DS9808 DIGITAL SCANNER PRODUCT REFERENCE GUIDE

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72E-112999-11

Revision A

May 2017

Publicly available software list:

Name: Regular Expression Evaluator
Version: 8.3
Description: Compiles and executes regular expressions
Software Site: http://www.freebsd.org/cgi/cvsweb.cgi/src/lib/libc/regex/
Source Code: No Source Distribution Obligations. Seller will not provide nor distribute the Source Code for the Regular Expression Evaluator.
License: BSD Style License

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Warranty

For the complete Zebra hardware product warranty statement, go to: http://www.zebra.com/warranty

Revision History

Changes to the original guide are listed below:

Change	Date	Description
-01 Rev A	03/2009	Initial release.
-02 Rev A	05/2009	Update to correct revision errors.
-03 Rev A	10/2009	Add Mobile Phone/Display Mode and PDF Prioritization parameters, add driver's license parsing criteria, add note that only SNAPI with Imaging USB host supports imaging, add note that RFID module is a future option not available in all countries.
-04 Rev A	4/2010	Add OCR parameters, Suppress Power Up Beeps, Unique Bar Code Reporting, Multicode, and Image Rotation, USB Beep Directive, USB Type Directive, and USB Static CDC, (IBM) Beep Directive and Configuration Directive, Korean 3 of 5 code type, Australia Post Format; add CUTE host in RS-232 chapter, remove baud rates 600, 1200, 2400, and 4800 from RS-232 baud rate options.
-05 Rev A	12/2010	Removed server based Driver's License option; updated to Motorola URLs and copyright; removed Motorola motion artwork.
-06 Rev A	09/02/11	Updated Motorola, Inc. references to Motorola Solutions, Inc. Corrected Enable Hand-Held Decode Aiming Pattern on PDF bar code in Chapter 4.
-07 Rev A	10/2012	Updated ambient light tolerance; added note to *Traditional Presentation Mode* indicating *Mobile Phone/Display Mode* must be enabled to scan bar codes from mobile phones or PC displays.
-08 Rev A	01/2013	Updated IBM Hand-Held USB parameter bar code captions and explanation.
-09 Rev A	08/2013	Added IBM USB Specification Version parameter bar codes.

Change	Date	Description
-10 Rev A	2/2015	- Rebranded to Zebra Technologies Corp. - Replaced SSI parameter numbers with attribute values. - Added minimum value recommendations for Signature Capture Width and Height. - USB chapter: added SSI over USB CDC device type, added Quick Keypad Emulation, USB Polling Interval, and Fast HID Keyboard parameters. - OCR chapter: added OCR-B ICAO Travel Documents option, Require and Suppress, Multiple Templates section, Health Industry HIBCC43 example, and Inverse OCR parameter; removed OCR Security Level - Added Code 128, Code 39, I 2 of 5, and GS1 DataBar Limited Security Levels. - Added UPC Reduced Quiet Zone, Code 128 Reduced Quiet Zone, Code 39 Reduced Quiet Zone, I 2 of 5 Reduced Quiet Zone, 1D Quiet Zone Level. - Added Ignore Code 128 <FNC4>. - Added Codabar Upper or Lower Case Start/Stop Character Transmission. - Added Han Xin parameters and sample bar code. - Removed Matrix 2 of 5 Redundancy. - Changed defaults for Unique Bar Code Reporting, Timeout Between Decodes Different Symbols, Coupon Report, Code 39 Lengths, Code 128 Lengths, I 2 of 5, I 2 of 5 Lengths, Codabar Lengths, Matrix 2 of 5 Lengths, GS1 DataBar Limited, GS1 DataBar Expanded, and Data Matrix Inverse. - Added 123Scan2 chapter. - Driver's License Setup chapter: added Output Gender as M or F and Date Format, added License Issue State bar code. - Added Alphanumeric Bar Codes appendix. - Added Non-Parameter Attributes appendix.
-11 Rev A	5/2017	- Added Decode Mirror Images parameter - Added Note to PDF Prioritization parameter to update length ranges - Added Product ID (PID) Type parameter - Renamed USB Device Type OPOS - Removed USB Country Keyboard Types and added reference to Country Code appendix for USB Device Type - Added CDC Beep on <Bel> and Direct I/O Beep parameters - Added IBM-485 Specification Version parameter - Removed Keyboard Wedge Country Types and added reference to Country Code appendix for Keyboard Wedge Host Types - Removed OCR statements regarding slow decoding - Changed MSI Check Digit Algorithm option Mod 10/Mod 11 to Mod 11/Mod 10 - Added MSI Reduced Quiet Zone parameter - Added Note for Inverse 1D parameter - Added Mailmark parameter - Add GS1 Databar Security Level parameter - Renamed GS1 DataBar-14 to GS1 DataBar Omnidirectional - Renamed GS1 DataBar Limited Security Level parameter to GS1 DataBar Limited Margin Check and updated description - Added Composite Inverse parameter - Removed QR Inverse parameter - Added GS1 Data Matrix parameter - Added GS1 QR parameter - Updated 123Scan chapter - Added appendices for Country Codes, Country Code Pages, and CJK Decode Control - Added GS1 Data Matrix, GS1 QR, and Mailmark to Code Identifiers and Modifier Characters tables - Updated copyright statement

TABLE OF CONTENTS

ABOUT THIS GUIDE

Introduction

The *DS9808 Product Reference Guide* provides general instructions for setting up, operating, maintaining, and troubleshooting the DS9808 digital scanner.

Configurations

This guide includes the following configurations:

Configuration	Scan Range	DL Parsing	Checkpoint EAS Support	RFID
DS9808-SR00007NNWR	Standard	No	No	N/A
DS9808-SR00007CNWR	Standard	No	Yes	N/A
DS9808-DL00007NNWR*	Standard	Yes	No	N/A
DS9808-DL00007CNWR*	Standard	Yes	Yes	N/A
DS9808-LR20007CRWR	Long	No	Yes	Upgradeable**
DS9808-LL20007CRWR*	Long	Yes	Yes	Upgradeable**
DS9808-SR00007C1WR**	Standard	No	Yes	902 – 928 Mhz - US only
DS9808-SR00007C2WR**	Standard	No	Yes	902 – 928 Mhz - Canada, Mexico
DS9808-DL00007C1WR*	Standard	Yes	Yes	902 – 928 Mhz - US only

***Available in the U.S. only.**
****Available in the U.S., Canada, and Mexico only.**

Configuration	Scan Range	DL Parsing	Checkpoint EAS Support	RFID
DS9808-LR20007C1WR**	Long	No	Yes	902 – 928 Mhz - US only
DS9808-LR20007C2WR**	Long	No	Yes	902 – 928 Mhz - Canada, Mexico
DS9808-LL20007C1WR*	Long	Yes	Yes	902 – 928 Mhz - US only

***Available in the U.S. only.**
****Available in the U.S., Canada, and Mexico only.**

NOTE RFID on the DS9808 is not available in all countries. Contact your local Zebra representative regarding availability in your region.

Chapter Descriptions

Topics covered in this guide are as follows:

- *Chapter 1, Getting Started* provides a product overview, unpacking instructions, and cable connection information.
- *Chapter 2, Data Capture* describes parts of the digital scanner, beeper and LED definitions, and how to use the scanner in hand-held and hands-free (presentation) modes.
- *Chapter 3, Maintenance & Technical Specifications* provides information on how to care for the digital scanner, troubleshooting, and technical specifications.
- *Chapter 4, User Preferences & Miscellaneous Digital Scanner Options* describes features frequently used to customize how data transmits to the host device and programming bar codes for selecting user preference features for the digital scanner.
- *Chapter 5, Imaging Preferences* provides imaging preference features and programming bar codes for selecting these features.
- *Chapter 6, USB Interface* describes how to set up the digital scanner with a USB host.
- *Chapter 7, RS-232 Interface* describes how to set up the digital scanner with an RS-232 host, such as point-of-sale devices, host computers, or other devices with an available RS-232 port.
- *Chapter 8, IBM 468X / 469X Interface* describes how to set up the digital scanner with IBM 468X/469X POS systems.
- *Chapter 9, Keyboard Wedge Interface* describes how to set up a Keyboard Wedge interface with the digital scanner.
- *Chapter 10, OCR Programming* describes how to set up the digital scanner for OCR programming.
- *Chapter 11, Symbologies* describes all symbology features and provides programming bar codes for selecting these features for the digital scanner.
- *Chapter 12, 123Scan2* provides information on the PC-based digital scanner configuration tool 123Scan^2.
- *Chapter 13, Advanced Data Formatting* briefly describes ADF, a means of customizing data before transmission to the host device, and includes a reference to the *ADF Programmer Guide*.

- *Chapter 14, Driver's License Set Up (DS9808-DL / DS9808-LL)* describes how the DS9808-DL and DS9808-LL digital scanners can parse out information from standard US driver's licenses and certain other American Association of Motor Vehicle Administrators (AAMVA) compliant ID cards.
- *Appendix A, Standard Default Parameters* provides a table of all host devices and miscellaneous scanner defaults.
- Appendix B, Country Codes provides bar codes for programming the country keyboard type for the USB keyboard (HID) device and the keyboard wedge host.
- Appendix C, Country Code Pages provides bar codes for selecting code pages for the country keyboard type.
- Appendix D, CJK Decode Control describes control parameters for Unicode/CJK (Chinese, Japanese, Korean) bar code decode through USB HID Keyboard Emulation mode.
- *Appendix E, Programming Reference* provides a table of AIM code identifiers, ASCII character conversions, and keyboard maps.
- *Appendix F, Sample Bar Codes* includes sample bar codes of various code types.
- *Appendix G, Numeric Bar Codes* includes the numeric bar codes to scan for parameters requiring specific numeric values.
- *Appendix H, Alphanumeric Bar Codes* includes the bar codes representing the alphanumeric keyboard, used when setting ADF rules.
- *Appendix I, ASCII Character Sets* provides ASCII character value tables.
- *Appendix J, Signature Capture Code* provides information on CapCode, a signature capture code that encloses a signature area on a document and allows a scanner to capture a signature.

