodes

To scan a barcode:

1. Press the Scan Trigger and aim the device at a barcode.
2. Adjust the device's position so that the red cross-hair appears at the center of the barcode.

   The status LED illuminates red. Upon successful decoding, the status LED changes from red to green and an audible beep sounds.

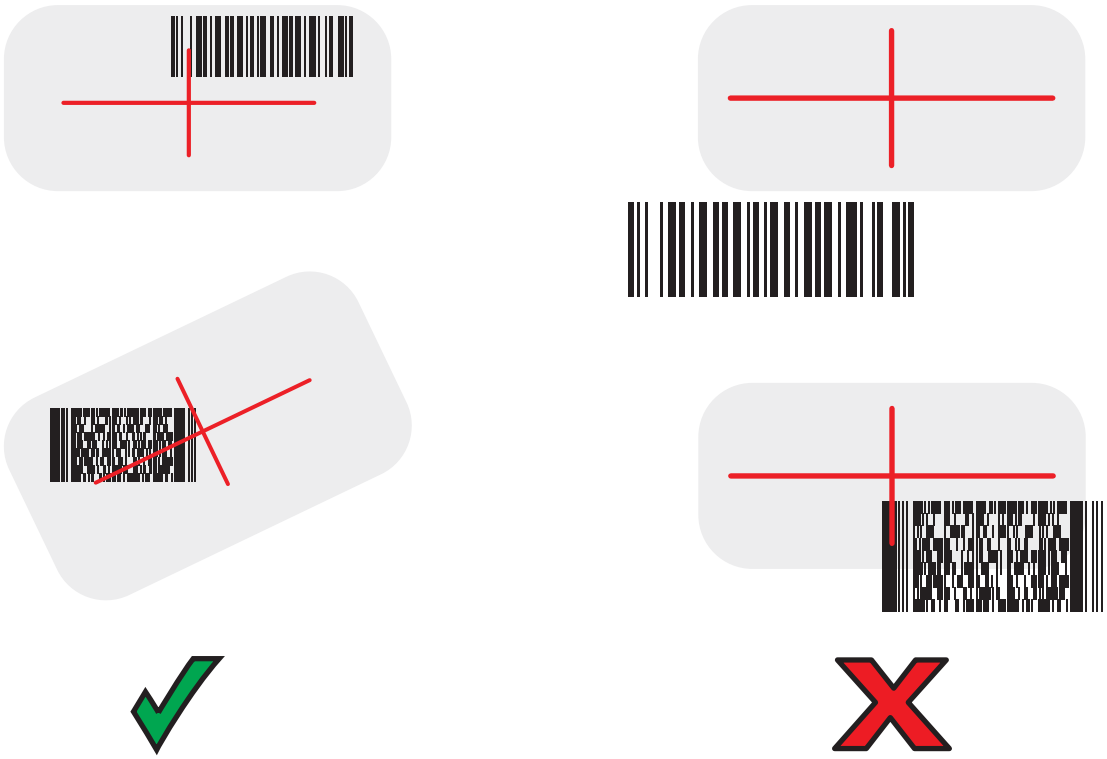
Aiming the Scanner

The aiming pattern of the RS2100 is a cross-hair laser beam with a bright center dot. The virtual rectangle made by the cross-hair reflects the field of view of the imager. Use the aiming pattern to position the barcode within the field of view.

The imager has an omnidirectional reading capability that allows it to decode a barcode when scanned at an angle or off-center. The aiming pattern is smaller when the RS2100 is closer to the symbols and larger when it is farther away from the barcode. Scan barcodes with smaller bars/elements closer to the RS2100 and those with larger bars/elements farther away.

NOTE: When using Pick List Mode, the center dot can be positioned anywhere on the symbol, as shown in Figure

Figure 3 Aiming Options



1. Position the RS2100 between two and eleven inches from the barcode, depending on barcode density.

NOTE: When a barcode is under transparent plastic or on a mobile computer screen, we recommend angling the scanner to minimize reflection.

2. Aim the cross-hair so that it covers the barcode. The RS2100 takes a picture of the barcode and stores it in memory for decoding.

   The Scan LED flashes green, and a high beep sounds to indicate that the barcode was properly decoded.

Resetting the RS2100

Reset the RS2100 when it stops responding to input or when reprogramming the device.

If the device is unresponsive, perform a cold boot. However, if you need to reset the scanner to scan a programming barcode, begin at step 1.

1. Ensure the scanner is on.
2. Scan the Set Factory Default barcode.

Performing a cold boot:

3. Press and hold the Scan Trigger for 15 seconds until the LED turns red.
4. Release the Scan Trigger.

Scanner Storage

The RS2100's battery drains while it is stored and not in use. For long-term storage, enable low-power mode.

Low-power mode preserves the scanner battery and prevents the scanner from entering an unrecoverably low battery level. Scan this barcode to enter low-power mode.

Charge the scanner or press the scan trigger to exit low-power mode.

123Scan and Software Tools

This section describes the Zebra software tools available for customizing scanner operation.

123Scan

123Scan is a software tool from Zebra Technologies that simplifies scanner setup and more.

Intuitive enough for first-time users, the 123Scan wizard guides users through a streamlined setup process. Settings are saved in a configuration file that can be printed as a single programming barcode for scanning, emailed to a smart phone for scanning from its screen or downloaded to the scanner using a USB cable.

Through 123Scan a user can:

- Configure a scanner using a wizard.
  - Program the following scanner settings.
    - Beeper tone/volume settings.
    - Enable/disable symbologies.
    - Communication settings.
  - Modify data before transmission to a host using:
    - Advanced Data Formatting (ADF) - Scans one barcode at a time.
    - Preferred Symbol - Single out one barcode on a label of many (select scanners).
- Load parameter settings to a scanner via the following:
  - Barcode scanning.
    - Scan a paper barcode.
    - Scan a barcode from a PC screen.
    - Scan a barcode from a smart phone screen.
  - Download over a USB cable.
    - Load settings to one scanner.
    - Stage up to 10 scanners simultaneously (Powered USB Hub recommended with 0.5 amp / port).
- Validate scanner setup.
  - View scanned data within the utility's Data view screen.

    - Capture an image and save it to a PC within the utility's Data view screen.
    - Review settings using the Parameter Report.
    - Clone settings from an already deployed scanner from the Start screen.
- Upgrade scanner firmware.
    - Load settings to one scanner.
    - Stage up to 10 scanners simultaneously (Powered USB Hub recommended with 0.5 amp/port).
- View statistics, such as:
    - Asset tracking information.
    - Time and usage information.
    - Barcodes scanned by symbology.
- Generate the following reports.
    - Barcode Report - Programming barcode, relevant parameter settings, and supported scanner models.
    - Parameter Report - Parameters programmed within a configuration file.
    - Inventory Report - Scanner asset tracking information.
    - Validation Report - Scanned data from the Data view.
    - Statistics Report - All statistics retrieved from the scanner.

For more information, go to zebra.com/123Scan.

123Scan Information

Use these links to learn more about using 123Scan and Zebra software tools.

For more information on 123Scan, go to zebra.com/123Scan

For a one-minute tour of 123Scan, go to How-to Videos For Zebra Scanners

To see a list of all of our software tools, go to zebra.com/scannersoftware

Scanner SDK, Other Software Tools, and Videos

Tackle all your scanner programming needs with our diversified set of software tools. Whether you need to stage a device or develop a fully featured application with image and data capture and asset management, these tools help you every step of the way.

To download any of the following free tools, go to: zebra.com/scannersoftware.

- 123Scan configuration utility
- SDKs
    - Scanner SDK for Windows
    - Scanner SDK for Linux
    - Scanner SDK for Android
    - Scanner SDK for iOS

- Drivers
  - OPOS driver
  - JPOS driver
  - USB CDC driver
- Scanner Management Service (SMS) for Remote Management
  - Windows
  - Linux
- Mobile Apps
  - Scanner Control App
    - Android
    - iOS
  - Scan-To-Connect Utility
    - Android
    - Windows
- How-To-Videos

NOTE: For a list of SDK-supported scanner functionality by communication protocol, see Communication Protocol Functionality.

Scanner Control App

The Scanner Control App (SCA) lets you control a Bluetooth scanner from a phone or tablet without a cradle. Use this app to showcase a Zebra Bluetooth scanner's capabilities and ease of control from your phone.

The SCA supports Scan-To-Connect (see Scan-to-Connect Utility) technology for one-step Bluetooth pairing, and allows you to control the following scanner functions:

- Program the beeper and LEDs.
- Enable and disable symbologies.
- Remotely trigger a scan.

The app displays scanned barcode data and can query scanner asset information and battery health statistics.

The SCA also works with USB-connected scanners such as the MP7000 if the Android tablet has a powered USB host port.

The SCA is available on the Google Play, iOS App, and Zebra AppGallery stores. Source code is available within the Zebra Scanner SDK for Android and iOS.

To watch a 1-minute tour of the Scanner Control App, go to: zebra.com/scannercontrolapp.

Scan-To-Connect Utility

In one step, connect your Zebra Bluetooth scanner to a phone, tablet, or PC by simply scanning a Scan-To-Connect (STC) barcode. Available as a standalone utility for Windows and Android operating systems from zebra.com/scantoconnect.

Source code is also available for easy app integration.

NOTE: The STC Utility allows you to pair a Bluetooth scanner to a phone, tablet, or PC without using a cradle.

Advanced Data Formatting

Advanced Data Formatting (ADF) allows customizing data before transmission to the host device. Use ADF to edit scanned data to suit the host application's requirements. With ADF you scan one barcode per decode session. ADF is programmed using 123Scan.

For a video on Creating an Advanced Data Formatting (ADF) Rule using 123Scan, go to How-to Videos For Zebra Scanners.

For additional information, refer to the Advanced Data Formatting Programmer Guide.

Multicode Data Formatting

Programming options include:

- Output all or specific barcodes.
- Control the barcode output sequence.
- Apply unique multicode data formatting (MDF) to each output barcode.
- Discard scanned data if all required barcodes are not present.

For more information, refer to the Multicode Data Formatting and Preferred Symbol User Guide, p/n MN-002895-xx.

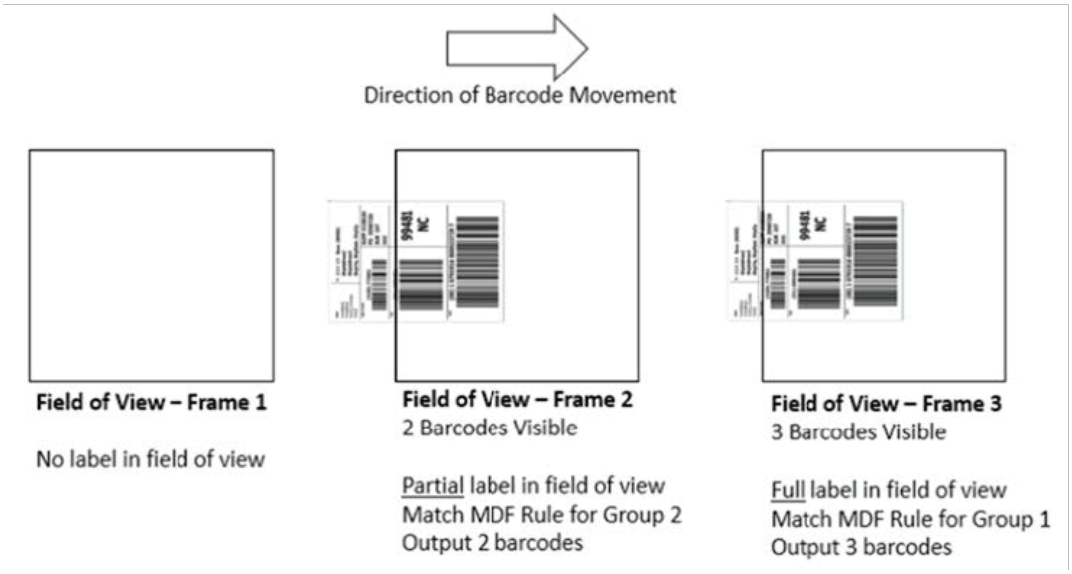
For a video on Creating an Multicode Data Formatting (MDF) Rule using 123Scan, go to How-to Videos For Zebra Scanners.

Multicode Data Formatting Use

Multicode Data Formatting may yield multiple unexpected and undesired outputs when a label (most likely on a complex label) passes through the scanner's field of view. This problem happens when the complex label's barcodes can be matched by more than one group (for example, Group 1 represents all barcodes present, and Group 2 represent some barcodes present).

1. As the label is moving through the field of view, it is first partially read (some of the barcodes in the field of view in Frame 2).
2. Then, the second decode occurs as it is fully read (all the barcodes in the field of view in Frame 3).
3. This yields two different outputs (instead of the expected single output) from the presentation of a label. This problem is driven by a complex label inadvertently matching two different MDF rules/ groups, thereby yielding two outputs.

Figure 4 Scanning Label in a Horizontal Orientation

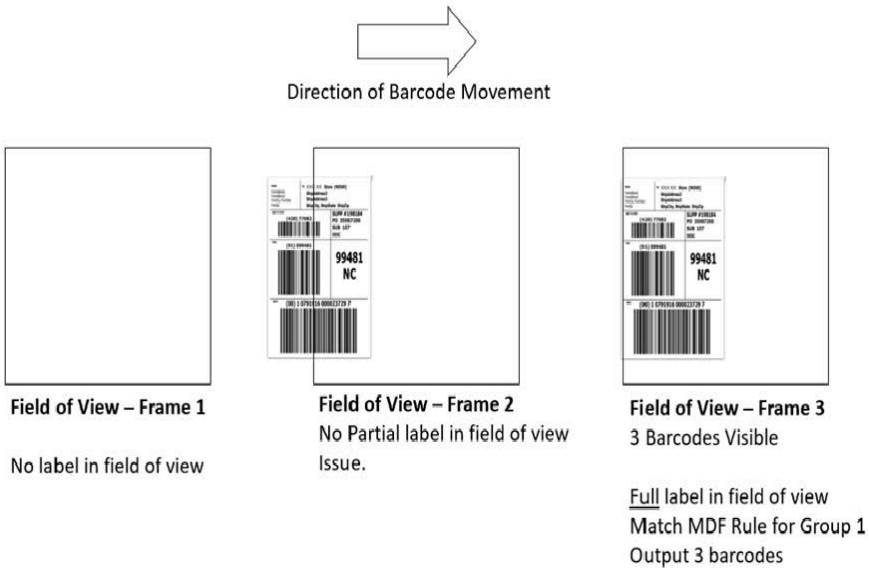


MDF for Best Practices

Suggestions to minimize the undesired multiple outputs when scanning with MDF.

- Scan barcodes in a vertical orientation.

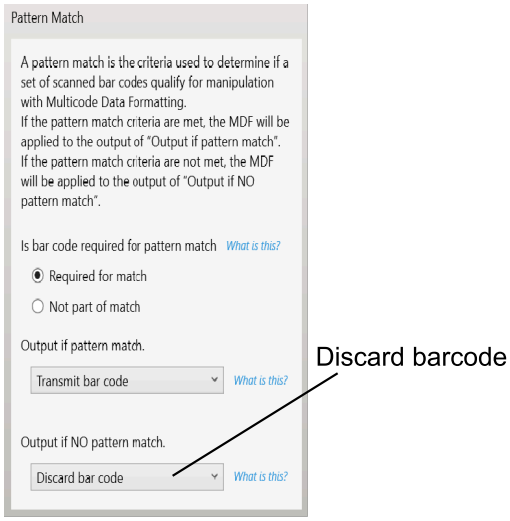
Figure 5 Scanning Label in a Vertical Orientation



- When creating the MDF programming with multiple groups, the Group 1's pattern match should be the most complicated (hardest to match), which equals to the most number of barcodes and criteria. Then Group 2, 3, and so on should be progressively matched more easily.

- When defining criteria, avoid enabling an output when the pattern is not matched. Set **Output if NO pattern match** set as **Discard barcode.**

Figure 6 Figure Match Setting for Output



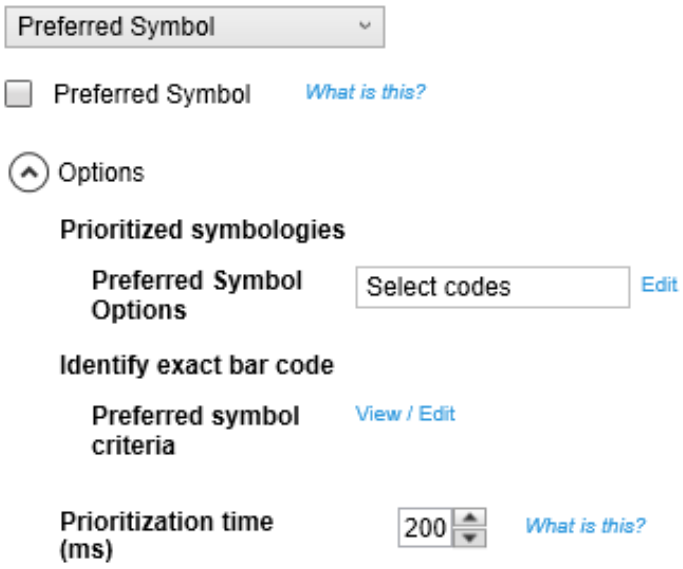
- Select **Discard barcode(s) NOT within the pattern match** in the 123Scan MDF setting. For more details, select **What is this?** located next to this selection.
- To prevent double decodes of the same symbol, increase the **Timeout Between Same Symbols** setting. See Timeout Between Decodes, Same Symbol for more details.
- Other reasons a label/barcode may not be decoded while in the field of view are as follows:
  - The label out of focus (too close or too far away). See Decode Distances for correct working range.
  - Specular reflection (reflection off a shiny surface).
  - The label is presented at an extreme angle to the scanner.

Preferred Symbol

Preferred Symbol is a barcode prioritization technique that enables the scanner to focus on decoding high-priority barcodes. The Preferred Symbol is the only barcode that is decoded and output within the preset Preferred Symbol Timeout. During this time, the scanner attempts to decode the prioritized barcode and reports only this barcode.

For more information, refer to the Multicode Data Formatting and Preferred Symbol User Guide, p/n MN-002895-xx.

Figure 7 Preferred Symbol Programming Options



Radio Communications Host Types

Each host type has Bluetooth Classic and Bluetooth Low Energy options.

Bluetooth Low Energy has better Wi-Fi coexistence, as advertising and connection is performed outside of Wi-Fi channels 1, 6, and 11 (2402, 2426, 2480 MHz). Due to its smaller data rate, Bluetooth Low Energy is up to 7 times slower than Bluetooth Classic (0.27 Mbps versus 0.7-2.1 Mbps), and data-intensive activities such as firmware updates can take significantly longer.

Table 1 Radio Communications Host Type Options

Host Type	Options
Keyboard Emulation (HID)	• HID Bluetooth Classic • HID Bluetooth Low Energy (Discoverable)
Simple Serial SSI (SSI)	• SSI Bluetooth Classic (Non-discoverable) • SSI Bluetooth Classic (Discoverable) • SSI Bluetooth Low Energy
Serial Port Profile (SPP)	• SPP Bluetooth Classic (Non-discoverable) • SPP Bluetooth Classic (Discoverable)

Bluetooth Host Parameter Defaults

The following table lists the defaults for Bluetooth host parameters. If you wish to change any option, scan the appropriate barcode(s).

Table 2 Host Parameter Defaults

Parameter	Parameter Number	SSI Number	Default
HID Host Parameters			
HID Features for Apple iOS	1114	F8h 04h 5Ah	Disable
Keyboard Keystroke Delay	N/A	N/A	No Delay (0 msec)
Caps Lock Override	N/A	N/A	Disable

Table 2 Host Parameter Defaults (Continued)

Parameter	Parameter Number	SSI Number	Default
Ignore Unknown Characters	N/A	N/A	Enable
Numeric Keypad Emulation	N/A	N/A	Disable
Fast HID Keyboard	1361	F8h 05h 51h	Enable
Quick Keypad Emulation	1362	F8h 05h 52h	Enable
Keyboard FN1 Substitution	N/A	N/A	Disable
Function Key Mapping	N/A	N/A	Disable
Simulated Caps Lock	N/A	N/A	Disable
Convert Case	N/A	N/A	No Case Conversion
Simple Serial Interface (SSI) Host Parameters			
Host Trigger Event Mode	N/A	N/A	Enabled
Serial Port Profile (SPP) Parameters			
Bluetooth SPP Beep on <BEL>	150	96h	Enable
Bell Indication Control	N/A	N/A	N/A

Keyboard Emulation (HID)

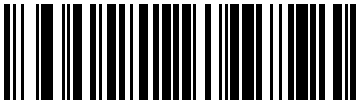
Select this host type when connecting to a PC/tablet/phone emulating a Bluetooth keyboard.

HID Bluetooth Classic

This enables the host and scanner to communicate using the Human Interface Device (HID) Keyboard Profile over Bluetooth Classic radio. The scanner(s) support Discoverable (Peripheral) and Non-Discoverable (Central) mode.

To establish a connection (initial setup only), select `HID Bluetooth Classic` and connect to Central or Peripheral mode:

- Central mode - Scan a pairing barcode with the MAC address of the host device.
- Peripheral mode - From the host, discover Bluetooth devices and select the scanner from the discovered device list.

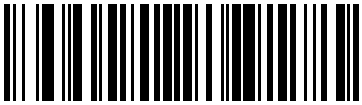


HID Bluetooth Classic

HID Bluetooth Low Energy (Discoverable)

This enables the host to establish an HID (Human Interface Device) Keyboard Profile connection with the scanner over a Bluetooth Low Energy radio. The scanner is discoverable (Peripheral mode).

To establish a connection (initial setup only), choose the `HID Bluetooth Low Energy (Discoverable)` option. From the host, discover Bluetooth devices and select the scanner from the discovered device list.



HID Bluetooth Low Energy (Discoverable)

HID Setup

The RS2100 can connect to an Android, Apple iOS, or Windows device as a Human Interface Device (HID). For all device types, reset the scanner before connecting it via Bluetooth.

Connecting to iOS/iPad/iPhone

To connect an HID scanner to an iOS device/iPad/iPhone:

1. Scan factory reset barcode.
2. Scan the appropriate HID Bluetooth barcode.
3. Perform a cold boot.
4. Select **Settings > General > Bluetooth**. Turn Bluetooth **On**.
5. Select **Bluetooth Settings** and choose RS2100 from the list of discovered devices.

   The scanner displays as RS2100-xxxxxx, where xxxxxx is the serial number.

Connecting with an Android Device

To establish a Bluetooth connection with an Android Device with an HID scanner:

1. Scan the Set Factory Defaults barcode.
2. Scan the appropriate HIDBluetooth barcode.
3. Select **Settings > Wireless & Networks > Bluetooth**. Turn Bluetooth **On**.
4. Select **Bluetooth Settings** and choose the RS2100 from the list of discovered devices.

   The RS2100 starts to operate and is discoverable as a keyboard.

NOTE: Some devices may require scanning a PIN to connect. If so, a PIN displays on the device. To enter the required PIN, scan the Variable Pin Barcode then re-attempt the connection. When a beep sounds indicating the scanner is waiting for PIN entry, scan the PIN using the Alphanumeric and Numeric Barcodes. Incorrect scanned entries can be deleted by scanning Cancel.

For more information, go to Variable PIN Code.

Connecting with Windows 11

Use Simple Secure Pairing (SPP) for the best user experience. SPP reduces the number of steps to minimal or none compared to legacy Bluetooth pairing. When SPP options are not available, use the HID connection.

1. Scan the Factory Defaults barcode.
2. Scan the HID Bluetooth Classic barcode.
3. Perform a cold boot.

   The scanner starts to operate and is discoverable as a keyboard.
4. On the Windows device, open **Settings** > **Add device** > **Bluetooth** > **RS2100 XXXXXXXXXXXXX** where the XXXXXXXXXXXXX corresponds to the scanner's serial number.

   The computer connects to the RS2100 and displays it on the list of connected devices.

Demonstrating an HID Connection

Following a successful connection, data can be scanned into any Windows, iOS, or Android application field that accepts keyboard data; for example, in Windows, the Notepad application.

To scan a barcode:

1. Open the Notepad application.
2. Click in the text area.
3. Scan a barcode.

   The scanned barcode information displays on the Notepad window.

HID Options

The RS2100 supports virtual keyboard emulation for the Apple, iOS, and keyboard emulation over the Bluetooth HID profile. In this mode, the RS2100 can interact with Bluetooth-enabled hosts supporting the HID profile as a Bluetooth keyboard. Scanned data is transmitted to the host as keystrokes.

HID Features for Apple iOS

Parameter # 1114

This option works with Apple iOS devices to enable the opening and closing of the iOS virtual keyboard by double-pressing the trigger.

NOTE: When this feature is enabled, the RS2100 may be incompatible with non-Apple iOS devices.

*Disable (0)

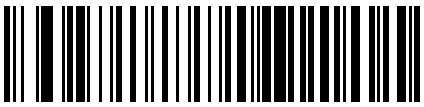
Enable (1)

Keyboard Keystroke Delay

This parameter sets the delay, in milliseconds, between emulated keystrokes. Select one of the following barcodes to increase the delay when the HID host requires slower data transmission.

*No Delay (0 msec)

Medium Delay (20 msec)



Long Delay (40 msec)

Caps Lock Override (Radio)

Select `Override Caps Lock Key` to preserve the case of the data regardless of the state of the Caps Lock key.

NOTE: This setting is always enabled for the **Japanese, Windows (ASCII)** keyboard type and cannot be disabled.

Override Caps Lock Key (Enable)

*Do Not Override Caps Lock Key (Disable)

HID Ignore Unknown Characters

This setting controls a scanner's ability to scan a barcode containing characters not recognized by the host.

This option only applies to the HID Keyboard Emulation device and IBM device. When **Send Barcodes With Unknown Characters** is selected, all barcode data is sent except for unknown characters, and no error beeps sound. When **Do Not Send Barcodes With Unknown Characters** is selected, barcode data is sent up to the first unknown character, then the RS2100 emits an error beep.

Send Barcodes With Unknown Characters

(*Enable)

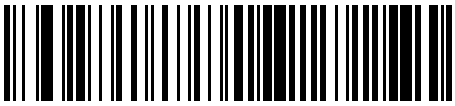
Do Not Send Barcodes With Unknown Characters

(Disable)

Numeric Keypad Emulation

You can send all characters as ASCII sequences over the numeric keypad.

For example, ASCII A transmits as “ALT make” 0 6 5 “ALT Break”.



*Enable Numeric Keypad Emulation

Disable Numeric Keypad Emulation

Fast HID Keyboard

Parameter # 1361 (SSI # F8h 05h 51h)

This parameter configures Bluetooth HID keyboard data transmission speed.

*Enable Fast HID Keyboard (1)

Disable Fast HID Keyboard (0)

Quick Keypad Emulation (Radio)

Parameter # 1362 (SSI # F8h 05h 52h)

This parameter enables a quicker method of emulation using the numeric keypad, where ASCII sequences are only sent for ASCII characters not found on the keyboard.

NOTE: This option applies only to the HID keyboard emulation device when Keyboard Emulation (HID) is enabled.

*Enable Quick Keypad Emulation (1)

Disable Quick Keypad Emulation (0)

Keyboard FN1 Substitution

This parameter replaces the FN1 character in an EAN-128 barcode with a user-selected Key Category and value.

See FN1 Substitution Values to set the Key Category and Key Value.

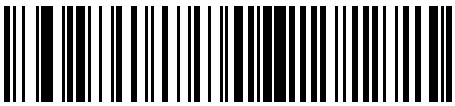
Enable Keyboard FN1 Substitution

*Disable Keyboard FN1 Substitution

Function Key Mapping (Radio)

This parameter maps bolded keys in the ASCII Character Sets to replace standard key mappings.

ASCII values under 32 are normally sent as control-key sequences. Keys that do not have a bold entry remain the same regardless of this parameter setting.



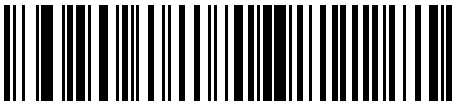
Enable Function Key Mapping

*Disable Function Key Mapping

Simulated Caps Lock (Keyboard Wedge)

Select Enable Caps Lock to invert upper and lower case characters on the barcode as if the Caps Lock state is enabled on the keyboard. This inversion occurs regardless of the keyboard's Caps Lock state.

NOTE: This parameter only applies to alpha characters.



Enable Caps Lock

*Disable Caps Lock

Convert Case (Keyboard Wegde)

This parameter converts all barcode data to the selected case.

NOTE: Convert Case applies to ASCII characters only.

Convert to Upper Case

Convert to Lower Case

*Do Not Convert

Simple Serial Interface (SSI)

Select this host type when connecting to a Zebra mobile device or PC/tablet/phone running a Zebra scanner SDK app.

SSI Bluetooth Classic (Non-discoverable)

This enables the scanner(s) to establish a connection with a Zebra mobile computer over a Bluetooth Classic radio. The scanner is not discoverable (Central mode).

To establish a connection (initial setup only), choose the SSI BT Classic (Non-discoverable) option, and then scan a pairing barcode with the host device's MAC address.

NOTE: Additional steps may be necessary depending on host's Bluetooth stack.

SSI Bluetooth Classic (Non-discoverable)

SSI Bluetooth Classic (Discoverable)

This enables communication with Scanner SDK for Android generated apps, and allows the host to establish a connection with the scanner over Bluetooth Classic radio. The scanner is discoverable (Peripheral mode).

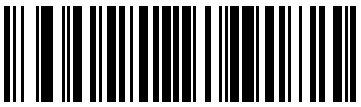
To establish a connection (initial setup only), choose the SSI Bluetooth Classic (Discoverable) option. From the host, discover Bluetooth devices and select the scanner from the discovered device list.

SSI Bluetooth Classic (Discoverable)

SSI Bluetooth Low Energy

This enables communication with Scanner SDK for iOS generated apps, and allows the host to establish a connection with the scanner over Bluetooth Low Energy radio. The scanner is discoverable (Peripheral mode).

To establish a connection (initial setup only), choose the SSI Bluetooth Low Energy option. From the host application, select the scanner from the discovered device list.



SSI Bluetooth Low Energy

SSI Setup

Once the scanner has been set up as an SSI device, it can pair with a host device.

Pairing using NFC Tap-to-Pair

The RS2100 is NFC-enabled and supports Bluetooth Tap-to-Pair.

NOTE: Not all Zebra devices support NFC readers and the Tap-to-Pair feature.

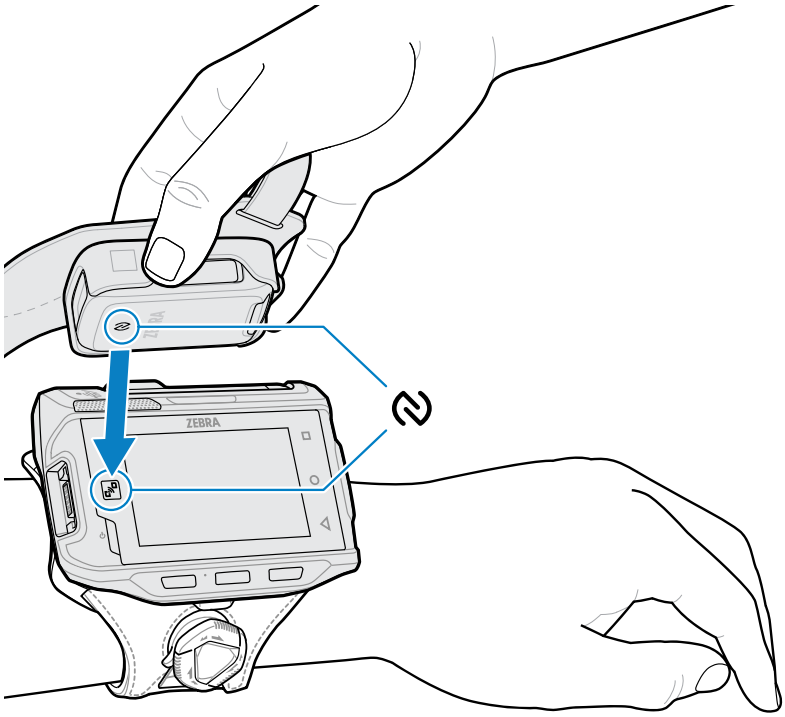
To connect with an NFC-enabled Zebra device:

1. Ensure NFC is enabled on the device.

   Refer to the product's Product Reference Guide to enable NFC.

2. Align the NFC icon on the RS2100 with the NFC icon on the device.

   The Notification LED blinks blue, indicating that the RS2100 is attempting to establish a connection with the device. When a connection is established, the Notification LED turns off, and the RS2100 emits a single string of low/high beeps.



Pairing With a Zebra Mobile Device

The RS2100 supports SSI Bluetooth pairing. Pair with a Bluetooth-enabled Zebra mobile device to send scan data or configure the scanner.

1. On the device, open **Settings > Bluetooth Pairing Utility.**

   The **Bluetooth Pairing Utility** opens.

2. Using the RS2100, scan the barcode on the screen.

The Status LED blinks blue, indicating that the RS2100 is attempting to establish a connection with the device. When a connection is established, the Status LED turns off, and the RS2100 emits a single string of low/high beeps. The device indicates a successful pairing attempt with a toast notification (audio and visual). When the Bluetooth connection is established, dialog box notifications display on the device's screen.

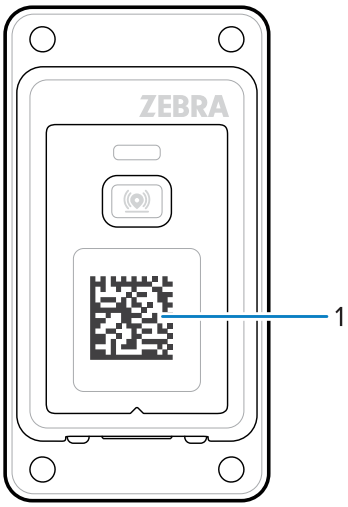
3. On the device, return to the main screen.

Pairing With a Bluetooth Adapter

The RS2100 Bluetooth profile supports Scan-to-Pair. Scan the pairing code to pair with the Bluetooth Adapter (BT-RS5X6-DNGL-01).

1. Ensure the scanner is in factory default mode. Scan the factory default barcode to return the scanner to its factory default settings.

2. Using the RS2100, scan the pairing code (1) on the adapter.



The Status LED blinks blue, indicating that the RS2100 is attempting to establish a connection with the device. When a connection is established, the Status LED turns off, and the RS2100 emits a single string of low/high beeps.

Connecting to the STB3678 Cradle

Scan the Set Factory Defaults barcode.

1. Connect the STB3678 cradle to the host computer.
2. Using the RS2100, scan the pairing barcode on the cradle.

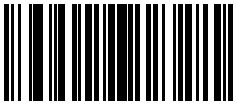
The status LED blinks blue, indicating that the scanner is attempting to establish a connection with the cradle. When the connection is established, the status LED turns off, and the scanner emits a string of high/low beeps.

Host Trigger Event Mode

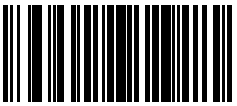
This parameter controls the scanner's trigger event to facilitate pairing with Zebra Scanner SDK and Zebra host terminal apps that use EMDK.

The scanner is compatible with the STB3678 cradle and applications utilizing Zebra Scanner SDK Zebra host terminals apps that use EMDK. However, the appropriate host trigger event mode must be selected when pairing with those devices. The scanner selects the appropriate mode automatically based on the pairing barcode, but it can be manually set in case an appropriate pairing barcode is not used.

Use Host Trigger Event Disabled to pair with the STB3678 cradle, Zebra Scanner SK apps, and utilities running on Windows, Android, or Apple iOS.



***Host Trigger Event Mode Enabled**



Host Trigger Event Mode Disabled

Lock Override

Lock Override overrides a locked scanner base pairing and connects a new scanner. In Multipoint-to-Point mode, this unpairs any disconnected (out of range) scanner first to connect the new scanner.

To use Lock Override, scan Lock Override and then pair the scanner.

NOTE: Lock Override is applicable in Point-to-Point mode only (it does not work on scanners in Multipoint-to-Point mode). If seven scanners are connected to a cradle/host device, disconnect them manually before connecting a new scanner.

Lock Override

Serial Port Profile (SPP)

Select this host type when connecting to a PC/tablet/phone using a Bluetooth serial connection.

SPP BT Classic (Non-discoverable)

This enables the scanner to establish an SPP connection with the host over Bluetooth Classic radio. The scanner is not discoverable (Central mode).

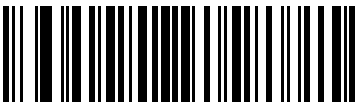
To establish a connection (initial setup only), choose the SPP BT Classic (Non-discoverable) option, and then scan a pairing barcode with the MAC address of the host device.

SPP Bluetooth Classic (Non-discoverable)

SPP BT Classic (Discoverable)

This enables the host to establish an SPP connection with the scanner over Bluetooth Classic radio. The scanner is discoverable (Peripheral mode).

To establish a connection (initial setup only), choose the SPP BT Classic (Discoverable) option. From the host, discover Bluetooth devices and select the scanner from the discovered device list.



SPP Bluetooth Classic (Discoverable)

SPP Bluetooth Connection to Windows 11 as Central

Central connection to Windows is a secure connection that ensures nearby Bluetooth devices will not detect the scanner when it is in pairing mode.

1. Scan the Factory Defaults barcode.

2. Scan the SPP Bluetooth Classic (Non-Discoverable) barcode.

3. Perform a cold boot.

   See Resetting the RS2100 for information on performing a cold boot.

   The scanner starts to operate and is discoverable as a Bluetooth serial device.
4. On the Windows device, open **Settings**.
5. Navigate to **Bluetooth & devices** > **View more devices** > **More Bluetooth settings**.

   The **Bluetooth Settings** window opens.
6. Select the **COM Ports** tab and click **Add.**

   The Add COM Port window opens.
7. Select the **Incoming (device initiates the connection)** option and select **OK**.

   The Add COM Port window closes.
8. Select the new **Incoming** COM. Click **OK**.
9. Click the **Hardware** tab and select **Properties**.

The Bluetooth LE Generic Attribute Service Properties window opens.

10. Select the **Advanced** tab, note the address, and click **OK**.
11. Run the PC Tool Application.
12. Click the **Show Bluetooth Address barcode** button.
13. Enter the Bluetooth Device address into the Barcode Generator window and click **Generate**.
14. Click **Close**.
15. Open the incoming COM port assigned in the application.

    After the COM port is opened, the computer connects to the RS2100, and a beep sounds.
16. Aim the RS2100 at the computer screen and scan the barcode of the BD address of the Windows device.

    The RS2100 LED flashes green, indicating that the RS2100 is attempting to establish a connection with the computer. The Windows device opens a notification window upon successful connection.

SPP Bluetooth Connection to Windows 11 as Peripheral

To connect an SPP device to Windows using Bluetooth:

1. Scan the Set Factory Defaults barcode.

2. Scan the SPP Bluetooth Classic (Non-discoverable) barcode.

3. Perform a cold boot.

   See Resetting the RS2100 for information on performing a cold boot.

   The scanner starts to operate and is discoverable as a Bluetooth serial device.
4. On the Windows device, open **Settings**. Under the Bluetooth devices section, select **Add device**.

   The Add a device window displays.
5. Select **Bluetooth**.

   The **Bluetooth connection** window displays.
6. Select the RS2100.
7. Open the COM port assigned (for example, COM7) in the application. After the COM port opens, the computer connects to the RS2100, and a beep sounds.

NOTE: Make sure the same COM port is closed in other applications.

Special Characters

SPP mode supports special characters that trigger actions when sent from the computer.

Table 3 Special Characters

Character	ASCII	Action
BELL	0x07	If Bell Indication is enabled, performs the configured Bell indication.
Serial	0x73	Sends the serial number of the RS5100.
Image Capture Mode	0x69	Activates Image Capture mode.
Custom notification 1	0x79	Performs custom notification sequence 1.
Custom notification 2	0x63	Performs custom notification sequence 2.
Scanner enable	0x65	Enables scanner.
Scanner disable	0x64	Disables scanner.

Bluetooth SPP Beep on <BEL>

Parameter # 150 (SSI # 96h)

This parameter enables the scanner to beep when it detects a <BEL> character on the serial line. <BEL> is issued to alert the user of an entry or other important event.

Choose the following:

- Enabled - Scanner beeps when it detects a <BEL>.
- Disabled - Scanner does not beep when it detects a <BEL>.