Notational Conventions

The following conventions are used in this document:

- *Italics* are used to highlight the following:
  - Chapters and sections in this and related documents
  - Dialog box, window and screen names
  - Drop-down list and list box names
  - Check box and radio button names
- **Bold** text is used to highlight the following:
  - Key names on a keypad
  - Button names on a screen.
- bullets (•) indicate:
  - Action items
  - Lists of alternatives
  - Lists of required steps that are not necessarily sequential
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

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

Related Documents

- *DS9808 Quick Start Guide*, p/n 72-109917-xx - provides general information for getting started with the DS9808 digital scanner, and includes basic set up and operation instructions.
- *Advanced Data Formatting Programmer Guide*, p/n 72E-69680-xx - provides information on ADF, a means of customizing data before transmission to a host.
- *Electronic Article Surveillance Cable Installation Guide*, p/n 70-32824-xx - provides instructions for installing an EAS cable.

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

Service Information

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

When contacting support, please have the following information available:

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

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

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

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

CHAPTER 1 GETTING STARTED

Introduction

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

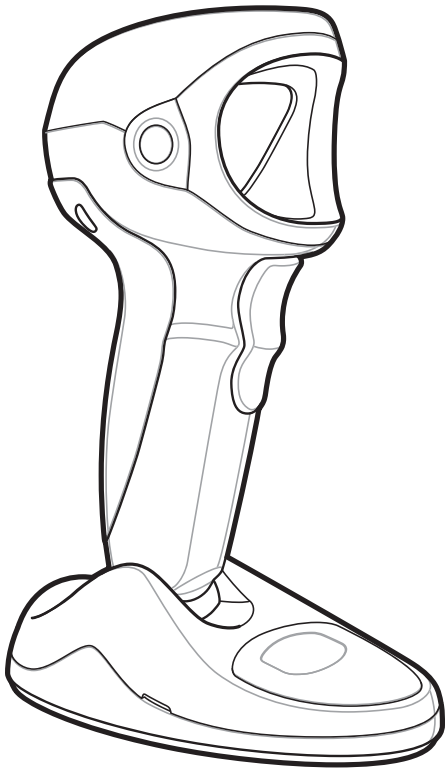


Figure 1-1 *DS9808 Digital Scanner*

Interfaces

The DS9808 digital scanner supports:

- USB connection to a host. The digital scanner autodetects a USB host and defaults to the HID keyboard interface type. Select other USB interface types by scanning programming bar code menus.This interface supports the following international keyboards (for Windows® environment): North America, German, French, French Canadian, Spanish, Italian, Swedish, UK English, Portuguese-Brazilian, and Japanese.
- Standard RS-232 connection to a host. Scan bar code menus to set up communication of the digital scanner with the host.
- Connection to IBM 468X/469X hosts. Scan bar code menus to set up communication of the digital scanner with the IBM terminal.
- Keyboard Wedge connection to a host. The host interprets scanned data as keystrokes. Scan bar code menus to set up communication of the digital scanner with the host. This interface supports the following international keyboards (for Windows® environment): North America, German, French, French Canadian, French Belgian, Spanish, Italian, Swedish, UK English, Portuguese-Brazilian, and Japanese.

NOTE Only the Symbol Native API (SNAPI) with Imaging interface supports image capture. See *USB Device Type on page 6-5* to enable this host.

Unpacking

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

Setting Up the Digital Scanner

Installing the Interface Cable

1. Plug the interface cable modular connector into the cable interface port on the bottom of the digital scanner's base (see *Figure 1-2*).
2. Gently tug the cable to ensure the connector is secure.
3. Connect the other end of the interface cable to the host (see the specific host chapter for information on host connections).

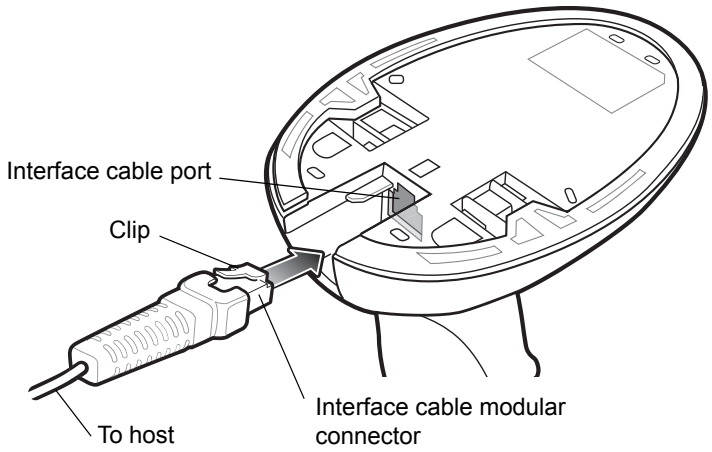


Figure 1-2 *Installing the Cable*

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

Removing the Interface Cable

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

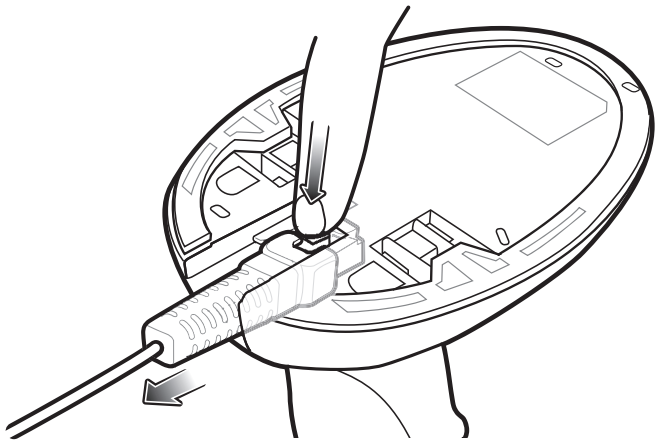


Figure 1-3 *Removing the Cable*

2. Carefully slide out the cable.
3. Follow the steps for *Installing the Interface Cable* to connect a new cable.

Connecting Power (if required)

If the host does not provide power to the digital scanner, connect an external power supply:

1. Connect the interface cable to the base of the digital scanner, as described in *Installing the Interface Cable on page 1-3*.
2. Connect the other end of the interface cable to the host (refer to the host manual to locate the correct port).
3. Plug the power supply into the power jack on the interface cable. Plug the other end of the power supply into an AC outlet.

Configuring the Digital Scanner

To configure the digital scanner use the bar codes included in this manual. See *Chapter 4, User Preferences & Miscellaneous Digital Scanner Options* and *Chapter 5, Imaging Preferences* for information about programming the digital scanner using bar code menus. Also see each host-specific chapter to set up connection to a specific host type.

Mounting the Digital Scanner

An optional wall mount bracket is available for mounting the scanner to a wall or other vertical surface. To mount the DS9808:

1. Place the bracket in its desired location on the wall, and insert three #6 screws through each screw hole in the bracket.

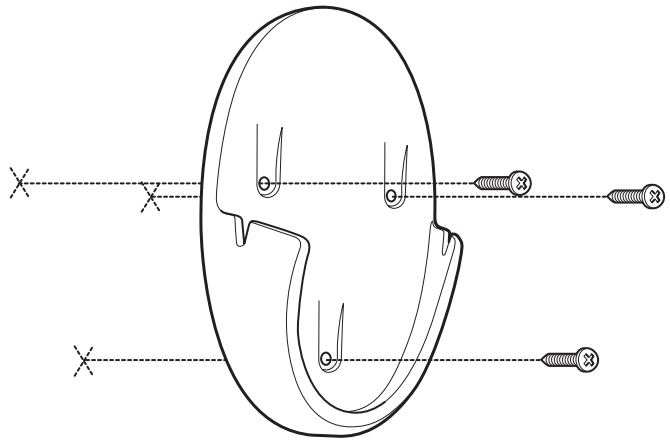


Figure 1-4 *Installing the Wall Mount Bracket*

2. Tighten the screws to secure the bracket to the wall.

3. Slide the base of the digital scanner into the bracket, oriented so the scan window faces down.

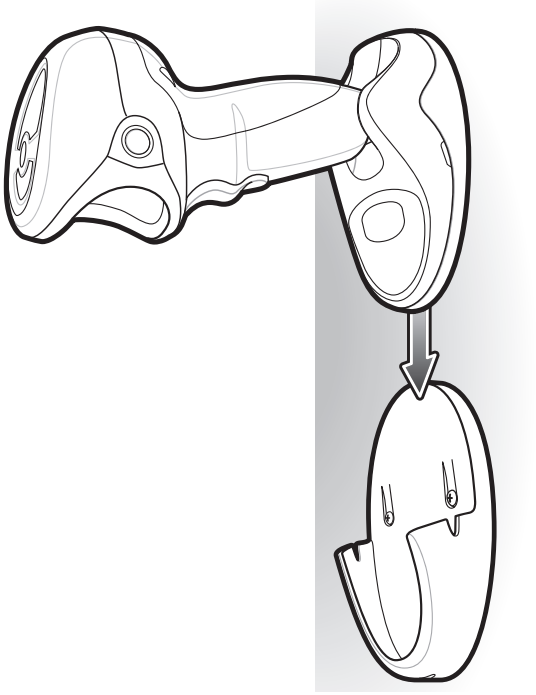


Figure 1-5 *Inserting the DS9808 into the Wall Mount Bracket*

Accessories

Required Accessories

The digital scanner ships with the *DS9808 Quick Start Guide*. Also order an interface cable for the appropriate interface, and a universal power supply if the interface requires this. For additional items, contact a local Zebra representative or business partner.

Optional Accessories

Contact Zebra to purchase the following accessories for the DS9808:

- Wall Mount Bracket (see *Mounting the Digital Scanner on page 1-4* for installation instructions)
- RFID module*.

*The RFID module is an option for use with the DS9808-LR only and is not available for all countries. Please contact your local Zebra representative regarding availability. RFID is only available in certain countries.

Electronic Article Surveillance (EAS) (Optional)

Because there are several Checkpoint EAS systems available, your local Checkpoint representative should install the EAS cable. To contact your local Checkpoint representative inside the U.S. call 800-257-5540, ext. 4300. Outside the U.S., call (609) 848-1800, ext. 4300.

If using an EAS cable, refer to the *Electronic Article Surveillance Cable Installation Guide* (p/n 70-32824-xx).

CHAPTER 2 DATA CAPTURE

Introduction

This chapter provides beeper and LED definitions, techniques involved in scanning bar codes, general instructions and tips about scanning, and decode zone diagrams.

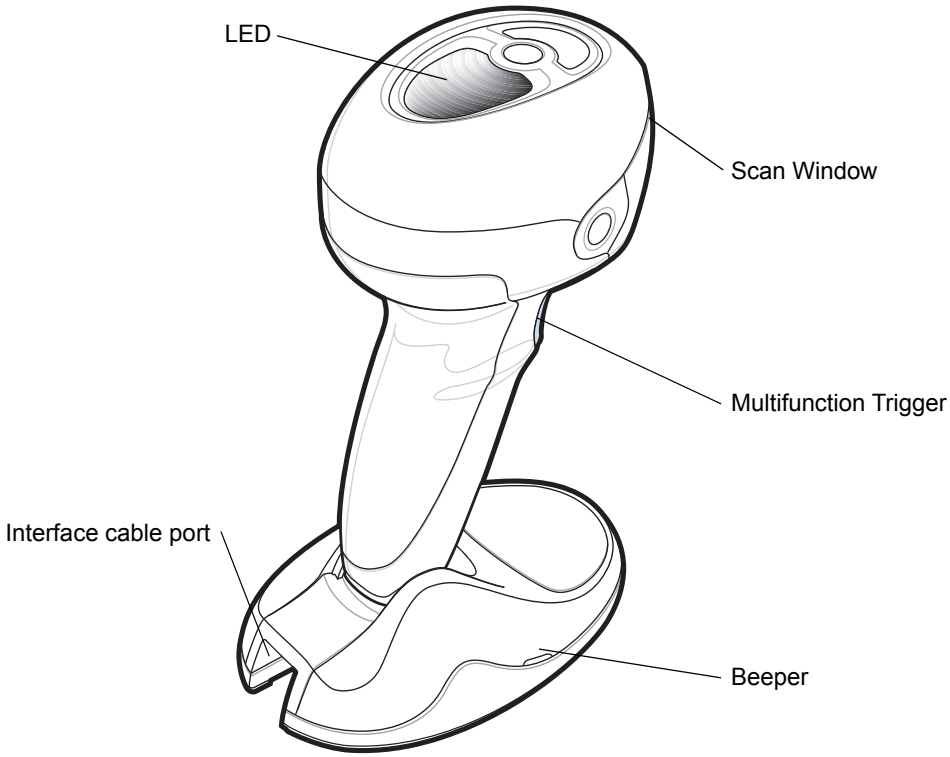


Figure 2-1 *Parts*

Beeper Definitions

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

Table 2-1 *Beeper Definitions*

Beeper Sequence	Indication
Standard Use	
Low/medium/high beeps	Power up.
Short high beep	A bar code symbol was decoded (if decode beeper is enabled).
4 long low beeps	Transmission error.
5 low beeps	Conversion or format error.
Low/low/low/extra low beeps	RS-232 receive error.
High beep	The digital scanner detected a <BEL> character over RS-232.
RFID	
Medium-high (two-tone) beep	An RFID tag was read (if RFID read beeper is enabled).
High-medium/low/low beeps	Unexpected RFID indication.
Image Capture	
Low beep	Snapshot mode started or completed.
High/low beeps	Snapshot mode timed out.
Parameter Menu Scanning	
Low/high beeps	Input error; incorrect bar code, programming sequence, or **Cancel** scanned.
High/low beeps	Keyboard parameter selected. Enter value using numeric bar codes.
High/low/high/low beeps	Successful program exit with change in parameter setting.
Code 39 Buffering	
High/low beeps	New Code 39 data was entered into the buffer.
3 long high beeps	Code 39 buffer is full.
High/low/high beeps	The Code 39 buffer was erased.
Low/high/low beeps	The Code 39 buffer was erased or there was an attempt to clear or transmit an empty buffer.
Low/high beeps	A successful transmission of buffered data.

Table 2-1 *Beeper Definitions (Continued)*

Beeper Sequence	Indication
Macro PDF	
2 low beeps	MPDF sequence buffered.
2 long low beeps	File ID error. A bar code not in the current MPDF sequence was scanned.
3 long low beeps	Out of memory. There is not enough buffer space to store the current MPDF symbol.
4 long low beeps	Bad symbology. Scanned a 1D or 2D bar code in a MPDF sequence, a duplicate MPDF label, a label in an incorrect order, or trying to transmit an empty or illegal MPDF field.
5 long low beeps	Flushing MPDF buffer.
Fast warble beep	Aborting MPDF sequence.
Low/high beeps	Flushing an already empty MPDF buffer.
Host Specific	
USB only	
4 short high beeps	The digital scanner has not completed initialization. Wait several seconds and scan again.
Low/medium/high beeps upon scanning a USB device type	Communication with the host must be established before the digital scanner can operate at the highest power level.
Low/medium/high beeps occur more than once	The USB host can put the digital scanner in a state where power to the scanner is cycled on and off more than once. This is normal and usually happens when the PC cold boots.
RS-232 only	
1 short high beep	A <BEL> character is received and Beep on <BEL> is enabled.

LED Definitions

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

Table 2-2 *Standard LED Definitions*

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

Scanning

The DS9808 has a built-in, light-weight stand to easily accommodate both hands-free (presentation) and hand-held scanning.

NOTE Certain areas of the digital scanner's handle may feel warm at times. This is normal.

Hands-Free Scanning

The digital scanner is in hands-free (presentation) mode when it sits on a counter top, or when it is mounted on a wall in the wall mount bracket. In this mode, the digital scanner operates in continuous (constant-on) mode, where it automatically decodes a bar code presented in its field of view.

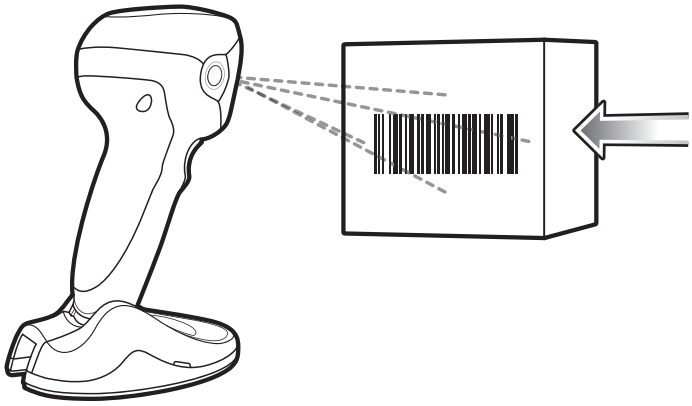


Figure 2-2 *Scanning in Hands-Free Mode*

Hand-Held Scanning

DS9808-SR/DL Hand-Held Scanning

When lifted off the counter or removed from the wall mount bracket, the DS9808-SR/DL operates in standard trigger mode. Aim the digital scanner at a bar code and pull the trigger to decode.

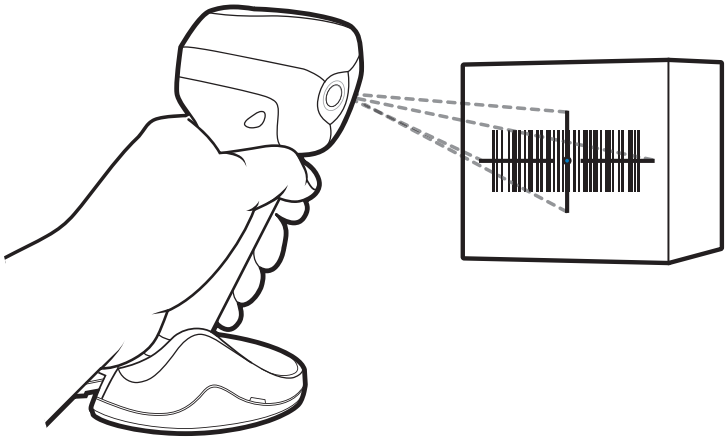


Figure 2-3 *Scanning in Hand-Held Mode - DS9808-SR/DL*

DS9808-LR/LL Multifunction Trigger

The DS9808-LR/LL digital scanner includes a multifunction trigger which you can program to quickly switch between imaging, laser scanning, and/or RFID reading. See *Multifunction Mode Triggering (DS9808-LR/LL Only) on page 4-21* for more information.