NOTE: This parameter only applies to SPP (Serial Port Profile), for example, the serial interface on the cradle. In Multipoint-to-Point mode only, the scanner that beeped last sounds Beep on <Bel>.

*Enable Beep on <BEL> (1)

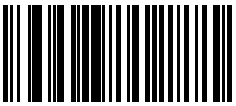
Disable Beep on <BEL> (0)

Bell Indication Control

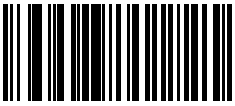
The BELL Indication Control parameter configures the beep tone sequence of the bell indication when a BELL character is received.

NOTE:

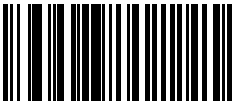
This feature is valid only in the SPP mode for PC connection.



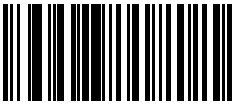
GP_1_HI_SHORT



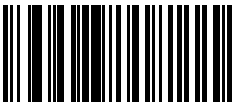
GP_2_HI_SHORT



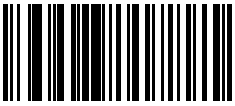
GP_3_HI_SHORT



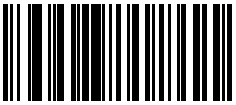
GP_4_HI_SHORT



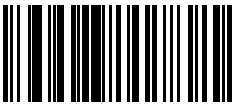
GP_5_HI_SHORT



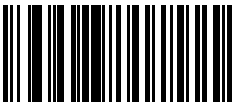
GP_1_LO_SHORT



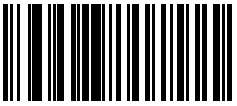
GP_2_LO_SHORT



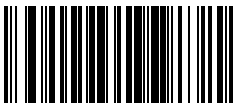
GP_3_LO_SHORT



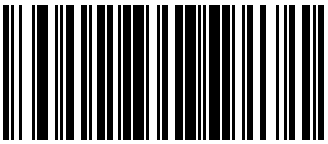
GP_4_LO_SHORT



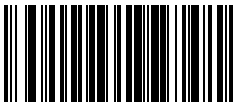
GP_5_LO_SHORT



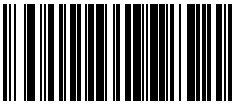
GP_1_HI_LONG



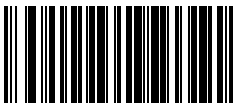
GP_2_HI_LONG



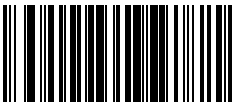
GP_3_HI_LONG



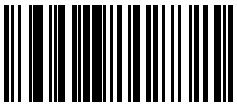
GP_4_HI_LONG



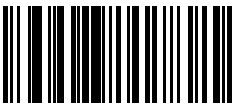
GP_5_HI_LONG



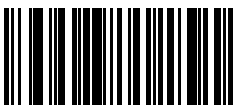
GP_1_LO_LONG



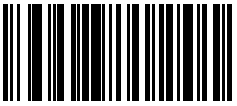
GP_2_LO_LONG



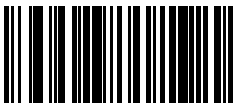
GP_3_LO_LONG



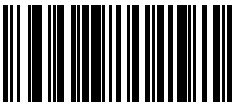
GP_4_LO_LONG



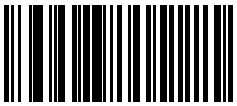
GP_5_LO_LONG



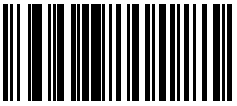
GP_FAST_WARBLE



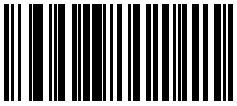
GP_SLOW_WARBLE



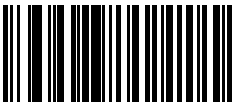
GP_HI_LO



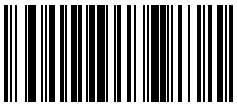
GP_LO_HI



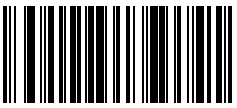
GP_HI_LO_HI



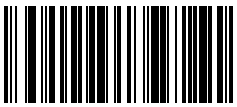
GP_LO_HI_LO



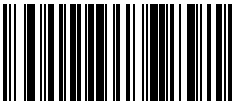
GP_HI_HI_LO_LO



APP_ERROR_BEEP



APP_CLICK



LOW_CLICK

Bluetooth Communications

This section provides information about the modes of operation and features available for wireless communication between the RS2100 and host computers. The section also includes the parameters necessary to configure the RS2100.

The scanner ships with the settings shown in the Bluetooth Parameter Defaults Table. For more configuration parameters, see the Standard Default Parameters chapter. If the default values suit your requirements, programming is not necessary.

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

NOTE: Unless otherwise specified, correct an error during a scanning sequence by re-scanning the correct parameter.

To return all features to default values, scan a default barcode in Default Parameters.

Throughout the programming barcode menus, default values are indicated with asterisks (*).

Bluetooth Communications Parameter Defaults

The following table lists the defaults for Bluetooth radio communication parameters. If you wish to change any option, scan the appropriate barcode(s).

Table 4 Bluetooth Parameter Defaults

Parameter	Parameter Number	SSI Number	Default
Default BT Friendly Name	1707	F8h 06h ABh	RS2100
Discoverable Mode	610	F1h 5Fh	General
Wi-Fi Friendly Mode	1299	F8h 05h 13h	Disable
Wi-Fi Friendly Channel Exclusion	1297	F8h 05h 11h	Use All Channels
Bluetooth Radio Parameters			
Radio Output Power	1324	F8h 05h 2Ch	Class 2
Link Supervision Timeout	1698	F8h 06h A2h	2 seconds
Auto-reconnect Parameters			
Beep on Reconnect Attempt	559	F1h 2Fh	Disable

Table 4 Bluetooth Parameter Defaults (Continued)

Parameter	Parameter Number	SSI Number	Default
Reconnect Attempt Interval	558	F1h 2Eh	30 seconds
Auto-reconnect	604	F1h 60h	Auto-reconnect Immediately
Beep on <BEL>	150	96h	Enable
Scanner(s) to Cradle Support Parameters			
Toggle Pairing	1322	F8h 05h 2Ah	Enable
Force Pairing Save	795	F2h 03h 1Bh	Disable
Auto Un-Pairing	1708	N/A	Disable
Bluetooth Security Parameters			
PIN Code (Set and Store)	552	F1h 28h	12345
Variable Pin Code	608	F1h 60h	Static (Default PIN code is 12345)
Bluetooth Security Levels	1393	F8h 05h 71h	Low
General Radio Parameters			
Battery Threshold	1367 1368 1369	F8h 05h 57h F8h 05h 58h F8h 05h 59h	N/A
Batch Mode	544	F1h 20h	Normal (Do Not Batch Data)
Unique Identifier (SPP only)	N/A	N/A	Disable
Bluetooth Friendly Name	607	F1h 5fh	N/A
Beaconing Parameters			
Beacon Upon Disconnection	2403	F8h 09h 63h	Disable
Unpaired Beaconing	2404	F8h 09h 64h	Disable
Beaconing Beep	2405	F8h 09h 65h	Disable
Beacon Frequency	2406	F8h 09h 66h	100 msec
Beacon Battery Threshold	2407	F8h 09h 67h	Disable
Beacon ID	2408 2409	F8h 09h 68h F8h 09h 69h	N/A

General Bluetooth Options

The following parameters control various scanner behaviors and capabilities. See Bluetooth Parameter Defaults for a consolidated list of parameters and their default values.

Default Bluetooth Friendly Name

Parameter # 1701

Select the default Bluetooth Friendly Name.

NOTE: The scanner must be in SSI mode.

- Select **RS2100** for pairing with a host device that supports the scanner. The Friendly Name becomes **RS2100 <serial number>**.
- Select **RS2100 and RS5100** for pairing with an older host device that does not support the **RS2100**. The Friendly Name becomes **RS2100 <serial number> (RS5100 compatible)**.

NOTE: After changing this parameter, reboot the device.

ATTENTION: If the scanner is already paired to a host device in RS2100 mode that doesn't have RS2100 support, then after you change the parameter to **RS2100 and RS5100** mode, reboot the host device, and pair it again.

*RS2100 (0)

RS2100 and RS5100 (1)

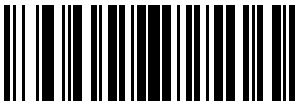
Discoverable Mode

Parameter # 610 (SSI # F1h 62h)

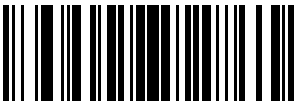
This parameter allows you to select the discoverable mode based on the device initiating discovery.

- General Discoverable Mode - The host initiates the connection.
- Limited Discoverable Mode - A mobile device initiates connection, and the device does not appear in General Discoverable Mode.

NOTE: It can take longer to discover the device in this mode. The device remains in Limited Discoverable Mode for 30 seconds, and green LEDs flash. After 30 seconds, it is non-discoverable. To re-activate Limited Discoverable Mode, press the trigger.



*General Discoverable Mode (0)



Limited Discoverable Mode (1)

Bluetooth Security

The scanner supports Bluetooth authentication. Either the remote device or the scanner can request authentication.

PIN Code

Parameter # 552 (SSI # F1h 28h)

This parameter allows to set a PIN code for a scanner..

You can increase security by requiring a PIN code when connecting the scanner to a new host device. To do this, connect the scanner to the host while setting the PIN code. If the scanner is not connected to the host, the new PIN code only takes effect on the scanner. The default PIN code is 12345.

NOTE: For extended security, a 16-character PIN code is available for additional security with Open Bluetooth (SPP and HID).

Setting the PIN Code

Set the PIN code (password) on the scanner to connect to the host.

1. Scan the Set & Store PIN Code barcode.

Set & Store PIN Code

2. Scan five barcodes from Alphanumeric Barcodes.
3. Scan Alphanumeric Barcodes.

Variable PIN Code

Parameter # 608 (SSI # F1h 60h)

This parameter allows you to set the default **Static PIN Code** stored in memory instead of requiring manual entry in Cradle Host mode with authentication enabled.

NOTE: Only devices using Bluetooth 2.0 or earlier support Variable PIN Code. Do not use Variable PIN Code to connect to cradles or devices using Bluetooth 2.1 or later.

The default PIN code is set using the **Set and Store PIN Code**. However, HID devices require entering a variable PIN code with each connection.

Entering the Variable PIN Code

When attempting connection, if the device application presents a PIN:

1. Scan Variable PIN Code.
2. Re-attempt connection.

   The scanner emits a beep indicating it is waiting for an alphanumeric entry.
3. Enter the application-provided PIN using the Alphanumeric Barcodes.
4. Scan Alphanumeric Barcodes if the code is less than 16 characters.

*Static PIN Code (0)

Variable PIN Code (1)

The scanner discards the variable PIN code after connection.

Bluetooth Security Level

Parameter # 1393 (SSI # F8h 05h 71h)

This parameter sets a Bluetooth security level.

Wi-Fi Friendly Mode

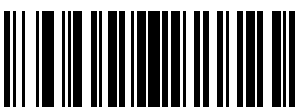
Parameter # 1299 (SSI # F8h 05h 13h)

This parameter configures the scanner for Wi-Fi Friendly Mode.

Choose an option to enable or disable `Wi-Fi Friendly Mode`, and then see Wi-Fi Channel Exclusion to select any channels to exclude.

When using this feature, configure all scanners in the area for Wi-Fi friendly mode. By default, no Wi-Fi channels are excluded. Since Bluetooth requires at least/ minimum of 20 channels to function when Wi-Fi channels 1, 6, and 11 are excluded. A small number of channels are cut from the hopping sequence. Update Wi-fi friendly settings before establishing a Bluetooth connection.

NOTE: The scanner remains in sniff mode, and exits sniff mode only during firmware update. If a Wi-Fi channel is excluded from the hopping sequence, AFH turns off. After establishing a connection, the scanner (and cradle) avoid the excluded Wi-Fi channels.



Enable Wi-Fi Friendly Mode (1)

*Disable Wi-Fi Friendly Mode (0)

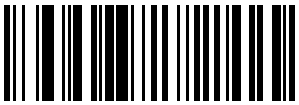
Wi-Fi Friendly Channel Exclusion

Parameter # 1297 (SSI # F8h 05h 11h)

This parameter allows you to exclude specific Wi-Fi channels from the hopping sequence.

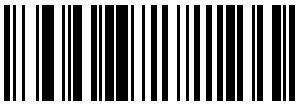
Select one of the following options:

- Exclude Wi-Fi channel 1 - Bluetooth channels 0-21 are excluded from the hopping sequence (2402-2423 MHz).
- Exclude Wi-Fi channel 6 - Bluetooth channels 25-46 are excluded from the hopping sequence (2427 - 2448 MHz).
- Exclude Wi-Fi channel 11 - Bluetooth channels 50-71 are excluded from the hopping sequence (2452 - 2473 MHz).
- Exclude Wi-Fi channel 1, 6 and 11 - Bluetooth channels 2-19 (2404-2421 MHz), 26-45 (2428 - 2447 MHz), and 51-69 (2453 - 2471 MHz) are excluded from the hopping sequence.
- Exclude Wi-Fi channels 1 and 6 - Bluetooth channels 0-21 (2402-2423 MHz) and 25-46 (2427 - 2448 MHz) are excluded from the hopping sequence.
- Exclude Wi-Fi channels 1 and 11 - Bluetooth channels 0-21 (2402-2423 MHz) and 50-71 (2452 - 2473 MHz) are excluded from the hopping sequence.
- Exclude Wi-Fi channel 6 and 11 - Bluetooth channels 25-46 (2427 - 2448 MHz) and 50-71 (2452 - 2473 MHz) are excluded from the hopping sequence.
- Use All Channels (Standard AFH) - Sets all channels to use.

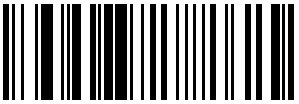


*Use All Channels (Standard AFH) (0)

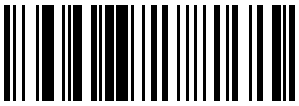
Exclude Wi-Fi Channel 1 (1)



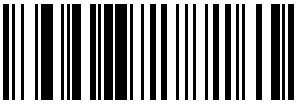
Exclude Wi-Fi Channel 6 (2)



Exclude Wi-Fi Channel 11 (3)

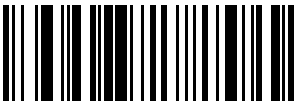


Exclude Wi-Fi Channels 1, 6, and 11 (4)



Exclude Wi-Fi Channels 1 and 6 (5)

Exclude Wi-Fi Channels 1 and 11 (6)



Exclude Wi-Fi Channels 6 and 11 (7)

Radio Output Power

Parameter # 1324

The scanner uses a radio which can be configured to operate in:

- Low power mode as a Class 2 device.
- High power mode as Class 1 device.

*Class 2 (Low Power)

Class 1 (High Power)

Link Supervision Timeout

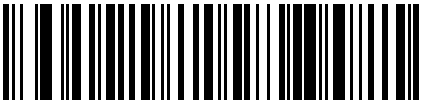
Parameter # 1698 (SSI # F4h 06h A2h)

Select a time interval to set how quickly the scanner senses that the Bluetooth radio loses connection to the remote device.

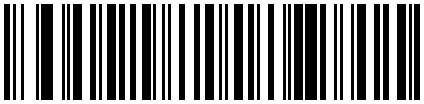
A lower value minimizes data loss at the edge of the operating range. A higher value minimizes disconnects caused by delayed responses from the remote device. If you are experiencing occasional disconnects and the scanner is able to reconnect, increase the link supervision timeout value.

NOTE: The scanner only controls Link Supervision Timeout in Central mode.

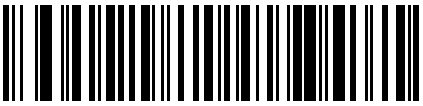
0.5 Seconds (800)



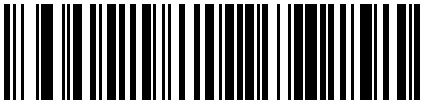
2 Seconds (3200)



*5 Seconds (8000)



10 Seconds (16000)



20 Seconds (32000)

Reconnecting

Several parameters contribute to reconnecting a scanner when its connection to a host device is lost. This information is relevant to SPP Central, SSI Bluetooth Classic, and Bluetooth HID connections.

The scanner automatically tries to reconnect to a remote device when a disconnection occurs due to radio communication loss. The loss may be prompted by:

- The scanner moving out of range.
- The remote device powering down.

The scanner initiates a reconnection attempt based on the Auto-Reconnect parameter setting. The Reconnect Attempt Interval parameter defines the duration of the connection attempt. During reconnection, the scanner's status LED blinks blue.

If the auto-reconnect process fails due to:

- Page Time-Outs: The scanner sounds a page timeout beep (long low, long high) and enters low power mode.
- Connection Attempt Rejected: The scanner sounds a connection reject beep sequence (long low, long high x2) and enters low power mode.

NOTE: If a barcode is scanned while the auto-reconnect sequence is in process, a transmission error beep sequence sounds, and the data is not transmitted to the host. After a connection is reestablished, normal scanning operation returns.

Switching between Bluetooth host types by scanning a host type barcode causes the radio to be reset. Scanning is disabled during this time. It takes several seconds for the scanner to re-initialize the radio, at which time scanning is enabled.

Restoring Lost Bluetooth Connection

Follow this procedure to reconnect a scanner if the auto-reconnect process fails and times out.

1. Ensure the scanner is within a 10 m (30 ft.) range from the host device.
2. Ensure that the mobile computer is on and awake.
3. Press the scan button twice to initiate the reconnect process.

The Status LED starts flashing blue, indicating that the scanner is attempting to establish a connection. Then the Status LED turns off, and the scanner emits a string of low/high beeps, indicating that the scanner is connected and ready to scan.

Beep on Reconnect Attempt

Parameter # 559 (SSI # F1h F2h)

This parameter allows to enable audio feedback during a reconnect attempt.

When the scanner disconnects as it moves out of range, it immediately attempts to reconnect. During this time, the green LED blinks. If auto-reconnect fails, the scanner emits a page timeout beep (long low/long high) and the LED stops blinking. Restart the process by pulling the trigger.

- Enabled - the scanner emits 5 short high beeps every 5 seconds during the reconnection attempt, providing an out-of-range indicator.
- Disabled - the scanner does not emit sound during a reconnection attempt.

NOTE: To extend the time the scanner attempts to reconnect, see Reconnect Attempt Interval.

Enable Beep on Reconnect Attempt (1)

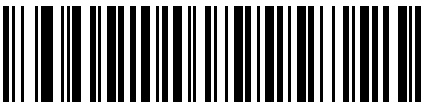
Disable Beep on Reconnect Attempt (0)

Reconnect Attempt Interval

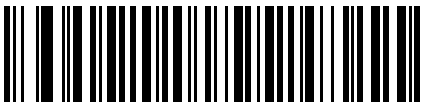
Parameter # 558 (SSI # F1h 2Eh)

This parameter adjusts the time interval after a scanner disconnects as it moves out of range and then tries to reconnect.

*Attempt to Reconnect for 30 Seconds (6)

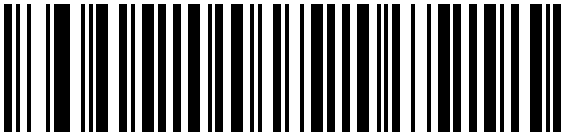


Attempt to Reconnect for 1 Minute (12)



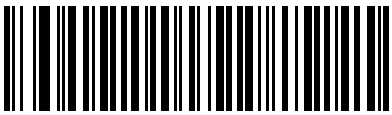
Attempt to Reconnect for 5 Minutes (60)

Attempt to Reconnect for 30 Minutes (360)



Attempt to Reconnect for 1 Hour (720)

Attempt to Reconnect Indefinitely (0)



Attempt to Reconnect for 2 Hours (1440)

Auto-reconnect

Parameter # 604 (SSI # F1h 5Ch)

You can select a reconnect option for the scanner when it disconnects from a remote device:

- Auto-reconnect on Barcode Data - The scanner auto-reconnects when you scan a barcode. A delay can occur when transmitting the first characters. The scanner sounds a decode beep upon barcode scan, followed by a connection, a page timeout, a rejection beep, or a transmission error beep. This option optimizes battery life on the scanner and mobile device. Note that auto-reconnect does not occur on rejection and cable unplug commands.

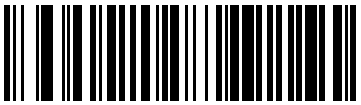
- Auto-reconnect Immediately - When the scanner loses connection, it attempts to reconnect. If a page timeout occurs, the scanner attempts reconnect on a trigger pull **or a wake up event such as picking the scanner up**. Select this option if the scanner's battery life is not an issue and you do not want a delay when transmitting the first barcode.

NOTE: Auto-reconnect does not occur on rejection and cable unplug commands.

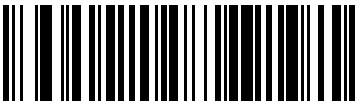
- Disable Auto-reconnect - When the scanner loses connection, you must re-establish it manually.

Auto-reconnect applies to the following hosts:

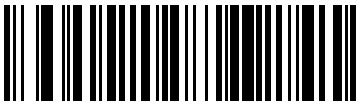
- Cradle Bluetooth Classic
- HID Bluetooth Classic
- SSI Bluetooth Classic (Non-discoverable)
- SPP Bluetooth Classic (Non-discoverable)



Auto-reconnect on Barcode Data (1)



*Auto-reconnect Immediately (2)



Disable Auto-reconnect (0)

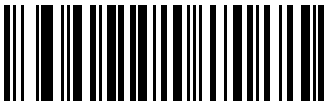
Toggle Pairing

Parameter # 1322 (SSI # F8h 05h 2Ah)

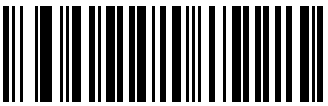
This parameter allows the scanner to toggle/switch between being paired and unpaired with a cradle or host (e.g., VC80).

Choose the following:

- Enabled - Scanner toggles between being paired and unpaired.
- Disabled - Scanner does not switch pairing on toggle.



Enable Toggle Pairing (1)

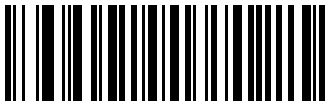


*Disable Toggle Pairing (0)

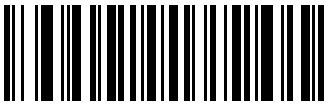
Force Pairing Save

This parameter controls how the scanner saves Bluetooth addresses after a connection attempt.

When this parameter is disabled, the Bluetooth address is only saved after a successful Bluetooth connection. The address is not saved when the connection attempt fails.



Disable



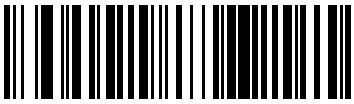
***Enable**

Auto Un-Pairing

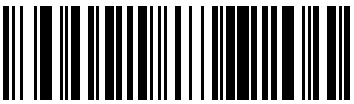
Parameter # 1708

The auto un-pair parameter configures the RS2100 to un-pair from the host computer on specific events.

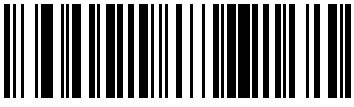
- **Disable (default)** - the RS2100 will not auto un-pair on any events.
- **On cradle insertion** - the RS2100 will un-pair when inserted charging cradle.
- **On reset** - the RS2100 will un-pair if a warm or cold reset occurs.
- **On cradle or reset** - the RS2100 will un-pair on cradle insertion or reset event.



*Disable



Un-pair on Cradle Insertion



On Reset

On Cradle or Reset

Pairing Barcode Format

When the scanner is configured as an SPP Central mode, you must create a pairing barcode for the remote Bluetooth device to which the scanner is connecting. You must know the Bluetooth address of the remote device.

To create a pairing barcode, format a Code 128 barcode as follows:

```
<Fnc 3>Bxxxxxxxxxxxx
```

where:

- B (or LNKB) is the prefix
- xxxxxxxxxxxx represents the 12-character Bluetooth address.

Unpairing

Choose Unpair to unpair the scanner, to make the host available for pairing with another scanner.

Unpair

Batch Mode

Parameter # 544 (SSI # F1h 20h)

This parameter enables the scanner to attempt to store barcode data (excluding parameter barcodes) until transmission is initialized or it stores the maximum number of barcodes.

When the scanner saves a barcode successfully, it emits a good decode beep and flashes the green LED. If the scanner cannot store a new barcode, it emits a low/high/low/high (out of memory) beep. See Status Indications for all definitions.

In all modes, calculate the amount of data (number of barcodes) the scanner can store as follows:

```
Number of storable barcodes= 9,000 bytes of memory/ (number of characters in
 the barcode + 3)
```

NOTE: If you change the batch mode while there is batched data, the new batch mode takes effect only after the scanner sends all previously batched data.

- Normal (default) - Do not batch data. The scanner transmits each barcode when scanned.

- Out-of-Range Batch Mode - The scanner stores barcode data when it loses connection to a remote device (for example, when the scanner moves out of range). When the scanner re-establishes connection with the device (for example, it moves back into range), it transmits the data.
- Standard Batch Mode - The scanner stores barcode data when you scan Enter Batch Mode. Scan Send Batch Data to transmit the data.

NOTE: Transmission stops if the scanner loses connection to the remote device.

- Batch Only Mode - The scanner radio is off, and the scanner stores all barcode data. Insert the scanner into the cradle to transmit the data.

NOTE:

- Removing the scanner from the cradle during batch data transfer stops transmission until you re-insert it in the cradle.
- The radio may be turned off during batch data transmission.
- To exit this mode, scan the **Normal (Do Not Batch Data)** barcode.
- Parameter Batch Mode - Use this mode if the cradle and/or scanner is configured with the radio turned off or connected to a non-cradle device. Scan **Enter Parameter Batch Mode** to enter this mode. The scanner stores parameter barcode data intended for the cradle. Insert the scanner into the cradle to transmit the batched parameter data. When data transmission is complete, the scanner exits this mode. Alternatively, scan **Exit Parameter Batch Mode** to cancel batching before inserting the scanner in the cradle.

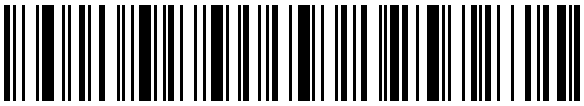
In all modes, transmission stops if the scanner moves out of range and resumes when the scanner moves back in range. If you scan a barcode during batch data transmission, it is appended to the end of the batched data. Parameter barcodes are not stored.

*Normal (Do Not Batch Data) (0)

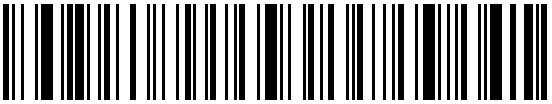
Out of Range Batch Mode (1)

Standard Batch Mode (2)

Batch Only Mode (4)



Enter Batch Mode



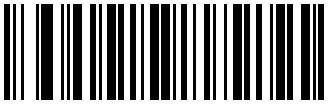
Send Batch Data

Enter Parameter Batch Mode

Exit Parameter Batch Mode

Unique Identifier (SPP only)

In Batch Mode, enable Unique Identifier to add the device's serial number to each data payload sent.



***Disable**

Enable

Using Image Capture Mode

Image Capture Mode allows the scanner to capture an image and send its binary data over an SPP connection. To use Image Catpure Mode:

The connected device uses the binary data sent by the scanner, starting from the PG signature (hex value **FF D8 FF**), to create the image file in JPG format.

1. Change the scanner to SPP mode.
2. Pair and connect the scanner to a host device.
3. Enable Image Capture Mode by sending the character **i** to the scanner.

   The cross-hair beam illuminates, indicating that the scanner is ready to capture an image.
4. Press the Scan trigger.

After capturing an image, the scanner

1. Sends the data to the connected device.
2. Exits Image Capture Mode.
3. Returns to the previous barcode scanning mode.

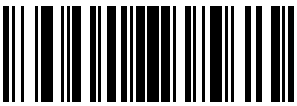
Battery Threshold

The following options specify various battery thresholds for the scanner:

- Battery Status High Threshold - Parameter #1367 When the battery status is above the High Threshold, the battery indicator is green. The default is 50%.
- Battery Status Medium Threshold - Parameter #1368 When the battery status is above the Medium Threshold (and below the High Threshold), the battery indicator is amber. When the battery status is below the Medium Threshold, the battery indicator is red. The default is 20%.
- Battery Status Low Warning Threshold - Parameter #1369 The Low Warning Threshold indicates that the Battery Status is critically low. When the battery status is below this threshold, on every trigger release the scanner issues four short beeps. The default is 10%.
- Battery Health Low Warning Threshold - Parameter #1370 When the battery health is below the Low Health Threshold, all battery indications alternate between red and the appropriate battery status indication. The default is 60%.

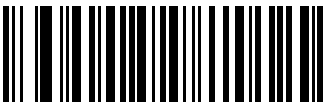
NOTE: When Battery Health is low, consider replacing the battery.

Battery Status High Threshold



Battery Status Medium Threshold

Battery Status Low Warning Threshold



Battery Health Low Warning Threshold

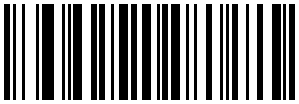
Bluetooth Friendly Name

Parameter # 607 (SSI # F1h 5fh)

This parameter allows you to assign a meaningful name to the scanner, which appears in the application during device discovery.

By default this is the scanner family name followed by the serial number, such as DS3578 123456789ABCDEF. Select `Set Defaults` to revert the scanner to its default name, use custom defaults to maintain the user-programmed name through a Set Defaults operation.

NOTE: If the application allows setting a device name, this name takes precedence over the Bluetooth Friendly Name.



Bluetooth Friendly Name

BLE Beaconing

Beacon Upon Disconnection

Parameter # 2403 (SSI # F8h 09h 63h)

This parameter controls beaconing when the scanner is disconnected from the host device.

NOTE: A scanner will still be paired to its host device when it disconnects from the host. Go to Bluetooth Communications for more information.

- **Enable:** The scanner beacons when it disconnects from the host.
- **Disable:** The scanner does not beacon when it disconnects from the host device.

Enable (1)

*Disable (0)

Unpaired Beaconing

Parameter # 2404 (SSI # F8h 09h 64h)

This parameter controls beaconing when the scanner is not paired to a host device.

- **Enable:** The scanner beacons if it is not paired to a host device. Any LE Bluetooth device will be able to detect the beacon signal.
- **Disable:** The scanner does not beacon when it is not paired to a host device.

Enable beaconing when there is no remote host address (1)

*Disable beaconing when there is no remote host address (0)

Beaconing Beep

Parameter # 2405 (SSI # F8h 09h 65h)

This parameter controls beeping during beaconing.

If beaconing activates because of a low battery level, beeping is disabled to preserve battery power.

Enable beeping (1)

*Disable beeping (0)

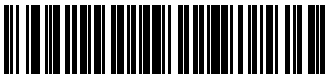
Beacon Frequency

Parameter #2406(SSI # F8h 09h 66h)

This parameter defines how often the scanner sends a beacon signal.

*100 msec

200 msec



300 msec

Beacon Battery Threshold

Parameter # 2407 (SSI # F8h 09h 67h)

This parameter defines the battery level at which beaconing activates.

Scan one of the following codes to set the corresponding battery level. The recommended range is 0-40%.

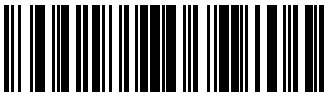
When the scanner's battery reaches the defined level, and beaconing activates, the scanner enters a power-saving mode. In the power-saving mode:

- pressing the trigger does not result in a scan
- sending data to and from the host device fails

To end the power-saving mode:

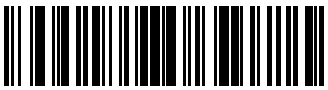
- place the scanner in a charger
- replace the battery with one that is more fully charged

NOTE: If the scanner battery reaches 0%, a beacon signal cannot be sent to recover the scanner.



10%

20%



30%

35%

37%

40%

*(Disable)

NOTE: BLE Beaconing consumes battery power. Enabling beaconing may cause the battery level to decrease more quickly.

Beacon ID

Parameters 2408 and 2409 comprise the Beacon ID in the Alt-Beacon packet.

ID1 is automatically generated and defined by Attribute 20036.

ID2

Parameter # 2408 (SSI # F8g 09h 68h)

This parameter sets the ID2 portion of the beacon ID.

0xE1E1 (1)

*0xEBEB (0)

ID3

Parameter #2409(SSI # F8h 09h 69h)

This parameter sets the ID3 portion of the beacon ID.

0xE2E2 (1)

*0xECDD (0)

Accessories

The device accessories provide a variety of product support capabilities.

Accessories List

This table provides a brief description of all of the scanner's accessories.

Table 5 Accessories List

Accessory	Part Number	Description
2-Slot Charger	CRD-RS2X-2SCHG-01	Charges up to two devices. Requires power supply PWR-WUA5V12W0US and USB A to USB C cord.
RS2100 20-Slot Charger	CRD-RS2X-20SCHG-01	Allows charging of 20 RS2100 wearable scanners. Requires PWR-BGA12V108W0WW, DC line cord CBL-DC-382A1-01 and 3-wire grounded country-specific AC line cord, sold separately.
Back of Hand Trigger (Left)	SG-RS2X-HMTLA-01 SG-RS2X-HMTLA-10 (10-pack)	Mounts the RS2100 on the back of the left hand and provides a remote finger trigger. Designed for all day comfort and dexterity. One size fits all. For use with bare hands or light gloves only.
Back of Hand Trigger (Right)	SG-RS2X-HMTRA-01 SG-RS2X-HMTRA-10 (10-pack)	Mounts the RS2100 on the back of the right hand and provides a remote finger trigger. Designed for all day comfort and dexterity. One size fits all. For use with bare hands or light gloves only.
Bluetooth Adapter	BT-RS5X6-DNGL-01 (Adapter only) KT-RS5X6-BTDCBL-01 (Adapter with cable)	Allows up to seven RS2100s to pair with a host computer via Bluetooth.

Charging

Use the 2-slot charger to charge the RS2100.

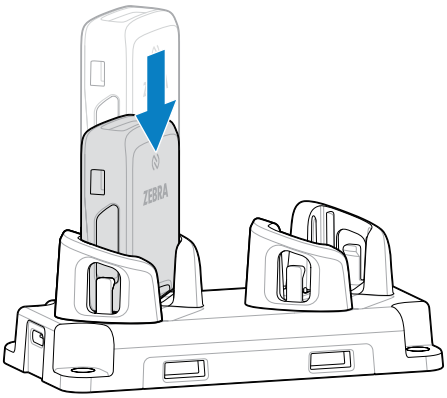
NOTE: This charger does not provide communication functionality.

IMPORTANT: The scanner ships in a battery-saving mode. To exit battery-saving mode and enable scanning, insert the scanner into the charger.

Charging a Scanner

To charge the scanner, insert it into a charging slot.

1. Take the scanner out of the Slim Mount.
2. Position the scanner so that the charging contacts on the scanner align with the charging contacts in the charging slot.



3. Insert the scanner into the charging slot.
4. Press firmly until the release tabs click into place.

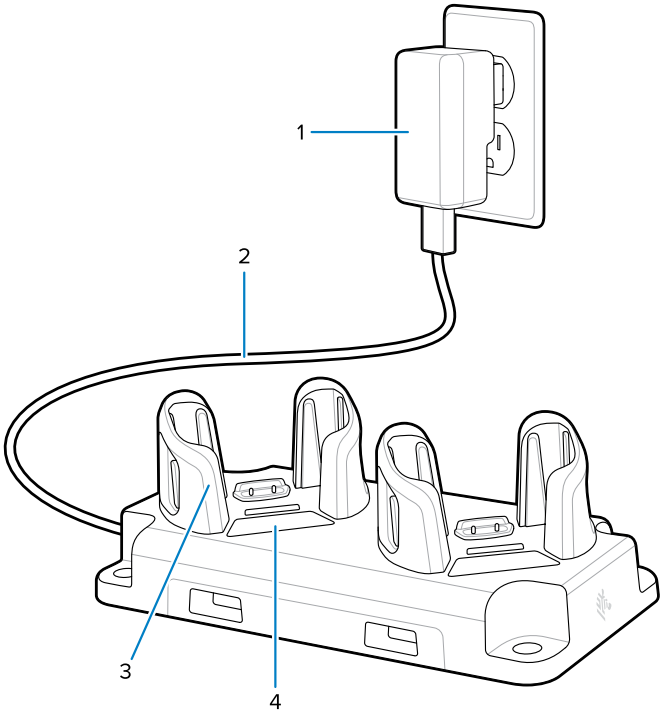
The scanner beeps and the LED indicator illuminates to show the scanner's charging level.

2-Slot Charger

The 2-Slot Charger charges up to two scanners.

NOTE: Follow the guidelines for battery safety described in Battery Safety Guidelines.

Figure 8 2-Slot Charger



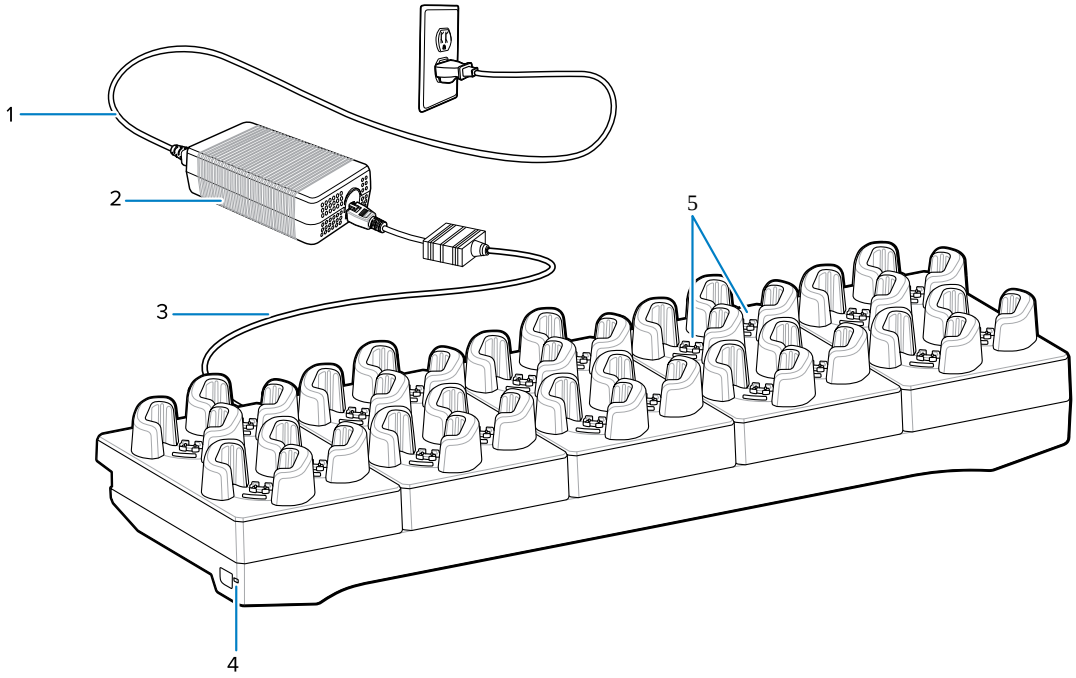
1	Power charger
2	DC line cord
3	Device charging slot
4	Power LED

20-Slot Charger

The 20-Slot RS2100 Charger charges up to 20 scanners.

NOTE: Follow the guidelines for battery safety described in Battery Safety Guidelines.