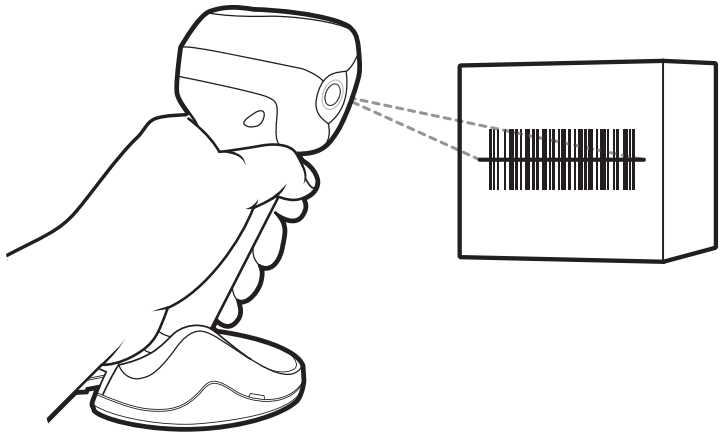


Figure 2-4 *Scanning in Hand-Held Mode - DS9808-LR/LL*

By default, this scanner automatically switches to a laser scanner when lifted off the counter for longer range 1D bar code scanning. If the scanner detects a PDF bar code or cannot decode the bar code, it switches to imager operation. After successful decode, time out, or trigger release, the digital scanner reverts to the laser engine for the next trigger pull.

Aiming

Imager Aiming

When scanning, the digital scanner projects a red laser aiming pattern which allows positioning the bar code within its field of view. See *Decode Ranges on page 2-8* for the proper distance to achieve between the digital scanner and a bar code.

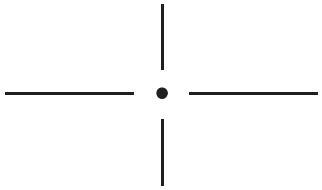


Figure 2-5 *Imager Aiming Pattern*

If necessary, the digital scanner turns on its red LEDs to illuminate the target bar code.

To scan a bar code, center the symbol in any orientation within the aiming pattern. Be sure the entire symbol is within the rectangular area formed by the cross pattern.

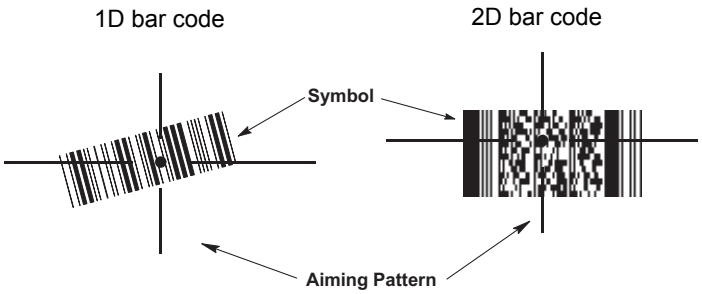


Figure 2-6 *Scanning Orientation with Imager Aiming Pattern*

The digital scanner can also read a bar code presented within the aiming pattern but not centered. The top examples in *Figure 2-7* show acceptable aiming options, while the bottom examples can not be decoded.

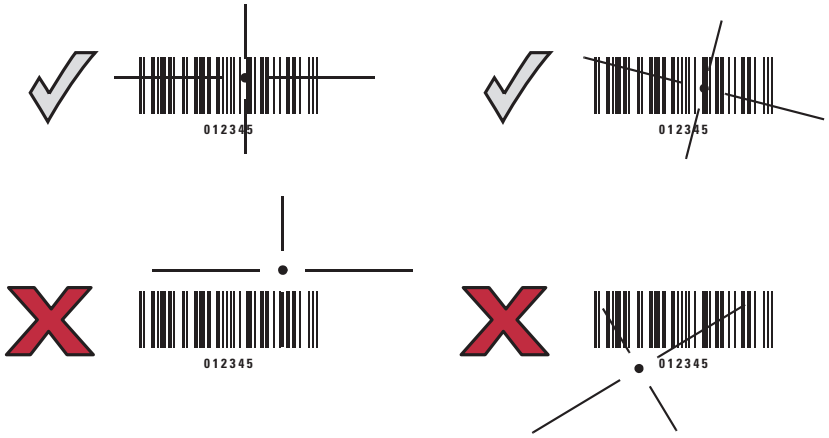


Figure 2-7 *Acceptable and Incorrect Aiming*

Laser Aiming

In hand-held mode, The DS9808-LR/LL digital scanner projects a laser line by default. Ensure the scan line crosses every bar and space of the symbol.

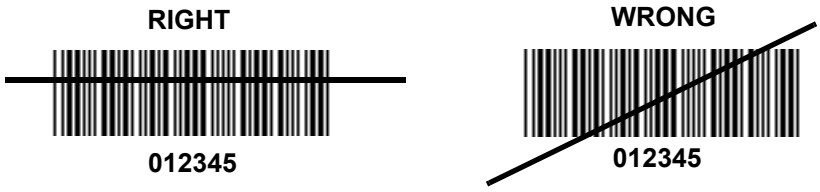


Figure 2-8 *Scanning Orientation with Laser Aiming Pattern*

The aiming pattern (or laser line) is smaller when the digital scanner is closer to the symbol and larger when it is farther from the symbol. Scan symbols with smaller bars or elements (mil size) closer to the digital scanner, and those with larger bars or elements (mil size) farther from the digital scanner.

The digital scanner beeps to indicate that it successfully decoded the bar code. For more information on beeper and LED definitions, see *Table 2-1* and *Table 2-2*.

Decode Ranges

Table 2-3 *DS9808-LR/LL 1D Laser Decode Distances*

Symbol Density	Bar Code Type	Typical Working Ranges	
		Near	Far
5.0 mil	Code 39	0 in / 0 cm	5.0 in / 12.7 cm
10 mil	80% UPCEAN	0 in / 0 cm	13.5 in / 34.3 cm
13 mil	100% UPC	0 in / 0 cm	18.0 in / 45.7 cm

Table 2-4 *DS9808-SR/DL 1D Imager Decode Ranges*

Symbol Density	Bar Code Type	Typical Working Ranges	
		Near	Far
5.0 mil	Code 39	0 in / 0 cm	4.5 in / 11.4 cm
10 mil	80% UPCEAN	0 in / 0 cm	8.5 in / 21.6 cm
13 mil	100% UPC	0 in / 0 cm	10.5 in / 26.7 cm

Table 2-5 *2D Imager Decode Ranges (All Models)*

Symbol Density	Bar Code Type	Typical Working Ranges	
		Near	Far
6.6 mil	PDF417	0 in / 0 cm	5.0 in / 12.7 cm
10 mil	Data Matrix	0 in / 0 cm	6.0 in / 15.2 cm

Table 2-6 *Hands-Free Decode Ranges (All Models)*

Symbol Density	Bar Code Type	Typical Working Ranges	
		Near	Far
5.0 mil	Code 39	0 in / 0 cm	4.5 in / 11.4 cm
10 mil	80% UPCEAN	0 in / 0 cm	7.0 in / 17.8 cm
13 mil	100% UPC	0 in / 0 cm	8.0 in / 20.3 cm
6.6 mil	PDF417	0 in / 0 cm	4.5 in / 11.4 cm
10 mil	Data Matrix	0 in / 0 cm	4.5 in / 11.4 cm

CHAPTER 3 MAINTENANCE & TECHNICAL SPECIFICATIONS

Introduction

This chapter provides suggested digital scanner maintenance, troubleshooting, technical specifications, and signal descriptions (pinouts).

Maintenance

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

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

Troubleshooting

Table 3-1 *Troubleshooting*

Problem	Possible Causes	Possible Solutions
The aiming pattern does not appear when pressing the trigger.	No power to the digital scanner.	If the configuration requires a power supply, re-connect the power supply.
	Incorrect host interface cable is used.	Connect the correct host interface cable.
	Interface/power cables are loose.	Re-connect cables.
	Digital scanner is disabled.	For IBM 468x and USB IBM hand-held, IBM table top, and OPOS modes, enable the digital scanner via the host interface. Otherwise, see the technical person in charge of scanning.
	If using RS-232 Nixdorf B mode, CTS is not asserted.	Assert CTS line.
	Aiming pattern is disabled.	Enable the aiming pattern. See *Hand-Held Decode Aiming Pattern on page 4-35*.
Digital scanner emits short low/short medium/short high beep sequence (power-up beep sequence) more than once.	The USB bus may put the digital scanner in a state where power to the scanner is cycled on and off more than once.	Normal during host reset.
Digital scanner emits aiming pattern, but does not decode the bar code.	Digital scanner is not programmed for the correct bar code type.	Program the digital scanner to read that type of bar code. See *Chapter 11, Symbologies*.
	Bar code symbol is unreadable.	Scan test symbols of the same bar code type to determine if the bar code is defaced.
	The symbol is not completely inside aiming pattern.	Move the symbol completely within the aiming pattern.
Digital scanner emits 4 short high beeps during decode attempt.	Digital scanner has not completed USB initialization.	Wait several seconds and scan again.