Figure 9 20-Slot Charger



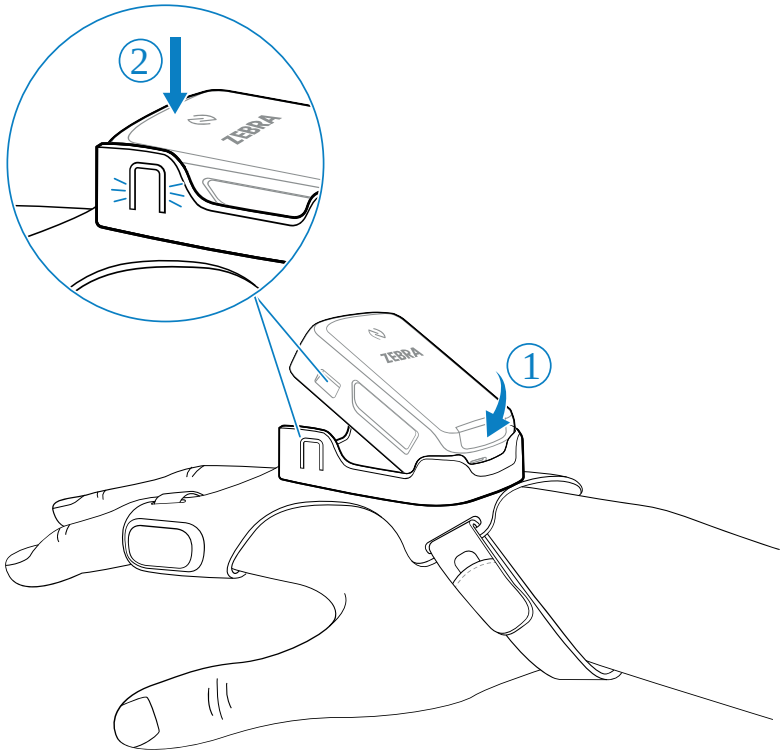
1	AC line cord
2	Power supply
3	DC line cord
4	Power LED
5	Device charging slots

Slim Mount

The Slim Mount allows you to wear the RS5100/RS6100 on the back of your hand and provides a remote finger trigger.

Mounting Instructions

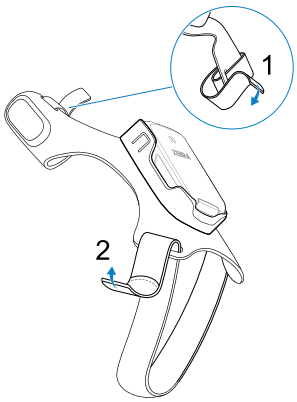
Press the scanner into the mount.



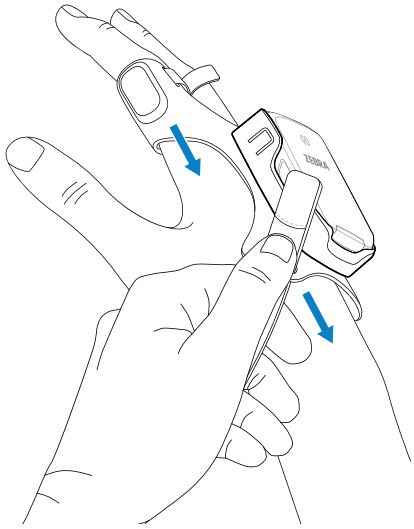
Placing the Slim Mount on Your Hand

Use the Slim Mount to mount the RS2100 onto your hand.

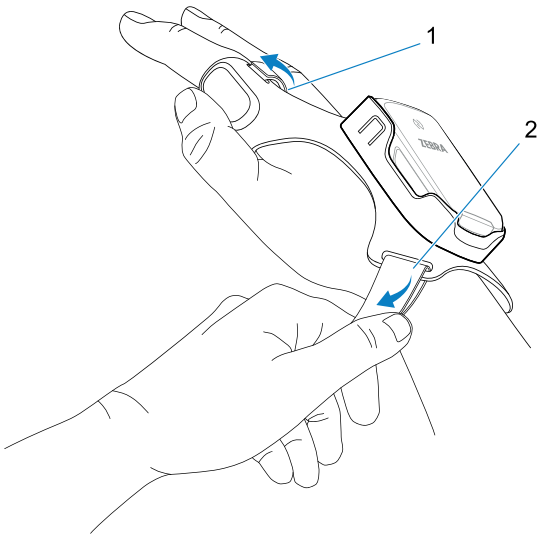
1. Loosen the finger strap (1) and wrist strap (2).



2. Slide your hand through the wrist strap and your index finger through the finger strap.



3. Pull the mount onto your hand until the wrist strap (1) sits comfortably on your wrist and the finger strap (2) is at the base of your finger.



4. Secure the wrist strap and finger strap.

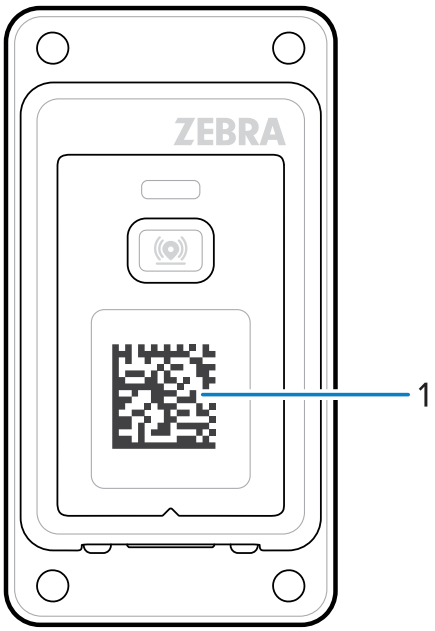
Bluetooth Adapter

The BT-RS5X6-DNGL-01 Bluetooth Adapter provides Bluetooth capability to a host computer. Place it on a horizontal surface or mount it vertically.

Pairing

To pair a Zebra scanner with the adapter:

Use a Zebra scanner in factory default mode to scan the pairing barcode (1) on the adapter.



The LED indicator blinks blue, indicating that the scanner is attempting to establish a connection with the adapter. When a connection is established, the LED indicator turns off, and the scanner emits an alert to signal successful pairing.

RS2100 Configuration

The RS2100 is provided with a default software configuration set in the factory, which can be configured to meet customer-specific operational requirements. Before using the RS2100, configure the device properly to best use its extensive capabilities and gain maximum efficiency.

To configure the RS2100, scan special configuration barcodes or use the 123Scan application. When the RS2100 is connected to a Zebra mobile computer, some configuration parameters can be automatically overwritten by an EMDK application or DataWedge.

NOTE: Perform a cold boot after scanning the configuration barcodes to reset the RS2100.

NOTE: Once the RS2100 is paired to a Zebra host device, the scanning software disables the ability to read configuration barcodes.

DataWedge

The DataWedge application available on Zebra mobile computers is used to configure scanner settings and process scanned data before sending it to an application.

DataWedge is based on profiles, which direct DataWedge behavior for different applications. Using profiles, each application can have a specific DataWedge configuration. For example, each user application can have a DataWedge profile that processes scanned data in the required format for that application.

Once connected to a Zebra mobile computer, DataWedge settings override some of the RS2100 parameters previously set via configuration barcodes or 123Scan. These settings only apply while the RS2100 is connected to the mobile computer and do not persist once the RS2100 is disconnected and reset.

For more information on DataWedge, refer to the host device's Integrator Guide.

123Scan

123Scan is a PC-based software tool that enables rapid customized setup of the device.

123Scan uses a wizard tool to guide users through a streamlined set up process. Settings are saved in a configuration file that can be distributed via e-mail or used to generate a sheet of programming barcodes.

123Scan can upgrade device firmware, check on-line to enable support for newly released products, generate a collection of multi-setting barcodes if the number of settings is very large, and generate reports with asset tracking information.

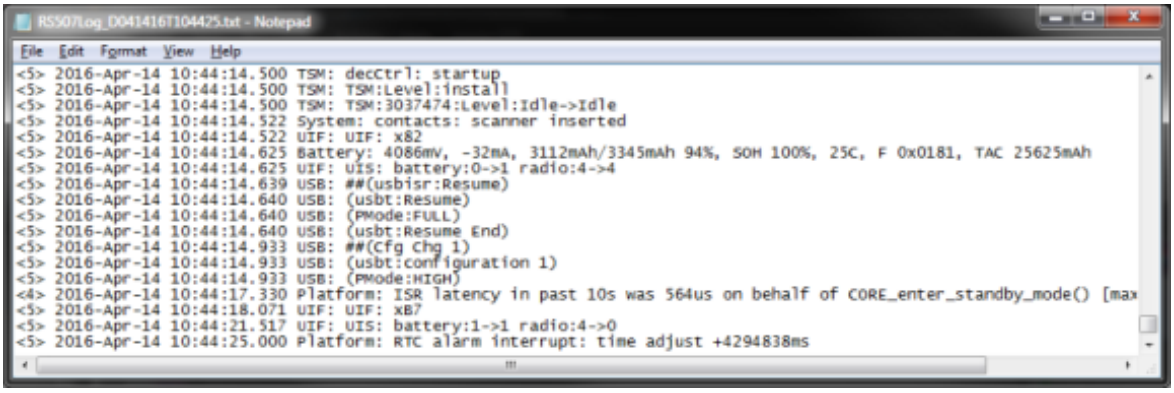
For more information on 123Scan, see 123Scan.

Real Time Logger

The Real Time Logger application logs RS2100 events, errors, exceptions, and software diagnostics . Each log record has a time stamp with a 1 ms resolution. The log record memory size is 4 MB and is cyclic. Log records reset after a cold boot.

The following figure shows the Real Time Logger file content as shown on a host computer screen.

Figure 10 Real Time Logger Content Screen



Retrieving the RS2100 Log File

Use the RS507PCTool Application to download the Log File from a paired Windows host device.

Ensure the correct port numbers display in the **RS507PCTools** Application.

NOTE: If your **RS507PCTools** Application only displays COM1 to COM20, right-click on the port, select **Properties** > **Advanced** and change the number in **COM Port Number** to **COM29**.

Pair the RS2100 with a Windows host device

1. If the RS2100 is paired to a different host device, scan the unpair barcode.

2. Enable discoverable mode by scanning SSI Bluetooth Discoverable barcode.

3. On the Windows device, open **Settings** > **Bluetooth & other devices** > **Add a Bluetooth or other device**.
4. Select the RS2100 from the list of available devices.

   The RS2100 is paired to the Windows device.

Retrieve the Log File

5. On the Windows device, open the **Device Manager** > **Ports (COM & LPT)**.

6. Note the **Standard Serial over Bluetooth link** COM values.
7. Open the **RS507PCTools** Application.
8. Open both ports and use the one that opens successfully.

   You will see the model #, serial number, and firmware version when the correct port opens.
9. Select **Get Log**.

   The log downloads into the RS5107PCTools application folder.

RS2100 Firmware Update

RS2100 devices can be updated and re-flashed with new firmware. To perform the update, download the firmware to the RS2100 flash memory. If the download fails, the previous firmware remains operational. The firmware remains in RS2100 memory even when the RS2100 reboots.

The RS2100 firmware can be updated via Bluetooth using 123Scan or a connected Zebra device.

NOTE: Ensure the current firmware version is different from the version selected for an update. Attempting to update the firmware version that is already installed results in a failed process.

Updating firmware with different parameters causes the scanner and its connection to the host device to reset. Manually scan/tap to pair the scanner to a host device after a firmware update.

Bluetooth Using 123Scan

The 123Scan application can upgrade the RS2100 firmware using Bluetooth to connect to a host computer. For more information on using 123Scan, go to 123Scan.

Bluetooth Connected Zebra Device

The Zebra WT6000 or later device provides Enterprise Mobility Developer Kit (EMDK) support for updating the firmware of a Bluetooth connected RS2100. Using a Mobile Device Management (MDM) application, RS2100 firmware is deployed to the WT6000 device. Then an EMDK application must be created which downloads the firmware to the RS2100.

Updating the Firmware

Update RS2100 firmware using the Zebra Device Central app (version 2.1.0.14 or later).

Scan RS2100 and RS5100 before updating the firmware using the Zebra Device Central app.

1. Deploy the firmware update to the Zebra host device in the location:

```
\Internal shared storage\Android\data\com.symbol.devicecentral\files
```

2. Open the Device Central app, and pair the RS2100.
3. Tap the RS2100 item to show device details.
4. Tap **Firmware update**.

User Preferences and Miscellaneous Options

You can program the scanner to perform various functions or activate different features. This section describes user preference features and provides programming barcodes for selecting these features.

The scanner ships with the settings shown in User Preferences Parameter Defaults. If the default values suit requirements, programming is not necessary.

Setting User Preference 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 scanner 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 (see each host section for specific host information) 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 Default Parameters. Throughout the programming barcode menus, asterisks indicate (*) default values.

User Preference Scanning Sequence Examples

In most cases, scanning one barcode sets the parameter value.

Other parameters require scanning several barcodes. Relevant parameters contain descriptions for this procedure.

User Preference Errors While Scanning

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

User Preferences/Miscellaneous Options Parameter Defaults

The following table lists defaults for 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 Default Parameters.
- Configure the scanner using the 123Scan configuration program. See 123Scan and Software Tools.

NOTE: Standard parameter defaults are available in each chapter of this guide.

Table 6 User Preferences Parameter Defaults

Parameter	Parameter Number [a]	SSI Number [b]	Default
User Preferences			
Set Default Parameter			N/A
Parameter Barcode Scanning	236	ECh	Enable
Beep After Good Decode	56	38h	Enable
Beep on Insertion	288		Enabled
Beeper Volume	140	8Ch	High
Beeper Tone	145	91h	High
Beeper Duration	628	F1h 74h	Short
Suppress Power up Beeps	721	F1h D1h	Do Not Suppress
Low Battery Indication	779	F2h 08h	Enable
Trigger Mode	138	8Ah	Level
Hand-held Decode Aiming Pattern	306	F0h 32h	Enable
Picklist Mode	402	F0h 92h	Disable Picklist Mode Always
Continuous Barcode Read	649	F1h 89h	Disable
Unique Barcode Reporting	723	F1h D3h	Enable
Decode Session Timeout	136	88h	9.9 seconds
Timeout Between Decodes, Same Symbol	137	89h	0.5 seconds
Timeout Between Decodes, Different Symbols	144	90h	0.1 seconds
Fuzzy 1D Processing	514	F1h 02h	Enable Fuzzy 1D Processing
Decode Mirror Images (Data Matrix Only)	537	F1h 19h	Auto
Mobile Phone/Display Mode	716	F1h CCh	Normal
PDF Prioritization	719	F4h F1h CFh	Disable
PDF Prioritization Timeout	720	F1h D0h	200 ms

Table 6 User Preferences Parameter Defaults (Continued)

Parameter	Parameter Number [a]	SSI Number [b]	Default
Decoding Illumination	298	F0h 2Ah	Enable
Motion Tolerance	858	F2h 5Ah	Less
Miscellaneous Options			
Enter Key	N/A	N/A	N/A
Transmit Code ID Character	45	2Dh	None
Prefix Value	99, 105	63h, 69h	7013 <CR><LF>
Suffix 1 Value	98, 104	62h, 68h	7013 <CR><LF>
Suffix 2 Value	100, 106	64h, 6Ah	7013 <CR><LF>
Scan Data Transmission Format	235	EBh	Data As Is
FN1 Substitution Values	103, 109	67h, 6Dh	7013 <CR><LF>
Transmit No Read Message	94	5E	Disable
Low Power Mode	128	80h	Enable

[a] Parameter number decimal values are used for programming via RSM commands.

[b] SSI number hex values are used for programming via SSI commands.

User Preferences

Set feature values by scanning the desired parameter values.

Default Parameters

Scan one of the following barcodes to reset the scanner to its default settings.

RESTRICTION: If the RS2100 is connected to a wearable computer via an SSI Bluetooth connection, the connection prohibits the RS2100 from scanning parameter barcodes. This prohibition remains until you reboot the scanner.

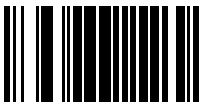
To scan the default parameters barcode:

1. Disable Bluetooth on the host device.
2. Reboot the scanner by holding the trigger for 15 seconds.

The scanner is ready to scan a default parameters barcode.

- Restore Defaults resets all default parameters as follows:
  - If you configured custom default parameter values via the Write to Custom Defaults barcode, scanning the Restore Defaults barcode restores these custom values.
  - If you did not configure custom default parameter values, scanning the Restore Defaults barcode restores the factory default values. Default values are available at the beginning of each section.

- Set Factory Defaults clears all custom default values and sets the factory default values. Default values are available at the beginning of each section.

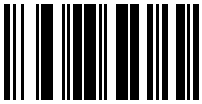


*Restore Defaults

Set Factory Defaults

Write to Custom Defaults

To create a set of custom defaults, select the desired parameter values in this guide and then scan Write to Custom Defaults.



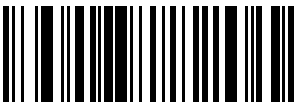
Write to Custom Defaults

Parameter Barcode Scanning

Parameter # 236 (SSI # ECh)

This parameter selects whether to enable or disable the decoding of parameter barcodes, including the **Set Defaults** barcodes.

*Enable Parameter Barcode Scanning (1)

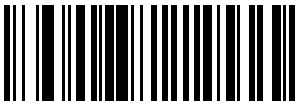


Disable Parameter Barcode Scanning (0)

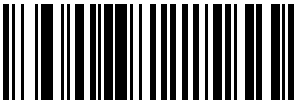
Beep After Good Decode

Parameter # 56 (SSI # 38h)

This parameter determines whether or not the scanner beeps after a good decode. If you select **Disable Beep After Good Decode**, the beeper still operates during parameter menu scanning and to indicate error conditions.



*Enable Beep After Good Decode (1)



Disable Beep After Good Decode (0)

Beep on Insertion

Parameter # 288

Use this option to enable or disable a short beep when the scanner is inserted into a charging cradle.

To enable or disable beeping on insertion, scan the appropriate barcode.

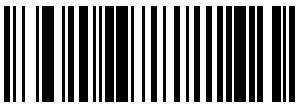
*Enable Beep on Insertion (00h)

Disable Beep on Insertion (01h)

Beeper Volume

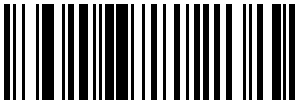
Parameter # 140 (SSI # 8Ch)

This parameter selects the volume of the beeper.



Low Volume (2)

Medium Volume (1)

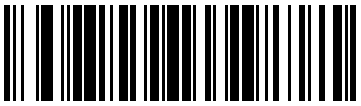


*High Volume (0)

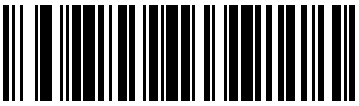
Beeper Tone

Parameter # 145 (SSI # 91h)

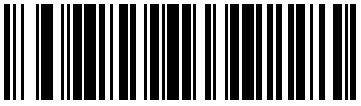
This parameter selects a beeper tone for a successful decode beep.



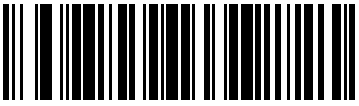
Disable Tone (3)



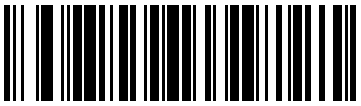
Low Tone (2)



*Medium Tone (1)



High Tone (0)

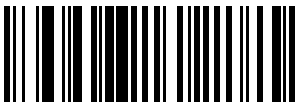


Medium to High Tone (2-tone) (4)

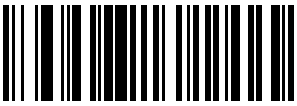
Beeper Duration

Parameter # 628 (SSI # F1h 74h)

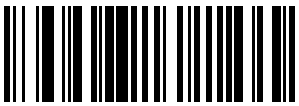
This parameter selects the duration for the good decode beep.



Short Duration (0)



*Medium Duration (1)



Long Duration (2)

Suppress Power Up Beeps

Parameter # 721 (SSI # F1h D1h)

This parameter selects whether or not to suppress the scanner's power-up beeps.

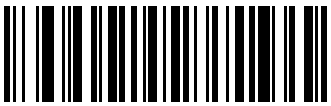
*Do Not Suppress Power Up Beeps (0)

Suppress Power Up Beeps (1)

Low Battery Indication

Parameter # 779 (SSI # F2h 0Bh)

Scan a barcode to control the scanner's low battery indication.



Disable (0)

*Enable (1)

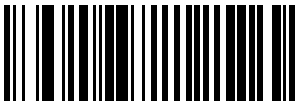
Trigger Mode

Parameter # 138 (SSI # 8Ah)

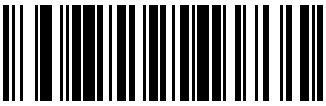
This parameter allows you to change your scanner's behavior to initiate a decode.

Choose one of the following to select a trigger mode for the scanner:

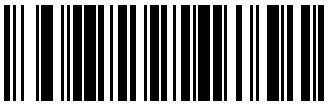
- Standard (Level) - A trigger press activates decode processing. Decode processing continues until the barcode decodes, you release the trigger or the Decode Session Timeout occurs. If the trigger is released before the timeout expires, the decode session terminates and no decode occurs.
- Two Stage Option 1 -Upon trigger pull, the aiming pattern appears. When the trigger is released, the scanner activates decode processing, using the currently configured decode session timeout. If the trigger is pulled again while in a decode session, the session is terminated and the aimer appears.
- Two Stage Option 2 -Upon trigger pull, the aiming pattern appears. When the trigger is released, the aiming pattern turns off. Pulling the trigger twice quickly activates decode processing, until the trigger is released.



*Standard (Level) (0)



Two Stage Option 1 (14)



Two Stage Option 2 (15)

Hand-held Decode Aiming Pattern

Parameter # 306 (SSI # F0h 32h)

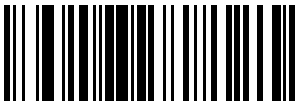
This parameter selects when to project the aiming pattern in hand-held mode:

- Enable Hand-held Decode Aiming Pattern - This projects the aiming pattern during barcode capture.
- Disable Hand-held Decode Aiming Pattern - This turns the aiming pattern off.
- Enable Hand-held Decode Aiming Pattern on PDF - This projects the aiming pattern when the scanner detects a PDF barcode.

NOTE: With Picklist Mode enabled, the decode aiming pattern flashes even if you disable the Hand-held Decode Aiming Pattern.

*Enable Hand-held Decode Aiming Pattern (2)

Disable Hand-held Decode Aiming Pattern (0)



Enable Hand-held Decode Aiming Pattern on PDF (3)

Picklist Mode

Parameter # 402 (SSI # F0h 92h)

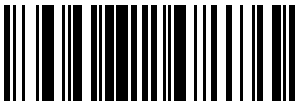
This parameter selects a Picklist Mode. In this mode, it allows you to pick and decode a specific barcode from a group of barcode printed close together. This is achieved by placing the aiming pattern on the desired barcode.

NOTE: Enabling Picklist Mode overrides the Disable Decode Aiming Pattern options. You can not disable the decode aiming pattern when Picklist Mode is enabled. Enabling Picklist Mode can slow decode speed and hinder the ability to decode longer barcodes.

- Enable Picklist Mode Always - Picklist Mode is always enabled.
- Enable Picklist Mode in Hand-held Mode - Picklist Mode is enabled when the scanner is out of hands-free mode and disabled when the scanner is in presentation mode.
- Enable Picklist Mode in Hands-free Mode - Picklist Mode is enabled when the scanner is in hands-free mode only.
- Disable Picklist Mode Always - Picklist Mode is always disabled.

Enable Picklist Mode Always (2)

Enable Picklist Mode in Hand-held Mode (1)



Enable Picklist Mode in Hands-free Mode (3)

*Disable Picklist Mode Always (0)

Continuous Barcode Read

Parameter # 649 (SSI # F1h 89h)

This parameter enables to report every barcode while the trigger is pressed.

Enable Continuous Barcode Read (1)

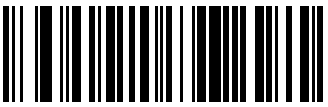
*Disable Continuous Barcode Read (0)

Unique Barcode Reporting

Parameter # 723 (SSI # F1h D3h)

Enable this parameter to report only unique barcodes while the trigger is pressed. This option only applies when Continuous Barcode Read is enabled.

*Enable Unique Barcode Reporting (1)



Disable Unique Barcode Reporting (0)

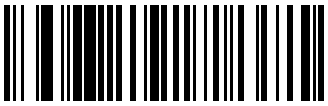
Decode Session Timeout

Parameter # 136 (SSI # 88h)

This parameter sets the maximum time decode processing continues during a scan attempt. It is programmable in 0.1 second increments from 0.5 to 9.9 seconds. The default timeout is 4.0 seconds.

NOTE: The default timeout is 0.75 seconds in temperatures below -20°C (-4°F) with the extended battery installed.

To set a Decode Session Timeout, scan the following barcode, and then scan two barcodes from Numeric Barcodes that correspond to the desired on time. Enter a leading zero for single digit numbers. For example, to set a Decode Session Timeout of 0.5 seconds, scan this barcode, and then scan the 0 and 5 barcodes. To correct an error or change the selection, scan Cancel.



Decode Session Timeout

Timeout Between Decodes, Same Symbol

Parameter # 137 (SSI # 89h)

Use this option in Presentation Mode or Continuous Barcode Read Mode to prevent the scanner from continuously decoding the same barcode while it remains in the scanner's field of view. The barcode must be removed from the field of view for the timeout period before the scanner reads the same consecutive symbol.

Timeout Between Decodes, Same Symbol is programmable in 0.1 second increments from 0.0 to 9.9 seconds. The default interval is 0.5 seconds seconds.

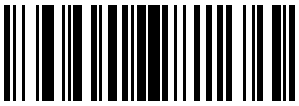
Timeout Between Decodes, Same Symbol

Timeout Between Decodes, Different Symbols

Parameter # 144 (SSI # 90h)

This parameter controls the time the scanner waits before decoding a different symbol. Use this parameter when the scanner is in Presentation Mode or Continuous Barcode Read.

Timeout Between Decodes, Different Symbols is programmable in 0.1 second increments from 0.1 to 9.9 seconds. The default is 0.1 seconds.



Timeout Between Decodes, Different Symbols

Fuzzy 1D Processing

Parameter # 514 (SSI # F1h 02h)

This parameter is enabled by default to optimize decode performance on 1D barcodes, including damaged and poor quality symbols. Disable this parameter only if you experience delays when decoding 2D barcodes, or in detecting a no decode.

*Enable Fuzzy 1D Processing (1)

Disable Fuzzy 1D Processing (0)

Decode Mirror Images (Data Matrix Only)

Parameter # 137 (SSI # 89h)

Use this option to control data matrix decoding.

Data Matrix Decoding options:

- Always: Decode only Data Matrix barcodes that are mirror images.
- Never: Do not decode Data Matrix barcodes that are mirror images.
- Auto: Decode both mirrored and un-mirrored Data Matrix barcodes.

Never (0)

Always (1)

*Auto (2)

Mobile Phone/Display Mode

Parameter # 716 (SSI # F1h CCh)

This mode improves barcode reading performance off mobile phones and electronic displays. Scan one of the following barcodes to select the desired mode.

Mobile barcodes include barcodes on mobile phone displays, PC displays, or other reflective surfaces such as clear plastic bags or cellophane wrapping. Printed barcodes include barcodes printed on paper or other non-reflective surfaces.

PDF Prioritization

Parameter # 719 (SSI # F4h F1h CFh)

Enable this parameter to delay decoding certain 1D barcodes by the value specified in PDF Prioritization Timeout.

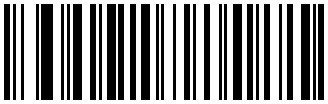
During the PDF Prioritization Timeout time, the scanner attempts to decode a PDF417 symbol (for example, on a US driver's license), and if successful, reports this only. If it does not decode (cannot find) a PDF417 symbol, it reports the 1D symbol after the timeout. The 1D symbol must be in the device's field of view for the scanner to report it. This parameter does not affect decoding other symbologies.

The 1D Code 128 barcode lengths include the following:

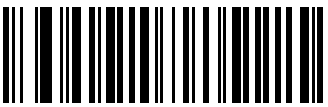
- 7 to 10 characters
- 14 to 22 characters
- 27 to 28 characters

In addition, a Code 39 barcode with the following lengths are considered to potentially be part of a US driver's license:

- 8 characters
- 12 characters



Enable PDF Prioritization (1)



*Disable PDF Prioritization (0)

PDF Prioritization Timeout

Parameter # 720 (SSI # F1h D0h)

If you enabled PDF Prioritization, set this timeout to indicate how long the scanner attempts to decode a PDF417 symbol before reporting the 1D barcode in the field of view.

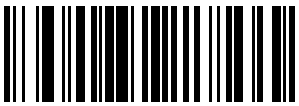
The PDF Prioritization Timeout range is 0 to 5000 ms, and the default is 200 ms.

PDF Prioritization Timeout

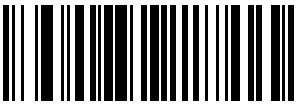
Decoding Illumination

Parameter # 298 (SSI # F0h 2Ah)

This parameter determines whether the scanner turns on illumination to aid decoding. Enabling illumination usually produces superior images and better decode performance. The effectiveness of the illumination decreases as the distance to the target increases.



Enable Decoding Illumination (1)



Disable Decoding Illumination (0)

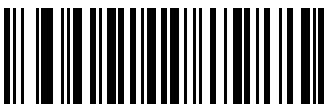
Motion Tolerance

Parameter # 858 (SSI # F2h 5Ah)

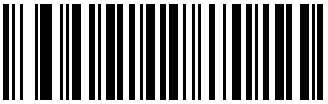
This parameter selects a motion tolerance option.

NOTE: Hand-held Trigger modes only.

- *Less Motion Tolerance - This provides optimal decoding performance on 1D barcodes.
- More Motion Tolerance - This increases motion tolerance and speeds decoding when scanning a series of 1D barcodes in rapid progression.



*Less Motion Tolerance (0)



More Motion Tolerance (1)

Battery Threshold

The following options specify various battery thresholds for the scanner:

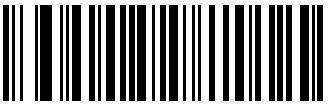
- Battery Status High Threshold - Parameter #1367 When the battery status is above the High Threshold, the battery indicator is green. The default is 50%.
- Battery Status Medium Threshold - Parameter #1368 When the battery status is above the Medium Threshold (and below the High Threshold), the battery indicator is amber. When the battery status is below the Medium Threshold, the battery indicator is red. The default is 20%.
- Battery Status Low Warning Threshold - Parameter #1369 The Low Warning Threshold indicates that the Battery Status is critically low. When the battery status is below this threshold, on every trigger release the scanner issues four short beeps. The default is 10%.
- Battery Health Low Warning Threshold - Parameter #1370 When the battery health is below the Low Health Threshold, all battery indications alternate between red and the appropriate battery status indication. The default is 60%.

NOTE: When Battery Health is low, consider replacing the battery.

Battery Status High Threshold

Battery Status Medium Threshold

Battery Status Low Warning Threshold



Battery Health Low Warning Threshold

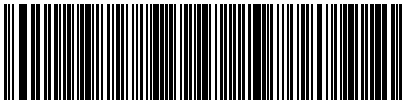
Miscellaneous Scanner Parameters

This section provides additional barcodes and parameters for miscellaneous options.

Enter Key

This parameter adds an Enter key (carriage return or line feed) after scanned data.

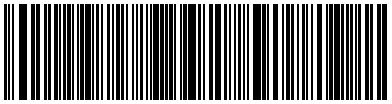
To program other prefixes and/or suffixes, see Prefix/Suffix Values.



Add Enter Key (Carriage Return/Line Feed)

Tab Key

This parameter adds a Tab key after scanned data.



Tab Key

Transmit Code ID Character

Parameter # 45 (SSI # 2Dh)

A Code ID character identifies the code type of a scanned barcode. This is useful when decoding more than one code type. In addition to any single character prefix selected, the Code ID character is inserted between the prefix and the decoded symbol.

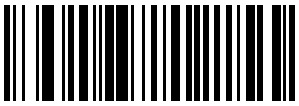
The Code ID character options are:

- No Code ID character
- Symbol Code ID character
- AIM Code ID character

For Code ID characters, see Symbol Code Identifiers and AIM Code Identifiers.

Symbol Code ID Character (2)

AIM Code ID Character (1)



*None (0)

Prefix Suffix Values

Key Category Parameter # P = 99

Key Category Parameter # S1 = 98

Key Category Parameter # S2 = 100

Key Category SSI # P = 63h, S1 = 62h, S2 = 64h

Decimal Value Parameter # P =105, S1 =104, S2 =106

Decimal Value SSI # P = 69h, S1 = 68h, S2 = 6Ah

This parameter appends up to one prefix or up to two suffix values to scan data for use in data editing. The default prefix and suffix value is 7013 <CR><LF> (Enter key).

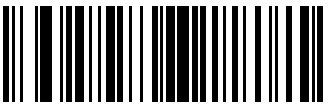
NOTE: To use Prefix/Suffix values, first set the Scan Data Transmission Format.

To set a value for a prefix or suffix, scan one of the following barcodes, and then scan four barcodes from Numeric Barcodes that correspond to that value. See ASCII Character Sets for the four-digit codes.

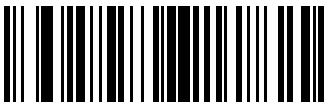
When using host commands to set the prefix or suffix, set the key category parameter to 1, and then set the 3-digit decimal value. See ASCII Character Sets for the four-digit codes.

To correct an error or change a selection, scan Cancel.

Scan Prefix (7)



Scan Suffix 1 (6)



Scan Suffix 2 (8)

Data Format Cancel

Scan Data Transmission Format

Parameter # 235 (SSI # EBh)

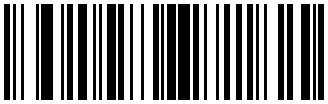
This parameter defines the format used for transmitting scan data.

NOTE: When using this parameter, avoid applying ADF rules to configure the prefix or suffix.

To set prefix or suffix values, see Prefix Suffix Values.

Data As Is (0)

<DATA> <SUFFIX 1> (1)

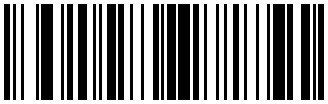


<DATA> <SUFFIX 2> (2)

<DATA> <SUFFIX 1> <SUFFIX 2> (3)

<PREFIX> <DATA > (4)

<PREFIX> <DATA> <SUFFIX 1> (5)



<PREFIX> <DATA> <SUFFIX 2> (6)

<PREFIX> <DATA> <SUFFIX 1> <SUFFIX 2> (7)

FN1 Substitution Values

Key Category Parameter # 103 (SSI # 67h)

Decimal Value Parameter # 109 (SSI # 6Dh)

The FN1 substitution feature supports keyboard wedge and USB HID keyboard hosts. When enabled, this feature replaces any FN1 character (0x1b) in an EAN128 barcode with a specific value. By default, the substitution value is 7013 <CR><LF> (Enter key).

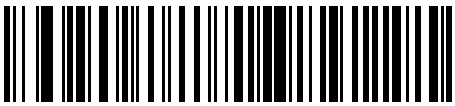
To configure the FN1 substitution value using host commands:

- Set the Key Category Parameter to 1.
- Define the 3-digit keystroke value.

See the ASCII Character Sets for the current host interface for the desired value.

FN1 Substitution

Select Enable FN1 Substitution to replace FN1 characters in an EAN128 barcode with a user-selected keystroke (see FN1 Substitution Values).



Enable FN1 Substitution

*Disable FN1 Substitution

Selecting a FN1 Substitution Value

Select a FN1 substitution value via the following barcode menus.

1. Scan the following barcode.

Set FN1 Substitution Value

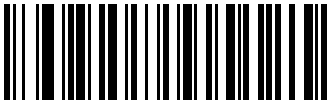
2. Locate the keystroke desired for FN1 Substitution in the ASCII Character Set table for the current host interface, and enter the 4-digit ASCII value by scanning four barcodes from Numeric Barcodes.

   To correct an error or change the selection, scan Cancel.

   To enable FN1 substitution for USB HID keyboard, scan the Enable FN1 Substitution barcode.

Report Software Version

When contacting support, a support representative may ask you to scan the bar code below to determine the version of software installed in the digital scanner.



Report Software Version

Transmit No Read Message

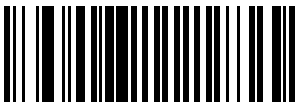
Parameter # 94 (SSI # 5Eh)

This parameter sets an option for transmitting the No Read (NR) characters.

NOTE: If you enable Transmit No Read, and also enable Symbol Code ID Character or AIM Code ID Character for Transmit Code ID Character, the scanner appends the code ID for Code 39 to the NR message.

This does not apply in presentation mode.

- Enable No Read - transmits the characters NR when a successful decode does not occur before trigger release or the Decode Session Timeout expires.
- Disable No Read - sends nothing to the host if a symbol does not decode.



Enable No Read (1)

*Disable No Read (0)

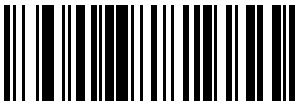
Low Power Mode

Parameter # 128 (SSI # 80h)

This parameter selects whether or not the scanner enters low power mode after a decode attempt or host communication.

This applies to serial and keyboard wedge connections. If disabled, power remains on after each decode attempt.

NOTE: The Low Power Mode parameter only applies for non-USB and non-RS485 host interfaces, and when Trigger Mode is set to `Level (Standard)`.



Enable Low Power Mode (1)

Disable Low Power Mode (0)

Symbologies

You can program the scanner to perform various functions or activate different features.

This section describes symbology features and provides programming barcodes for selecting these features.

The scanner ships with the settings shown in the Symbology Parameter Defaults table. If the default values suit requirements, programming is not necessary.

Symbology Parameter Defaults

Symbology Parameter Defaults lists the defaults for all symbology parameters.

Change these values in one of two ways:

- Choose the appropriate parameter in this section. The new value replaces the standard default value in memory. To recall the default parameter values, see Default Parameters.
- Configure the scanner using the 123Scan configuration program. See 123Scan and Software Tools.

NOTE: Standard parameter defaults are available in each chapter of this guide.

Table 7 Symbology Parameter Defaults

Parameter	Parameter Number[a]	SSI Number[b]	Default
Enable/Disable All Code Types			
1D Symbologies			
UPC/EAN/JAN			
UPC-A	1	01h	Enable
UPC-E	2	02h	Enable
UPC-E1	12	0Ch	Disable
EAN-8/JAN 8	4	04h	Enable
EAN-13/JAN 13	3	03h	Enable
Bookland EAN	83	53h	Disable
Bookland ISBN Format	576	F1h 40h	ISBN-10

Table 7 Symbology Parameter Defaults (Continued)

Parameter	Parameter Number[a]	SSI Number[b]	Default
ISSN EAN	617	F1h 69h	Disable
Decode UPC/EAN/JAN Supplementals (2 and 5 digits)	16	10h	Ignore
User-Programmable Supplementals Supplemental 1: Supplemental 2:	 579 580	 F1h 43h F1h 44h	000
UPC/EAN/JAN Supplemental Redundancy	80	50h	10
UPC/EAN/JAN Supplemental AIM ID	672	F1h A0h	Combined
Transmit UPC-A Check Digit	40	28h	Enable
Transmit UPC-E Check Digit	41	29h	Enable
Transmit UPC-E1 Check Digit	42	2Ah	Enable
UPC-A Preamble	34	22h	System Character
UPC-E Preamble	35	23h	System Character
UPC-E1 Preamble	36	24h	System Character
Convert UPC-E to UPC-A	37	25h	Disable
Convert UPC-E1 to UPC-A	38	26h	Disable
EAN/JAN Zero Extend	39	27h	Disable
UCC Coupon Extended Code	85	55h	Disable
Coupon Report	730	F1h DAh	New Coupon Format
UPC Reduced Quiet Zone	1289	F8h 05h 09h	Disable
Digimarc Digital Watermark	1687	F8h 06h 97h	Disable
Code 128			
Code 128	8	08h	Enable
Set Length(s) for Code 128	209 210	D1h D2h	1 55
GS1-128 (formerly UCC/EAN-128)	14	0Eh	Enable
ISBT 128	84	54h	Enable
ISBT Concatenation	577	F1h 41h	Autodiscriminate
Check ISBT Table	578	F1h 42h	Enable
ISBT Concatenation Redundancy	223	DFh	10
Code 128 <FNC4>	1254	F8h 04h E6h	Honor
Code 128 Security Level	751	F1h EFh	Security Level 1
Code 128 Reduced Quiet Zone	1208	F8h 04h B8h	Disable

Table 7 Symbology Parameter Defaults (Continued)

Parameter	Parameter Number[a]	SSI Number[b]	Default
Code 128 Exclusive	673	F1h A1H	Disable
Code 39			
Code 39	0	00h	Enable
Trioptic Code 39	13	0Dh	Disable
Convert Code 39 to Code 32 (Italian Pharmacy Code)	86	56h	Disable
Code 32 Prefix	231	E7h	Disable
Set Length(s) for Code 39	18 19	12h 13h	1 55
Code 39 Check Digit Verification	48	30h	Disable
Transmit Code 39 Check Digit	43	2Bh	Disable
Code 39 Full ASCII Conversion	17	11h	Disable
Code 39 Security Level	750	F1h EEh	Security Level 1
Code 39 Reduced Quiet Zone	1209	F8h 04h B9h	Disable
Code 39 Buffering - Scan and Store	113	71h	Disable
Code 93			
Code 93	9	09h	Enable
Set Length(s) for Code 93	26 27	1Ah 1Bh	1 55
Code 11			
Code 11	10	0Ah	Disable
Set Lengths for Code 11	28 29	1Ch 1Dh	4 55
Code 11 Check Digit Verification	52	34h	Disable
Transmit Code 11 Check Digit(s)	47	2Fh	Disable
Interleaved 2 of 5 (ITF)			
Interleaved 2 of 5 (ITF)	6	06h	Disable
Set Lengths for I 2 of 5	22 23	16h 17h	6 55
I 2 of 5 Check Digit Verification	49	31h	Disable
Transmit I 2 of 5 Check Digit	44	2Ch	Disable
Convert I 2 of 5 to EAN 13	82	52h	Disable
I 2 of 5 Security Level	1121	F8h 04h 61h	Security Level 1

Table 7 Symbology Parameter Defaults (Continued)

Parameter	Parameter Number[a]	SSI Number[b]	Default
I 2 of 5 Reduced Quiet Zone	1210	F8h 04h BAh	Disable
Discrete 2 of 5 (DTF)			
Discrete 2 of 5	5	05h	Disable
Set Length(s) for D 2 of 5	20 21	14h 15h	1 55
Codabar (NW - 7)			
Codabar	7	07h	Enable
Set Lengths for Codabar	24 25	18h 19h	4 55
CLSI Editing	54	36h	Disable
NOTIS Editing	55	37h	Disable
Codabar Upper or Lower Case Start/ Stop Characters Detection	855	F2h 57h	Upper Case
Codabar Mod 16 Check Digit Verification	1784	F8 06h F8h	None
MSI			
MSI	11	0Bh	Disable
Set Length(s) for MSI	30 31	1Eh 1Fh	4 55
MSI Check Digits	50	32h	One
Transmit MSI Check Digit	46	2Eh	Disable
MSI Check Digit Algorithm	51	33h	Mod 10/Mod 10
Chinese 2 of 5			
Chinese 2 of 5	408	F0h 98h	Disable
Matrix 2 of 5			
Matrix 2 of 5	618	F1h 6Ah	Disable
Set Lengths for Matrix 2 of 5	619 620	F1h 6Bh F1h 6Ch	4 55
Matrix 2 of 5 Check Digit	622	F1h 6Eh	Disable
Transmit Matrix 2 of 5 Check Digit	623	F1h 6Fh	Disable
Korean 3 of 5			
Korean 3 of 5	581	F1h 45h	Disable
Inverse 1D	586	F1h 4Ah	Regular
GS1 DataBar			

Table 7 Symbology Parameter Defaults (Continued)

Parameter	Parameter Number[a]	SSI Number[b]	Default
GS1 DataBar Omnidirectional	338	F0h 52h	Enable
GS1 DataBar Limited	339	F0h 53h	Enable
GS1 DataBar Expanded	340	F0h 54h	Enable
Convert GS1 DataBar to UPC/EAN/JAN	397	F0h 8Dh	Disable
GS1 DataBar Limited Security Level	728	Fih 4Ah	Regular
Symbology-Specific Security Features			
Redundancy Level	78	4Eh	1
Security Level	77	4Dh	1
1D Quiet Zone Level	1288	F8h 05h 08h	1
Intercharacter Gap Size	381	F0h 7Dh	Normal
Composite Codes			
Composite CC-C	341	F0h 55h	Disable
Composite CC-A/B	342	F0h 56h	Disable
Composite TLC-39	371	F0h 73h	Disable
UPC Composite Mode	344	F0h 58h	UPC Never Linked
Composite Beep Mode	398	F0h 8Eh	Beep As Each Code Type is Decoded
GS1-128 Emulation Mode for UCC/EAN Composite Codes	427	F0h ABh	Disable
2D Symbologies			
PDF417	15	0Fh	Enable
MicroPDF417	227	E3h	Disable
Code 128 Emulation	123	7Bh	Disable
Data Matrix	292	F0h 24h	Enable
GS1 Data Matrix	1336	F8h 05h 38h	Disable
Data Matrix Inverse	588	F1h 4Ch	Inverse Autodetect
Maxicode	294	F0h 26h	Disable
QR Code	293	F0h 25h	Enable
GS1 QR	1343	F8h 05h 3Fh	Disable
MicroQR	573	F1h 3Dh	Enable
Aztec	574	F1h 3Eh	Enable
Aztec Inverse	589	F1h 4Dh	Inverse Autodetect
Han Xin	1167	F8h 04h 8Fh	Disable

Table 7 Symbology Parameter Defaults (Continued)

Parameter	Parameter Number [a]	SSI Number [b]	Default
Han Xin Inverse	1168	F8h 04h 90h	Regular
DotCode	1906	F8 07 72h	Disable
DotCode Prioritize	1937	F8 07 91h	Disable
DotCode Inverse	1907	F8 07 73h	Autodetect
DotCode Mirrored	1908	F8 07 74h	Autodetect
Macro PDF			
Flush Macro PDF Buffer	N/A	N/A	N/A
Abort Macro PDF Entry	N/A	N/A	N/A
Postal Codes			
US Postnet	89	59h	Disable
US Planet	90	5Ah	Disable
Transmit US Postal Check Digit	95	5Fh	Enable
UK Postal	91	5Bh	Disable
Transmit UK Postal Check Digit	96	60h	Enable
Japan Postal	290	F0h 22h	Disable
Australia Post	291	F0h 23h	Disable
Australia Post Format	718	F1h CEh	Autodiscriminate
Netherlands KIX Code	326	F0h 46h	Disable
USPS 4CB/One Code/Intelligent Mail	592	F1h 50h	Disable
UPU FICS Postal	611	F1h 63h	Disable
Mailmark	1337	F8h 05h 39h	Disable
Canada Post	92	5Ch	Disable
Digimarc Barcode	N/A	N/A	Disable
Posti LAPA 4-State Code	2031	F8 07EF	Disable

[a] Parameter number decimal values are used for programming via RSM commands.

[b] SSI number hex values are used for programming via SSI commands.

Enable/Disable All Code Types

Scan one of the following barcodes to enable or disable the scanner's ability to decode all barcode types.

- Disable All Code Types - Disable all code types. This is useful when enabling only a few code types.

- Enable All Code Types - Enable all code types. This is useful if you need to disable only a few code types.

Disable All Code Types

Enable All Code Types

UPC/EAN/JAN

You can choose one of these parameters to enable UPC, EAN, or JAN settings.

UPC-A

Parameter # 1 (SSI #01h)

This parameter enables or disables the scanner to decode UPC-A barcodes.

- *Enabled - enables UPC-A decoding.
- Disabled - disables UPC-A decoding.

*Enable UPC-A (1)

Disable UPC-A (0)

UPC-E

Parameter # 2 (SSI # 02h)

This parameter enables or disables the scanner to decode UPC-E barcodes.

- *Enabled - this sets UPC-E to use.
- Disabled - UPC-E is no longer in use.

*Enable UPC-E (1)

Disable UPC-E (0)

UPC-E1

Parameter # 12 (SSI # 0Ch)

This parameter enables or disables the scanner to decode UPC-E1 barcodes.

- Enabled - This sets UPC-E1 to use.
- Disabled - UPC-E1 is no longer in use.

NOTE: UPC-E1 is not a UCC (Uniform Code Council) approved symbology.

Enable UPC-E1 (1)

*Disable UPC-E1 (0)

EAN-8/JAN-8

Parameter # 4 (SSI # 04h)

This parameter enables or disables the scanner to decode EAN-8/JAN-8 barcodes.

- Enabled - Sets EAN-8/JAN-8 for use.
- Disabled - EAN-8/JAN-8 is no longer in use.

*Enable EAN-8/JAN-8 (1)

Disable EAN-8/JAN-8 (0)

EAN-13/JAN-13

Parameter # 3 (SSI # 03h)

This parameter enables or disables the scanner to decode EAN-13/JAN-13 barcodes.

- Enabled - Sets EAN-13/JAN-13 for use.
- Disabled - EAN-13/JAN-13 is no longer in use.

*Enable EAN-13/JAN-13 (1)

Disable EAN-13/JAN-13 (0)

Bookland EAN

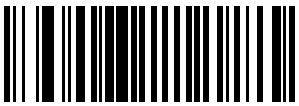
Parameter # 83 (SSI # 53h)

This parameter enables or disables the scanner to decode Bookland EAN barcodes.

- Enabled - This sets Bookland EAN for use.
- Disabled - Bookland EAN is no longer in use.

NOTE: If you enable Bookland EAN, select a Bookland ISBN Format. Also set Decode UPC/EAN/JAN Supplementals , select one of the following options:

- Decode UPC/EAN/JAN with Supplementals Only
- Autodiscriminate UPC/EAN/JAN With Supplementals
- Enable 978/979 Supplemental Mode



Enable Bookland EAN (1)

*Disable Bookland EAN (0)

Bookland ISBN Format

Parameter # 576 (SSI # F1h 40h)

If Bookland EAN is enabled, this parameter allows you to choose a format for Bookland data.

- *Bookland ISBN-10 - The scanner reports Bookland data starting with 978 in traditional 10-digit format with the special Bookland check digit for backward-compatibility. Data starting with 979 is not considered Bookland in this mode.

- Bookland ISBN-13 - The scanner reports Bookland data (starting with either 978 or 979) as EAN-13 in 13-digit format to meet the 2007 ISBN-13 protocol.

NOTE: For Bookland EAN to function properly, first enable Bookland EAN and then set Decode UPC/EAN/JAN Supplementals , select one of the following options:

- Decode UPC/EAN/JAN with Supplementals Only.
- Autodiscriminate UPC/EAN/JAN With Supplementals.
- Enable 978/979 Supplemental Mode.

*Bookland ISBN-10 (0)

Bookland ISBN-13 (1)

ISSN EAN

Parameter # 617 (SSI # F1h 69h)

This parameter enables or disables the scanner to decode ISSN EAN barcodes.

- Enabled - Sets ISSN EAN for use.
- *Disabled - ISSN EAN is no longer in use.

Enable ISSN EAN (1)

*Disable ISSN EAN (0)

Decode UPC/EAN/JAN Supplementals

Parameter # 16 (SSI # 10h)

Supplementals are barcodes appended according to specific format conventions (for example, UPC A +2, UPC E+2, EAN 13+2).

The following options are available:

- Decode UPC/EAN/JAN with Supplementals Only - The scanner only decodes UPC/EAN/JAN symbols with supplemental characters, and ignores symbols without supplementals.
- Ignore UPC/EAN/JAN Supplementals - When presented with a UPC/EAN/JAN plus supplemental symbol, the scanner decodes UPC/EAN/JAN and ignores the supplemental characters.

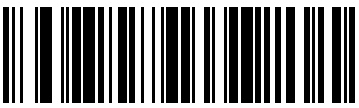
- Autodiscriminate UPC/EAN/JAN with Supplementals - The scanner decodes UPC/EAN/JAN symbols with supplemental characters immediately. If the symbol does not have a supplemental, the scanner must decode the barcode the number of times set via UPC/EAN/JAN Supplemental Redundancy before transmitting its data to confirm that there is no supplemental.
- Select one of the following Supplemental Mode options to immediately transmit EAN-13 barcodes starting with that prefix that have supplemental characters. If the symbol does not have a supplemental, the scanner must decode the barcode the number of times set via UPC/EAN/JAN Supplemental Redundancy before transmitting the data to confirm that there is no supplemental. The scanner transmits UPC/EAN/JAN barcodes that do not have that prefix immediately
  - Enable 378/379 Supplemental Mode
  - Enable 978/979 Supplemental Mode

NOTE: If you select 978/979 Supplemental Mode and are scanning Bookland EAN barcodes, see Bookland EAN to enable Bookland EAN, and select a format using Bookland ISBN Format.

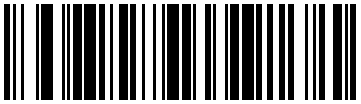
- Enable 977 Supplemental Mode
- Enable 414/419/434/439 Supplemental Mode
- Enable 491 Supplemental Mode
- Enable Smart Supplemental Mode - This applies to EAN-13 barcodes starting with any prefix listed previously.
- Supplemental User-Programmable Type 1 - This applies to EAN-13 barcodes starting with a 3-digit user-defined prefix. Set this using User-Programmable Supplementals.
- Supplemental User-Programmable Type 1 and 2 - This applies to EAN-13 barcodes starting with either of two 3-digit user-defined prefixes. Set the prefixes using User-Programmable Supplementals.
- Smart Supplemental Plus User-Programmable 1 - This applies to EAN-13 barcodes starting with any prefix listed previously or the prefix set using User-Programmable Supplementals.
- Smart Supplemental Plus User-Programmable 1 and 2 - This applies to EAN-13 barcodes starting with any prefix listed previously or one of the two user-defined prefixes set using User-Programmable Supplementals.

NOTE: To minimize the risk of invalid data transmission, select either to decode or ignore supplemental characters.

Decode UPC/EAN/JAN With Supplementals Only (1)



*Ignore UPC/EAN/JAN Supplementals (0)



Autodiscriminate UPC/EAN/JAN with Supplementals (2)

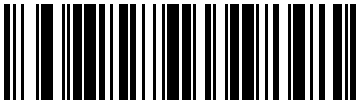
Enable 378/379 Supplemental Mode (4)

Enable 978/979 Supplemental Mode (5)

Enable 977 Supplemental Mode (7)

Enable 414/419/434/439 Supplemental Mode (6)

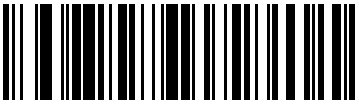
Enable 491 Supplemental Mode (8)



Enable Smart Supplemental Mode (3)

Supplemental User-Programmable Type 1 (9)

Supplemental User-Programmable Type 1 and 2 (10)



Smart Supplemental Plus User-Programmable 1 (11)

Smart Supplemental Plus User-Programmable 1 and 2 (12)

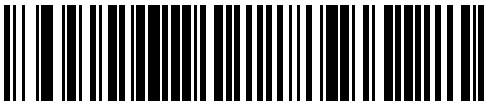
User-Programmable Supplementals

Parameter # 579 (SSI # F4h F1h 43h)

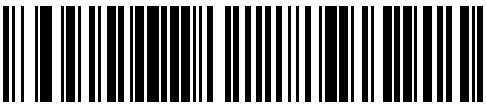
Parameter # 580 (SSI # F4h F1h 44h)

This parameter allows you to set two 3-digit prefixes if you have selected a Supplemental User-Programmable option.

- User-Programmable Supplemental 1 - Sets the first 3-digit prefix. See Numeric Barcodes.
- User-Programmable Supplemental 2 - Sets a second 3-digit prefix, if necessary. See Numeric Barcodes.



User-Programmable Supplemental 1



User-Programmable Supplemental 2

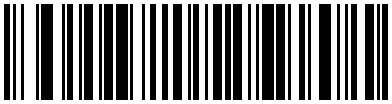
UPC/EAN/JAN Supplemental Redundancy

Parameter # 80 (SSI # 50h)

If Autodiscriminate UPC/EAN/JAN is configured to Autodiscriminate, this parameter defines the number of times a symbol is decoded without supplementals before transmission.

The range is from 2-30. Five or above is recommended when decoding a mix of UPC/EAN/JAN symbols with and without supplementals. The default is ten.

To set a redundancy value, scan the following barcode, and then scan two barcodes from Numeric Barcodes. Enter a leading zero for single digit numbers. To correct an error or change a selection, scan Cancel.



UPC/EAN/JAN Supplemental Redundancy

UPC/EAN/JAN Supplemental AIM ID Format

Parameter # 672 (SSI # F1h A0h)

If Transmit Code ID Character is set to **AIM Code ID Character**, select an output format when reporting UPC/EAN/JAN barcodes with supplementals.

- Separate - Transmit UPC/EAN/JAN with supplementals with separate AIM IDs but one transmission, for example,

```
]E<0 or 4><data>]E<1 or 2>[supplemental data]
```

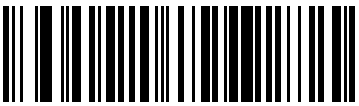
- Combined - Transmit UPC/EAN/JAN with supplementals with one AIM ID and one transmission. For example, see below.

```
]E3<data+supplemental data>
```

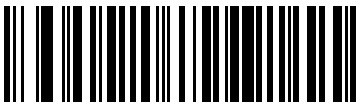
- Separate Transmissions - Transmit UPC/EAN/JAN with supplementals with separate AIM IDs and separate transmissions, for example,

```
]E<0 or 4><data>
]E<1 or 2>[supplemental data]
```

Separate (0)



*Combined (1)



Separate Transmissions (2)

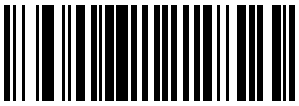
Transmit UPC-A Check Digit

Parameter # 40 (SSI # 28h)

This parameters transmits data with or without the UPC-A check digit.

The check digit is the last character of the symbol used to verify the integrity of the data. It is always verified to guarantee the integrity of the data.

- *Transmit UPC-A Check Digit - Transmits the data with the UPC-A check digit.
- Do Not Transmit UPC-A Check Digit - Transmits the data without the UPC-A check digit.



*Transmit UPC-A Check Digit (1)

Do Not Transmit UPC-A Check Digit (0)

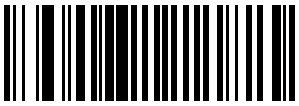
Transmit UPC-E Check Digit

Parameter # 41 (SSI # 29h)

This parameters transmits data with or without the UPC-E check digit.

The check digit is the last character of the symbol used to verify the integrity of the data. It is always verified to guarantee the integrity of the data.

- *Transmit UPC-E Check Digit - transmits the data with the UPC-E check digit.
- Do Not Transmit UPC-E Check Digit - transmits the data without the UPC-E check digit.



*Transmit UPC-E Check Digit (1)

Do Not Transmit UPC-E Check Digit (0)

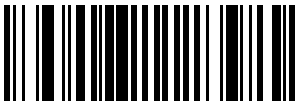
Transmit UPC-E1 Check Digit

Parameter # 42 (SSI #2Ah)

This parameters transmits data with or without the UPC-E1 check digit.

The check digit is the last character of the symbol used to verify the integrity of the data. It is always verified to guarantee the integrity of the data.

- *Transmit UPC-E1 Check Digit - Transmits the data with the UPC-E1 check digit.
- Do Not Transmit UPC-E1 Check Digit - Transmits the data without the UPC-E1 check digit.



*Transmit UPC-E1 Check Digit (1)

Do Not Transmit UPC-E1 Check Digit (0)

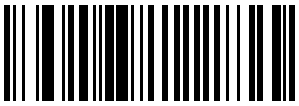
UPC-A Preamble

Parameter # 34 (SSI # 22h)

Preamble characters are part of the UPC symbol, and include Country Code and System Character.

Select the appropriate option for transmitting a UPC-A preamble to match the host system:

- Transmit System Character only
- Transmit System Character and Country Code (“0” for USA)
- Transmit no preamble.



No Preamble (<DATA>) (0)

*System Character (<SYSTEM CHARACTER> <DATA>) (1)

System Character & Country Code (< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>) (2)

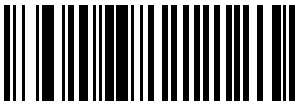
UPC-E Preamble

Parameter # 35 (SSI # 23h)

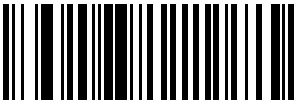
Preamble characters are part of the UPC symbol, and include Country Code and System Character.

Select the appropriate option for transmitting a UPC-E preamble to match the host system:

- Transmit System Character only
- Transmit System Character and Country Code (“0” for USA)
- Transmit no preamble.



No Preamble (<DATA>) (0)



*System Character (<SYSTEM CHARACTER> <DATA>) (1)

System Character & Country Code (< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>) (2)

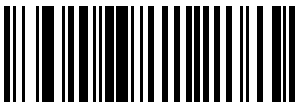
UPC-E1 Preamble

Parameter # 36 (SSI # 24h)

Preamble characters are part of the UPC symbol, and include Country Code and System Character.

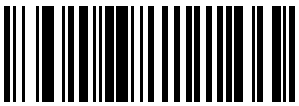
Select the appropriate option for transmitting a UPC-E1 preamble to match the host system:

- Transmit System Character only
- Transmit System Character and Country Code (“0” for USA)
- Transmit no preamble.



No Preamble (<DATA>) (0)

*System Character (<SYSTEM CHARACTER> <DATA>) (1)



System Character & Country Code (< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>) (2)

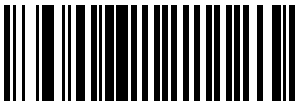
Convert UPC-E to UPC-A

Parameter # 37 (SSI # 25h)

This parameter converts UPC-E (zero suppressed) decoded data to UPC-A format before transmission.

After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (such as, Preamble, Check Digit).

- *Enabled - Converts UPC-E decoded data to UPC-A format.
- Disabled - Transmits UPC-E decoded data without conversion to UPC-A.



Convert UPC-E to UPC-A (Enable) (1)

*Do Not Convert UPC-E to UPC-A (Disable) (0)

Convert UPC-E1 to UPC-A

Parameter # 38 (SSI # 26h)

This parameter converts UPC-E1 (zero suppressed) decoded data to UPC-A format before transmission.

After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (for example, Preamble, Check Digit).

- Enabled - converts UPC-E1 decoded data to UPC-A format.
- *Disabled - transmits UPC-E1 decoded data without conversion to UPC-A.

Convert UPC-E1 to UPC-A (Enable) (1)

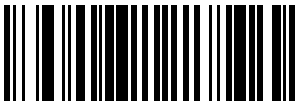
*Do Not Convert UPC-E1 to UPC-A (Disable) (0)

EAN/JAN Zero Extend

Parameter # 39 (SSI # 27h)

This parameter enables or disables decoded EAN-8 symbols to be compatible in length with EAN-13 symbols.

- Enabled - Adds five leading zeros to decoded EAN-8 symbols to make them compatible in length to EAN-13 symbols
- Disabled - Transmits EAN-8 symbols as-is, without adding zeroes.



Enable EAN/JAN Zero Extend (1)

*Disable EAN/JAN Zero Extend (0)

UCC Coupon Extended Code

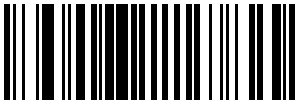
Parameter # 85 (SSI # 55h)

This parameter allows decoding UPC-A barcodes starting with digit '5', EAN-13 barcodes starting with digit '99', and UPC-A/GS1-128 coupon codes.

- Enabled - Extends decoding for UPC-A, EAN-13, and GS1-128 coupon codes.
- *Disabled - Does not extend decoding for UPC-A, EAN-13, and GS1-128 coupon codes.

NOTE: UPC-A, EAN-13, and GS1-128 must be enabled to use this feature.

NOTE: See UPC/EAN/JAN Supplemental Redundancy to control autodiscrimination of the GS1-128 portion (right half) of a coupon code.



Enable UCC Coupon Extended Code (1)

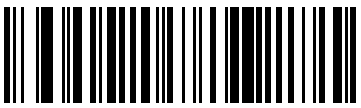
*Disable UCC Coupon Extended Code (0)

Coupon Report

Parameter # 730 (SSI # F1h DAh)

This parameter selects the type of coupon format to support.

- Old Coupon Format - Support UPC-A/GS1-128 and EAN-13/GS1-128.
- New Coupon Format - An interim format to support UPC-A/GS1-DataBar and EAN-13/GS1-DataBar.
- Autodiscriminate Format - Support both Old Coupon Format and New Coupon Format.



Old Coupon Format (0)

*New Coupon Format (1)

Autodiscriminate Coupon Format (2)

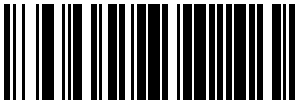
UPC Reduced Quiet Zone

Parameter # 1289 (SSI # F8h 05h 09h)

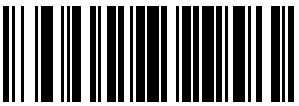
This parameter enables or disables the scanner to decode the UPC barcodes with reduced quiet zones (the margins on either side of the barcode).

- Enabled - Allows the scanner to decode UPC barcodes with reduced quiet zones.
- *Disabled - Prevents the scanner from decoding UPC barcodes with reduced quiet zones.

NOTE: If you select Enable, select a 1D Quiet Zone Level.



Enable UPC Reduced Quiet Zone (1)



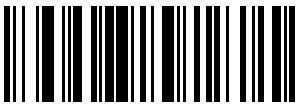
*Disable UPC Reduced Quiet Zone (0)

Digimarc Digital Watermarks

Parameter # 1687 (SSI # F8h 0h 97h)

This parameter enables or disables Digimarc Digital Watermars being added to decode data.

- Enabled - Enables the Digimarc Digital Watermarks.
- *Disabled - Disables the Digimarc Digital Watermarks.



Enable Digimarc Digital Watermarks/DW (1)

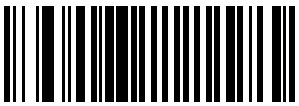
*Disable Digimarc Digital Watermarks/DW (0)

Code 128

Parameter # 8 (SSI #08h)

This parameter enables or disables the scanner to decode Code 128 barcodes.

- *Enabled - Enables Code 128 decoding.
- Disabled - Disables Code 128 decoding.



*Enable Code 128 (1)

Disable Code 128 (0)

Set Lengths for Code 128

Parameter # 209 (SSI #D1h)

Parameter # 210 (SSI #D2h)

This parameter sets lengths for Code 128 to any length, one or two discrete lengths, or lengths within a specific range.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains.

The default value for Parameter 209 is 1.

The default value for Parameter 210 is 55.

The maximum range is 1-55

NOTE: When setting lengths, enter a leading zero for single-digit numbers.

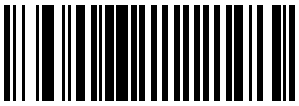
- One Discrete Length - Decode only Code 128 symbols containing a selected length.
- Two Discrete Lengths - Decode only Code 128 symbols containing either of two lengths.
- Length Within Range - Decode Code 128 symbols with a specific length range.
- Any Length - Decode Code 128 symbols containing any number of characters within the scanner's capability.

Select lengths using barcodes in Numeric Barcodes. To correct an error or change the selection, scan Cancel.

For example:

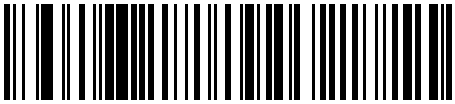
- To decode only Code 128 symbols with 14 characters, scan Code 128 - One Discrete Length, and then scan 1, 4.
- To decode only Code 128 symbols containing either 2 or 14 characters, scan Code 128 - Two Discrete Lengths, and then scan 0, 2, 1, 4.

- To decode Code 128 symbols containing between 4 and 12 characters, scan Code 128 - Length Within Range, and then scan 0, 4, 1, 2.



Code 128 - One Discrete Length

Code 128 - Two Discrete Lengths



*Code 128 - Length Within Range (Default: 1-55)

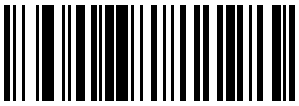
Code 128 - Any Length

GS1-128 (formerly UCC/EAN-128)

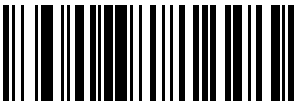
Parameter # 14 (SSI #0Eh)

This parameter enables or disables the scanner to decode GS1-128 barcodes.

- Enabled - Enables GS1-128 decoding.
- Disabled - Disables GS1-128 decoding.



Enable GS1-128 (1)



Disable GS1-128 (0)

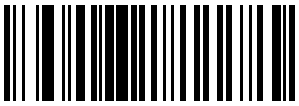
ISBT 128

Parameter # 84 (SSI #54h)

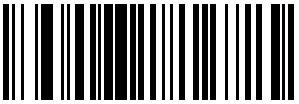
This parameter enables or disables the scanner to decode ISBT 128 barcodes.

- Enabled - enables ISBT 128 decoding.
- Disabled - disables ISBT 128 decoding.

ISBT 128 is a variant of Code 128 used in the blood bank industry.



Enable ISBT 128 (1)



Disable ISBT 128 (0)

ISBT Concatenation

Parameter # 577 (SSI #F1h 41h)

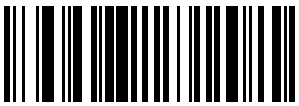
This parameter enables or disables the scanner to decode ISBT concatenation.

Select an option for concatenating pairs of ISBT code types:

- Enable ISBT Concatenation - The scanner decodes and concatenates two ISBT codes. The scanner does not decode single ISBT symbols.
- Disable ISBT Concatenation - The scanner does not concatenate pairs of ISBT codes it encounters.
- Autodiscriminate ISBT Concatenation - The scanner decodes and concatenates pairs of ISBT codes immediately. If only a single ISBT symbol is present, the scanner must decode the symbol the number of times set via ISBT Concatenation Redundancy before transmitting its data to confirm that there is no additional ISBT symbol.

NOTE: For ISBT AutoDetect to operate as expected, both barcodes must be in the field of view simultaneously. This may be difficult to achieve in presentation mode.

NOTE: When enabling ISBT Concatenation or Autodiscriminate ISBT Concatenation, set Code 128 Security Level to Level 2.



Enable ISBT Concatenation (1)

Disable ISBT Concatenation (0)

Autodiscriminate ISBT Concatenation (2)

Check ISBT Table

Parameter # 578 (SSI #F1h 42h)

This parameter enables or disables the Check ISBT Table which concatenates only pairs of ISBT codes found in the table. Other types of ISBT codes are not concatenated.

- *Enabled - enables the Check ISBT Table to concatenate only those pairs found in this table.
- Disabled - disables the Check ISBT Table to concatenate only those pairs found in this table.

The ISBT specification includes a table that lists several types of ISBT barcodes that are commonly used in pairs.

*Enable Check ISBT Table (1)

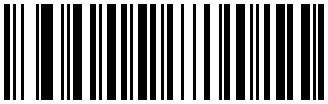
Disable Check ISBT Table (0)

ISBT Concatenation Redundancy

Parameter # 223 (SSI #DFh)

This parameter sets the number of times the scanner must decode an ISBT symbol before determining that there is no additional symbol.

This parameter applies if you set ISBT Concatenation to Autodiscriminate.



ISBT Concatenation Redundancy

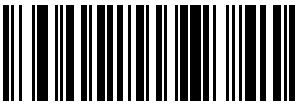
Code 128 <FNC4>

Parameter # 1254 (SSI #F8h 04h E6h)

This parameter processes the Code 128 <FNC4> character, and either ignores (removes) the character or honors (does not remove) the character.

- Honor Code 128 <FNC4> - The <FNC4> character is processed normally, per Code 128 standard.
- Ignore Code 128 <FNC4> - Strips the <FNC4> character from the decode data. The remaining characters are sent to the host unchanged.

Honor Code 128 <FNC4> (0)



Ignore Code 128 <FNC4> (1)

Code 128 Security Level

Parameter # 751 (SSI #F1h EFh)

This parameter enables four levels of decode security for Code 128.

Code 128 barcodes are vulnerable to misdecodes, particularly when Code 128 Lengths is set to Any Length. There is an inverse relationship between security and scanner aggressiveness. Increasing the level of security can reduce scanning aggressiveness, so select only the level of security necessary.

- Code 128 Security Level 0 - The scanner operates in its most aggressive state, while providing sufficient security in decoding most in-spec barcodes.
- Code 128 Security Level 1 - This option eliminates most misdecodes while maintaining reasonable aggressiveness.
- Code 128 Security Level 2 - This option applies greater barcode security requirements if Security Level 1 fails to eliminate misdecodes.
- Code 128 Security Level 3 - If you selected Security Level 2, and misdecodes still occur, select this security level to apply the highest safety requirements.

NOTE: Selecting Code 128 Security Level 3 is an extreme measure against mis-decoding severely out-of-spec barcodes, and significantly impairs the decoding ability of the device. If this level of security is required, try to improve the quality of the barcodes.

Code 128 Security Level 0 (0)

*Code 128 Security Level 1 (1)

Code 128 Security Level 2 (2)

Code 128 Security Level 3 (3)

Code 128 Reduced Quiet Zone

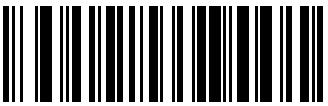
Parameter # 1208 (SSI #F8h 04h B8h)

This parameter enables or disables decoding Code 128 with reduced quiet zones (the margins on either side of the barcode).

If you select Enable, select a 1D Quiet Zone Level.

- Enabled - enables Code 128 with reduced Quiet Zones.
- *Disabled - disables Code 128 with reduced Quiet Zones.

Enable Code 128 Reduced Quiet Zone (1)

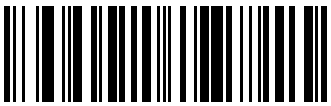


*Disable Code 128 Reduced Quiet Zone (0)

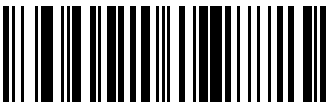
Code 128 Exclusive

Parameter # 673 (SSI # F1h A1h)

This feature only allows decoding of barcodes matching the Code 128 Exclusive format.



Enable (1)



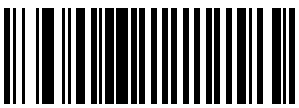
*Disable (1)

Code 39

Parameter # 0 (SSI #00h)

This parameter enables or disables the scanner to decode Code 39 barcodes.

- *Enabled - Enables Code 39 decoding.
- Disabled - Disables Code 39 decoding.



*Enable Code 39 (1)

Disable Code 39 (0)

Trioptic Code 39

Parameter # 13 (SSI #0Dh)

This parameter enables or disables the scanner to decode Trioptic Code 39 barcodes.

Trioptic Code 39 is a variant of Code 39 used in the marking of computer tape cartridges. Trioptic Code 39 symbols always contain six characters.

- Enabled - enables Trioptic Code 39 decoding.
- *Disabled - disables Trioptic Code 39 decoding.

NOTE: You cannot enable Trioptic Code 39 and Code 39 Full ASCII simultaneously.

Enable Trioptic Code 39 (1)

*Disable Trioptic Code 39 (0)

Convert Code 39 to Code 32

Parameter # 86 (SSI #5h)

This parameter enables or disables converting Code 39 to Code 32.

Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry.

NOTE: Code 39 must be enabled for this parameter to function.

- Enabled - enables Convert Code 39 to Code 32.
- *Disabled - disables Convert Code 39 to Code 32.

Enable Convert Code 39 to Code 32 (1)

Disable Convert Code 39 to Code 32 (0)

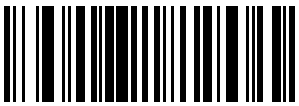
Code 32 Prefix

Parameter # 231 (SSI #E7h)

This parameter enables or disables adding the prefix character "A" to all Code 32 barcodes.

- Enabled - enables Code 32 Prefix.
- *Disabled - disables Code 32 Prefix.

NOTE: Convert Code 39 to 32 must be enabled for this parameter to function.



Enable Code 32 Prefix (1)

*Disable Code 32 Prefix (0)

Set Lengths for Code 39

L1 **Parameter # 18 (SSI #12h)**

L2 **Parameter # 19 (SSI #13h)**

This parameter set lengths for Code 39.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set lengths for Code 39 to any length, one or two discrete lengths, or lengths within a specific range. If Code 39 Full ASCII is enabled, Length Within Range or Any Length are the preferred options.

The default value for Parameter 18 is 1.

The default value for Parameter 19 is 55.

The maximum range is 1-55.

NOTE: When setting lengths, enter a leading zero for single-digit numbers.

- One Discrete Length - Decode only Code 39 symbols containing a selected length.
- Two Discrete Lengths - Decode only Code 39 symbols containing either of two lengths.
- Length Within Range - Decode Code 39 symbols with a specific length range.
- Any Length - Decode Code 39 symbols containing any number of characters within the scanner's capability.

Select lengths using barcodes in Numeric Barcodes. To correct an error or change the selection, scan Cancel.

For example:

- To decode only Code 39 symbols with 14 characters, scan Code 39 - One Discrete Length, and then scan 1, 4.
- To decode only Code 39 symbols containing either 2 or 14 characters, scan Code 39 - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode Code 39 symbols containing between 4 and 12 characters, scan Code 39 - Length Within Range, and then scan 0, 4, 1, 2.

Code 39 - One Discrete Length

Code 39 - Two Discrete Lengths

*Code 39 - Length Within Range (Default: 1 -55)

Code 39 - Any Length

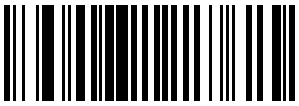
Code 39 Check Digit Verification

Parameter # 48 (SSI #30h)

This parameter checks the integrity of all Code 39 symbols to verify that the data complies with specified check digit algorithm.

Only Code 39 symbols which include a modulo 43 check digit are decoded. Enable this parameter if the Code 39 symbols contain a Modulo 43 check digit.

- Enabled - enables Code 39 Check Digit.
- *Disabled - disables Code 39 Check Digit.



Enable Code 39 Check Digit (1)

*Disable Code 39 Check Digit (0)

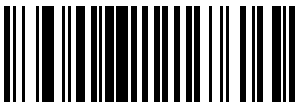
Transmit Code 39 Check Digit

Parameter # 43 (SSI #2Bh)

This parameter transmits Code 39 data with or without the check digit.

- Enabled - enables Transmit Code 39 Check Digit.
- *Disabled - disables Transmit Code 39 Check Digit.

NOTE: Code 39 Check Digit Verification must be enabled for this parameter to function.



Transmit Code 39 Check Digit (Enable) (1)

*Do Not Transmit Code 39 Check Digit (Disable) (0)

Code 39 Full ASCII Conversion

Parameter # 17 (SSI #11h)

This parameter enables or disables the scanner to decode Code 39 Full ASCII.

Code 39 Full ASCII is a variant of Code 39 which pairs characters to encode the full ASCII character set.

- Enabled - enables Code 39 Full ASCII.
- *Disabled - disables Code 39 Full ASCII.

NOTE: Code 39 Full ASCII to Full ASCII Correlation is host-dependent, and is therefore described in the ASCII character set table for the appropriate interface. See ASCII Character Sets.

Enable Code 39 Full ASCII (1)

*Disable Code 39 Full ASCII (0)

Code 39 Security Level

Parameter # 750 (SSI #F1h EEh)

This parameter sets the security level for Code 39.

Select increasing levels of security for decreasing levels of barcode quality. There is an inverse relationship between security, and device aggressiveness, so choose only that level of security necessary for any given application.

- Code 39 Security Level 0 - Allows the device to operate in its most aggressive state, while providing sufficient security in decoding most "in-spec" barcodes.
- *Code 39 Security Level 1 - This setting eliminates most mis-decodes
- Code 39 Security Level 2 - Select this option if Security Level 1 fails to eliminate mis-decodes.
- Code 39 Security Level 3 - If you selected Security Level 2 and mis-decodes still occur, select this security level.

NOTE: Selecting Security Level 3 is an extreme measure against mis-decoding severely out of spec barcodes. Selecting this level of security significantly impairs the decoding ability of the device. If you need this level of security, try to improve the quality of the barcodes.

Code 39 Security Level 0 (0)

*Code 39 Security Level 1 (1)

Code 39 Security Level 2 (2)

Code 39 Security Level 3 (3)

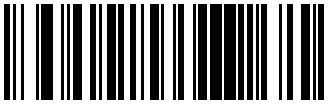
Code 39 Reduced Quiet Zone

Parameter # 1209 (SSI #F8h 04h B9h)

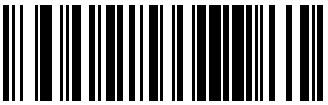
This parameter enables or disables decoding Code 39 with reduced quiet zones. Quiet zones are the margins on either side of the barcode.

If you select Enable, select a 1D Quiet Zone Level.

- Enabled - enables Code 39 with reduced Quiet Zones.
- Disabled - disables Code 39 with reduced Quiet Zones.



Enable Code 39 Reduced Quiet Zone (1)



Disable Code 39 Reduced Quiet Zone (0)

Code 39 Buffering - Scan and Store

Parameter # 113 (SSI # 71h)

This feature allows the digital scanner to accumulate data from multiple Code 39 symbols.

Selecting the Scan and Store option (Buffer Code 39) temporarily buffers all Code 39 symbols having a leading space as a first character for later in transmission. The leading space is not buffered.