Table 3-1 *Troubleshooting (Continued)*

Problem	Possible Causes	Possible Solutions
Digital scanner decodes bar code, but does not transmit the data to the host.	Digital scanner is not programmed for the correct host type.	Scan the appropriate host type programming bar code. See the chapter corresponding to the host type.
	Interface cable is loose.	Re-connect the cable.
	If the digital scanner emits 4 long low beeps, a transmission error occurred.	Set the scanner's communication parameters to match the host's setting.
	If the digital scanner emits 5 low beeps, a conversion or format error occurred.	Configure the digital scanner's conversion parameters properly.
	If the digital scanner emits low/high/low beeps, it detected an invalid ADF rule.	Program the correct ADF rules. Refer to the *Advanced Data Formatting Programmer Guide.*
	If the digital scanner emits high/low beeps, the scanner is buffering Code 39 data.	Normal scanning a Code 39 bar code and the Code 39 Buffering option is enabled.
Host displays scanned data incorrectly.	Digital scanner is not programmed to work with the host.	Scan the appropriate host type programming bar code.
		For RS-232, set the digital scanner's communication parameters to match the host's settings.
		For a Keyboard Wedge configuration, program the system for the correct keyboard type, and turn off the CAPS LOCK key.
		Program the proper editing options (e.g., UPC-E to UPC-A Conversion).
Digital scanner emits high/high/high/low beeps when not in use.	RS-232 receive error.	Normal during host reset. Otherwise, set the digital scanner's RS-232 parity to match the host setting.
Digital scanner emits low/high beeps during programming.	Input error or **Cancel** bar code was scanned.	Scan the correct numeric bar codes within range for the parameter programmed.
Digital scanner emits low/high/low/high beeps during programming.	Out of ADF parameter storage space.	Erase all rules and re-program with shorter rules.

Table 3-1 *Troubleshooting (Continued)*

Problem	Possible Causes	Possible Solutions
Digital scanner emits low/high/low beeps.	Clearing Code 39 buffer.	Normal when scanning the Code 39 Buffering **Clear Buffer** bar code or upon attempt to transmit an empty Code 39 buffer.
Digital scanner emits a power-up beep after changing USB host type.	The USB bus re-established power to the digital scanner.	Normal when changing USB host type.
Digital scanner emits one high beep when not in use.	In RS-232 mode, a <BEL> character was received and Beep on <BEL> option is enabled.	Normal when **Beep on <BEL>** is enabled and the digital scanner is in RS-232 mode.

NOTE If after performing these checks the digital scanner still experiences problems, contact the distributor or call support. See *page xx* for the telephone numbers.

Technical Specifications

Table 3-2 *Technical Specifications*

Item	Description
Physical Characteristics	
Dimensions	8 in. (max) H x 5.4 in. L x 3.4 in. W 20.3 cm (max) H x 13.7 cm L x 8.6 cm W
Weight	12 oz. (340 g)
Power With optional RFID module	5 +/-10%VDC @ 450 mA nominal 5 +/-10%VDC @ 1.2 A nominal (special power supply and cable required)
Performance Characteristics: DS9808-SR/DL and DS9808-LR/LL Imager Engine	
Light Source	Aiming pattern: 650 nm laser diode Illumination: 630 nm LED
Imager Field of View (Vertical x Horizontal)	39º (H) x 25º (V)
Roll Pitch Yaw	360º +/- 65º +/- 60º
Swipe Speed	Programmable up to 100 in. (254 cm) per second
Performance Characteristics: DS9808-LR/LL Laser Engine	
Light Source	650nm laser diode
Scan Angle	40º nominal
Symbology Decode Capability	
1D	UPC/EAN, UPC/EAN with supplementals, Bookland EAN, ISSN, UCC Coupon Extended Code, Code 128, GS1-128, ISBT 128, Code 39, Code 39 Full ASCII, Trioptic Code 39, Code 32, Code 93, Code 11, Matrix 2 of 5, Interleaved 2 of 5, Discrete 2 of 5, Codabar, MSI, Chinese 2 of 5, GS1 DataBar variants
2D	PDF417, MicroPDF417, Composite Codes, TLC-39, Data Matrix, Maxicode, QR Code, MicroQR, Aztec
Postal	US Postnet and Planet, UK Postal, Japan, Australian, Netherlands KIX Code, USPS 4CB/One Code/Intelligent Mail, UPU FICS Postal
Typical Working Distance	See *Decode Ranges on page 2-8*.
Motion Tolerances	Swipe speed: 100 inches per second at full illumination, measured on 100% UPC bar code 80% MRD at 4 inches distance form the housing

Table 3-2 *Technical Specifications (Continued)*

Item	Description
Interfaces Supported	The scanner supports the following protocols over USB: HID Keyboard (default mode), SNAPI, COM Port Emulation, IBM SurePOS (Yellowstone) (IBM Handheld, IBM Tabletop, OPOS) The scanner supports the following protocols over RS232: Standard, Wincor Nixdorf, ICL, Fujitsu, Olivetti
User Environment	
Operating Temperature	32º F to 104º F (0º C to 40º C)
Storage Temperature	-40º F to 158º F (-40º C to 70º C)
Humidity	5% to 95%, non-condensing
Drop Specifications	Withstands multiple 5 ft. (1.52 m) drops to concrete at operating temperature extremes.
Ambient Light Tolerance	Tolerant to typical artificial indoor and natural outdoor (direct sunlight) lighting conditions. Fluorescent, Incandescent, Mercury Vapor, Sodium Vapor, LED: 450 Ft Candles (4,844 Lux) Sunlight: 8000 Ft Candles (86,111 Lux) Note: LED lighting with high AC ripple content can impact scanning performance.
Accessories	
Mounting Options	Wall mount bracket
Power Supplies	Power supplies are available for applications that do not supply power over the host cable.

Digital Scanner Signal Descriptions

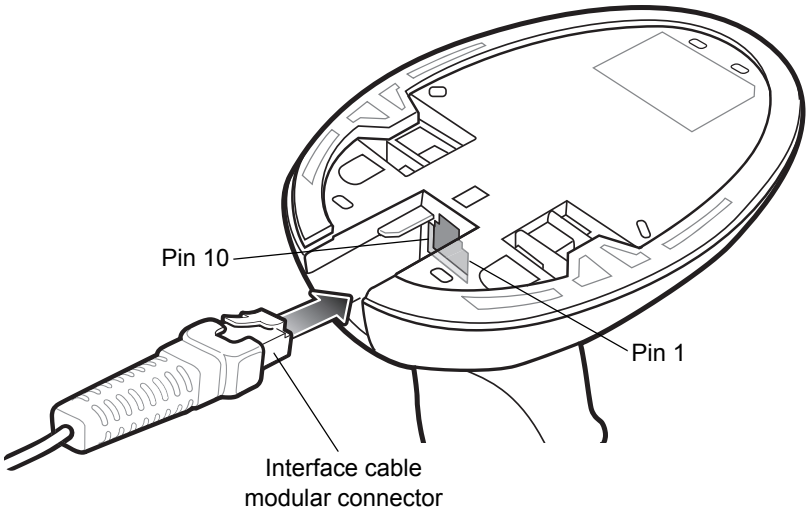


Figure 3-1 *Digital Scanner Cable Pinouts*

The signal descriptions in *Table 3-3* apply to the connectors on the DS9808 digital scanner and are for reference only.

Table 3-3 *DS9808 Digital Scanner Signal Pin-outs*

Pin	IBM	RS-232	Keyboard Wedge	USB
1	Reserved	Reserved	Reserved	Jump to Pin 6
2	Power	Power	Power	Power
3	Ground	Ground	Ground	Ground
4	IBM_A(+)	TxD	KeyClock	Reserved
5	Reserved	RxD	TermData	D +
6	IBM_B(-)	RTS	KeyData	Jump to Pin 1
7	Reserved	CTS	TermClock	D -
8	Reserved	Reserved	Reserved	Reserved
9	Reserved	Reserved	Reserved	Reserved
10	Reserved	Reserved	Reserved	Reserved

CHAPTER 4 USER PREFERENCES & MISCELLANEOUS DIGITAL SCANNER OPTIONS

Introduction

You can program the digital scanner to perform various functions, or activate different features. This chapter describes each user preference feature and provides programming bar codes for selecting these features.

The digital scanner ships with the settings shown in *Table 4-1 on page 4-2* (also see *Appendix A, Standard Default Parameters* for all host device and miscellaneous defaults). If the default values suit requirements, programming is not necessary.

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

NOTE Most computer monitors allow scanning the bar codes directly on the screen (when using the imaging engine). When scanning from the screen, be sure to set the document magnification to a level where you can see the bar code clearly, and bars and/or spaces are not merging.

If not using a USB cable, select a host type (see each host chapter 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, scan the *Set Default Parameter on page 4-5*. Throughout the programming bar code menus, asterisks indicate (*)default values.

* Indicates Default — *High Volume — Feature/Option
(0) — Option Value

Scanning Sequence Examples

In most cases, scanning one bar code sets the parameter value. For example, to set the beeper tone to high, scan the **High Frequency** (beeper tone) bar code listed under *Beeper Tone on page 4-7*. The digital scanner issues a fast warble beep and the LED turns green, signifying a successful parameter entry.

Other parameters, such as **Serial Response Time-Out** or **Data Transmission Formats**, require scanning several bar codes. See these parameter descriptions for this procedure.

Errors While Scanning

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

User Preferences/Miscellaneous Options Parameter Defaults

Table 4-1 lists defaults for user preferences parameters. To change the default values, scan the appropriate bar codes in this guide. These new values replace the standard default values in memory. To recall the default parameter values, scan the *Set Default Parameter on page 4-5*.

NOTE See *Appendix A, Standard Default Parameters* for all user preferences, hosts, symbologies, and miscellaneous default parameters.