Decoding a Code 39 symbol with no leading space transmits in sequence all buffered data in a first-in-first-out format, plus the triggering symbol.

Select **Do Not Buffer Code 39** to transmit all decoded Code 39 symbols immediately without storing them in the buffer.

This feature affects Code 39 only. If selecting **Buffer Code 39,** we recommend you configure the scanner to decode only Code 39 symbology.

Buffer Code 39 (01h)

*Do Not Buffer Code 39 (Disable) (00h)

While there is data in the transmission buffer, you cannot select **Do not Buffer Code 39**. The buffer colds 200 bytes of information.

To disable Code 39 buffering when there is data in the transmission buffer, first force the buffer transmission (see Transmit Buffer) or clear the buffer.

Buffer Data

Enable Code 39 and scan a Code 39 symbol with a space immediately following the start pattern.

- Unless the data overflows the transmission buffer, the digital scanner issues a low/high beep to indicate successful decode and buffering. (For overflow conditions, see Overfilling Transmission Buffer)
- The digital scanner adds the decoded data, excluding the leading space to the transmission buffer.
- No transmission occurs.

Clear Transmission Buffer

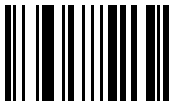
To clear the transmission buffer, scan the clear buffer barcode. The barcode contains a start character, a dash (minus), and a stop character.

- The digital scanner issues a short high/low/high beep.
- The digital scanner erases the transmission buffer.
- No transmission occurs.

NOTE: The Clear Buffer contains only the dash (minus) command. In order to scan this command, set Code 39 lengths to include length 1.

Transmit Buffer

There are two methods to transmit the Code 39 buffer.

- Scan the Transmit Buffer barcode (it only includes a start character, a plus (+), and a stop character.
- The digital scanner transmits and clears the buffer. The digital scanner issues a low/high beep.
- 
- Scan a Code 39 barcode with a leading character that is not a space. The digital scanner appends a new decode data to buffered data. The digital scanner transmits and clears the buffer. The scanner signals that it transmitted the buffer with a low/high beep. The scanner transmits and clears the buffer.

NOTE: The Transmit Buffer contains only a plus (+) character. In order to scan this command, set Code 39 lengths to include length 1.

Overfilling Transmission Buffer

The Code 39 buffer holds 200 characters. If the symbol just read overflows the transmission buffer:

- The digital scanner indicates that it rejected the symbol by issuing three long, high beeps.
- No transmission occurs. The data in the buffer is not affected.

Attempt to Transmit an Empty Buffer

If you scan the **Transmit Buffer** symbol, and the Code 39 buffer is empty:

- A short low, high, low beep signals that the buffer is empty.

- No transmission occurs.
- The buffer remains empty.

Code 93

Parameter # 9 (SSI #09h)

This parameter enables or disables the scanner to decode Code 93 barcodes.

- Enabled - enables Code 93 decoding.
- Disabled - disables Code 93 decoding.

Enable Code 93 (1)

Disable Code 93 (0)

Set Lengths for Code 93

Parameter # 26 (SSI #1Ah)

Parameter # 27 (SSI #1Bh)

This parameter sets the lengths for Code 93 to any length, one or two discrete lengths, or lengths within a specific range.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains.

The options are:

- Any length
- One or two discrete lengths
- Lengths within a specific range

The default behavior is , with a default value of digits.

NOTE: When setting the lengths, enter a leading zero for single-digit numbers.

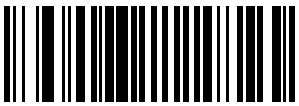
- One Discrete Length - Decode only Code 93 symbols containing a selected length.
- Two Discrete Lengths - Decode only Code 93 symbols containing either of two lengths.
- Length Within Range - Decode Code 93 symbols with a specific length range.
- Any Length - Decode Code 93 symbols containing any number of characters within the scanner's capability.

Code 11

Parameter # 10 (SSI #0Ah)

This parameter enables or disables the scanner to decode Code 11 barcodes.

- Enabled - enables Code 11 decoding.
- *Disabled - disables Code 11 decoding.



Enable Code 11 (1)

*Disable Code 11 (0)

Set Lengths for Code 11

L1 **Parameter # 28 (SSI #1Ch)**

L2 **Parameter # 29 (SSI #1Dh)**

This parameter sets the length for Code 11.

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains.

The options are:

- Any length
- One or Two discrete lengths
- Lengths within a specific range

The default behavior is , with a default value of .

NOTE: When setting the lengths, enter a leading zero for single digit numbers.

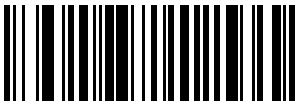
- One Discrete Length - Decode only Code 11 symbols containing a selected length.
- Two Discrete Lengths - Decode only Code 11 symbols containing either of two lengths.
- Length Within Range - Decode Code 11 symbols with a specific length range.
- Any Length - Decode Code 11 symbols containing any number of characters within the scanner's capability.

Code 11 Check Digit Verification

Parameter # 52 (SSI #34h)

This parameter checks the integrity of all Code 11 symbols to verify that the data complies with specified check digit algorithm.

- *Disabled - disables Code 11 Check Digit.
- One Check Digit - enables Code 11 to check one digit.
- Two Check Digits - enables Code 11 to check 2 digits.



*Disable (0)

One Check Digit (1)

Two Check Digits (2)

Transmit Code 11 Check Digits

Parameter # 47 (SSI #2Fh)

This parameter transmits Code 11 data with or without the check digit.

- Enabled - enables Transmit Code 11 Check Digit.
- *Disabled - disables Transmit Code 11 Check Digit.

NOTE: Code 11 Check Digit Verification must be enabled for this parameter to function.

Transmit Code 11 Check Digit(s) (Enable) (1)

*Do Not Transmit Code 11 Check Digit(s) (Disable) (0)

Interleaved 2 of 5 (I 2 of 5)

Parameter # 6 (SSI #06h)

This parameter enables or disables the scanner to decode I 2 of 5 barcodes.

- Enabled - enables I 2 of 5 decoding.
- Disabled - disables I 2 of 5 decoding.

Enable Interleaved 2 of 5 (1)

Disable Interleaved 2 of 5 (0)

Set Lengths for Interleaved 2 of 5 (I 2 of 5)

L1 **Parameter # 22 (SSI #16h)**

L2 **Parameter # 23 (SSI #17h)**

This parameter set lengths for I 2 of 5.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set lengths for I 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range.

The default value for Parameter 22 is 6 .

he default value for Parameter 23 is 55

The maximum range is 0 - 55.

NOTE: When setting lengths, enter a leading zero for single-digit numbers.

- One Discrete Length - Decode only I 2 of 5 symbols containing a selected length.
- Two Discrete Lengths - Decode only I 2 of 5 symbols containing either of two lengths.
- Length Within Range - Decode I 2 of 5 symbols with a specific length range.
- Any Length - Decode I 2 of 5 symbols containing any number of characters within the scanner's capability.

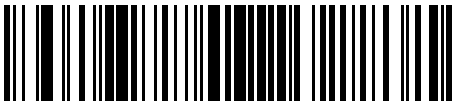
NOTE: Due to the construction of the I 2 of 5 symbology, it is possible for a scan line covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the barcode. To prevent this, select specific lengths (I 2 of 5 - One Discrete Length, Two Discrete Lengths) for I 2 of 5 applications or increase the Security Level.

Select lengths using barcodes in Numeric Barcodes. To correct an error or change the selection, scan Cancel.

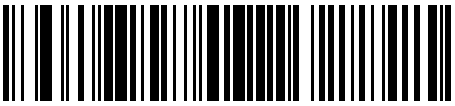
For example:

- To decode only I 2 of 5 symbols with 14 characters, scan I 2 of 5 - One Discrete Length, and then scan 1, 4.
- To decode only I 2 of 5 symbols containing either 2 or 14 characters, scan I 2 of 5 - Two Discrete Lengths, and then scan 0, 2, 1, 4.

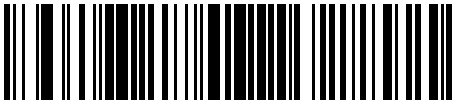
- To decode I 2 of 5 symbols containing between 4 and 12 characters, scan I 2 of 5 - Length Within Range, and then scan 0, 4, 1, 2.



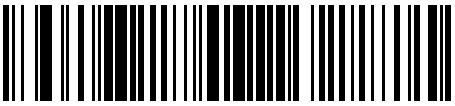
I 2 of 5 - One Discrete Length



I 2 of 5 - Two Discrete Lengths



*I 2 of 5 - Length Within Range (Default: 6 - 55)



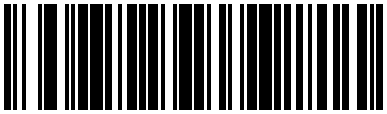
I 2 of 5 - Any Length

Interleaved 2 of 5 (I 2 of 5) Check Digit Verification

Parameter # 49 (SSI #31h)

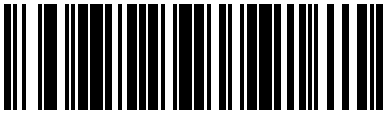
This parameter enables or disables checking the integrity of all I 2 of 5 symbols to verify the data complies with either the specified Uniform Symbology Specification (USS) or the Optical Product Code Council (OPCC) check digit algorithm.

- *Disable - disables checking the integrity of all I 2 of 5 symbols to verify the data complies.
- USS Check Digit - enables checking the integrity of USS.
- OPCC Check Digit - enables checking the integrity of OPCC.



*Disable (0)

USS Check Digit (1)



OPCC Check Digit (2)

Transmit I 2 of 5 Check Digit

Parameter # 44 (SSI #2Ch)

This parameter enables or disables transmission of I 2 of 5 data with or without the check digit.

- Enabled - enables transmission of check digit.
- *Disabled - disables transmission of check digit.

Transmit I 2 of 5 Check Digit (Enable) (1)

*Do Not Transmit I 2 of 5 Check Digit (Disable) (0)

Convert Interleaved 2 of 5 (I 2 of 5) to EAN-13

Parameter # 82 (SSI #52h)

This parameter enables or disables converting 14-character I 2 of 5 codes to EAN-13, and then transmitting to the host as EAN-13.

- Enabled - converts 14-character I 2 of 5 codes to EAN-13.
- *Disabled - does not convert 14-character I 2 of 5 codes to EAN-13.

NOTE: The I 2 of 5 code must be enabled, and the code must have a leading zero and a valid EAN-13 check digit.

Convert I 2 of 5 to EAN-13 (Enable) (1)

*Do Not Convert I 2 of 5 to EAN-13 (Disable) (0)

Interleaved 2 of 5 (I 2 of 5) Security Level

Parameter # 1121 (SSI #F8h 04h 61h)

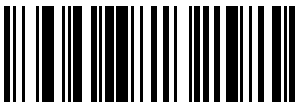
This parameter sets the security level for I 2 of 5.

I 2 of 5 barcodes are vulnerable to misdecodes, particularly when I 2 of 5 Lengths is set to Any Length. The scanner offers four levels of decode security for I 2 of 5 barcodes. There is an inverse relationship

between security and scanner aggressiveness. Increasing the level of security can reduce scanning aggressiveness, so select only the level of security necessary.

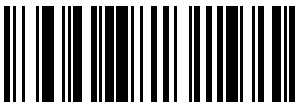
- I 2 of 5 Security Level 0: The scanner operates in its most aggressive state, while providing sufficient security in decoding most in-spec barcodes.
- I 2 of 5 Security Level 1: A barcode must be successfully read twice, and satisfy certain safety requirements before being decoded. This default setting eliminates most misdecodes.
- I 2 of 5 Security Level 2: This option applies greater barcode security requirements if Security Level 1 fails to eliminate misdecodes.
- I 2 of 5 Security Level 3: If you selected Security Level 2, and misdecodes still occur, select this security level. The highest safety requirements are applied. A barcode must be successfully read three times before being decoded.

NOTE: Selecting this option is an extreme measure against mis-decoding severely out-of-spec barcodes, and significantly impairs the decoding ability of the scanner. If this level of security is required, try to improve the quality of the barcodes.

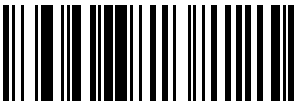


I 2 of 5 Security Level 0 (0)

*I 2 of 5 Security Level 1 (1)



I 2 of 5 Security Level 2 (2)



I 2 of 5 Security Level 3 (3)

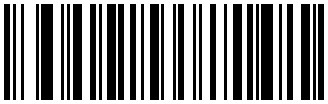
Interleaved 2 of 5 (I 2 of 5) Reduced Quiet Zone

Parameter # 1210 (SSI #F8h 04h B9h)

This parameter enables or disables decoding I 2 of 5 with reduced quiet zones (the margins on either side of the barcode).

If you select Enable, select a 1D Quiet Zone Level.

- Enabled - enables I 2 of 5 with reduced Quiet Zones.
- *Disabled - disables 2 of 5 with reduced Quiet Zones.



Enable I 2 of 5 Reduced Quiet Zone (1)

*Disable I 2 of 5 Reduced Quiet Zone (0)

Discrete 2 of 5 (D 2 of 5)

Parameter # 5 (SSI #05h)

This parameter enables or disables the scanner to decode D 2 of 5 barcodes.

- Enabled - enables D 2 of 5 decoding.
- *Disabled - disables D 2 of 5 decoding.

Enable Discrete 2 of 5 (1)

*Disable Discrete 2 of 5 (0)

Set Lengths for Discrete 2 of 5 (D 2 of 5)

L1 **Parameter # 20 (SSI #14h)**

L2 **Parameter # 21 (SSI #15h)**

This parameter set lengths for D 2 of 5.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set lengths for D 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range.

The default value for Parameter 20 is 1.

The default value for Parameter 21 is 55

HELLO The maximum range is 1 - 55.

NOTE: When setting lengths, enter a leading zero for single digit numbers.

Scan one of the following barcodes to select a length option:

- One Discrete Length - Decode only D 2 of 5 symbols containing a selected length.
- Two Discrete Lengths - Decode only D 2 of 5 symbols containing either of two lengths.

- Length Within Range - Decode D 2 of 5 symbols with a specific length range.
- Any Length - Decode D 2 of 5 symbols containing any number of characters within the scanner's capability.

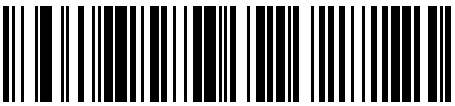
NOTE: Due to the construction of the D 2 of 5 symbology, it is possible for a scan line covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the barcode. To prevent this, select specific lengths (D 2 of 5 - One Discrete Length, Two Discrete Lengths) for D 2 of 5 applications.

Select lengths using barcodes in Numeric Barcodes. To correct an error or change the selection, scan Cancel.

For example:

- To decode only D 2 of 5 symbols with 14 characters, scan D 2 of 5 - One Discrete Length, and then scan 1, 4.
- To decode only D 2 of 5 symbols containing either 2 or 14 characters, scan D 2 of 5 - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode D 2 of 5 symbols containing between 4 and 12 characters, scan D 2 of 5 - Length Within Range, and then scan 0, 4, 1, 2.

D 2 of 5 - One Discrete Length



D 2 of 5 - Two Discrete Lengths

*D 2 of 5 - Length Within Range (Default: 1 - 55)

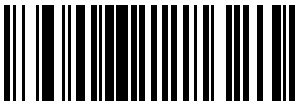
D 2 of 5 - Any Length

Codabar (NW - 7)

Parameter # 7 (SSI #07h)

This parameter enables or disables the scanner to decode Codabar barcodes.

- Enabled - enables Codabar decoding.
- Disabled - disables Codabar decoding.



Enable Codabar (1)

Disable Codabar (0)

Set Lengths for Codabar

L1 **Parameter # 24 (SSI #18h)**

L2 **Parameter # 25 (SSI #19h)**

This parameter set lengths for Codabar.

The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set lengths for Codabar to any length, one or two discrete lengths, or lengths within a specific range.

The default value for Parameter 24 is 4.

The default value for Parameter 25 is 55.

The maximum range is 4 - 55.

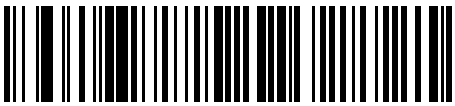
NOTE: When setting lengths, enter a leading zero for single-digit numbers.

- One Discrete Length - Decode only Codabar symbols containing a selected length.
- Two Discrete Lengths - Decode only Codabar symbols containing either of two lengths.
- Length Within Range - Decode Codabar symbols with a specific length range.
- Any Length - Decode Codabar symbols containing any number of characters within the scanner's capability.

Select lengths using barcodes in Numeric Barcodes. To correct an error or change the selection, scan Cancel.

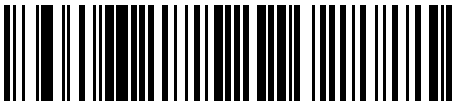
For example:

- To decode only Codabar symbols with 14 characters, scan Codabar - One Discrete Length, and then scan 1, 4.
- To decode only Codabar symbols containing either 2 or 14 characters, scan Codabar - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode Codabar symbols containing between 4 and 12 characters, scan Codabar - Length Within Range, and then scan 0, 4, 1, 2.

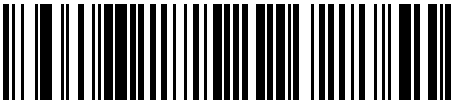


Codabar - One Discrete Length

Codabar - Two Discrete Lengths



*Codabar - Length Within Range (Default: 4 - 55)



Codabar - Any Length

CLSI Editing

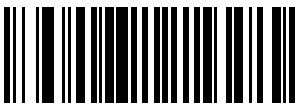
Parameter # 54 (SSI #36h)

This parameter enables or disables the scanner to decode CLSI editing barcodes.

Select Enable CLSI Editing to strip the start and stop characters and insert a space after the first, fifth, and tenth characters of a 14-character Codabar symbol if the host system requires this data format.

- Enabled - enables CLSI editing.
- *Disabled - disables CLSI editing.

NOTE: Symbol length does not include start and stop characters.



Enable CLSI Editing (1)

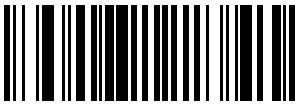
*Disable CLSI Editing (0)

NOTIS Editing

Parameter # 55 (SSI #37h)

This parameter enables or disables the scanner to decode NOTIS editing barcodes, which strips the start and stop characters from a decoded Codabar symbol if the host system requires this data format.

- Enabled - enables NOTIS editing.
- *Disabled - disables NOTIS editing.



Enable NOTIS Editing (1)

*Disable NOTIS Editing (0)

Codabar Security Level

Parameter # 1776 (SSI #F8h 06h F0h)

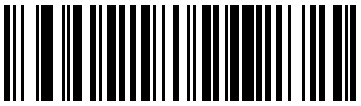
This parameter sets the security level for Codabar 39.

The scanner offers four levels of decode security for Codabar barcodes. There is an inverse relationship between security and scanner aggressiveness. Increasing the security level can reduce scanning aggressiveness, so select only the level of security necessary.

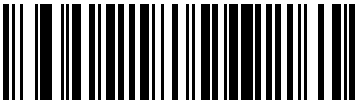
- Codabar Security Level 0: This setting allows the scanner to operate in its most aggressive state, while providing sufficient security in decoding most in-spec barcodes.
- Codabar Security Level 1: This default setting eliminates most misdecodes.
- Codabar Security Level 2: Select this option with greater barcode security requirements if Security Level 1 fails to eliminate misdecodes.
- Codabar Security Level 3: Select this security level if Security Level 2 fails to eliminate mis-codes.

NOTE: Selecting this option is an extreme measure against mis-decoding severely out-of-spec barcodes, and significantly reducesthe decoding ability of the scanner. If this level of security is required, consider improving the quality of the barcodes.

NOTE: Selecting this option is an extreme measure against mis-decoding severely out-of-spec barcodes, and significantly impairs the decoding ability of the scanner. If this level of security is required, try to improve the quality of the barcodes.

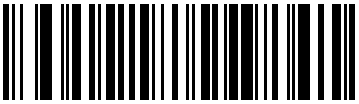


Codabar Security Level 0 (0)



*Codabar Security Level 1 (1)

Codabar Security Level 2 (2)



Codabar Security Level 3 (3)

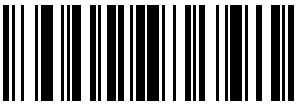
Codabar Upper or Lower Case Start/Stop Characters

Parameter # 855 (SSI #F2h 57h)

This parameter selects whether to transmit upper case or lower case Codabar start/stop characters.

- Lower Case (1) - enables lowercase start/stop characters.
- Upper Case (0) - enables upper case start/stop characters.

Lower Case (1)



Upper Case (0)

Codabar Mod 16 Check Digit Verification

Parameter # 1784 (SSI #F8h 06h F8h)

This parameter verifies the Codabar Mod 16 check digit to ensure the data complies with the specified check digit algorithm.

- Enabled - enables check digit.
- *Disabled - disables check digit.

Enable Codabar Mod 16 Check digit (1)

*Disable Codabar Mod 16 Check digit (0)

Transmit Codabar Check Digit

Parameter # 704 (SSI #F1h C0h)

This parameter selects whether or not to transmit the Codabar check digit(s).

- Enabled - enables check digit transmission.

- *Disabled - disables check digit transmission.

Enable Codabar Check Digit Transmission (1)

*Disable Codabar Check Digit Transmission (0)

MSI

Parameter # 11 (SSI #0Bh)

This parameter enables or disables the scanner to decode MSI barcodes.

- Enabled - enables MSI decoding.
- *Disabled - disables MSI decoding.

Enable MSI (1)

*Disable MSI (0)

Set Lengths for MSI

L1 **Parameter # 30 (SSI #1Eh)**

L2 **Parameter # 31 (SSI #1Fh)**

This parameter set lengths for MSI. The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set lengths for MSI to any length, one or two discrete lengths, or lengths within a specific range.

.

The default value for Parameter 30 is 4

The default value for Parameter 31 is 55

The maximum range is 4 - 55.

NOTE: When setting lengths, enter a leading zero for single-digit numbers.

Scan one of the following barcodes to select a length option:

- One Discrete Length - Decode only MSI symbols containing a selected length.

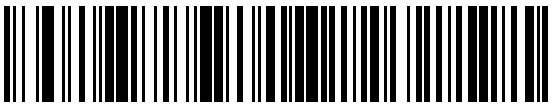
- Two Discrete Lengths - Decode only MSI symbols containing either of two lengths.
- Length Within Range - Decode MSI symbols with a specific length range.
- Any Length - Decode MSI symbols containing any number of characters within the scanner's capability.

NOTE: Due to the construction of the MSI symbology, it is possible for a scan line covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the barcode. To prevent this, select specific lengths (MSI - One Discrete Length, Two Discrete Lengths) for MSI applications.

Select lengths using barcodes in Numeric Barcodes. To correct an error or change the selection, scan Cancel.

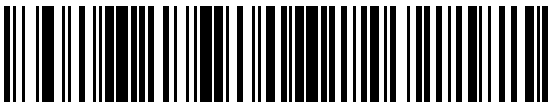
For example:

- To decode only MSI symbols with 14 characters, scan MSI - One Discrete Length, and then scan 1, 4.
- To decode only MSI symbols containing either 2 or 14 characters, scan MSI - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode MSI symbols containing between 4 and 12 characters, scan MSI - Length Within Range, and then scan 0, 4, 1, 2.



MSI - One Discrete Length

MSI - Two Discrete Lengths



*MSI - Length Within Range (Default: 4 - 55)

MSI - Any Length

MSI Check Digits

Parameter # 50 (SSI #32h)

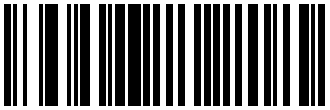
This parameter checks the MSI check digit to verify that the data complies with the specified check digit algorithm.

With MSI symbols, one check digit is mandatory and always verified by the reader. The second check digit is optional. If the MSI codes include two check digits, select the Two MSI Check Digits option to enable verification of the second check digit.

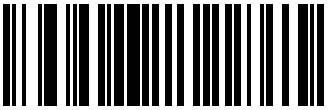
- 0 - Does not check the MSI check digit; decodes MSI with no check digit.

- 1 - This is for MSI barcodes with one check digit. This is the default.
- 2 - This is for MSI barcodes with two check digits.

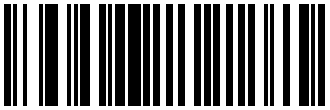
MSI Check Digit Algorithm to select second digit algorithms.



No MSI Check Digit (0)



*One MSI Check Digits (1)



Two MSI Check Digit (2)

Transmit MSI Check Digit(s)

Parameter # 46 (SSI #2Eh)

This parameter transmits MSI data with or without the check digit.

- Enabled - transmits MSI data with check digit.
- *Disabled - does not transmit MSI data check digit.

Transmit MSI Check Digit(s) (Enable) (1)

*Do Not Transmit MSI Check Digit(s) (Disable) (0)

MSI Check Digit Algorithm

Parameter # 51 (SSI #33h)

This parameter selects the algorithm used to encode the check digit.

Two algorithms are available for verifying the second MSI check digit. Select one of the following options to select the algorithm used to encode the check digit.

MOD 11/MOD 10 (0)

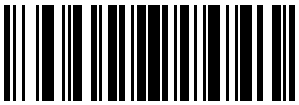
*MOD 10/MOD 10 (1)

Chinese 2 of 5

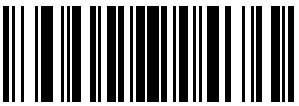
Parameter # 408 (SSI #98h)

This parameter enables or disables the scanner to decode Chinese 2 of 5.

- Enabled - enables Chinese 2 of 5.
- *Disabled - disables Chinese 2 of 5.



Enable Chinese 2 of 5 (1)



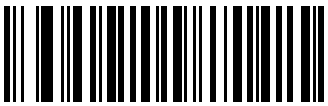
*Disable Chinese 2 of 5 (0)

Matrix 2 of 5

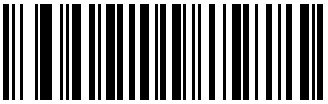
Parameter # 618 (SSI #F1h 6Ah)

This parameter enables or disables the scanner to decode Matrix 2 of 5 barcodes.

- Enabled - enables Matrix 2 of 5.
- *Disabled - disables Matrix 2 of 5.



Enable Matrix 2 of 5 (1)



*Disable Matrix 2 of 5 (0)

Set Lengths for Matrix 2 of 5

L1 **Parameter # 619 (SSI #F1h 6Bh)**

L2 **Parameter # 620 (SSI #F1h 6Ch)**

This parameter set lengths for Matrix 2 of 5. The length of a code refers to the number of characters (for example, human-readable characters), including check digit(s) the code contains. Set lengths for Matrix 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range

The default value for Parameter 619 is 4.

The default value for Parameter 620 is 55.

The maximum range is 4 - 55.

NOTE: When setting lengths, enter a leading zero for single-digit numbers.

Scan one of the following barcodes to select a length option:

- One Discrete Length - Decode only Matrix 2 of 5 symbols containing a selected length.
- Two Discrete Lengths - Decode only Matrix 2 of 5 symbols containing either of two lengths.
- Length Within Range - Decode Matrix 2 of 5 symbols with a specific length range.
- Any Length - Decode Matrix 2 of 5 symbols containing any number of characters within the scanner's capability.

Select lengths using barcodes in Numeric Barcodes. To correct an error or change the selection, scan Cancel.

For example:

- To decode only Matrix 2 of 5 symbols with 14 characters, scan Matrix 2 of 5 - One Discrete Length, and then scan 1, 4.
- To decode only Matrix 2 of 5 symbols containing either 2 or 14 characters, scan Matrix 2 of 5 - Two Discrete Lengths, and then scan 0, 2, 1, 4.
- To decode Matrix 2 of 5 symbols containing between 4 and 12 characters, scan Matrix 2 of 5 - Length Within Range, and then scan 0, 4, 1, 2.

Matrix 2 of 5 - One Discrete Length

Matrix 2 of 5 - Two Discrete Lengths

*Matrix 2 of 5 - Length Within Range (Default: 4 - 55)

Matrix 2 of 5 - Any Length

Matrix 2 of 5 Check Digit

Parameter # 622 (SSI #F1h 6Eh)

This parameter determines whether to include the Matrix 2 of 5 check digit with the barcode data.

The check digit is the last character of the symbol used to verify the integrity of the data.

- Enabled - enables Matrix 2 of 5 Check Digit.
- *Disabled - disables Matrix 2 of 5 Check Digit.

Enable Matrix 2 of 5 Check Digit (1)

*Disable Matrix 2 of 5 Check Digit (0)

Transmit Matrix 2 of 5 Check Digit

Parameter # 623 (SSI #F1h 6Fh)

This parameter transmits Matrix 2 of 5 data with or without the check digit.

- Transmit - enables Transmit Matrix 2 of 5 Check Digit.
- *Do Not Transmit - does not Transmit Matrix 2 of 5 Check Digit.

Transmit Matrix 2 of 5 Check Digit (1)

*Do Not Transmit Matrix 2 of 5 Check Digit (0)

Korean 3 of 5

Parameter # 581 (SSI #F1h 45h)

This parameter enables or disables to decode Korean 3 of 5 barcodes.

- Enabled - enables decoding Korean 3 of 5 barcodes.
- *Disabled - disables decoding Korean 3 of 5 barcodes.

NOTE: The length for Korean 3 of 5 is fixed at 6.

Enable Korean 3 of 5 (1)

*Disable Korean 3 of 5 (0)

Inverse 1D

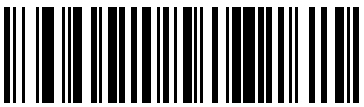
Parameter # 586 (SSI #F1h 4Ah)

This parameter configures the 1D inverse decoder setting.

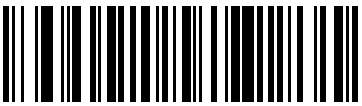
- Regular Only - The scanner decodes regular 1D barcodes only.
- Inverse Only - The scanner decodes inverse 1D barcodes only.
- Inverse Autodetect - The scanner decodes both regular and inverse 1D barcodes.

NOTE: This parameter does not apply to GS1 DataBarcode types.

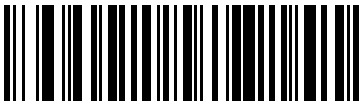
NOTE: The Inverse 1D setting may impact Composite or Inverse Composite decoding.



*Regular Only (0)



Inverse Only (1)



Inverse Autodetect (2)

GS1 DataBar

The variants of GS1 DataBar are DataBar Omnidirectional, DataBar Limited, and DataBar Expanded. The limited and expanded versions have stacked variants. Choose to enable or disable each variant of the GS1 DataBar.

GS1 DataBar Omnidirectional (formerly GS1 DataBar-14)

The variants of GS1 DataBar are DataBar Omnidirectional, DataBar Limited, and DataBar Expanded. The limited and expanded versions have stacked variants. Scan the appropriate barcodes to enable or disable each variant of GS1 DataBar.

Parameter # 338 (SSI #F0h 52h)

This parameter enables or disables the scanner to decode GS1 DataBar Omnidirectional barcodes.

- *Enabled - enables GS1 DataBar Omnidirectional decoding.
- Disabled - disables GS1 DataBar Omnidirectional decoding.

*Enable GS1 DataBar Omnidirectional (1)

Disable GS1 DataBar Omnidirectional (0)

GS1 DataBar Limited

Parameter # 339 (SSI #F0h 53h)

This parameter enables or disables the scanner to decode GS1 DataBar Limited barcodes.

- *Enabled - enables GS1 DataBar Limited decoding.
- Disabled - disables GS1 DataBar Limited decoding.

*Enable GS1 DataBar Limited (1)

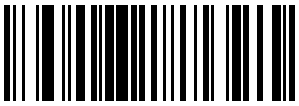
Disable GS1 DataBar Limited (0)

GS1 DataBar Expanded

Parameter # 340 (SSI #F0h 54h)

This parameter enables or disables the scanner to decode GS1 DataBar Expanded barcodes.

- *Enabled - enables GS1 DataBar Expanded decoding.
- Disabled - disables GS1 DataBar Expanded decoding.



*Enable GS1 DataBar Expanded (1)

Disable GS1 DataBar Expanded (0)

Convert GS1 DataBar to UPC/EAN/JAN

Parameter # 397 (SSI #F0h, 8Dh)

This parameter enables or disables the scanner to decode Convert GS1 DataBar to UPC/EAN/JAN.

- Enabled - Converts GS1 DataBar to UPC/EAN/JAN.
- *Disabled - Does not convert GS1 DataBar to UPC/EAN/JAN.

This parameter only applies to GS1 DataBar Omnidirectional and GS1 DataBar Limited symbols not decoded as part of a Composite symbol. Enable Convert GS1 DataBar to UPC/EAN/JAN strips the leading '010' from DataBar Omnidirectional and DataBar Limited symbols encoding a single zero as the first digit, and then reports as EAN-13.

For barcodes beginning with two to five zeros, this strips the leading '0100' and reports the barcode as UPC-A. The UPC-A Preamble option that transmits the system character and country code applies to converted barcodes. Note that neither the system character nor the check digit can be stripped.

Enable Convert GS1 DataBar to UPC/EAN/JAN (1)

*Disable Convert GS1 DataBar to UPC/EAN/JAN (0)

GS1 DataBar Security Level

Parameter # 1706 (SSI #F8h 06h AAh)

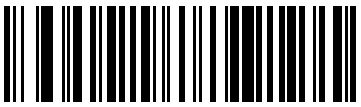
This parameter sets the security level for GS1 DataBar.

The scanner offers four levels of decode security for GS1 DataBar (GS1 DataBar Omnidirectional, GS1 DataBar Limited, GS1 DataBar Expanded) barcodes.

- Security Level 0 - The scanner operates in its most aggressive state, while providing sufficient security decoding most in-spec barcodes.
- Security Level 1 - This setting eliminates most misdecodes while maintaining reasonable aggressiveness.
- Security Level 2 - Select this option with greater barcode security requirements if Security Level 1 fails to eliminate misdecodes.
- *Security Level 3 - If you selected Security Level 2 and misdecodes still occur, select this security level to apply the highest safety requirements.

GS1 DataBar Security Level 0 (0)

GS1 DataBar Security Level 1 (1)



GS1 DataBar Security Level 2 (2)

*GS1 DataBar Security Level 3 (3)

GS1 DataBar Expanded Security Level

Parameter # 1707 (SSI #F8h 06h ABh)

This parameter set the expanded security level for GS1 DataBar.

The scanner offers four levels of decode security for GS1 DataBar Expanded:

- Security Level 0 - The scanner operates in its most aggressive state, decoding most in-spec barcodes with sufficient security.
- *Security Level 1 - This setting eliminates most misdecodes while maintaining reasonable aggressiveness.
- Security Level 2 - Select this option with greater barcode security requirements if Security Level 1 fails to eliminate misdecodes.
- Security Level 3 - If you selected Security Level 2 and misdecodes still occur, select this security level to apply the highest safety requirements.

GS1 DataBar Expanded Security Level 0 (0)

*GS1 DataBar Expanded Security Level 1 (1)

GS1 DataBar Expanded Security Level 2 (2)

GS1 DataBar Expanded Security Level 3 (3)

GS1 DataBar Limited Security Level

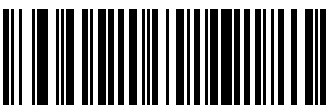
Parameter # 728 (SSI # F1h D8h)

The scanner offers four levels of decode security for GS1 DataBar Limited barcodes. There is an inverse relationship between security and scanner aggressiveness. Increasing the level of security may result in reduced aggressiveness in scanning, so choose the lowest necessary security level.

Select one of the following security levels:

1. No clear margin required. This complies with the original GS1 standard, but may result in erroneous decoding of the DataBar Limited barcode when scanning some UPS symbols that start with digits 9 and 7.
2. Automatic Risk Detection. This level of security may result in erroneous decoding of DataBar Limited barcodes when scanning some UPC symbols. The scanner defaults to Level 3, otherwise to level 1.
3. Security level reflects newly proposed GS1 standard that requires a 5 times trailing clear margin.
4. Security level extends beyond the standard required by GS1. This level of security requires a five times leading and trailing clear margin.

GS1 DataBar Limited Security Level 1 (1)



GS1 DataBar Limited Security Level 2 (2)

*GS1 DataBar Limited Security Level 3 (3)

GS1 DataBar Limited Security Level 4 (4)

Symbology-Specific Security Features

These security features are unique to the Symbology section.

Redundancy Level

Parameter # 78 (SSI #4Eh)

This parameter sets the redundancy level appropriate to the barcode quality.

Select higher redundancy levels for decreasing levels of barcode quality. As redundancy levels increase, the scanner's aggressiveness decreases.

- *Redundancy Level 1 - The scanner must read the following code types twice before decoding:
  - Codabar (8 characters or less)
  - MSI (4 characters or less)
  - D 2 of 5 (8 characters or less)
  - I 2 of 5 (8 characters or less)
- Redundancy Level 2 - The scanner must read all code types twice before decoding.
- Redundancy Level 3 - The scanner reads all code types twice before decoding. The following are read three times before decoding:
  - Codabar (8 characters or less)
  - MSI (4 characters or less)
  - D 2 of 5 (8 characters or less)
  - I 2 of 5 (8 characters or less)
- Redundancy Level 4 - The scanner must read all code types three times before decoding.

*Redundancy Level 1 (1)

Redundancy Level 2 (2)

Redundancy Level 3 (3)

Redundancy Level 4 (4)

Security Level

Parameter # 77 (SSI #4Dh)

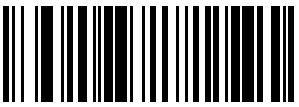
This parameter sets the security level.

The scanner offers four levels of decode security, which include the Code 128 family, UPC/EAN/JAN, and Code 93. Select increasing levels of security for decreasing levels of scanning quality. There is an inverse relationship between security and scanner aggressiveness, so choose the security level necessary for the application.

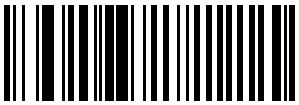
- Security Level 0 - The scanner operates in its most aggressive state, while providing sufficient security decoding most in-spec barcodes.
- Security Level 1 - This default setting eliminates most mis-decodes.
- Security Level 2 - Select this option if Security Level 1 fails to eliminate mis-decodes.
- Security Level 3 - Select this security level if Security Level 2 fails to eliminate mis-decodes.

NOTE: Selecting this option is an extreme measure against mis-decoding severely out-of-spec barcodes, and significantly reduces the decoding ability of the scanner. If this level of security is required, consider improving the quality of the barcodes.

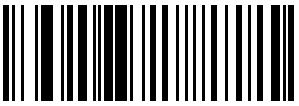
Security Level 0 (0)



*Security Level 1 (1)



Security Level 2 (2)



Security Level 3 (3)

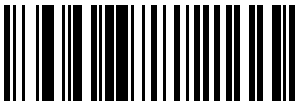
1D Quiet Zone Level

Parameter # 1288 (SSI #F8h 05h 08h)

This parameter sets the level of aggressiveness when setting a reduced quiet zone (the margin on either side of a barcode), and applies to symbologies enabled by a Reduced Quiet Zone parameter.

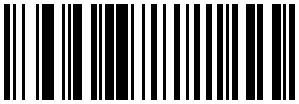
Because higher levels increase the decoding time and risk of mis-decodes, Zebra strongly recommends enabling only the symbologies which require higher quiet zone levels, and leaving Reduced Quiet Zone disabled for all other symbologies. Options are:

- 1D Quiet Zone Level 0 - The scanner performs normally in terms of quiet zone.
- *1D Quiet Zone Level 1 - The scanner performs more aggressively in terms of quiet zone.
- 1D Quiet Zone Level 2 - The scanner only requires a quiet zone at the end of barcode for decoding.
- 1D Quiet Zone Level 3 - The scanner decodes anything in terms of quiet zone or end of barcode.

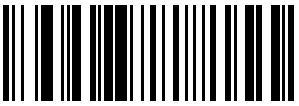


1D Quiet Zone Level 0 (0)

*1D Quiet Zone Level 1 (1)



1D Quiet Zone Level 2 (2)



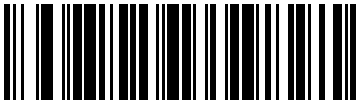
1D Quiet Zone Level 3 (3)

Intercharacter Gap Size

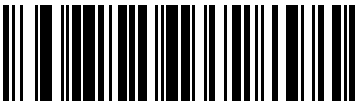
Parameter # 381 (SSI #F0h 7Dh)

This parameter enables a device to tolerate large intercharacter gap sizes.

The Code 39 and Codabar symbologies typically contain small intercharacter gaps. Due to various barcode printing technologies, these gaps can sometimes exceed the maximum allowed size, preventing the scanner from decoding the symbol. If there is a decoding issues, scan the Large Intercharacter Gaps parameter to enable the scanner to tolerate these out-of-specification barcodes.



*Normal Intercharacter Gaps (6)



Large Intercharacter Gaps (10)

Composite

Composites link symbols or barcodes together and they are read by a scanner as one object.

Composite CC-C

Parameter # 341 (SSI #F0h 55h)

This parameter enables or disables the scanner to decode Composite barcodes of type CC-C.

- Enabled - enables CC-C.
- Disabled - disables CC-C.

Enable CC-C (1)

Disable CC-C (0)

Composite CC-A/B

Parameter # 342 (SSI #F0h 56h)

This parameter enables or disables the scanner to decode CC-A/B.

- Enabled - enables CC-A/B.
- *Disabled - disables CC-A/B.

Enable CC-A/B (1)

Disable CC-A/B (0)

Composite TLC-39

Parameter # 371 (SSI #F0h 73h)

This parameter enables or disables the scanner to decode TLC-39 barcodes.

- Enabled - enables TLC-39.
- *Disabled - disables TLC-39.

Enable TLC39 (1)

*Disable TLC39 (0)

UPC Composite Mode

Parameter # 344 (SSI #F0h 58h)

This parameter links UPC symbols with a 2D symbol during transmission, treating them as a single symbol.

- *UPC Never Linked - Transmit UPC barcodes regardless of whether a 2D symbol is detected.
- UPC Always Linked - Transmit UPC barcodes along with the 2D portion. If 2D is not present, the scanner does not transmit the barcode.
- Autodiscriminate UPC Composites - The scanner checks for a 2D portion, then transmits both the UPC and 2D portion if present.

*UPC Never Linked (0)

UPC Always Linked (1)

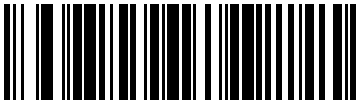
Autodiscriminate UPC Composites (2)

Composite Beep Mode

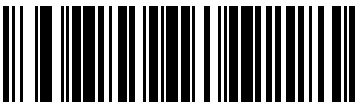
Parameter # 398 (SSI #F0h 8Eh)

This parameter selects the number of decode beeps emitted when a composite symbol is decoded.

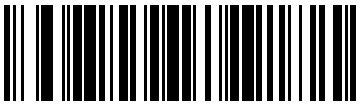
- Single Beep - Sounds one beep after decoding both codes.
- *Beep for each code type - Sounds one beep as the scanner decoded each code type.
- Double Beep - Sounds two beeps after decoding both codes.



Single Beep After Both are Decoded (0)



*Beep as Each Code Type is Decoded (1)



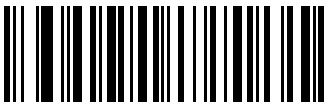
Double Beep After Both are Decoded (2)

GS1-128 Emulation Mode for UCC/EAN Composite Codes

Parameter # 427 (SSI #F0h ABh)

This parameter enables or disables GS1-128 Emulation Mode for UCC/EAN Composite Codes.

- Enabled - enables GS1-128 Emulation Mode for UCC/EAN Composite Codes.
- *Disabled - disables GS1-128 Emulation Mode for UCC/EAN Composite Codes.



Enable GS1-128 Emulation Mode for UCC/EAN Composite Codes (1)

*Disable GS1-128 Emulation Mode for UCC/EAN Composite Codes (0)

2D Symbologies

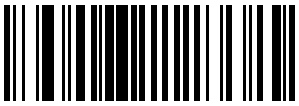
The following parameters are specific to 2D Symbologies.

PDF417

Parameter # 15 (SSI 0Fh)

This parameter enables or disables the scanner to decode PDF417 barcodes.

- Enabled - enables PDF417 decoding.
- Disabled - disables PDF417 decoding.



Enable PDF417 (1)

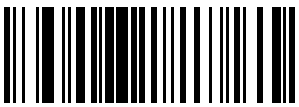
Disable PDF417 (0)

MicroPDF417

Parameter # 227 (SSI #E3h)

This parameter enables or disables the scanner to decode MicroPDF417 decoding.

- Enabled - enables MicroPDF417 decoding.
- *Disabled - disables MicroPDF417decoding.



Enable MicroPDF417 (1)

*Disable MicroPDF417 (0)

Code 128 Emulation

Parameter # 123 (SSI #7Bh)

This parameter transmits data from certain MicroPDF417 symbols as Code 128.

You must enable AIM Code Characters for this parameter to work.

Enable Code 128 Emulation to transmit these MicroPDF417 symbols with one of the following prefixes:

```
]C1    if the first codeword is 903-905
```

```
]C2    if the first codeword is 908 or 909
```

```
]C0    if the first codeword is 910 or 911
```

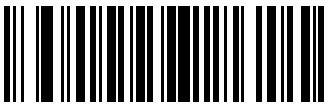
Disable Code 128 Emulation to transmit these MicroPDF417 symbols with one of the following prefixes:

```
]L3    if the first codeword is 903-905
```

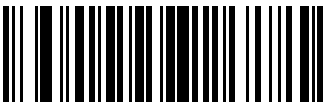
```
]L4    if the first codeword is 908 or 909
```

```
]L5    if the first codeword is 910 or 911
```

NOTE: Linked MicroPDF codewords 906, 907, 912, 914, and 915 are not supported. Use GS1 Composites instead.



Enable Code 128 Emulation (1)



*Disable Code 128 Emulation (0)

Data Matrix

Parameter # 292 (SSI #F0h 24h)

This parameter enables or disables the scanner to decode Data Matrix barcodes.

- Enabled - enables Data Matrix decoding.
- Disabled - disables Data Matrix decoding.

Enable Data Matrix (1)

Disable Data Matrix (0)

GS1 Data Matrix

Parameter # 1336 (SSI #F8h 05h 38h)

This parameter enables or disables the scanner to decode GS1 Data Matrix.

- Enabled - enables GS1 Data Matrix.
- *Disabled - disables GS1 Data Matrix.

Enable GS1 Data Matrix (1)

*Disable GS1 Data Matrix (0)

Data Matrix Inverse

Parameter # 588 (SSI #F1h 4Ch)

This parameter configures the scanner's ability to decode inverse Data Matrix barcodes.

- Regular Only - The scanner decodes regular Data Matrix barcodes only.
- Inverse Only - The scanner decodes inverse Data Matrix barcodes only.
- Inverse Autodetect - The scanner decodes both regular and inverse Data Matrix barcodes.

Regular Only (0)

Inverse Only (1)

Inverse Autodetect (2)

Maxicode

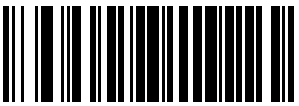
Parameter # 294 (SSI #F0h 26h)

This parameter enables or disables the scanner to decode Maxicode.

- Enabled - enables Maxicode.

- *Disabled - disables Maxicode.

Enable Maxicode (1)



*Disable Maxicode (0)

QR Code

Parameter # 293 (SSI #F0h 25h)

This parameter enables or disables the scanner to decode QR Code barcodes.

- Enabled - enables QR Code decoding.
- Disabled - disables QR Code decoding.

NOTE: Enabling this parameter also enables QR Mirrored and Linked QR.

Enable QR Code (1)

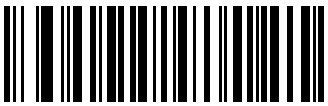
Disable QR Code (0)

GS1 QR

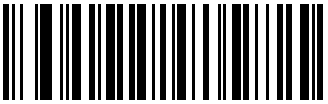
Parameter # 1343 (SSI #F8h 05h 3Fh)

This parameter enables or disables the scanner to decode GS1 QR barcodes.

- Enabled - enables GS1 QR decoding.
- Disabled - disables GS1 QR decoding.



Enable GS1 QR (1)



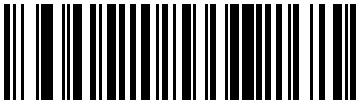
Disable GS1 QR (0)

QR Inverse

Parameter # 587 (SSI #F1h 4Bh)

This parameter configures the QR inverse decoder setting.

- *Regular Only - The scanner decodes regular QR barcodes only.
- Inverse Only - The scanner decodes inverse QR barcodes only.
- Inverse Autodetect - The scanner decodes both regular and inverse QR barcodes.



*Regular Only (0)

Inverse Only (1)

Inverse Autodetect (2)

MicroQR

Parameter # 573 (SSI #F1h 3Dh)

This parameter enables or disables the scanner to decode MicroQR barcodes.

- Enabled - enables MicroQR decoding.
- Disabled - disables MicroQR decoding.

Enable MicroQR (1)

Disable MicroQR (0)

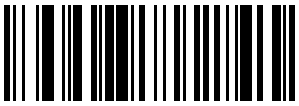
Linked QR Mode

Parameter # 1847 (SSI #737h)

Linked QR mode can be used to split data across several QR codes.

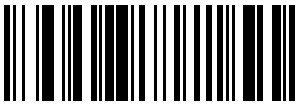
NOTE: Linked QR mode is not available

- *Linked QR Only - The scanner does not decode individual QR symbols from a set of linked QR codes.
- Individual QR With Headers - The scanner decodes individual QR symbols from a set of linked QR codes and retains the header information and data.
- Individual QR No Headers - The scanner decodes individual QR symbols from a set of linked QR codes and transmits the data without header information.



*Linked QR Only (0)

Individual QR With Headers (1)



Individual QR No Headers (2)

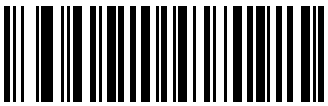
Aztec

Parameter # 574 (SSI #F1h 3Eh)

This parameter enables or disables the scanner to decode Aztec barcodes.

- Enabled - enables Aztec decoding.
- Disabled - disables Aztec decoding.

NOTE: Enabling this parameter also enables Linked Aztec.



Enable Aztec (1)

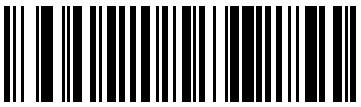
Disable Aztec (0)

Aztec Inverse

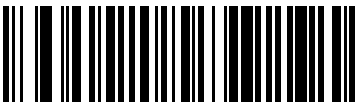
Parameter # 589 (SSI #F1h 4Dh)

This parameter configures the Aztec inverse decoder setting.

- Regular Only - The scanner decodes regular Aztec barcodes only.
- Inverse Only - The scanner decodes inverse Aztec barcodes only.
- *Inverse Autodetect - The scanner decodes both regular and inverse Aztec barcodes.



Regular Only (0)



Inverse Only (1)

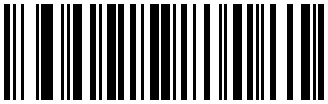
*Inverse Autodetect (2)

Han Xin

Parameter # 1167 (SSI #F8h 04h 8Fh)

This parameter enables or disables the scanner to decodeHan Xin.

- Enabled - enables Han Xin.
- *Disabled - disables Han Xin.



Enable Han Xin (1)

*Disable Han Xin (0)

Han Xin Inverse

Parameter # 1168 (SSI #F8h 04h 90h)

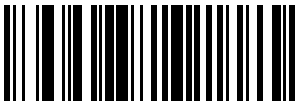
This parameter selects a Han Xin inverse decoder setting.

- *Regular Only - The scanner decodes Han Xin barcodes with normal reflectance only.

- Inverse Only - The scanner decodes Han Xin barcodes with inverse reflectance only.
- Inverse Autodetect - The scanner decodes both regular and inverse Han Xin barcodes.

*Regular Only (0)

Inverse Only (1)



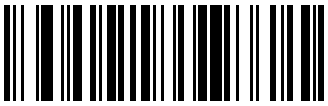
Inverse Autodetect (2)

Grid Matrix

Parameter # 1718 (SSI #F8 06h B6h)

This parameter enables or disables the scanner to decode Grid Matrix barcodes.

- Enabled - enables Grid Matrix.
- *Disabled - disables Grid Matrix.



Enable Grid Matrix (1)

*Disable Grid Matrix (0)

DotCode

Parameter # 1906 (SSI #F8 07 72h)

You can enable or disable DotCode.

- Enabled - enables DotCode.
- *Disabled - disables DotCode.

*Disable DotCode (0)

Enable Dotcode (1)

DotCode Prioritize

Parameter # 1937 (SSI #F8 07 91h)

This parameter enables or disables giving priority to DotCode decoding versus other symbologies.

- Disabled - disables DotCode as a priority.
- Enabled - enables DotCode as a priority.

Disable DotCode Prioritize (0)

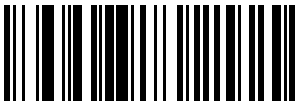
Enable DotCode Prioritize (1)

DotCode Inverse

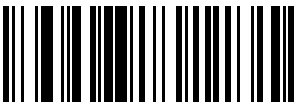
Parameter # 1907 (SSI #F8 07 73h)

This parameter selects the DotCode Inverse decoder setting.

- Regular Only - the device decodes DotCode Inverse codes with normal reflectance only.
- Inverse Only - the device decodes DotCode Inverse codes with inverse reflectance only.
- Inverse Autodetect - the device decodes DotCode Inverse codes with both normal and inverse reflectance.



Regular (0)



Inverse Only (1)

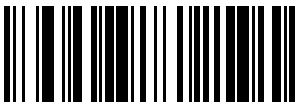
*Inverse Autodetect (2)

DotCode Mirrored

Parameter # 1908 (SSI #F8 07 74h)

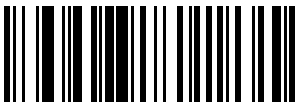
This parameter sets a DotCode Mirror decoder setting.

- Never - decodes non-mirrored DotCode codes only.
- Always - decodes mirrored DotCode codes only.
- *Autodetect - decodes both mirrored and non-mirrored DotCode codes.



Never (0)

Always (1)



*Autodetect (2)

Macro PDF Features

Macro PDF is a special feature for combining multiple PDF symbols into one file. The scanner can decode symbols encoded with this feature, and can store more than 64 Kb of decoded data from up to 50 MacroPDF symbols.

When printing, keep each Macro PDF sequence separate, as each sequence has unique identifiers. Do not mix barcodes from several Macro PDF sequences, even if they encode the same data. When scanning a Macro PDF sequence, scan the entire sequence without interruption. When scanning a mixed sequence, two long low beeps (low/low) indicate an inconsistent file ID or inconsistent symbology error.

Macro PDF User Indications

In this mode the scanner provides the following feedback.

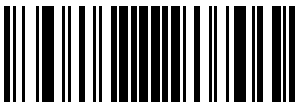
NOTE: The beep only sounds if the *BEEPER_ON signal is connected.

NOTE: The T columns indicate whether the symbol transmitted to the host (N = No transmission).

User Scans	Passthrough All Symbols		Transmit Any Symbol in Set		Buffer All Symbols	
	Beep	T	Beep	T	Beep	T
Last Macro PDF in set	Decode beep	Y	Decode beep	Y	Decode beep	Y
Any Macro PDF in set except last	Decode beep	Y	Decode beep	Y	2 short low	N
Macro PDF is not in current set	Decode beep	Y	2 long low	N	2 long low	N
Invalid Macro PDF formatting	Decode beep	Y	2 long low	N	2 long low	N
Macro PDF from set was already scanned	Decode beep	Y	4 long low	N	4 long low	N
Out of Macro PDF memory	N/A	N/A	3 long low	N	3 long low	N
A non-Macro PDF scanned during a set	N/A	N/A	4 long low	N	4 long low	N
Flush Macro PDF	Low high	N	5 long low	N	5 long low	Y
Abort Macro PDF	High low high low	N	High low high low	N	High low high low	N

Flush Macro PDF Buffer

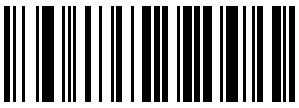
This parameter flushes the buffer of all decoded Macro PDF data stored to that point, transmits it to the host device, and aborts from Macro PDF mode.



Flush Macro PDF Buffer

Abort Macro PDF Entry

This parameter clears all currently-stored Macro PDF data in the buffer without transmission and aborts from Macro PDF mode.



Abort Macro PDF Entry

Postal Codes

These parameters are regarding postal codes from around the globe.

US Postnet

Parameter # 89 (SSI #59h)

This parameter enables or disables to decode the scanner US Postnet barcodes.

- Enabled - enables US Postnet.
- *Disabled - disables US Postnet.

Enable US Postnet (1)

*Disable US Postnet (0)

US Planet

Parameter # 90 (SSI #5Ah)

This parameter enables or disables the scanner to decode US Planet barcodes.

- Enabled - enables US Planet.
- *Disabled - disables US Planet.

Enable US Planet (1)

*Disable US Planet (0)

Transmit US Postal Check Digit

Parameter # 95 (SSI #5Fh)

This parameter selects whether to transmit US Postal data, which includes both US Postnet and US Planet, with or without the check digit.

- *Transmit - transmit US Postal with Check Digit.
- Do Not Transmit - do not transmit US Postal with Check Digit.

*Transmit US Postal Check Digit (1)

Do Not Transmit US Postal Check Digit (0)

UK Postal

Parameter # 91 (SSI # 5Bh)

This parameter enables or disables the scanner to decode UK Postal barcodes.

Enable UK Postal (1)

*Disable UK Postal (0)

Transmit UK Postal Check Digit

Parameter # 96 (SSI # 60h)

This parameter enables or disables the scanner to decode Transmit UK Postal Check Digit.

*Transmit UK Postal Check Digit (1)

Do Not Transmit UK Postal Check Digit (0)

Japan Postal

Parameter # 290 (SSI # F0h, 22h)

This parameter enables or disables the scanner to decode Japan Postal.

Enable Japan Postal (1)

*Disable Japan Postal (0)

Australia Post

Parameter # 291 (SSI # F0h, 23h)

This parameter enables or disables the scanner to decode Australia Post.

Enable Australia Post (1)

*Disable Australia Post (0)

Australia Post Format

Parameter # 718 (SSI # F1h, CEh)

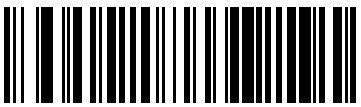
This parameter enables or disables Australia Post Format.

- Autodiscriminate (or Smart mode) - Decode the Customer Information Field using the N and C Encoding Tables.

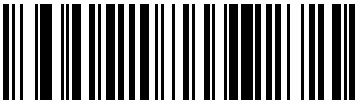
NOTE: This option increases the risk of misdecodes because the encoded data format does not specify the Encoding Table used for encoding.

- Raw Format - Output raw bar patterns as a series of numbers 0 through 3.
- Alphanumeric Encoding - Decode the Customer Information Field using the C Encoding Table.
- Numeric Encoding - Decode the Customer Information Field using the N Encoding Table.

For more information on Australia Post Encoding Tables, refer to the Australia Post Customer Barcoding Technical Specifications available at auspost.com.au.



*Autodiscriminate (0)



Raw Format (1)

Alphanumeric Encoding (2)

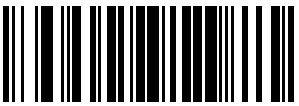
Numeric Encoding (3)

Netherlands KIX Code

Parameter # 326 (SSI # F0h, 46h)

This parameter enables or disables the scanner to decode Netherlands KIX Code.

Enable Netherlands KIX Code (1)



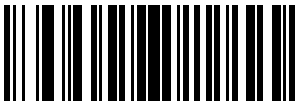
*Disable Netherlands KIX Code (0)

USPS 4CB/One Code/Intelligent Mail

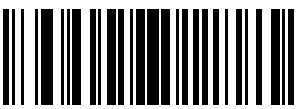
Parameter # 592 (SSI # F1h 50h)

This parameter enables or disables the scanner to decode Intelligent Mail barcodes.

Scan one of the following barcodes to enable or disable USPS 4CB/One Code/Intelligent Mail.



Enable USPS 4CB/One Code/Intelligent Mail (1)



*Disable USPS 4CB/One Code/Intelligent Mail (0)

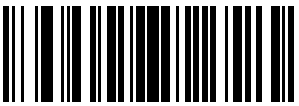
UPU FICS Postal

Parameter # 611 (SSI # F1h 63h)

This parameter enables or disables the scanner to decode Code 39 barcodes.

Scan one of the following barcodes to enable or disable UPU FICS Postal.

Enable UPU FICS Postal (1)



*Disable UPU FICS Postal (0)

Mailmark

Parameter # 1337 (SSI # F8h 05h 39h)

This parameter enables or disables Mailmark.

Scan one of the following barcodes to enable or disable the scanner to decode Mailmark barcodes.

*Disable Mailmark (0)

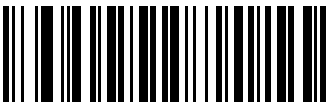
Enable Mailmark (1)

Canada Post

Parameter # 92 (SSI # 5Ch)

To enable or disable Canada Post, scan the appropriate barcode below.

*Disable Canada Post (0)



Enable Canada Post (1)

Digimarc Barcode

Digimarc Barcode is an invisible machine-readable code reported as UPC-A, UPC-E, EAN-13, or RSS Expanded.

NOTE: Converting the Digimarc reported code types to other barcode types is not supported.

AIM and Symbol code IDs are supported for the reported Digimarc code types.

Scan one of the following barcodes to enable or disable Digimarc Barcode.

Enable Digimarc Barcode

*Disable Digimarc Barcode

Posti LAPA 4-State Code

Parameter # 2031 (SSI #F8 07EF)

This parameter enables or disable the scanner to decode Posti LAPA barcodes.

- *Disabled - disable Posti LAPA.
- Enabled - enables Posti LAPA.

*Disable Posti LAPA (0)

Enable Posti LAPA (1)

OCR Programming

This section describes how to set up the scanner for OCR programming. The scanner can read 6 to 60-point OCR typeface. It supports font types OCR-A, OCR-B, MICR-E13B, and US Currency Serial Number.

OCR is not as secure as a barcode. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit.

All OCR fonts are disabled by default. You can enable OCR-A and OCR-B at the same time but not other combined font types.

OCR Parameter Defaults

OCR Programming Defaults lists the defaults for OCR 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 Default Parameters.
- Configure the scanner using the 123Scan configuration program. See 123Scan and Software Tools.

NOTE: Standard parameter defaults are available in each chapter of this guide.

Table 8 OCR Programming Defaults

Parameter	Parameter Number	SSI Number	Default
OCR-A	680	F1h A8h	Disable
OCR-A Variant	684	F1h ACh	Full ASCII
OCR-B	681	F1h A9h	Disable
OCR-B Variant	685	F1h ADh	Full ASCII
MICR E13B	682	F1h AAh	Disable
US Currency Serial Number	683	F1h ABh	Disable
OCR Orientation	687	F1h AFh	0o
OCR Lines	691	F1h B3h	1
OCR Minimum Characters	689	F1h B1h	3
OCR Maximum Characters	690	F1h B2h	100

Table 8 OCR Programming Defaults (Continued)

Parameter	Parameter Number	SSI Number	Default
OCR Subset	686	F1h AEh	Selected font variant
OCR Quiet Zone	695	F1h B7h	50
OCR Template	547	F1h 23h	99999999
OCR Check Digit Modulus	688	F1h B0h	1
OCR Check Digit Multiplier	700	F1h BCh	121212121212
OCR Check Digit Validation	694	F1h B6h	None
Inverse OCR	856	F2h 58h	Regular
OCR Redundancy	1770	F8h 06h EAh	Level 1

OCR Programming Parameters

The OCR programming parameters enable scanners to read font types for OCR-A, OCR-B, MICR-E13B, and US Currency Serial Numbers.

OCR-A

Parameter # 680 (SSI # F1h A8h)

This parameter enables scanners to read OCR-A fonts.

- Enabled - OCR-A can be read by the scanner.
- Disabled - OCR-A fonts will not be read by the scanner.

NOTE: OCR is not as secure as a barcode. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See OCR Subset and OCR Template.

Enable OCR-A (1)

*Disable OCR-A (0)

OCR-A Variant

Parameter # 684 (SSI # F1 ACh)

This parameter enables scanners to read OCR-A font variants.

The font variant sets a processing algorithm and default character subset for the given font. Select the most appropriate font variant to optimize performance and accuracy.

OCR-A supports the following variants:

- OCR-A Full ASCII

```
!"#$()*+,-./0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ\^
```

- OCR-A Reserved 1

```
$*+-./0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

- OCR-A Reserved 2

```
$*+-./0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

- OCR-A Banking

```
-0123456789<>
```

Special banking characters output as the following representative characters:

- ⊦ outputs as f
- ⊣ outputs as c
- ⊥ outputs as h

NOTE: Enable OCR-A before setting this parameter. If disabling OCR-A, set the variant to OCR-A Full ASCII.

*OCR-A Full ASCII (0)

OCR-A Reserved 1 (1)

OCR-A Reserved 2 (2)

OCR-A Banking (3)

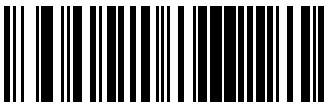
OCR-B

Parameter # 681 (SSI # F1h A9h)

This parameter enables scanners to read OCR-B fonts.

- Enabled - OCR-B can be read by the scanner.
- Disabled - OCR-B fonts will not be read by the scanner.

NOTE: OCR is not as secure as a barcode. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See OCR Subset and OCR Template.



Enable OCR-B (1)

*Disable OCR-B (0)

OCR-B Variant

Parameter # 685 (SSI # F1h ADh)

This parameter enables scanners to read OCR-A font variants.

OCR-A supports the following variants:

- OCR-B Full ASCII

```
!#$%()*+,-./0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ^|Ñ
```

- OCR-B Banking

```
#+-0123456789<>JNP|
```

- OCR-B Limited

```
+,-./0123456789<>ACENPSTVX
```

- OCR-B ISBN 10-Digit Book Numbers

```
-0123456789>BCEINPSXz
```

- OCR-B ISBN 10 or 13-Digit Book Numbers

```
-0123456789>BCEINPSXz
```

- OCR-B Travel Document Version 1 (TD1) 3-Line ID Cards

```
-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

- OCR-B Travel Document Version 2 (TD2) 2-Line ID Cards

```
-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

- OCR-B Travel Document 2 or 3-Line ID Cards Auto-Detect

```
!#$%()*+,-./0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ^|Ñ
```

- OCR-B Passport

```
-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZÑ
```

- OCR-B Visa Type A

```
-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

- OCR-B Visa Type B

```
-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZÑ
```

- OCR-B ICAO Travel Documents

This allows reading either TD1, TD2, Passport, Visa Type A, or Visa Type B without switching between these options. It automatically recognizes the travel document read.

Selecting one of the ISBN Book Numbers automatically applies the appropriate ISBN checksum, so setting this is not required.

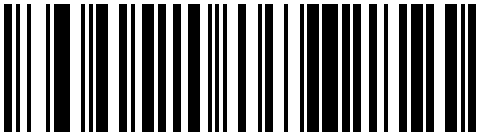
Selecting the following OCR-B variants automatically sets the appropriate OCR Lines. These five variants invoke extensive special algorithms and checking for that particular document type:

Variant	OCR Lines Setting
Passport	2
TD1 ID Cards	3
TD2 ID Cards	2
Visa Type A	2
Visa Type B	2

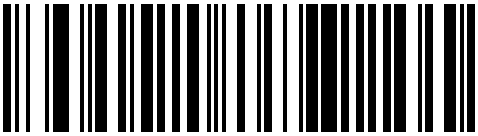
If you set one of these variants with both OCR-A and OCR-B enabled, only the specified travel document is read without reading OCR-A. Returning OCR-B variant to its default (Full ASCII) allows reading OCR-A.

For the best performance in passport reading, fix the target passport and the scanner in place (6.5 - 7.5").

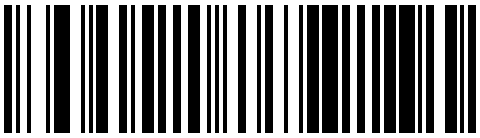
NOTE: Enable OCR-B before setting this parameter. If disabling OCR-B, set the variant to OCR-B Full ASCII.



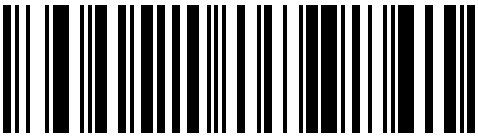
*OCR-B Full ASCII (0)



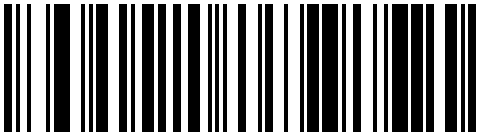
OCR-B Banking (1)



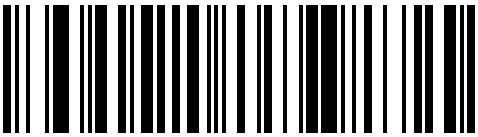
OCR-B Limited (2)



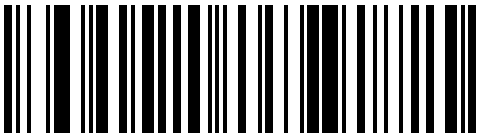
OCR-B ISBN 10-Digit Book Numbers (6)



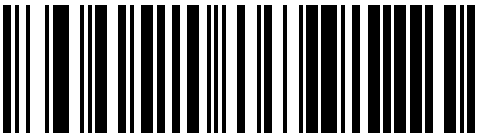
OCR-B ISBN 10 or 13-Digit Book Numbers (7)



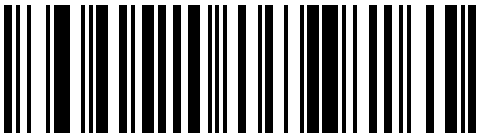
OCR-B Travel Document Version 1 (TD1) 3 Line ID Cards (3)



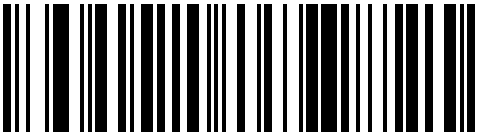
OCR-B Travel Document Version 2 (TD2) 2-Line ID Cards (8)



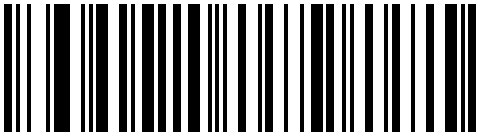
Travel Document 2 or 3-Line ID Cards Auto-Detect (20)



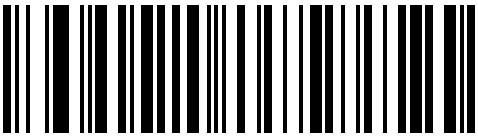
OCR-B Passport (4)



OCR-B Visa Type A (9)



OCR-B Visa Type B (10)



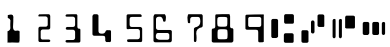
OCR-B ICAO Travel Documents (11)

MICR E13B

Parameter # 682 (SSI # F1h AAh)

This parameter enables scanners to read MICR E13B fonts.

MICR E 13B uses the following characters:



TOAD characters (Transit, On Us, Amount, and Dash) output as the following representative characters:

outputs as **t**

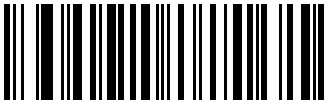
outputs as **a**

outputs as **o**

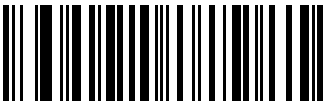
outputs as **d**

- Enabled - MICR E13B fonts can be read by the scanner.
- Disabled -MICR E13B fonts will not be read by the scanner.

NOTE: OCR is not as secure as a barcode. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See OCR Subset and OCR Template.



Enable MICR E13B (1)



*Disable MICR E13B (0)

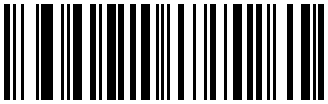
US Currency Serial Number

Parameter # 683 (SSI # F1h ABh)

This parameter enables scanners to read US Currency Serial Numbers.

- Enabled - US Currency Serial Numbers can be read by the scanner.
- Disabled - US Currency Serial Numbers will not be read by the scanner.

NOTE: OCR is not as secure as a barcode. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See OCR Subset and OCR Template.



Enable US Currency (1)

*Disable US Currency (0)

OCR Orientation

Parameter # 687 (SSI # F1h AFh)

This parameter specifies the orientation of the OCR to read to the imaging engine.

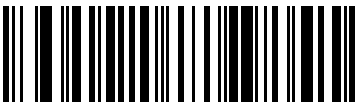
- OCR Orientation 0°
- OCR Orientation 270° clockwise (or 90° counterclockwise)
- OCR Orientation 180° (upside down)
- OCR Orientation 90° clockwise
- OCR Orientation Omnidirectional

Setting an incorrect orientation can cause misdecodes.

*OCR Orientation 0° (0)

OCR Orientation 270° Clockwise (1)

OCR Orientation 180° Clockwise (2)



OCR Orientation 90° Clockwise (3)

OCR Orientation Omnidirectional (4)

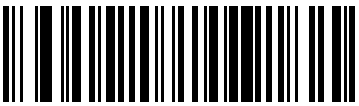
OCR Lines

Parameter # 691 (SSI # F1h B3h)

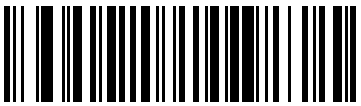
This parameter selects the number of OCR lines to decode.

Selecting Visas, TD1, or TD2 ID cards automatically sets the appropriate **OCR Lines**. Also see OCR-B Variant.

*OCR 1 Line (1)



OCR 2 Lines (2)



OCR 3 Lines (3)

OCR Minimum Characters

Parameter # 689 (SSI # F1h B1h)

This parameter selects the minimum number of OCR characters (not including spaces) per line to decode.

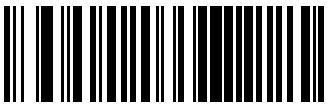
OCR Minimum Characters

OCR Maximum Characters

Parameter # 690 (SSI # F1h B2h)

This parameter selects the maximum number of OCR characters (including spaces) per line to decode.

Scan OCR Maximum Characters, then scan a three-digit number between 003 and 100 using the barcodes in Numeric Barcodes representing the number of OCR characters to decode. Strings of OCR characters greater than the maximum are ignored.



OCR Maximum Characters

OCR Subset

Parameter # 686 (SSI # F1h AEh)

This parameter creates an OCR subset to define a custom group of characters in place of a preset font variant.

For example, if scanning only numbers and the letters A, B, and C, create a subset of just these characters to speed decoding. This applies a designated OCR Subset across all enabled OCR fonts.

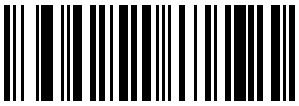
To cancel an OCR subset, for OCR-A or OCR-B, scan OCR-A variant Full ASCII, or OCR-B variant Full ASCII.

For MICR E13B or US Currency Serial Number, create a subset which includes all allowed characters in that character set, or scan an option from the Default Parameters and re-program the scanner.

Setting or Modifying the OCR Font Subset

To set or modify the OCR Font Subset, follow this procedure.

1. Enable the appropriate OCR font(s).
2. Scan the **OCR Subset** barcode.



OCR Subset

3. Scan numbers and letters from Alphanumeric Barcodes to form the OCR Subset.
4. Scan OCR Subset.

OCR Quiet Zone

Parameter # 695 (SSI # F1h B7h)

This parameter sets the OCR quiet zone.

The scanner stops scanning a field when it detects a sufficiently wide blank space. The width of this space is defined by the End of Field option. Used with parsers that tolerate slanted characters, the End of Field count is approximately a count of 8 for a character width. For example, if set to 15, then two character widths are an end of line indicator for the parser. Larger end of field numbers require bigger quiet zones at each end of text line.

OCR Quiet Zone

OCR Template

Parameter # 547 (SSI # F1h 23h)

This parameter creates a template for precisely matching scanned OCR characters to a desired input format.

Carefully constructing an OCR template eliminates scanning errors.

To set or modify the OCR decode template, scan OCR Template, and then scan barcodes on the following pages that correspond to numbers and letters to form the template expression. Finally, scan **End of Message**.

OCR Template

End of Message

Required Digit (9)

Only a numeric character is allowed in this position.

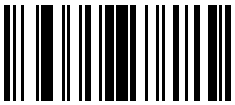
Template	Valid data	Valid data	Invalid data
99999	12987	30517	123AB

9

Required Alpha (A)

Only an alpha character is allowed in this position.

Template	Valid data	Valid data	Invalid data
AAAAA	ABCDE	UVWXY	12FGH

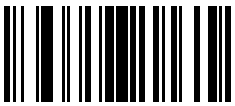


A

Optional Alphanumeric (1)

An alphanumeric character is accepted in this position if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Valid data	Invalid data
99991	1234A	12345	1234<



1

Optional Alpha (2)

An alpha character is accepted in this position if present. Optional characters are not allowed as the first character(s) in a field of like characters.

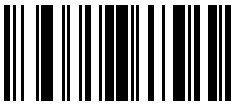
Template	Valid data	Valid data	Invalid data
AAAA2	ABCDE	WXYZ	ABCD6

2

Alpha or Digit (3)

An alphanumeric character is required in this position to validate the incoming data.

Template	Valid data	Valid data	Invalid data
33333	12ABC	WXY34	12AB<



3

Any Including Space & Reject (4)

Any character is accepted in this position, including space and reject. An underscore (_) represents rejects in the output. This is a good selection for troubleshooting.

Template	Valid data	Valid data
99499	12$34	34 98

4

Any except Space & Reject (5)

Any character is accepted in this position, except a space or reject.

Template	Valid data	Valid data	Invalid data
55999	A.123	*Z456	A BCD

5

Optional Digit (7)

A numeric character is accepted if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Valid data	Invalid data
99977	12345	789	789AB

7

Digit or Fill (8)

Any numeric or fill character is accepted in this position.

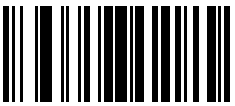
Template	Valid data	Valid data	Valid data
88899	12345	>>789	<<789

8

Alpha or Fill (F)

Any alpha or fill character is accepted in this position.

Template	Valid data	Valid data	Valid data
AAAFF	ABCXY	LMN>>	ABC<5



F

Optional Space ( )

A space is accepted if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Valid data	Invalid data
99 99	12 34	1234	67891

Space

Optional Small Special (.)

A special character is accepted if present. Optional characters are not allowed as the first character(s) in a field of like characters. Small special characters are - , and .

Template	Valid data	Valid data	Invalid data
AA.99	MN.35	XY98	XYZ12

.

Other Template Operators

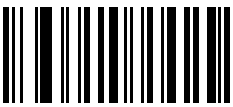
These template operators assist in capturing, delimiting, and formatting scanned OCR data.

Literal String (" and +)

Use either of these delimiting characters surrounding characters from the alphanumeric keyboard in Alphanumeric Barcodes to define a literal string within a template that must be present in scanned OCR data. There are two characters used to delimit required literal strings; if one of the delimiter characters is present in the desired literal string, use the other delimiter.

Template	Valid data	Invalid data
"35+BC"	35+BC	AB+22

“



+

New Line (E)

To create a template of multiple lines, add **E** between the template of each single line.

Template	Valid data	Valid data	Invalid data
999EAAAA	321	987	XYZW
	BCAD	ZXYW	12

E

String Extract (C)

This operator, combined with others, defines a string of characters to extract from the scanned data. The string extract is structured as follows:

```
CbPe
```

Where:

- C is the string extract operator
- b is the string begin delimiter
- P is the category (one or more numeric or alpha characters) describing the string representation
- e is the string end delimiter

Values for b and e can be any scannable character. They are included in the output stream.

Template	Incoming data	Output
C>A>	XQ3>ABCDE>	>ABCDE>
	->ATHRUZ>123	>ATHRUZ>
	1ABCZXYZ	No Output

C

Ignore to End of Field (D)

This operator causes all characters after a template to be ignored. Use this as the last character in a template expression. Examples for the template 999D:

Template	Incoming data	Output
999D	123-PED	123
	357298	357
	193	193

D

Skip Until (P1)

This operator skips over characters until a specific character type or a literal string is detected. It can be used in two ways:

```
P1ct
```

Where:

- P1 is the Skip Until operator
- c is the type of character that triggers the start of output
- t is one or more template characters