Table 4-1 *User Preferences Parameter Defaults*

Parameter	Parameter Number	Default	Page Number
User Preferences			
Set Default Parameter	N/A	Set Defaults	*4-5*
Parameter Bar Code Scanning	236	Enable	*4-6*
Beep After Good Decode	56	Enable	*4-6*
Beeper Tone	145	Medium	*4-7*
Beeper Volume	140	High	*4-8*
Beeper Duration	628	Medium	*4-9*
Suppress Power-up Beeps	721	Do not suppress	*4-9*
Hands-Free Mode	630	Enable	*4-10*
Presentation Performance Mode	650	Standard	*4-11*
Time Delay to Presentation Idle Mode	663	1 Minute	*4-13*
Time Delay to Presentation Sleep Mode	662	1 Hour	*4-15*
Low Power Mode	128	Disable	*4-17*
Time Delay to Low Power Mode	146	1 Hour	*4-18*

Table 4-1 *User Preferences Parameter Defaults (Continued)*

Parameter	Parameter Number	Default	Page Number
Hand-Held Trigger Mode	138	Auto Aim	4-20
Multifunction Triggering (DS9808-LR/LL Only)		Single Trigger	4-21
Trigger A	631	Laser Preferred Decoding	4-22
Trigger B	632	Trigger A value	4-23
Trigger A + B	633	Ignore	4-24
Laser Preferred Timeout	637	1.5 seconds	4-25
Dual Trigger Debounce Timeout	634	0.05 seconds	4-25
Dual Trigger Processing	635	Wait	4-26
Host Trigger Mode (DS9808-LR/LL Only)	636	Imager Decoding	4-26
Picklist Mode	402	Disabled Always	4-28
Continuous Bar Code Read	649	Disable	4-29
Unique Bar Code Reporting	723	Enable	4-29
Decode Session Timeout	136	9.9 Sec	4-30
Timeout Between Decodes, Same Symbol	137	0.5 Sec	4-30
Timeout Between Decodes, Different Symbols	144	0.1 Sec	4-31
Fuzzy 1D Processing	514	Enable	4-31
Decode Mirror Images	537	Auto	4-32
Mobile Phone/Display Mode	716	Disable	4-33
PDF Prioritization	719	Disable	4-34
PDF Prioritization Timeout	720	200 ms	4-34
Hand-Held Decode Aiming Pattern	306	Enable	4-35
Hands-Free Decode Aiming Pattern	590	Enable for PDF	4-36
Presentation Mode Field of View	609	Full	4-37
Decoding Illumination	298	Enable	4-38
Product ID (PID) Type	1281	Host Type Unique	4-38
Multicode Mode	677	Disable	4-39
Multicode Expression	661	1	4-40
Multicode Mode Concatenation	717	Disable	4-45
Multicode Concatenation Symbology	722	Concatenate as PDF417	4-46

Table 4-1 *User Preferences Parameter Defaults (Continued)*

Parameter	Parameter Number	Default	Page Number
Miscellaneous Options			
Transmit Code ID Character	45	None	*4-49*
Prefix Value	99, 105	7013 <CR><LF>	*4-50*
Suffix 1 Value Suffix 2 Value	98, 104 100, 106	7013 <CR><LF>	*4-50*
Scan Data Transmission Format	235	Data as is	*4-51*
FN1 Substitution Values	103, 109	Set	*4-52*
Transmit “No Read” Message	94	Disable	*4-53*

User Preferences

Set Default Parameter

You can reset the digital scanner to two types of defaults: factory defaults or custom defaults. Scan the appropriate bar code below to reset the digital scanner to its default settings and/or set its current settings as custom defaults.

- **Set Defaults** - Scan this bar code to reset all default parameters as follows.
  - If you previously set custom defaults by scanning **Write to Custom Defaults**, scan **Set Defaults** to retrieve and restore the digital scanner's custom default settings.
  - If you did not set custom defaults, scan **Restore Defaults** to restore the factory default values listed in *Table A-1*.
- **Set Factory Defaults** - Scan this bar code to restore the factory default values listed in *Table A-1.* This deletes any custom defaults set.
- **Write to Custom Defaults** - Scan this bar code to set the current digital scanner settings as custom defaults. Once set, you can recover custom default settings by scanning **Restore Defaults**.

***Set Defaults**

Set Factory Defaults

Write to Custom Defaults

Parameter Bar Code Scanning

Parameter # 236

To disable the decoding of parameter bar codes, including the **Set Defaults** parameter bar codes, scan the **Disable Parameter Scanning** bar code below. To enable decoding of parameter bar codes, scan **Enable Parameter Scanning**.

***Enable Parameter Bar Code Scanning**
(1)

Disable Parameter Bar Code Scanning
(0)

Beep After Good Decode

Parameter # 56

Scan a bar code below to select whether or not the digital scanner beeps after a good decode. If selecting **Do Not Beep After Good Decode**, the beeper still operates during parameter menu scanning and to indicate error conditions.

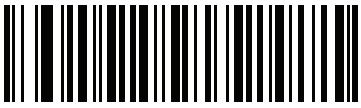
***Beep After Good Decode**
(Enable)
(1)

Do Not Beep After Good Decode
(Disable)
(0)

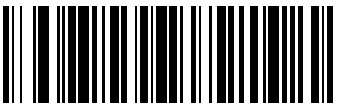
Beeper Tone

Parameter # 145

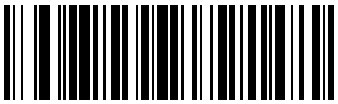
To select a decode beep frequency (tone), scan one of the following bar codes.



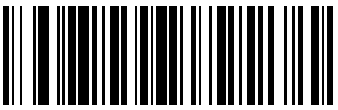
Off
(3)



Low Tone
(2)



***Medium Tone**
(1)



High Tone
(0)

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

Beeper Volume

Parameter # 140

To select a beeper volume, scan the **Low Volume, Medium Volume**, or **High Volume** bar code.

Low Volume
(2)

Medium Volume
(1)

***High Volume**
(0)

Beeper Duration

Parameter # 628

To select the duration for the beeper, scan one of the following bar codes.

Short
(0)

*** Medium**
(1)

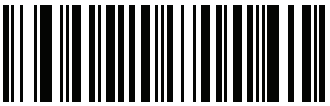
Long
(2)

Suppress Power-up Beeps

Parameter # 721

Select whether or not to suppress the digital scanner's power-up beeps.

*** Do Not Suppress Power-up Beeps**
(0)



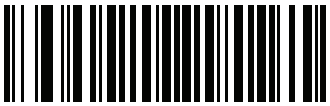
Suppress Power-up Beeps
(1)

Hands-Free Mode

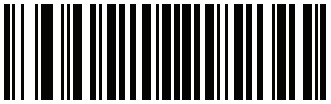
Parameter # 630

In hands-free mode, when you place the digital scanner on the counter top, it automatically triggers when presented with a bar code. Lifting the digital scanner causes it to behave according to the setting of the *Hand-Held Trigger Mode on page 4-20*.

If you select **Disable Hands-Free Mode**, the digital scanner behaves according to the setting of the *Hand-Held Trigger Mode* regardless of whether it is hand-held or on a counter top.



***Enable Hands-Free Mode**
(1)



Disable Hands-Free Mode
(0)

Presentation Performance Mode

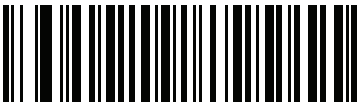
Parameter # 650

Select one of the following Presentation Performance Mode options:

- **Standard Presentation Mode** is optimized for general purpose scanning, i.e., reading bar codes from standard surfaces such as paper labels or hang tags. This mode balances bar code swipe speed (the speed a bar code can pass through the field of view and still be read) and decode range (distance between the digital scanner and the bar code) for optimal performance on standard paper-based bar codes.
- **Enhanced Presentation Mode** is also optimized for general purpose (paper-based) scanning but provides for a faster bar code swipe speed and shorter decode range than **Standard Presentation Mode**. This mode is recommended for applications requiring the highest bar code swipe speed (e.g., automated scanning) or a reduced decode range (e.g., to better match EAS deactivation range or reduce the occurrence of inadvertent reads during hands-free operation).
- **Traditional Presentation Mode** is optimized for applications that require frequent reading of bar codes from mobile phones or PC displays. This mode allows more time for the digital scanner to analyze each bar code, improving performance on challenging bar codes such as those on a mobile phone display where the backlight has dimmed. This mode is also recommended for applications that include many truncated or poor quality bar codes. Because swipe speed is reduced, present bar codes to the digital scanner rather than swiping them when using this mode.

> ***NOTE*** To scan bar codes from mobile phones or PC displays, you must enable *Mobile Phone/Display Mode on page 4-33*.

***Standard Presentation Mode**
(2)



Enhanced Presentation Mode
(0)

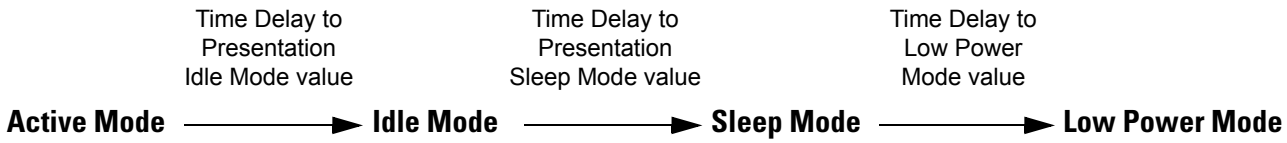
Traditional Presentation Mode
(3)

Digital Scanner Activity Modes

The digital scanner is capable of four modes of activity:

- **Active Mode** - The digital scanner uses full illumination for active scanning.
- **Idle Mode** - In presentation mode only, the digital scanner's illumination dims after a programmable time period. See *Time Delay to Presentation Idle Mode on page 4-13*. The digital scanner wakes when it is lifted or senses motion, upon presentation of a bar code, or upon a trigger pull.
- **Sleep Mode** - In presentation mode only, the digital scanner's illumination shuts off after a programmable time period after Idle Mode has expired. See *Time Delay to Presentation Sleep Mode on page 4-15*. The digital scanner wakes when it is lifted or senses motion, upon presentation of a bar code (depending on ambient light conditions), or upon a trigger pull.
- **Low Power Mode** - The digital scanner enters a low power consumption mode after Sleep Mode has expired, in which the LEDs turn off in order to conserve energy and prolong the life of the scanner. See *Low Power Mode*. In hand-held mode, this occurs immediately after the programmed *Time Delay to Low Power Mode*. In presentation mode, this occurs after idle mode and sleep mode. The digital scanner wakes when it is lifted, senses a trigger pull, or when the host attempts to communicate.