```
P1"s"t
```

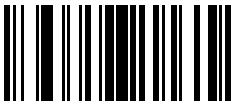
Where:

- P1 is the Skip Until operator
- "s" is one or more literal string characters (for example, "+") that trigger the start of output
- t is one or more template characters

The trigger character or literal string is included in output from a Skip Until operator, and the first character in the template should accommodate this trigger.

Template	Incoming data	Output
P1"PN"AA9999	123PN9876	PN9876
	PN1234	PN1234
	X-PN3592	PN3592

P



1

Skip Until Not (P0)

This operator skips over characters until a specific character type or a literal string is not matched in the output stream. It can be used in two ways:

```
P0ct
```

Where:

- P0 is the Skip Until Not operator
- c is the type of character that triggers the start of output

- t is one or more template characters

```
P0"s"t
```

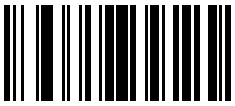
Where:

- P0 is the Skip Until Not operator
- "s" is one or more literal string characters (for example, "+") that trigger the start of output
- t is one or more template characters

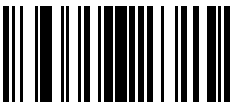
The trigger character or literal string is not included in output from a Skip Until Not operator.

Template	Incoming data	Output
P0A9999	BPN3456	3456
	PN1234	1234
	5341	No output

Template	Incoming data	Output
P0"PN"9999	PN3456	3456
	5341	No output
	PNPN7654	7654



P



0

Repeat Previous (R)

This operator allows a template character to repeat one or more times, allowing the capture of variable-length scanned data. The following examples capture two required alpha characters followed by one or more required digits:

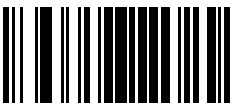
Template	Incoming data	Output
AA9R	AB3	AB3
	PN12345	PN12345
	32RM52700	No output

R

Scroll Until Match (S)

This operator steps through scanned data one character at a time until the data matches the template.

Template	Incoming data	Output
S99999	AB3	No Output
	PN12345	12345
	32RM52700	52700



S

Multiple Templates

This feature sets up multiple templates for OCR decoding.

To create multiple templates, see OCR Template, and for each template in the multiple template string, using a capital letter X as a separator between templates.

For example, set the OCR template as **99999XAAAAA** to decode OCR strings of either **12345** or **ABCDE**.

Template Examples

Following are sample templates with descriptions of valid data for each definition.

Field Definition	Description
"M"99977	**M** followed by three digits and two optional digits.
"X"997777"X"	**X** followed by two digits, four optional digits, and an X.
9959775599	Two digits followed by any character, a digit, two optional digits, any two characters, and two digits.
A55"-"999"-"99	A letter followed by two characters, a dash, three digits, a dash, and two digits.
33A"."99	Two alphanumeric characters followed by a letter, a period, and two digits.

999992991	Five digits followed by an optional alpha, two digits, and an optional alphanumeric.
"PN98"	Literal field - **PN98**

OCR Check Digit Modulus

Parameter # 688 (SSI # F1h B0h)

This parameter sets the OCR module check digit calculation.

The check digit is the last digit (in the right-most position) in an OCR string and improves the accuracy of the collected data. The calculation is performed on incoming data to determine this check digit, based on the numeric weight of the alpha and numeric characters. See OCR Check Digit Multiplier. If the incoming data does not match the check digit, the data is considered corrupt.

The selected check digit option does not take effect until you set OCR Check Digit Validation.

OCR Check Digit

OCR Check Digit Multiplier

Parameter # 700 (SSI # F1h BCh)

This parameter sets OCR check digit multipliers for character positions.

For check digit validation, each character in scanned data has an assigned weight to use in calculating the check digit. The scanner OCR ships with the following weight equivalents:

0 = 0	A = 10	K = 20	U = 30
1 = 1	B = 11	L = 21	V = 31
2 = 2	C = 12	M = 22	W = 32
3 = 3	D = 13	N = 23	X = 33
4 = 4	E = 14	O = 24	Y = 34
5 = 5	F = 15	P = 25	Z = 35
6 = 6	G = 16	Q = 26	Space = 0
7 = 7	H = 17	R = 27	
8 = 8	I = 18	S = 28	
9 = 9	J = 19	T = 29	

All other characters are equivalent to one (1).

You can define the multiplier string if it is different from the default.

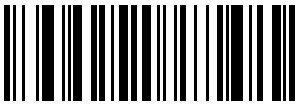
NOTE: 123456789A (for ISBN, Product Add Right to Left. See OCR Check Digit Validation)

For example:

ISBN	0	2	0	1	1	8	3	9	9	4	
Multiplier	10	9	8	7	6	5	4	3	2	1	
Product	0	18	0	7	6	40	12	27	18	4	
Product add	0+	18+	0+	7+	6+	40+	12+	27+	18+	4=	132

ISBN uses Modulus 11 for the check digit. In this case, 132 is divisible by 11, so it passes the check digit.

To set the check digit multiplier, scan OCR Check Digit Multiplier, and then scan numbers and letters to form the multiplier string before scanning End of Message from Alphanumeric Barcodes



OCR Check Digit Multiplier

OCR Check Digit Validation

Parameter # 694 (SSI # F1h B6h)

This parameter protects against scanning errors by applying a check digit validation scheme.

None

No check digit validation, indicating no check digit is applied.

*No Check Digit (0)

Product Add Left to Right

This parameter helps validate the check digit.

Each character in the scanned data is assigned a numeric value (see OCR Check Digit Multiplier). Each digit representing a character in the scanned data is multiplied by its corresponding digit in the multiplier, and the sum of these products is computed. The check digit passes if this sum modulo Check Digit Modulus is zero.

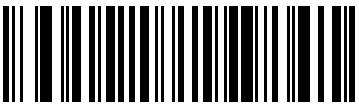
For example:

Scanned data numeric value is 132456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	6	
Multiplier	1	2	3	4	5	6	
Product	1	6	6	16	25	36	
Product add	1+	6+	6+	16+	25+	36=	90

The Check Digit Modulus is 10. It passes because 90 is divisible by 10 (the remainder is zero).



Product Add Left to Right (3)

Product Add Right to Left

This parameter changes the order of the numeric values the check digit multiplier uses with the Check Digit Modulus.

Each character in the scanned data is assigned a numeric value (see OCR Check Digit Multiplier). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of these products is computed. The check digit passes if this sum modulo Check Digit Modulus is zero.

For example:

Scanned data numeric value is 132459 (check digit is 9)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	9	
Multiplier	6	5	4	3	2	1	
Product	6	15	8	12	10	9	
Product add	6+	15+	8+	12+	10+	9=	60

The Check Digit Modulus is 10. It passes because 60 is divisible by 10 (the remainder is 0).

Product Add Right to Left (1)

Digit Add Left to Right

This parameter adds individual digits from left to right to use in the Check Digit Modulus.

Each character in the scanned data is assigned a numeric value (see OCR Check Digit Multiplier). Each value representing a character in the scanned data is multiplied by its corresponding digit in the multiplier, resulting in a product for each character in the scanned data. The sum of each individual digit in all of the products is then calculated. The check digit passes if this sum modulo Check Digit Modulus is zero.

For example:

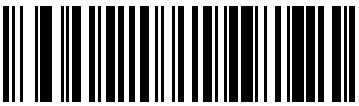
Scanned data numeric value is 132456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	6

Multiplier	1	2	3	4	5	6	
Product	1	6	6	16	25	36	
Digit add	1+	6+	6+	1+6+	2+5+	3+6=	36

The Check Digit Modulus is 12. It passes because 36 is divisible by 12 (the remainder is 0).



Digit Add Left to Right (4)

Digit Add Right to Left

This parameter adds individual digits from right to left to use in the Check Digit Modulus.

Each character in the scanned data is assigned a numeric value (see OCR Check Digit Multiplier). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of each individual digit in all of the products is then calculated. The check digit passes if this sum modulo Check Digit Modulus is zero.

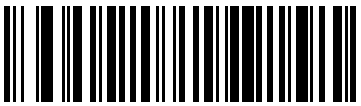
For example:

Scanned data numeric value is 132456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	6	
Multiplier	6	5	4	3	2	1	
Product	6	15	8	12	10	6	
Digit add	6+	1+5+	8+	1+2+	1+0+	6=	30

The Check Digit Modulus is 10. It passes because 30 is divisible by 10 (the remainder is 0).



Digit Add Right to Left (2)

Product Add Right to Left Simple Remainder

This parameter reverses the order of the check digit multiplier before adding the product to use in the Check Digit Modulus.

Each character in the scanned data is assigned a numeric value (see OCR Check Digit Multiplier). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of these products **except for the check digit's product** is computed. The check digit passes if this sum modulo Check Digit Modulus is equal to the check digit's product.

For example:

Scanned data numeric value is 122456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	2	2	4	5		6
Multiplier	6	5	4	3	2		1
Product	6	10	8	12	10		6
Product add	6+	10+	8+	12+	10=	46	6

The Check Digit Modulus is 10. It passes because 46 divided by 10 leaves a remainder of 6.

Product Add Right to Left Simple Remainder (5)

Digit Add Right To Left Simple Remainder

This parameter reverses the order of the check digit multiplier before adding the product and checking the remainder to use in the Check Digit Modulus.

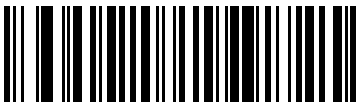
Each character in the scanned data is assigned a numeric value (see OCR Check Digit Multiplier). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of each individual digit in all of the products **except for the check digit's product** is then calculated. The check digit passes if this sum modulo Check Digit Modulus is equal to the check digit's product.

For example:

Scanned data numeric value is 122459 (check digit is 6)Check digit multiplier string is 123456

Digit	1	2	2	4	5		9
Multiplier	6	5	4	3	2		1
Product	6	10	8	12	10		9
Digit add	6+	1+0+	8+	1+2+	1+0=	19	9

The Check Digit Modulus is 10. It passes because 19 divided by 10 leaves a remainder of 9.



Digit Add Right to Left Simple Remainder (6)

Health Industry - HIBCC43

This parameter is the health industry module 43 check digit standard.

The check digit is the modulus 43 sum of all the character values in a given message, and is printed as the last character in a given message.

Example:

Supplier Labelling Data Structure: + A 1 2 3 B J C 5 D 6 E 7 1

Sum of values: 41+10+1+2+3+11+19+12+5+13+6+14+7+1 = 145

Divide 145 by 43. The quotient is 3 with a remainder of 16. The check digit is the character corresponding to the value of the remainder, which in this example is 16, or G. The complete Supplier Labeling Data Structure, including the check digit, therefore is:

```
A 1 2 3 B J C 5 D 6 E 7 1 G
```

Numeric Value Assignments for Computing HIBC LIC Data Format Check Digit

0 = 0	9 = 9	I = 18	R = 27	- = 36
1 = 1	A = 10	J = 19	S = 28	. = 37
2 = 2	B = 11	K = 20	T = 29	Space = 38
3 = 3	C = 12	L = 21	U =30	$ = 39
4 = 4	D = 13	M = 22	V = 31	/ = 40
5 = 5	E = 14	N = 23	W = 32	+ = 41
6 = 6	F = 15	O = 24	X = 33	% = 42
7 = 7	G = 16	P = 25	Y = 34	
8 = 8	H = 17	Q = 26	Z = 35	

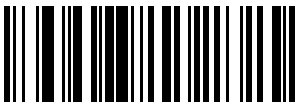
Health Industry - HIBCC43 (9)

Inverse OCR

Parameter # 856 (SSI # F2h 58h)

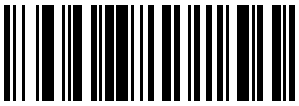
This parameter can read white or light words on a black or dark background.

- Regular Only - Decode regular OCR (black on white) strings only.
- Inverse Only - Decode inverse OCR (white on black) strings only.
- Autodiscriminate - Decode both regular and inverse OCR strings.



*Regular Only (0)

Inverse Only (1)



Autodiscriminate (2)

OCR Redundancy

Parameter # 1770 (SSI # F8h 06h EAh)

This parameter adjusts the number of times the scanner decodes an OCR text string before transmission.

There are three levels of OCR decode redundancy. There is an inverse relationship between the redundancy level and OCR decoding aggressiveness. Increasing the level of the redundancy can reduce OCR scanning aggressiveness, so select only the level of redundancy necessary.

- OCR Redundancy Level 1 - This option allows the scanner to operate in its most aggressive state while providing sufficient accuracy in decoding most in-spec OCR text strings.
- OCR Redundancy Level 2 - This option eliminates most misdecodes while maintaining reasonable aggressiveness.
- OCR Redundancy Level 3 - Select this option with greater redundancy requirements if OCR Redundancy Level 2 fails to eliminate misdecodes.

*OCR Redundancy Level 1 (1)

OCR Redundancy Level 2 (2)

OCR Redundancy Level 3 (3)

Maintenance and Troubleshooting

This chapter provides suggested RS2100 troubleshooting and maintenance.

Maintenance

Cleaning the scan window is the basic maintenance required. A dirty window can affect scanning performance.

- 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.

Battery Safety Guidelines

- The area in which the RS2100 units are charged should be clear of debris and combustible materials or chemicals. Particular care should be taken where the device is charged in a non-commercial environment.
- Do not crush, puncture, or place a high degree of pressure on the battery.
- Follow battery usage, storage, and charging guidelines.
- Improper battery use may result in a fire, explosion, or other hazard.
- To charge the mobile device battery, the battery and charger temperatures must be between +41°F and 89.6°F (5°C and 32°C)
- Do not disassemble or open, crush, bend or deform, puncture, or shred.
- Severe impact from dropping any battery-operated device on a hard surface could cause the battery to overheat.
- Do not short circuit a battery or allow metallic or conductive objects to contact the battery terminals.
- Do not modify or remanufacture, attempt to insert foreign objects into the battery, immerse or expose to water or other liquids, or expose to fire, explosion, or other hazard.
- Do not leave or store the equipment in or near areas that might get very hot, such as in a parked vehicle or near a radiator or other heat source. Do not place battery into a microwave oven or dryer.
- Battery usage by children should be supervised.
- Please follow local regulations to promptly dispose of used re-chargeable batteries.

- Do not dispose of batteries in fire.
- Seek medical advice immediately if a battery has been swallowed.
- In the event of a battery leak, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with large amounts of water and seek medical advice.
- If you suspect damage to your equipment or battery, call Customer Support to arrange for inspection. See Service Information for contact information.

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/firmware 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.

Troubleshooting the Scanner

Table 9 RS2100 Troubleshooting

Problem	Cause	Solution
Laser aiming pattern does not display when pressing the scan trigger.	Battery is not charged.	Charge battery.
	Power is not applied to scanner.	Charge battery.
	Scan application on the mobile computer is not functioning.	Restart the scanning application on the mobile computer.
	Scanner does not respond.	Reset the RS2100 (see).
RS2100 does not decode a barcode.	Barcode is unreadable.	Verify that the barcode is not defective, smudged, or damaged.
	Exit window is dirty.	Clean the exit window with a lens tissue. Tissues for eyeglasses work well. Do not use tissues coated with lotion (see Maintenance).
	Barcode symbology is not supported or enabled.	See your system administrator.

Table 9 RS2100 Troubleshooting (Continued)

Problem	Cause	Solution
	Bluetooth link is disconnected.	Reestablish Bluetooth connection (see Bluetooth Communications).
Scanner loses connection to the host device after a firmware update.	Differences in supported parameters after a firmware update cause the Bluetooth connection to reset.	Manually scan a pairing barcode to reconnect to the host computer.

NOTE: If after performing these checks the RS2100 still experiences problems, contact the distributor or call Zebra Support. See Service Information.

Troubleshooting Cradles

Table 10 Cradle Troubleshooting

Problem	Cause	Solution
Device battery is not charging.	Device was removed from cradle or cradle was unplugged from AC power.	Ensure cradle is receiving power. Ensure device is seated correctly. Confirm main battery is charging. The battery fully charges in approximately four hours.
	Battery is faulty.	Insert a different scanner. If it charges, contact Zebra for further assistance.
	The device is not fully seated in the cradle.	Remove and re-insert the device into the cradle, ensuring it is firmly seated.
	Ambient temperature of the cradle is too warm or too cold.	Move the cradle to an area where the ambient temperature is between 5°C and 32°C (41°F and 89.6°F).

NOTE: If after performing these checks the RS2100 still experiences problems, contact the distributor or call Zebra Support. See Service Information.

Specifications

For device technical specifications, go to zebra.com/rs2100.

2-Slot Charger Technical Specifications

Physical specifications and requirements for the 2-Slot Charger are listed in the following table.

Item	Description
Dimensions	Height: 40 mm (1.57 in.) Width: 111 mm (4.37 in.) Depth: 57 mm (2.24 in.)
Weight	75 g (2.65 oz)
Input Voltage	5 V, 1 A
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	-40°C to 60°C (-40°F to 140°F)
Charging Temperature	5°C to 40°C (41°F to 104°F)[a]
Humidity	0% to 95% non-condensing
Drop	76.2 cm (30 in.) drops to concrete at room temperature
Electrostatic Discharge	+/- 20 kV air discharge +/- 10 kV contact discharge

[a] Expect slower charging times between 33 and 40°C

20-Slot Charger Technical Specifications

Physical specifications and requirements for the 20-Slot Charger are listed in the following table.

Item	Description
Dimensions	Height: 81.6 mm (3.21 in.) Width: 489 mm (19.25 in.) Depth: 147.7 mm (5.81 in.)

Item	Description
Weight	2000 g (70.5 oz)
Input Voltage	12 V, 9 A
Operating Temperature	0°C to 45°C (32°F to 113°F)
Storage Temperature	-40°C to 60°C (-40°F to 140°F)
Charging Temperature	5°C to 40°C (41°F to 104°F)
Humidity	0% to 95% non-condensing
Drop	76.2 cm (30 in.) drops to concrete at room temperature
Electrostatic Discharge	+/- 20 kV air discharge +/- 10 kV contact discharge

Bluetooth Adapter Technical Specifications

Physical specifications and requirements for the Bluetooth Adapter.

Table 11 Bluetooth Adapter Technical Specifications

Item	Description
Dimensions	Height: 113 mm (4.45 in.) Width: 60.1 mm (2.37 in.) Depth: 31mm (1.22 in.)
Weight	98 g (3.46 oz)
Input Power Requirements	5 V DV, 200 mA
Operating Temperature	-20°C to 50°C (-4°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Humidity	5 to 95% non-condensing
Drop	75 cm (30 in.) drops to concrete at room temperature.
Electrostatic Discharge (ESD)	+/- 15 kV air discharge +/- 8 kV contact discharge
Bluetooth	Class 1 and 2, Bluetooth v 5.2 Supported profiles: Serial Port Profile (SPP), Human Interface Device Profile (HID), Simple Serial Interface (SSI).

SE4770 Decode Distances

The following table lists the typical distances for selected barcode densities. The minimum element width (or "symbol density") is the width in mils of the narrowest element (bar or space) in the symbol.

Table 12 SE4770 Decode Distances

Symbol Density/Barcode Type	Typical Working Ranges	
	Near	Far
3 mil Code 39	7.9 cm (3.0 in.)	14.7 cm (5.8 in.)
5 mil Code 128	5.8 cm (2.3 in.)	24.9 cm (9.8 in.)
5 mil PDF417	7.6 cm (3.0 in.)	20.1 cm (7.9 in.)
6.67 mil PDF417	6.4 cm (2.5 in.)	25.7 cm (10.1 in.)
10 mil Data Matrix	5.3 cm (2.1 in.)	27.9 cm (11.0 in.)
100% UPCA	4.1 cm (1.6 in.)	63.2 cm (24.9 in.)
15 mil Code 128	6.1 cm (2.4 in.)	70.6 cm (27.8 in.)
20 mil Code 39	4.1 cm (1.6 in.)	91.7 cm (36.1 in.)
20 mil QR Code	2.8 cm (1.1 in.)	44.5 cm (17.5 in.)

Programming Reference

This section provides symbol and AIM code identifiers.

Symbol Code Identifiers

Symbol code identifiers identify the symbology type of decode data. The identifier may be appended to data transmitted to the host, or used in other ways to help identify decode data.

Table 13 Symbol Code Characters

Code Character	Code Type
A	UPC-A, UPC-E, UPC-E1, EAN-8, EAN-13
B	Code 39, Code 32
C	Codabar
D	Code 128, ISBT 128, ISBT 128 Concatenated
E	Code 93
F	Interleaved 2 of 5
G	Discrete 2 of 5, or Discrete 2 of 5 IATA
J	MSI
K	GS1-128
L	Bookland EAN
R	GS1 DataBar Family
U	Chinese 2 of 5
X	ISSN EAN, PDF417, Macro PDF417, Micro PDF417
z	Aztec, Aztec Rune
P00	Data Matrix
P01	QR Code, MicroQR
P02	Maxicode
P08	Netherlands KIX Code
P0A	USPS 4CB/One Code/Intelligent Mail

Table 13 Symbol Code Characters (Continued)

Code Character	Code Type
P0C	Mailmark
P0D	Grid Matrix
P0G	GS1 Data Matrix
P0H	Han Xin
P0Q	GS1 QR
P0X	Signature Capture

AIM Code Identifiers

An AIM code identifier identifies the symbology type of decode data. The identifier may be appended to data transmitted to the host, or used in other ways to help identify decode data.

Each AIM Code Identifier contains the three-character string]cm where:

```
]    =    Flag Character (ASCII 93)
```

```
c    =    Code Character (see table below)
```

```
m    =    Modifier Character (see table below)
```

Table 14 AIM Code Characters

Code Character	Code Type
A	Code 39, Code 39 Full ASCII, Code 32
C	Code 128, ISBT 128, ISBT 128 Concatenated, GS1-128, Coupon (Code 128 portion)
d	Data Matrix, GS1 Data Matrix
E	UPC/EAN, Coupon (UPC portion)
e	GS1 DataBar Family
F	Codabar
G	Code 93
g	Grid Matrix
h	Han Xin
I	Interleaved 2 of 5
L	PDF417, Macro PDF417, Micro PDF417
M	MSI
Q	QR Code, MicroQR, GS1 QR

Table 14 AIM Code Characters (Continued)

Code Character	Code Type
S	Discrete 2 of 5, IATA 2 of 5
U	Maxicode
z	Aztec, Aztec Rune
X	Bookland EAN, ISSN EAN, Code 39, Chinese 2 of 5,, Korean 3 of 5, US Postnet, US Planet, UK Postal, Japan Postal, Australia Post, Netherlands KIX Code, USPS 4CB/One Code/ Intelligent Mail, UPU FICS Postal, Mailmark, Signature Capture

The modifier character is the sum of the applicable option values based on the following table.

Table 15 Modifier Characters

Code Type	Option Value	Option
Code 39	0	No check character or Full ASCII processing.
	1	Reader has checked one check character.
	3	Reader has checked and stripped check character.
	4	Reader has performed Full ASCII character conversion.
	5	Reader has performed Full ASCII character conversion and checked one check character.
	7	Reader has performed Full ASCII character conversion and checked and stripped check character.
	Example: A Full ASCII barcode with check character W, A+I+MI+DW, is transmitted as]A7AIMID where 7 = (3+4).	
Code 128	0	Standard data packet, no Function code 1 in first symbol position.
	1	Function code 1 in first symbol character position.
	2	Function code 1 in second symbol character position.
	Example: A Code (EAN) 128 barcode with Function 1 character FNC1 in the first position, AIMID is transmitted as]C1AIMID	
I 2 of 5	0	No check digit processing.
	1	Reader has validated check digit.
	3	Reader has validated and stripped check digit.
	Example: An I 2 of 5 barcode without check digit, 4123, is transmitted as]I04123	
Codabar	0	No check digit processing.
	1	Reader has checked check digit.
	3	Reader has stripped check digit before transmission.
	Example: A Codabar barcode without check digit, 4123, is transmitted as]F04123	
Code 93	0	No options specified at this time. Always transmit 0.

Table 15 Modifier Characters (Continued)

Code Type	Option Value	Option
	Example: A Code 93 barcode 012345678905 is transmitted as]G0012345678905	
MSI	0	Check digits are sent.
	1	No check digit is sent.
	Example: An MSI barcode 4123, with a single check digit checked, is transmitted as]M14123	
D 2 of 5	0	No options specified at this time. Always transmit 0.
	Example: A D 2 of 5 barcode 4123, is transmitted as]S04123	
UPC/EAN	0	Standard data packet in full EAN format, i.e., 13 digits for UPC-A, UPC-E, and EAN-13 (not including supplemental data).
	1	Two digit supplemental data only.
	2	Five digit supplemental data only.
	3	Combined data packet comprising 13 digits from EAN-13, UPC-A or UPC-E symbol and 2 or 5 digits from supplemental symbol.
	4	EAN-8 data packet.
	Example: A UPC-A barcode 012345678905 is transmitted as]E0012345678905	
Bookland EAN	0	No options specified at this time. Always transmit 0.
	Example: A Bookland EAN barcode 123456789X is transmitted as]X0123456789X	
ISSN EAN	0	No options specified at this time. Always transmit 0.
	Example: An ISSN EAN barcode 123456789X is transmitted as]X0123456789X	
GS1 DataBar Family		No option specified at this time. Always transmit 0. GS1 DataBar Omnidirectional and GS1 DataBar Limited transmit with an Application Identifier “01”.Note: In GS1-128 emulation mode, GS1 DataBar is transmitted using Code 128 rules (i.e.,]C1).
	Example: A GS1 DataBar Omnidirectional barcode 0110012345678902 is transmitted as]e00110012345678902.	
EAN (GS1 DataBar, GS1-128, 2D portion of UPC composite)		Native mode transmission. **NOTE:** UPC portion of composite is transmitted using UPC rules.
	0	Standard data packet.
	1	Data packet containing the data following an encoded symbol separator character.
	2	Data packet containing the data following an escape mechanism character. The data packet does not support the ECI protocol.

Table 15 Modifier Characters (Continued)

Code Type	Option Value	Option
	3	Data packet containing the data following an escape mechanism character. The data packet supports the ECI protocol.
		GS1-128 emulationNote: UPC portion of composite is transmitted using UPC rules.
	1	Data packet is a GS1-128 symbol (i.e., data is preceded with]JC1).
PDF417, Micro PDF417	0	Reader set to conform to protocol defined in 1994 PDF417 symbology specifications. Note: When this option is transmitted, the receiver cannot reliably determine whether ECIs have been invoked or whether data byte 92DEC has been doubled in transmission.
	1	Reader set to follow the ECI protocol (Extended Channel Interpretation). All data characters 92DEC are doubled.
	2	Reader set for Basic Channel operation (no escape character transmission protocol). Data characters 92DEC are not doubled. Note: When decoders are set to this mode, unbuffered Macro symbols and symbols requiring the decoder to convey ECI escape sequences cannot be transmitted.
	3	The barcode contains a GS1-128 symbol, and the first codeword is 903-907, 912, 914, 915.
	4	The barcode contains a GS1-128 symbol, and the first codeword is in the range 908-909.
	5	The barcode contains a GS1-128 symbol, and the first codeword is in the range 910-911.
	Example: A PDF417 barcode ABCD, with no transmission protocol enabled, is transmitted as]L2ABCD.	
Data Matrix	0	ECC 000-140, not supported.
	1	ECC 200.
	2	ECC 200, FNC1 in first or fifth position.
	3	ECC 200, FNC1 in second or sixth position.
	4	ECC 200, ECI protocol implemented.
	5	ECC 200, FNC1 in first or fifth position, ECI protocol implemented.
	6	ECC 200, FNC1 in second or sixth position, ECI protocol implemented.
GS1 Data Matrix	2	ECC 200, FNC1 in first or fifth position.
MaxiCode	0	Symbol in Mode 4 or 5.
	1	Symbol in Mode 2 or 3.
	2	Symbol in Mode 4 or 5, ECI protocol implemented.
	3	Symbol in Mode 2 or 3, ECI protocol implemented in secondary message.

Table 15 Modifier Characters (Continued)

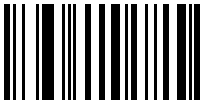
Code Type	Option Value	Option
QR Code	0	Model 1 symbol.
	1	Model 2 / MicroQR symbol, ECI protocol not implemented.
	2	Model 2 symbol, ECI protocol implemented.
	3	Model 2 symbol, ECI protocol not implemented, FNC1 implied in first position.
	4	Model 2 symbol, ECI protocol implemented, FNC1 implied in first position.
	5	Model 2 symbol, ECI protocol not implemented, FNC1 implied in second position.
	6	Model 2 symbol, ECI protocol implemented, FNC1 implied in second position.
GS1 QR	3	Model 2 symbol, ECI protocol not implemented, FNC1 implied in first position.
Aztec	0	Aztec symbol.
	C	Aztec Rune symbol.
Han Xin	0	Generic data, no special features are set. The transmitted data does not follow the AIM ECI protocol.
	1	ECI protocol enabled. There is at least one ECI mode encoded. Transmitted data must follow the AIM ECI protocol.
Mailmark	0	No option specified at this time. Always transmit 0.

Numeric Barcodes

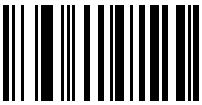
For parameters requiring specific numeric values, scan the appropriately numbered barcode(s).

0

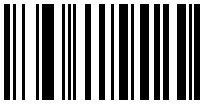
1



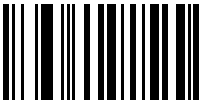
2



3

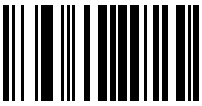


4

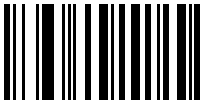


5

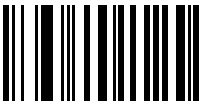
6



7



8



9

Cancel

To correct an error or change a selection, scan the barcode below.

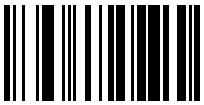
Cancel

Alphanumeric Barcodes

For parameters requiring specific alphanumeric values, scan the appropriately numbered barcode(s).

Cancel

To correct an error or change a selection, scan the barcode below.



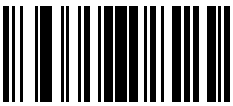
Cancel

Alphanumeric Barcodes

Space

#

$



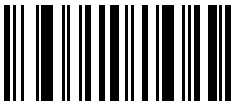
%

*

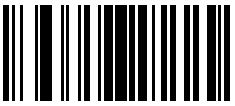
+

-

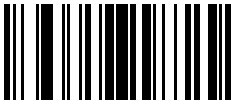
.



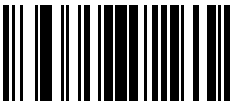
/



!



“



&

‘

(

)

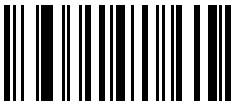
:

;

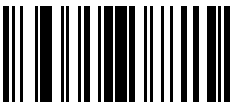
<

=

>



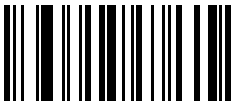
?



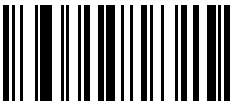
@

[

\



]



^

_

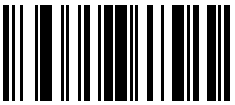
`

NOTE: Do not confuse the following barcodes with those on the numeric keypad.

0

1

2



3

4

5

6

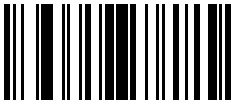
7

8

9

End of Message

Cancel



A

B

C

D

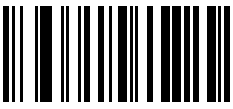
E

F

G

H

I



J

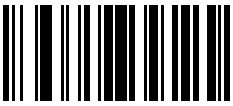
K

L

M

N

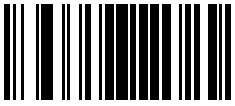
O



P

Q

R



S

T

U

V

W

X

Y

Z

a

b

c

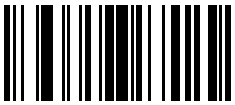
d

e

f

g

h

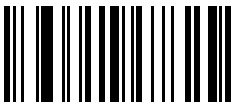


i

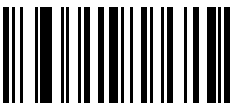
j

k

l



m



n

o

p

q

r

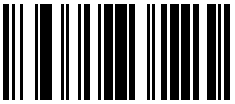
s

t

u

v

w



x

y

z

{

|

}

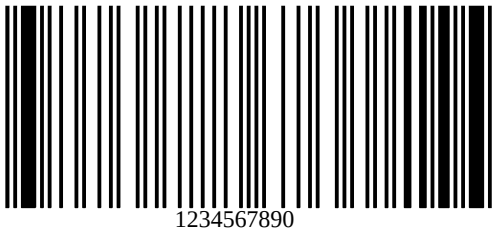
~

Sample Barcodes

This section provides sample barcodes.

Sample Code 39

Sample Code 93



Sample UPC/EAN

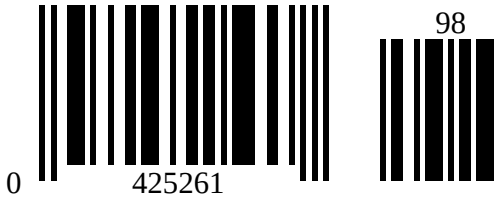
UPC-A, 100%

UPC-A Plus 2

UPC-A Plus 5

UPC-E

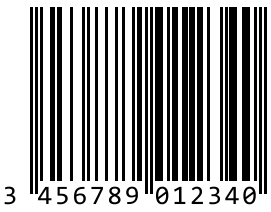
UPC-E Plus 2



UPC-E Plus 5

EAN-8

EAN-13, 100%



EAN-13 Plus 2

EAN-13 Plus 5

Sample Code 128

Sample Interleaved 2 of 5

Sample Chinese 2 of 5

Sample Matrix 2 of 5

Sample Korean 3 of 5

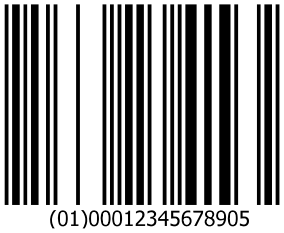
Sample GS1 DataBar

GS1 DataBar Omnidirectional

NOTE: GS1 DataBar Omnidirectional must be enabled to read the following barcode (see GS1 DataBar Omnidirectional (formerly GS1 DataBar-14).

GS1 DataBar Limited

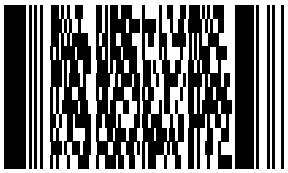
NOTE: DataDataBar Limited must be enabled to read the following barcode (see GS1 DataBar Limited).



GS1 DataBar Expanded

NOTE: DataBar Expanded must be enabled to read the following barcode (see GS1 DataBar Expanded).

Sample PDF417



Postal Codes

The following parameters are specific to postal code barcodes.

Sample US Postnet

Sample UK Postal

Country Codes

This chapter provides instructions for configuring the keyboard when the scanner is operating in Bluetooth HID mode.

To select a code page for the country keyboard type, go to Country Keyboard Types (Country Codes).

Throughout the programming barcode menus, default values are indicated with an asterisk (*).

Country Keyboard Types (Country Codes)

Scan the barcode corresponding to the keyboard type. This setting applies only to the Bluetooth Keyboard (HID) device.

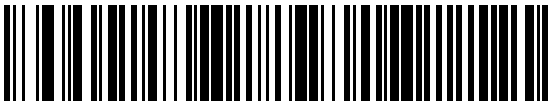
NOTE: For best results when using international keyboards, enable Quick Keypad Emulation

IMPORTANT: Some country keyboard barcode types are specific to certain Windows Operating Systems (such as XP and Windows 7 or higher). Barcodes requiring a specific Windows OS are noted in their barcode captions. Use the **French International** barcode for Belgian French keyboards.

Country Code Barcodes

Parameter # 960

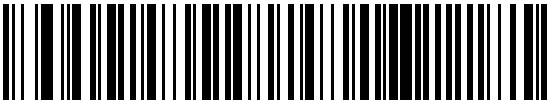
This chapter provides instructions for programming the keyboard to interface with a USB, BT HID, or keyboard wedge host. The host powers the scanner.



*US English (North American)

US English (Mac)

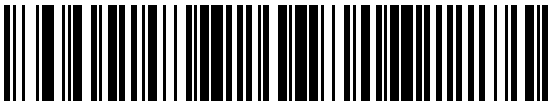
Albanian



Arabic (101)

Arabic (102)

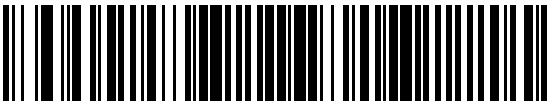
Arabic (102) AZERTY



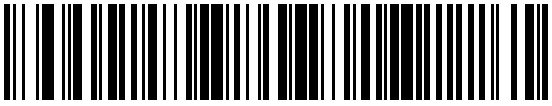
Azeri (Latin)

Azeri (Cyrillic)

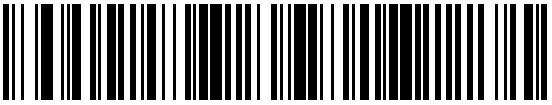
Belarusian



Bosnian (Latin)

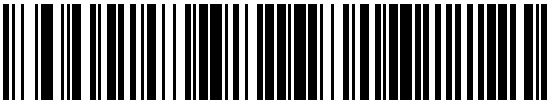


Bosnian (Cyrillic)

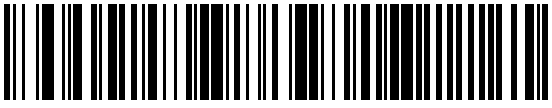


Bulgarian (Latin)

Bulgarian Cyrillic (Typewriter) (Bulgarian - Windows XP Typewriter - Windows 7 or higher)



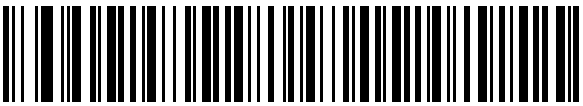
Canadian French Win7



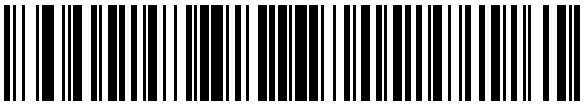
Canadian French (Legacy)

Canadian Multilingual Standard

Chinese (ASCII)



Chinese (Simplified)*



Chinese (Traditional)*

*For CJK keyboard types, see CJK Decode Control.

Croatian

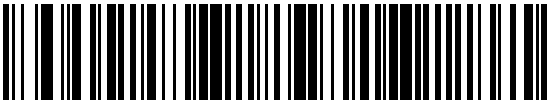
Czech

Czech (Programmer)

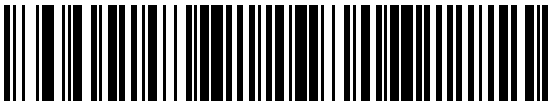
Czech (QWERTY)

Danish

Dutch (Netherlands)

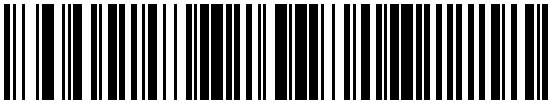


Estonian



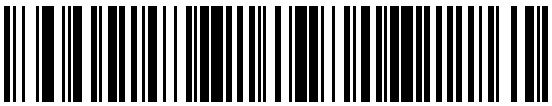
Faeroese

Finnish



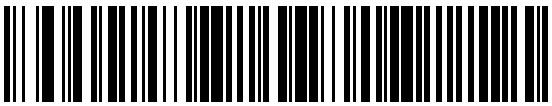
French (France)

French International (Belgian French)

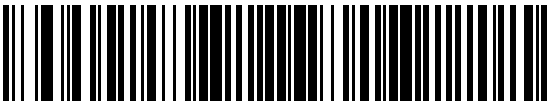


Galician

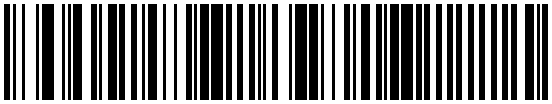
German



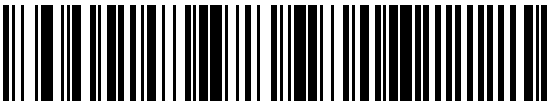
Greek Latin



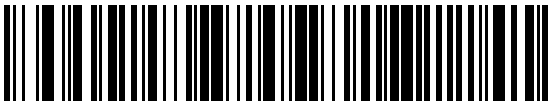
Greek (220) Latin



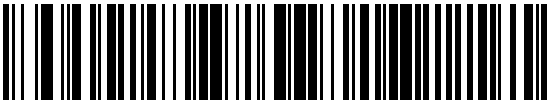
Greek (319) Latin



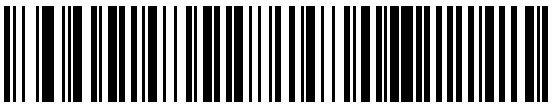
Greek



Greek (220)

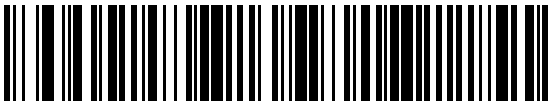


Greek (319)

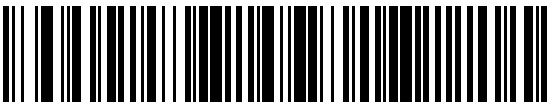


Greek Polytonic

Hebrew Israel



Hungarian



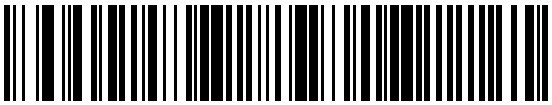
Hungarian_101KEY

Icelandic

Irish

Italian

Italian (142)

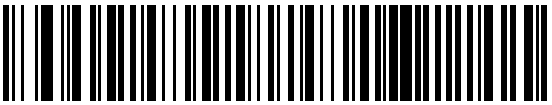


Japanese (ASCII)

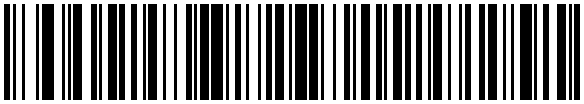
Japanese (SHIFT-JIS)*

*For CJK keyboard types, see CJK Decode Control.

Kazakh



Korean (ASCII)



Korean (Hangul)*

*For CJK keyboard types, see CJK Decode Control.

Kyrgyz

Latin American

Latvian

Latvian (QWERTY)

Lithuanian

Lithuanian (IBM)

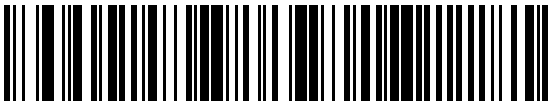
Macedonian (FYROM)

Maltese_47KEY

Mongolian

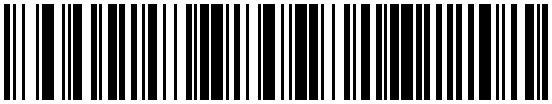
Norwegian

Polish (214)

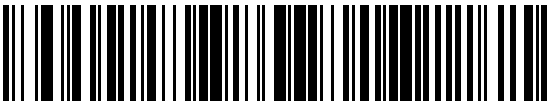


Polish (Programmer)

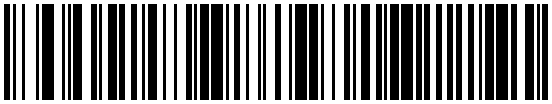
Portuguese (Brazil) (Windows XP)



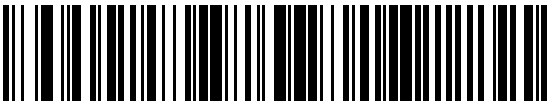
Portuguese (Brazilian ABNT)



Portuguese (Brazilian ABNT2)



Portuguese (Portugal)



Russian

Russian (Typewriter)

Serbian (Latin)

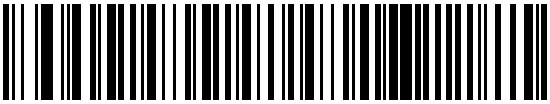
Serbian (Cyrillic)

Slovak

Slovak (QWERTY)

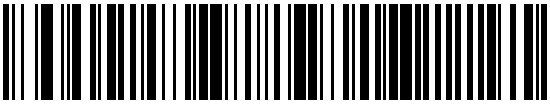
Slovenian

Spanish

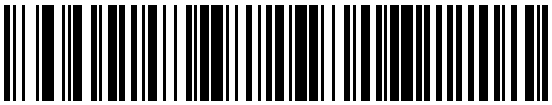


Spanish (Variation)

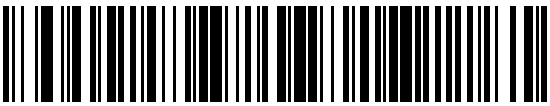
Swedish



Swiss French



Swiss German



Tatar

Thai (Kedmanee)

Turkish F

Turkish Q

UK English

Ukrainian

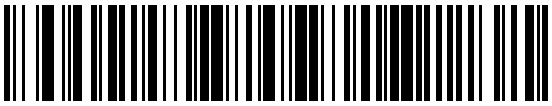
US Dvorak

US Dvorak Left

US Dvorak Right

US International

Uzbek



Vietnamese

Country Code Pages

This section provides barcodes for selecting code pages for the country keyboard type selected in Country Codes.

If the default code page in Country Code Pages is appropriate for your selected country keyboard type, you do not need to scan a country code page barcode.

NOTE: ADF rules can also specify a code page based on the symbology and other ADF criteria. Refer to the Advanced Data Formatting Programmer Guide.

Country Code Page Defaults

The table in this section lists the code page default for each country keyboard.

Table 16 Country Code Page Defaults

Country Keyboard	Code Page Default
US English (North American)	Windows 1252
US English (Mac)	Mac CP10000
Albanian	Windows 1250
Arabic 101	Windows 1256
Arabic 102	Windows 1256
Arabic 102 AZERTY	Windows 1256
Azeri Latin	Windows 1254
Azeri Cyrillic	Windows 1251
Belarusian	Windows 1251
Bosnian Latin	Windows 1250
Bosnian Cyrillic	Windows 1251
Bulgarian Latin	Windows 1250
Bulgarian Cyrillic	Windows 1251
Canadian French Win7	Windows 1252
Canadian French (Legacy)	Windows 1252
Canadian Multilingual	Windows 1252

Table 16 Country Code Page Defaults (Continued)

Country Keyboard	Code Page Default
Croatian	Windows 1250
Chinese ASCII	Windows 1252
Chinese (Simplified)	Windows 936, GBK
Chinese (Traditional)	Windows 950, Big5
Czech	Windows 1250
Czech Programmers	Windows 1250
Czech QWERTY	Windows 1250
Danish	Windows 1252
Dutch Netherland	Windows 1252
Estonian	Windows 1257
Faeroese	Windows 1252
Finnish	Windows 1252
French (France)	Windows 1252
French International (Belgian French)	Windows 1252
Galician	Windows 1252
German	Windows 1252
Greek Latin	Windows 1252
Greek220 Latin	Windows 1253
Greek319 Latin	Windows 1252
Greek	Windows 1253
Greek220	Windows 1253
Greek319	Windows 1253
Greek Polytonic	Windows 1253
Hebrew Israel	Windows 1255
Hungarian	Windows 1250
Hungarian_101KEY	Windows 1250
Icelandic	Windows 1252
Irish	Windows 1252
Italian	Windows 1252
Italian_142	Windows 1252
Japanese ASCII	Windows 1252
Japanese (Shift-JIS)	Windows 932, Shift-JIS
Kazakh	Windows 1251

Table 16 Country Code Page Defaults (Continued)

Country Keyboard	Code Page Default
Korean ASCII	Windows 1252
Korean (Hangul)	Windows 949, Hangul
Kyrgyz Cyrillic	Windows 1251
Latin America	Windows 1252
Latvian	Windows 1257
Latvian QWERTY	Windows 1257
Lithuanian	Windows 1257
Lithuanian_IBM	Windows 1257
Macedonian -FYROM	Windows 1251
Maltese_47KEY	Windows 1252
Mongolian-Cyrillic	Windows 1251
Norwegian	Windows 1252
Polish_214	Windows 1250
Polish Programmer	Windows 1250
Portuguese Portugal	Windows 1252
Russian	Windows 1251
Russian Typewriter	Windows 1251
Serbian Latin	Windows 1250
Serbian Cyrillic	Windows 1251
Slovak	Windows 1250
Slovak QWERTY	Windows 1250
Slovenian	Windows 1250
Spanish	Windows 1252
Spanish Variation	Windows 1252
Swedish	Windows 1252
Swiss French	Windows 1252
Swiss German	Windows 1252
Tatar	Windows 1251
Thai-Kedmanee	Windows 874
Turkish F	Windows 1254
Turkish Q	Windows 1254
Ukrainian	Windows 1251
United Kingdom	Windows 1252

Table 16 Country Code Page Defaults (Continued)

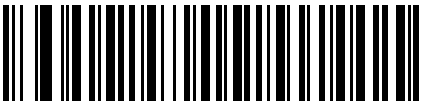
Country Keyboard	Code Page Default
United States	Windows 1252
US Dvorak	Windows 1252
US Dvorak Left Hand	Windows 1252
US Dvorak Right Hand	Windows 1252
US International	Windows 1252
Uzbek Cyrillic	Windows 1251
Vietnamese	Windows 1258

Country Code Page Barcodes

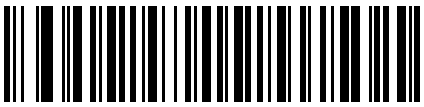
Parameter # 961

Scan the barcode corresponding to the country keyboard code page.

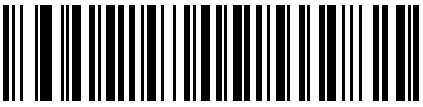
Windows 1250 Latin 2, Central European



Windows 1251 Cyrillic, Slavic

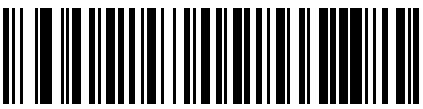


Windows 1252 Latin 1, Western European



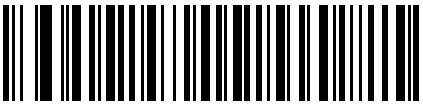
Windows 1253 Greek

Windows 1254 Latin 5, Turkish



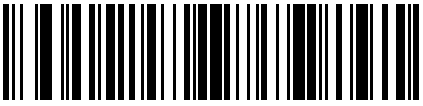
Windows 1255 Hebrew

Windows 1256 Arabic



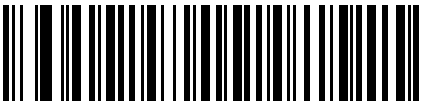
Windows 1257 Baltic

Windows 1258 Vietnamese



Windows 874 Thai

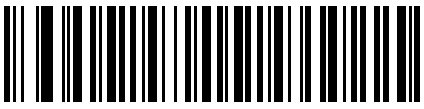
Windows 20866 Cyrillic KOI8-R



Windows 932 Japanese Shift-JIS

Windows 936 Simplified Chinese GBK

Windows 54936 Simplified Chinese GB18030



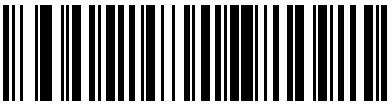
Windows 949 Korean Hangul

Windows 950 Traditional Chinese Big5

MS-DOS 437 Latin US

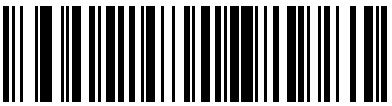
MS-DOS 737 Greek

MS-DOS 775 Baltic

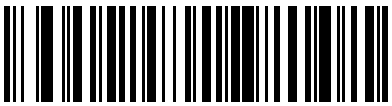


MS-DOS 850 Latin 1

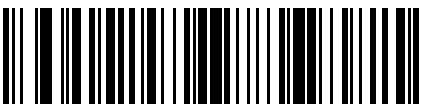
MS-DOS 852 Latin 2



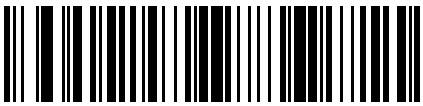
MS-DOS 855 Cyrillic



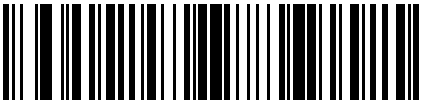
MS-DOS 857 Turkish



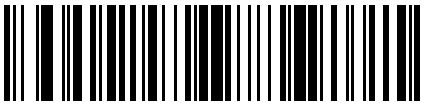
MS-DOS 860 Portuguese



MS-DOS 861 Icelandic



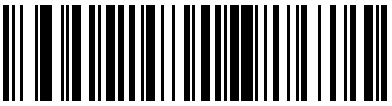
MS-DOS 862 Hebrew



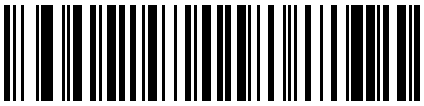
MS-DOS 863 French Canada

MS-DOS 865 Nordic

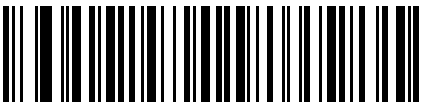
MS-DOS 866 Cyrillic



MS-DOS 869 Greek 2

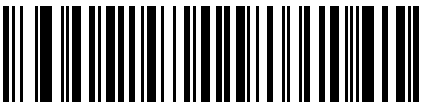


ISO 8859-1 Latin 1, Western European

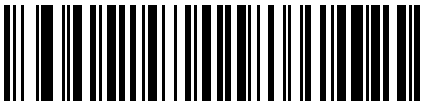


ISO 8859-2 Latin 2, Central European

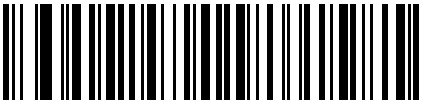
ISO 8859-3 Latin 3, South European



ISO 8859-4 Latin 4, North European

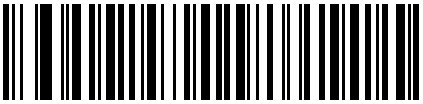


ISO 8859-5 Cyrillic



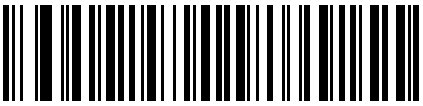
ISO 8859-6 Arabic

ISO 8859-7 Greek



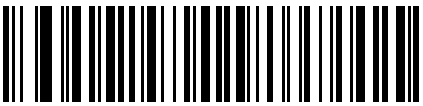
ISO 8859-8 Hebrew

ISO 8859-9 Latin 5, Turkish



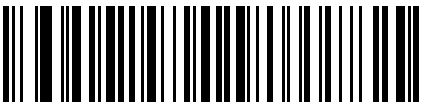
ISO 8859-10 Latin 6, Nordic

ISO 8859-11 Thai



ISO 8859-13 Latin 7, Baltic

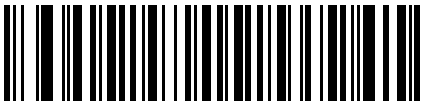
ISO 8859-14 Latin 8, Celtic



ISO 8859-15 Latin 9

ISO 8859-16 Latin 10, South-Eastern European

UTF-8



UTF-16LE UTF-16 Little Endian

UTF-16BE UTF-16 Big Endian

Mac CP10000 Roman

CJK Decode Control

This section describes control parameters for CJK (Chinese, Japanese, Korean) barcode decode through USB HID Keyboard Emulation mode.

NOTE: Because ADF does not support CJK character processing, there is no format manipulation for CJK output.

CJK Control Parameters

Unicode Output Control

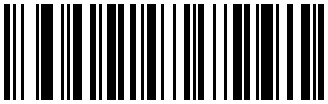
Parameter # 973 (SSI # F2h CDh)

For a Unicode encoded CJK barcode, select one of the following options for Unicode output. Universal Output applies to Unicode and MBCS-expected applications, while Unicode Application Only is limited to Unicode-expected applications.

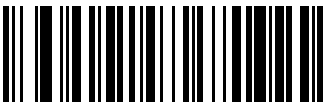
- **Universal Output to Unicode and MBCS Application:** This default method applies to Unicode and MBCS expected applications, such as MS Word and Notepad on a Windows host.

NOTE: To support Unicode universal output, set up the registry table for the Windows host. See Unicode/CJD Decode Setup with Windows Host.

- Output to Unicode Application Only - This method applies only to Unicode expected applications, such as MS Word and WordPad, but not Notepad.



*Universal Output (0)



Unicode Application Only (1)

CJK Output Method to Windows Host

Parameter # 972

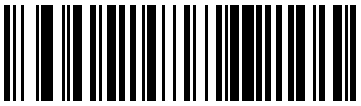
For a national standard encoded CJK barcode, select one of the following options for CJK output to a Windows host:

- Universal CJK Output: This is the default universal CJK output method for US English IME or Chinese/Japanese/Korean ASCII IME on a Windows host. This method converts CJK characters to Unicode and emulates the characters when transmitting to the host. Use the Unicode Output Control parameter to control Unicode output.

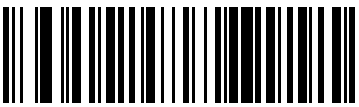
NOTE: To support universal CJK output, set up the registry table for the Windows host. See Unicode/CJK Decode Setup Windows Host.

- **Other options for CJK output** - With the following methods, the scanner sends the CJK character hexadecimal internal code (Nei Ma) value to the host, or converts the CJK character to Unicode and sends the hexadecimal Unicode value to the host. When using these methods, the Windows host must select the corresponding IME to accept the CJK character. See Unicode/CJK Decode Setup Windows Host.
- **Japanese Unicode Output**
- **Simplified Chinese GBK Code Output**
- **Simplified Chinese Unicode Output**
- **Korean Unicode Code Output**
- **Traditional Chinese Big5 Code Output** (Windows XP)
- **Traditional Chinese Big5 Code Output** (Windows 7)
- **Traditional Chinese Unicode Code Output** (Windows XP)
- **Traditional Chinese Unicode Code Output** (Windows 7)

NOTE: The Unicode emulate output method depends on the host system (Windows XP or Windows 7).

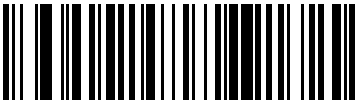


*Universal CJK Output (0)

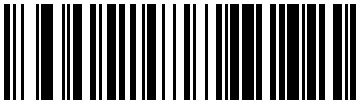


Japanese Unicode Output (34)

Chinese (Simplified) GBK Output (1)

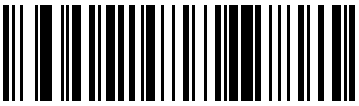


Chinese (Simplified) Unicode Output (2)

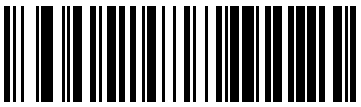


Korean Unicode Output (50)

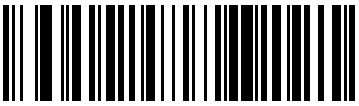
(for Korean Unicode Output, select Simplified Chinese Unicode IME on the Windows host)



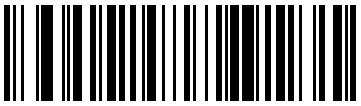
Chinese (Traditional) Big5 Output (Windows XP) (1)



Chinese (Traditional) Big5 Output (Windows 7) (19)



Chinese (Traditional) Unicode Output (Windows XP) (18)



Chinese (Traditional) Unicode Output (Windows 7) (20)

Non-CJK UTF Barcode Output

Parameter # 960

Some country keyboard type layouts contain characters that do not exist in the default code page (see below). Although the default code page can not encode these characters in a barcode, they can be encoded in the UTF-8 barcode.

Scan the following barcode to output the Unicode values by emulation mode.

NOTE: Use this special country keyboard type to decode the non-CJK UTF-8 barcode. After decoding, re-configure the scanner to use the original country keyboard type.

Use US English IME on Windows. See Unicode Output Control.

Non-CJK UTF-8 Emulation Output

Missing Characters for Country Keyboard Type: Tatar, Uzbek, Mongolian, Kyrgyz, Kazakh and Azeri

Default code page: CP1251

Missing characters:

ғ	Ғ
ҳ	Ҳ
қ	Қ
һ	Һ
ө	Ө
ә	Ә
ү	Ү
ң	Ң
җ	Җ
ҭ	
ң	Ң
ұ	Ұ
қ	Қ
ч	Ч
к	К

Missing Characters for Country Keyboard Type: Romanian (Standard)

Default code page: CP1250

Missing characters:

ș	Ș
ț	Ț

Missing Characters for Country Keyboard Type: Portuguese-Brazilian (ABNT), Portuguese-Brazilian (ABNT2)

Default code page: CP1252

Missing character: ₡

Missing Characters for Country Keyboard Type: Azeri-Latin

Default code page: CP1254

Missing characters: ə, Ə

Unicode/CJK Decode Setup with Windows Host

This section describes how to set up CJK decode with a Windows host.

Setting Up the Windows Registry Table for Unicode Universal Output

Set up a Windows host registry table in order to support a universal output method for your data.

1. Select **Start** > **Run** > **regedt32** to start the registry editor.
2. Under **HKEY_Current_User\Control Panel\Input Method**, set **EnableHexNumpad** to **1** as follows:

```
[HKEY_CURRENT_USER\Control Panel\Input Method]
```

```
"EnableHexNumpad"="1"
```

   If this key does not exist, add it as type **REG_SZ** (string value).
3. Reboot the computer to implement the registry change.

Adding CJK IME on Windows

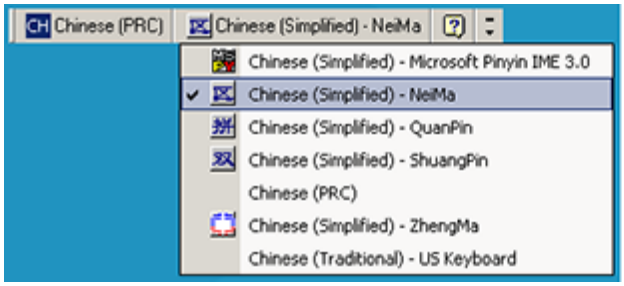
Modify your host device to display a Chinese, Japanese, or Korean keyboard.

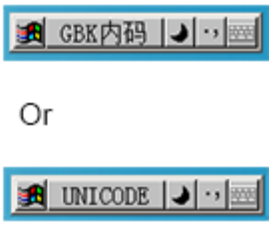
1. Click **Start** > **Control Panel**.
2. If the Control Panel opens in category view, select **Switch to Classic View** in the top left corner.
3. Select **Regional and Language Options**.
4. Click the **Language** tab.
5. Under **Supplemental Language Support**, select the **Install Files for East Asian Languages** check box if not already selected, and click **Apply**. This may require a Windows installation CD to install the required files. This step ensures that the East Asian Languages (CJK) are available.
6. Under **Text Services and Input Language**, click **Details**.
7. Under **Installed Services**, click **Add**.
8. In the **Add Input Language** dialog box, choose the CJK input language and keyboard layout or Input Method Editor (IME) to add.
9. Click **OK** twice. The language indicator appears in the system tray (at bottom right corner of the desktop by default). To switch between input languages (keyboard languages) select the language indicator in the system tray.
10. Select the language indicator in the system tray to select the desired country keyboard type.
11. Verify that the characters displayed on each country's keyboard appear.

Selecting the Simplified Chinese Input Method on the Host

You can display a Simplified Chinese keyboard as the input method from the RS5100/RS6100 to display on your Windows 7 / Windows XP host device.

- Select Unicode/GBK input on Windows XP: **Chinese (Simplified) - NeiMa**, then click the input bar to select **Unicode** or **GBK NeiMa** input.



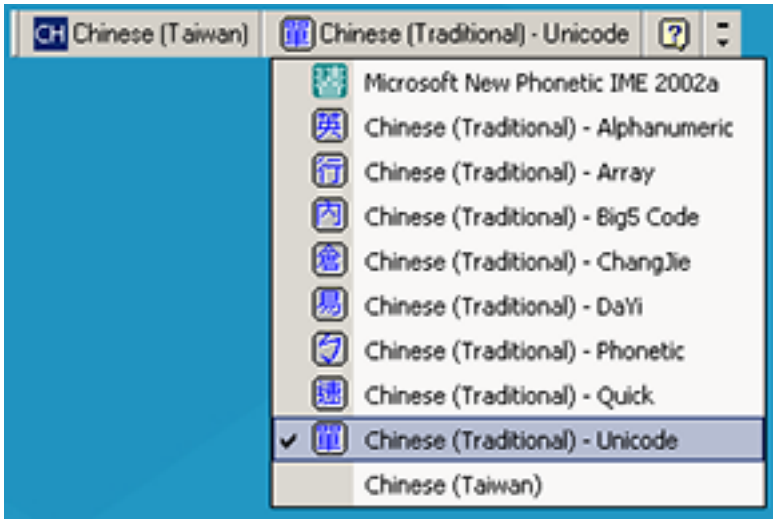


- Select Unicode/GBK input on Windows 7: **Chinese (Simplified) - Microsoft Pinyin New Experience Input Style**, then select **Tool Menu** > **Secondary Inputs** > **Unicode Input** or **GB Code Input**.

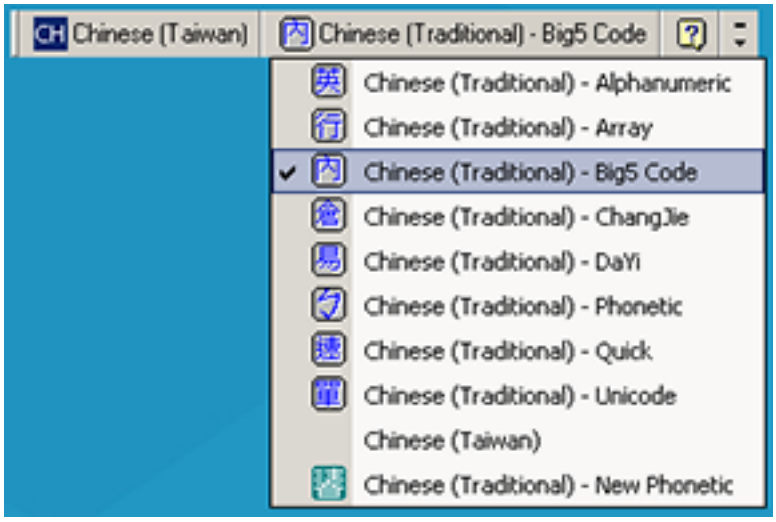
Selecting the Traditional Chinese Input Method on the Host

To select the Traditional Chinese input method:

- Select Unicode input on Windows XP: **Chinese (Traditional) - Unicode**



- Select Big5 input on Windows XP: **Chinese (Traditional) - Big5 Code**



- Select Unicode/Big5 input on Windows 7: **Chinese (Traditional) - New Quick**. This option support both Unicode and Big5 input.

ASCII Character Sets

Use this table to identify ASCII codes and their corresponding keyboard keystroke.

NOTE: For the Keyboard Wedge Interface, Code 39 Full ASCII interprets the barcode special character ($ + % /) preceding a Code 39 character and assigns an ASCII character value to the pair. For example, if you enable Code 39 Full ASCII and scan +B, it transmits as b, %J as ?, and %V as @. Scanning ABC%I outputs the keystroke equivalent of ABC >.

Table 17 ASCII Character Sets

ASCII Value (Prefix/ Suffix Value)	Full ASCII Code 39 Encode Char	Keystroke	ASCII Character (Applies to RS-232 Only)
1000	%U	CTRL 2	NUL
1001	$A	CTRL A	SOH
1002	$B	CTRL B	STX
1003	$C	CTRL C	ETX
1004	$D	CTRL D	EOT
1005	$E	CTRL E	ENQ
1006	$F	CTRL F	ACK
1007	$G	CTRL G	BELL
1008	$H	CTRL H/**BACKSPACE**[a]	BCKSPC
1009	$I	CTRL I/**HORIZONTAL TAB**[b]	HORIZ TAB
1010	$J	CTRL J	LF/NW LN
1011	$K	CTRL K	VT
1012	$L	CTRL L	FF
1013	$M	CTRL M/**ENTER**[c]	CR/ENTER
1014	$N	CTRL N	SO
1015	$O	CTRL O	SI
1016	$P	CTRL P	DLE
1017	$Q	CTRL Q	DC1/XON

Table 17 ASCII Character Sets (Continued)

ASCII Value (Prefix/ Suffix Value)	Full ASCII Code 39 Encode Char	Keystroke	ASCII Character (Applies to RS-232 Only)
1018	$R	CTRL R	DC2
1019	$S	CTRL S	DC3/XOFF
1020	$T	CTRL T	DC4
1021	$U	CTRL U	NAK
1022	$V	CTRL V	SYN
1023	$W	CTRL W	ETB
1024	$X	CTRL X	CAN
1025	$Y	CTRL Y	EM
1026	$Z	CTRL Z	SUB
1027	%A	CTRL [	ESC
1028	%B	CTRL \	FS
1029	%C	CTRL]	GS
1030	%D	CTRL 6	RS
1031	%E	CTRL -	US
1032	Space	Space	Space
1033	/A	!	!
1034	/B	“	"
1035	/C	#	#
1036	/D	$	$
1037	/E	%	%
1038	/F	&	&
1039	/G	‘	‘
1040	/H	(	(
1041	/I	)	)
1042	/J	*	*
1043	/K	+	+
1044	/L	,	,
1045	-	-	-
1046	.	.	.
1047	/o	/	/
1048	0	0	0
1049	1	1	1
1050	2	2	2

Table 17 ASCII Character Sets (Continued)

ASCII Value (Prefix/ Suffix Value)	Full ASCII Code 39 Encode Char	Keystroke	ASCII Character (Applies to RS-232 Only)
1051	3	3	3
1052	4	4	4
1053	5	5	5
1054	6	6	6
1055	7	7	7
1056	8	8	8
1057	9	9	9
1058	/Z	:	:
1059	%F	;	;
1060	%G	<	<
1061	%H	=	=
1062	%I	>	>
1063	%J	?	?
1064	%V	@	@
1065	A	A	A
1066	B	B	B
1067	C	C	C
1068	D	D	D
1069	E	E	E
1070	F	F	F
1071	G	G	G
1072	H	H	H
1073	I	I	I
1074	J	J	J
1075	K	K	K
1076	L	L	L
1077	M	M	M
1078	N	N	N
1079	O	O	O
1080	P	P	P
1081	Q	Q	Q
1082	R	R	R
1083	S	S	S

Table 17 ASCII Character Sets (Continued)

ASCII Value (Prefix/ Suffix Value)	Full ASCII Code 39 Encode Char	Keystroke	ASCII Character (Applies to RS-232 Only)
1084	T	T	T
1085	U	U	U
1086	V	V	V
1087	W	W	W
1088	X	X	X
1089	Y	Y	Y
1090	Z	Z	Z
1091	%K	[	[
1092	%L	\	\
1093	%M	]	]
1094	%N	^	^
1095	%O	_	_
1096	%W	‘	`
1097	+A	a	a
1098	+B	b	b
1099	+C	c	c
1100	+D	d	d
1101	+E	e	e
1102	+F	f	f
1103	+G	g	g
1104	+H	h	h
1105	+I	i	i
1106	+J	j	j
1107	+K	k	k
1108	+L	l	l
1109	+M	m	m
1110	+N	n	n
1111	+O	o	o
1112	+P	p	p
1113	+Q	q	q
1114	+R	r	r
1115	+S	s	s
1116	+T	t	t

Table 17 ASCII Character Sets (Continued)

ASCII Value (Prefix/ Suffix Value)	Full ASCII Code 39 Encode Char	Keystroke	ASCII Character (Applies to RS-232 Only)
1117	+U	u	u
1118	+V	v	v
1119	+W	w	w
1120	+X	x	x
1121	+Y	y	y
1122	+Z	z	z
1123	%P	{	{
1124	%Q	I	|
1125	%R	}	}
1126	%S	~	~
1127			Undefined
7013			ENTER

[a] The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the unbold keystroke transmits.

[b] The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the unbold keystroke transmits.

[c] The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the unbold keystroke transmits.

Table 18 ALT Key Character Set

ALT Keys	Keystroke
2045	ALT -
2050	ALT 2
2054	ALT 6
2064	ALT @
2065	ALT A
2066	ALT B
2067	ALT C
2068	ALT D
2069	ALT E
2070	ALT F
2071	ALT G
2072	ALT H
2073	ALT I

Table 18 ALT Key Character Set (Continued)

ALT Keys	Keystroke
2074	ALT J
2075	ALT K
2076	ALT L
2077	ALT M
2078	ALT N
2079	ALT O
2080	ALT P
2081	ALT Q
2082	ALT R
2083	ALT S
2084	ALT T
2085	ALT U
2086	ALT V
2087	ALT W
2088	ALT X
2089	ALT Y
2090	ALT Z
2091	ALT [
2092	ALT \
2093	ALT]

NOTE: GUI Shift Keys - The Apple™ iMac keyboard has an apple key on either side of the space bar. Windows-based systems have a GUI key to the left of the left ALT key, and to the right of the right ALT key.

Table 19 GUI Key Character Set

GUI Key	Keystroke
3000	Right Control Key
3048	GUI 0
3049	GUI 1
3050	GUI 2
3051	GUI 3
3052	GUI 4
3053	GUI 5

Table 19 GUI Key Character Set (Continued)

GUI Key	Keystroke
3054	GUI 6
3055	GUI 7
3056	GUI 8
3057	GUI 9
3065	GUI A
3066	GUI B
3067	GUI C
3068	GUI D
3069	GUI E
3070	GUI F
3071	GUI G
3072	GUI H
3073	GUI I
3074	GUI J
3075	GUI K
3076	GUI L
3077	GUI M
3078	GUI N
3079	GUI O
3080	GUI P
3081	GUI Q
3082	GUI R
3083	GUI S
3084	GUI T
3085	GUI U
3086	GUI V
3087	GUI W
3088	GUI X
3089	GUI Y
3090	GUI Z

Table 20 PF Key Character Set

PF Keys	Keystroke
4001	PF 1
4002	PF 2
4003	PF 3
4004	PF 4
4005	PF 5
4006	PF 6
4007	PF 7
4008	PF 8
4009	PF 9
4010	PF 10
4011	PF 11
4012	PF 12
4013	PF 13
4014	PF 14
4015	PF 15
4016	PF 16

Table 21 F Key Character Set

F Keys	Keystroke
5001	F 1
5002	F 2
5003	F 3
5004	F 4
5005	F 5
5006	F 6
5007	F 7
5008	F 8
5009	F 9
5010	F 10
5011	F 11
5012	F 12
5013	F 13
5014	F 14

Table 21 F Key Character Set (Continued)

F Keys	Keystroke
5015	F 15
5016	F 16
5017	F 17
5018	F 18
5019	F 19
5020	F 20
5021	F 21
5022	F 22
5023	F 23
5024	F 24

Table 22 Numeric Key Character Set

Numeric Keypad	Keystroke
6042	*
6043	+
6044	Undefined
6045	-
6046	.
6047	/
6048	0
6049	1
6050	2
6051	3
6052	4
6053	5
6054	6
6055	7
6056	8
6057	9
6058	Enter
6059	Num Lock

Table 23 Extended Key Character Set (Extended Keypad)

Extended Keypad	Keystroke
7001	Break
7002	Delete
7003	Pg Up
7004	End
7005	Pg Dn
7006	Pause
7007	Scroll Lock
7008	Backspace
7009	Tab
7010	Print Screen
7011	Insert
7012	Home
7013	Enter
7014	Escape
7015	Up Arrow
7016	Dn Arrow
7017	Left Arrow
7018	Right Arrow

RSM Attributes

Remote Scanner Manager (RSM) attributes can be used to query information, like Serial Number and Battery Percentage, from a connected RS2100 scanner. The following table describes various attributes and their attribute numbers.

Table 24 Remote Scanner Manager (RSM) Attributes

Attribute Description	Attribute Number
Model Number	533
Serial Number	534
Date of Manufacture	535
Date of Service	536
Bluetooth MAC Address	541
Firmware Version	20004
Battery Voltage	30010
Battery Percentage	30012
Battery Model Number	30017
Battery Manufacture Date	30018

BLE Beaconing Parameter Defaults

BLE Beaconing can be customized by programming various parameters and attributes.

BLE Beaconing is designed to prevent the loss of scanners. A scanner emits an alert when it is about to lose its connection to a host device. Loss of connection may result when the scanner:

- reaches a low battery level
- stays inactive for too long
- moves too far away from the host

To enable beaconing, one of the following three parameters must be enabled:

- Beacon Upon Disconnection
- Unpaired Beaconing
- Beacon Battery Threshold

NOTE: Beaconing is disabled when the Beacon Battery, Beaconing Upon Disconnection, and Unpaired Beaconing parameters are disabled.

You can program all of the specific definitions for triggering the BLE Beaconing alert using the parameters listed in the following parameter defaults table.

BLE Beaconing Parameter Defaults

Table 25 BLE Beaconing Parameter Defaults

Parameter	Parameter Number	Default
Low Power Mode*	128	Enable
Reconnect Attempt Interval	558	30 seconds
Auto-reconnect	604	Immediately
Bluetooth Friendly Name*	607	N/A
Discoverable Mode*	610	General
Apple iOS Virtual Keyboard Toggle*	1114	Disable
Wi-Fi Friendly Channel Exclusion*	1297	Use all Channels (Standard AFH)
Wi-Fi Friendly Mode*	1299	Disable

Table 25 BLE Beaconing Parameter Defaults (Continued)

Radio Output Power	1324	High
Battery Threshold	1367, 1368, 1369	N/A
Bluetooth Security Level*	1393	N/A
Link Supervision Timeout*	1698	2 seconds
Auto Un-Pairing	1708	Disable
Beacon Upon Disconnection	2403	Disable
Unpaired Beaconing	2404	Disable
Beaconing Beep	2405	Disable
Beacon Frequency	2406	100
Beacon Battery Threshold	2407	Disable
Beacon ID	N/A	N/A
Scanner Alias	2410	Bluetooth-Friendly Name

NOTE: *Configure these parameters before pairing the scanner with a host device. Changing these parameters in a connected scanner may cause it to reset.

Table 26 BLE Beaconing Attributes

Attribute	Attribute Number
Model Number	533
Serial Number	534
Date of Manufacture	535
Date of Service	536
Bluetooth MAC Address	541
Paging Activate	6032
ATT Beacon Command	6052
Firmware Version	20004
Device Type	20007
Ring Scanner Firmware Package Version	20012
Beacon ID	20036
Ring Scanner Battery Status	30009
Battery Percentage	30012
Battery Model Number	30017
Battery Manufacture Date	30018

BLE Beaconing Attributes

Model Number

Attribute #533

The model number of the scanner. This electronic output matches the printout on the physical device label.

Type	S
Size (Bytes)	18
User Mode Access	R
Values	Variable

Serial Number

Attribute #534

The unique serial number assigned in the manufacturing facility. This electronic output matches the printout on the physical device label, for example M1J26F45V.

Type	S
Size (Bytes)	16
User Mode Access	R
Values	Variable

Date of Manufacture

Attribute #535 Date of device manufacture assigned in the manufacturing facility. This electronic output matches the printout on the physical device label, for example, 30APR14 (which reads the 30th of April 2014).

Attribute Property	Property Value
Type	S
Size (Bytes)	7
User Mode Access	R
Values	Variable

Firmware Version

Parameter # 20004

This parameter returns the scanner's operating system version. For example, NBRFMAAC or PAAAABS00-007-R03D0.

Attribute Property	Property Value
Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

Communication Protocol Functionality

This section provides information about functionality supported via communication (cable) interface.

The following table lists supported scanner functionality by communication protocol.

Table 27 Communication Interface Functionality

Communication Interfaces	Functionality		
	Data Transmission	Remote Management	Image and Video Transmission
USB			
HID Keyboard Emulation	Supported	Not Available	Not Available
CDC COM Port Emulation	Supported	Not Available	Not Available
SSI over CDC COM Port Emulation	Supported	Supported	Supported
IBM Table-top USB	Supported	Supported	Not Available
IBM Hand-held USB	Supported	Supported	Not Available
USB OPOS Hand-held	Supported	Supported	Not Available
Symbol Native API (SNAPI) without Imaging Interface	Supported	Supported	Not Available
Symbol Native API (SNAPI) with Imaging Interface	Supported	Supported	Supported
RS-232			
Standard RS-232	Supported	Not Available	Not Available
ICL RS-232	Supported	Not Available	Not Available
Fujitsu RS-232	Supported	Not Available	Not Available
Wincor-Nixdorf RS-232 Mode A	Supported	Not Available	Not Available
Wincor-Nixdorf RS-232 Mode B	Supported	Not Available	Not Available
Olivetti ORS4500	Supported	Not Available	Not Available
Omron	Supported	Not Available	Not Available
CUTE	Supported	Not Available	Not Available
OPOS/JPOS	Supported	Not Available	Not Available
SSI	Supported	Supported	Supported

Table 27 Communication Interface Functionality (Continued)

Communication Interfaces	Functionality		
	Data Transmission	Remote Management	Image and Video Transmission
IBM 4690			
Hand-held Scanner Emulation (Port 9B)	Supported	Not Available	Not Available
Table-top Scanner Emulation (Port 17)	Supported	Supported	Not Available
Non-IBM Scanner Emulation (Port 5B)	Supported	Supported	Not Available
Keyboard Wedge			
IBM PC/AT & IBM PC Compatibles	Supported	Not Available	Not Available
IBM AT Notebook	Supported	Not Available	Not Available