NOTE The digital scanner does not use Low Power Mode when connected to a USB or IBM host.



Note: Time delays are cumulative.

Figure 4-1 *Power Levels*

Time Delay to Presentation Idle Mode

Parameter # 663

In Presentation Mode, this parameter sets the time the digital scanner remains active before entering idle mode with dim illumination. The digital scanner wakes upon presentation of a bar code or a trigger pull.

Disable
(0)

1 Second
(1)

10 Seconds
(10)

***1 Minute**
(17)

5 Minutes
(21)

15 Minutes
(27)

Time Delay to Presentation Idle Mode (continued)

30 Minutes
(29)

45 Minutes
(30)

1 Hour
(33)

3 Hours
(35)

6 Hours
(38)

9 Hours
(41)

Time Delay to Presentation Sleep Mode

Parameter # 662

In Presentation Mode, this parameter sets the time the digital scanner remains active before entering sleep mode with no illumination. The digital scanner wakes when it senses motion, upon presentation of a bar code, or a trigger pull.

NOTE Digital scanner performance is not guaranteed in dim conditions.

Disable
(0)

1 Second
(1)

10 Seconds
(10)

1 Minute
(17)

5 Minutes
(21)

Time Delay to Presentation Sleep Mode (continued)

15 Minutes
(27)

30 Minutes
(29)

45 Minutes
(30)

***1 Hour**
(33)

3 Hours
(35)

6 Hours
(38)

9 Hours
(41)

Low Power Mode

Parameter # 128

If enabled, the digital scanner enters a low power consumption mode after Sleep Mode has expired, in which the LEDs turn off in order to conserve energy and prolong the life of the scanner. In hand-held mode, this occurs immediately after the programmed *Time Delay to Low Power Mode*. In presentation mode, this occurs after idle mode and sleep mode. The digital scanner wakes when it is lifted, senses a trigger pull, or when the host attempts to communicate.

If disabled, power remains on after each decode attempt.

***Disable Low Power Mode**
(0)

Enable Low Power Mode
(1)

Time Delay to Low Power Mode

Parameter # 146

NOTE This parameter only applies when Low Power Mode is enabled.

This parameter sets the time the digital scanner remains active before entering lower power mode (after the applicable activity mode - see *Digital Scanner Activity Modes on page 4-12*). The digital scanner wakes upon trigger pull or when the host attempts to communicate with the digital scanner.

1 Second
(17)

10 Seconds
(26)

1 Minute
(33)

5 Minutes
(37)

15 Minutes
(43)

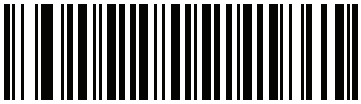
Time Delay to Low Power Mode (continued)

30 Minutes
(45)

45 Minutes
(46)

***1 Hour**
(49)

3 Hours
(51)



6 Hours
(54)

9 Hours
(57)

Hand-Held Trigger Mode

Parameter # 138

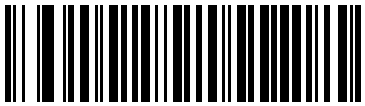
Select one of the following trigger modes for the digital scanner:

- **Standard (Level)** - A trigger pull activates decode processing. Decode processing continues until the bar code decodes, you release the trigger, or the Decode Session Timeout occurs.
- **Presentation (Blink)** - The digital scanner activates decode processing when it detects a bar code in its field of view. After a period of non-use, the digital scanner enters a low power mode, in which the LEDs turn off until the digital scanner senses motion.

  NOTE Laser scanning is not applicable in hand-held presentation mode.

- **Auto Aim** - If the primary trigger (trigger A) is set to imager, this trigger mode turns on the laser aiming pattern when you lift the digital scanner. A trigger pull activates decode processing. After 2 seconds of inactivity the aiming pattern shuts off.

Standard (Level)
(0)



Presentation (Blink)
(7)

***Auto Aim**
(9)

Multifunction Mode Triggering (DS9808-LR/LL Only)

NOTE Multifunction Mode Triggering is only available in the dual-engine (imager and laser) models of the digital scanner.

The RFID module is an option for use with the DS9808-LR only and is not available for all countries. Please contact your local Zebra representative regarding availability. RFID is only available in certain countries.

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

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

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

- **Laser Preferred Decoding** - Programs the trigger for decoding using the laser engine first, then the imager if a decode does not occur. See *Scanning on page 2-5* for more information.
- **Imager Decoding** - Programs the trigger for decoding using the imager engine.
- **RFID Reading** - Programs the trigger for reading RFID tags.
- **Imager Plus RFID** - A trigger pull attempts decode using the imager engine, and turns on the optional RFID reader, if available, to read RFID tags.
- **Laser Preferred Plus RFID** - A trigger pull attempts decode using the laser engine first, then the imager if a decode does not occur, and also turns on the optional RFID reader, if available, to read RFID tags.
- **Laser Only Decoding** - Programs the trigger for decoding using the laser engine only.
- **Set to Trigger A Value** (Trigger B Only) - Sets Trigger B to the same value as Trigger A. This allows you to automatically program Trigger B upon selecting the function of Trigger A.
- **Ignore Dual Trigger Pull** (Trigger A+B Only) - Uses the mode of the first trigger pull only. This increases triggering efficiency when the dual trigger is not needed.

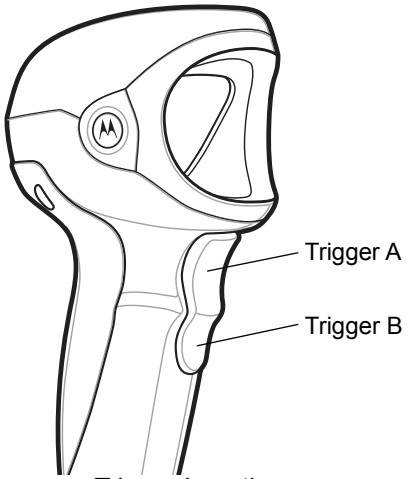


Figure 4-2 *Trigger Locations*

Trigger A (DS9808-LR/LL Only)

Parameter # 631

NOTE You cannot set Trigger A to **RFID Reading** if Trigger B is set to either **RFID Reading** or **Set to Trigger A Value**.

***Laser Preferred Decoding**
(0)

Imager Decoding
(1)

RFID Reading
(2)

Imager Plus RFID
(3)

Laser Preferred Plus RFID
(4)

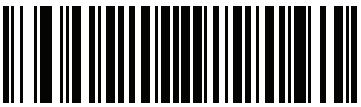
Laser Only Decoding
(6)

Trigger B (DS9808-LR/LL Only)

Parameter # 632

NOTE You cannot set Trigger B to **RFID Reading** or **Set to Trigger A Value** if Trigger A is set to **RFID Reading**.

Laser Preferred Decoding
(0)



Imager Decoding
(1)

RFID Reading
(2)
(Default for devices with RFID module)

Imager Plus RFID
(3)

Laser Preferred Plus RFID
(4)

***Set to Trigger A Value**
(5)

Laser Only Decoding
(6)

Trigger A+B (DS9808-LR/LL Only)

Parameter # 633

Laser Preferred Decoding
(0)

Imager Decoding
(1)

RFID Reading
(2)

Imager Plus RFID
(3)

Laser Preferred Plus RFID
(4)

***Ignore Dual Trigger Pull (Use Mode of First Trigger Pull)**
(5)

Laser Only Decoding
(6)

Laser Preferred Timeout (DS9808-LR/LL Only)

Parameter # 637

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

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

Laser Preferred Timeout

Dual Trigger Debounce Timeout (DS9808-LR/LL Only)

Parameter # 634

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

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

The default is 0.05 seconds.

Dual Trigger Debounce Timeout

Dual Trigger Processing (DS9808-LR/LL Only)

Parameter # 635

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

Process Immediately

***Wait for Timeout Before Processing**

Host Triggering (DS9808-LR/LL Only)

Parameter # 636

Set an option for host-initiated triggering:

- **Laser Preferred Decoding** - Programs the host trigger for decoding using the laser engine first, then the imager if a decode does not occur. See *Scanning on page 2-5* for more information.
- **Imager Decoding** - Programs the trigger for decoding using the imager engine.
- **RFID Reading** - Programs the trigger for reading RFID tags.
- **Imager Plus RFID** - A trigger pull attempts decode using the imager engine, and turns on the optional RFID reader, if available, to read RFID tags.
- **Laser Preferred Plus RFID** - A trigger pull attempts decode using the laser engine first, then the imager if a decode does not occur, and also turns on the optional RFID reader, if available, to read RFID tags.
- **Laser Only Decoding** - Programs the trigger for decoding using the laser engine only.

Host Triggering (continued)

Laser Preferred Decoding
(0)

***Imager Decoding**
(1)

RFID Reading
(2)

Imager Plus RFID
(3)

Laser Preferred Plus RFID
(4)

Laser Only Decoding
(6)

Picklist Mode

Parameter # 402

Picklist mode enables the digital scanner to decode only bar codes that are aligned under the laser crosshair. Select one of the following picklist modes for the digital scanner:

- **Disabled Always** - Picklist mode is always disabled.
- **Enabled in Hand-Held Mode** - Picklist mode is enabled when the digital scanner is out of hands-free mode and disabled when the digital scanner is in presentation mode.
- **Enabled in Hands-Free Mode** - Picklist mode is enabled when the digital scanner is in hands-free mode only.
- **Enabled Always** - Picklist mode is always enabled.

NOTE For the DS9808-LR/LL, if you configure Trigger B for Imager Decoding and enable Picklist Mode, activating Trigger B turns on the imager aiming pattern, and releasing the trigger activates decoding.

***Disabled Always**
(0)

Enabled in Hand-Held Mode
(1)

Enabled in Hands-Free Mode
(3)

Enabled Always
(2)

Continuous Bar Code Read

Parameter # 649

Enable this to report every bar code while the trigger is pressed.

✓ ***NOTE*** Zebra strongly recommends enabling *Picklist Mode on page 4-28* with this feature. Disabling Picklist Mode can cause accidental decodes when more than one bar code is in the imaging engine's field of view.

***Disable Continuous Bar Code Read**
(0)

Enable Continuous Bar Code Read
(1)

Unique Bar Code Reporting

Parameter # 723

Enable this to report only unique bar codes while the trigger is pressed. This option only applies when **Continuous Bar Code Read** is enabled.

Disable Continuous Bar Code Read Uniqueness
(0)

***Enable Continuous Bar Code Read Uniqueness**
(1)

Decode Session Timeout

Parameter # 136

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 9.9 seconds.

To set a Decode Session Timeout, scan the bar code below. Next, scan two numeric bar codes from *Appendix G, Numeric Bar Codes* 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 the bar code below, then scan the **0** and **5** bar codes. To correct an error or change the selection, scan **Cancel** on *page G-2*.

Decode Session Timeout

Timeout Between Decodes, Same Symbol

Parameter # 137

Use this option in presentation mode and Continuous Bar Code Read to prevent the beeper from continuously beeping when a symbol is left in the digital scanner's field of view. It is programmable in 0.1 second increments from 0.0 to 9.9 seconds. The default interval is 0.5 seconds.

To select the timeout between decodes for the same symbol, scan the bar code below, then scan two numeric bar codes from *Appendix G, Numeric Bar Codes* that correspond to the desired interval, in 0.1 second increments.

Timeout Between Decodes, Same Symbol

Timeout Between Decodes, Different Symbols

Parameter # 144

Use this option in presentation mode and Continuous Bar Code Read to control the time the scanner is inactive between decoding different symbols. It is programmable in 0.1 second increments from 0.1 to 9.9 seconds. The default is 0.1 seconds.

To select the timeout between decodes for different symbols, scan the bar code below, then scan two numeric bar codes from *Appendix G, Numeric Bar Codes* that correspond to the desired interval, in 0.1 second increments.

Timeout Between Decodes, Different Symbols

Fuzzy 1D Processing

Parameter # 514

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

***Enable Fuzzy 1D Processing (1)**

Disable Fuzzy 1D Processing (0)

Decode Mirror Images (Data Matrix Only)

Parameter # 537

Select an option for decoding mirror image Data Matrix bar codes:

- Always - decode only Data Matrix bar codes that are mirror images
- Never - do not decode Data Matrix bar codes that are mirror images
- Auto - decode both mirrored and unmirrored Data Matrix bar codes.

Never
(0)

Always
(1)

***Auto**
(2)

Mobile Phone/Display Mode

Parameter # 716

This mode improves bar code reading performance off mobile phones and electronic displays. Enable this in hand-held, hands-free, or both modes, or disable this.

NOTE If you enable this mode, for best performance also select *Traditional Presentation Mode (3) on page 4-11* and enable *Hands-Free Decode Aiming Pattern on page 4-36*.

***Disable Mobile Phone/Display Mode**
(0)

Enable in Hand-Held Mode
(1)

Enable in Hands-Free Mode
(2)

Enable in Both Modes
(3)

PDF Prioritization

Parameter # 719

Enable this feature to delay decoding certain 1D bar codes (see *Note* below) by the value specified in *PDF Prioritization Timeout*. During that time the digital scanner attempts to decode a PDF417 symbol (e.g., on a US driver's license), and if successful, reports this only. If it does not decode (can not 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 digital scanner to report it. This parameter does not affect decoding other symbologies.

NOTE

The 1D Code 128 bar code lengths include the following:

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

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

- 8 characters
- 12 characters

***Disable PDF Prioritization (0)**

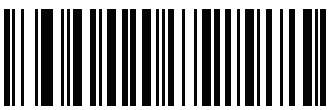
Enable PDF Prioritization (1)

PDF Prioritization Timeout

Parameter # 720

When *PDF Prioritization* is enabled, this timeout specifies how long the digital scanner attempts to decode a PDF417 symbol before reporting the 1D bar code in the field of view.

Scan the following bar code, then scan four digits from *Appendix G, Numeric Bar Codes* that specify the timeout in milliseconds. For example, to enter 400 ms, scan the following bar code, then scan 0400. The range is 0 to 5000 ms, and the default is 200 ms.



PDF Prioritization Timeout

Hand-Held Decode Aiming Pattern

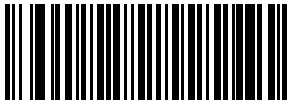
Parameter # 306

Select **Enable Hand-Held Decode Aiming Pattern** to project the aiming pattern during bar code capture, **Disable Hand-Held Decode Aiming Pattern** to turn the aiming pattern off, or **Enable Hand-Held Decode Aiming Pattern on PDF** to project the aiming pattern when the digital scanner detects a 2D bar code.

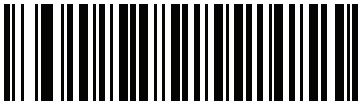
This parameter does not apply to Snapshot Mode. See *Operational Modes on page 5-4*.

NOTE With *Picklist Mode on page 4-28* enabled, the decode aiming pattern flashes even when the **Decode Aiming Pattern** is disabled.

***Enable Hand-Held Decode Aiming Pattern**
(2)



Disable Hand-Held Decode Aiming Pattern
(0)



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

Hands-Free Decode Aiming Pattern

Parameter # 590

Select **Enable Hands-Free Decode Aiming Pattern** to project the aiming pattern during bar code capture, **Disable Hands-Free Decode Aiming Pattern** to turn the aiming pattern off, or **Enable Hands-Free Decode Aiming Pattern on PDF** to project the aiming pattern when the digital scanner detects a 2D bar code.

This parameter does not apply to Snapshot Mode. See *Operational Modes on page 5-4*.

NOTE With *Picklist Mode on page 4-28* enabled, the decode aiming pattern flashes even when the **Decode Aiming Pattern** is disabled.

Enable Hands-Free Decode Aiming Pattern (1)

Disable Hands-Free Decode Aiming Pattern (0)

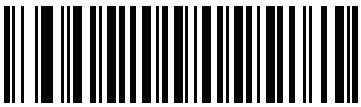
***Enable Hands-Free Decode Aiming Pattern on PDF (2)**

Presentation Mode Field of View

Parameter # 609

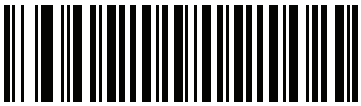
In presentation mode, by default the digital scanner searches the larger area of the aiming pattern (**Full Field of View**).

To search for a bar code in a smaller region around the aiming pattern's center cross in order to speed search time, select **Small Field of View** or **Medium Field of View**.



Small Field of View
(0)

Medium Field of View
(1)



***Full Field of View**
(2)

Decoding Illumination (Hand-Held Mode only)

Parameter # 298

When in hand-held mode, selecting **Enable Decoding Illumination** causes the digital scanner to flash illumination to aid decoding. Select **Disable Decoding Illumination** to prevent the digital scanner from using decoding illumination.

Enabling illumination usually results in superior images. The effectiveness of the illumination decreases as the distance to the target increases.

***Enable Decoding Illumination**
(1)

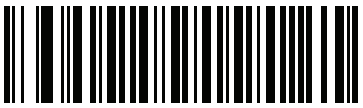
Disable Decoding Illumination
(0)

Product ID (PID) Type

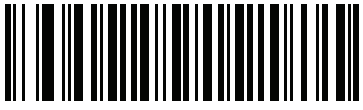
Parameter # 1281

Select the PID value reported in USB enumeration.

***Host Type Unique**
(0)



Product Unique
(1)



IBM Unique
(2)

Multicode Mode

Parameter # 677

Enable this parameter to allow multiple bar codes to decode upon one trigger event based on the programmed multicode expression. The digital scanner reports a successful decode and provides user indication only if it decodes all bar codes indicated by the multicode expression, otherwise the decode fails. Bar codes are transmitted in the order defined in the multicode expression. Disable this to operate in normal decode mode.

NOTES Enabling **Multicode Mode** disables *Picklist Mode*.

Multicode does not operate in presentation mode.

Do not use **Multicode Mode** if a trigger is set to **Laser Preferred Decoding**.

Do not use **Multicode Mode** if *Continuous Bar Code Read* is enabled.

When using this mode, always orient the digital scanner at the same distance and angle (perpendicular).

***Disable Multicode Mode**
(0)

Enable Multicode Mode
(1)

Multicode Expression

Parameter # 661

Use this feature to program a multicode expression for *Multicode Mode* (grid method). The default is 1, which indicates any bar code.

To set the multicode expression:

1. Scan the bar code below.
2. Scan bar codes from the alphanumeric keyboard in the *Advanced Data Formatting Programmer Guide* to define the expression.
3. Scan the **End of Message** bar code from the *Advanced Data Formatting Programmer Guide.*

Multicode Expression

Multicode Expression Syntax: [n] [Element 1]; [Element 2]; ... [Element n];

Where *n* is the number of elements in the overall expression.

The multicode expression describes the bar code(s) that the digital scanner can expect to find in an image. Each element represents one bar code in the digital scanner's field of view. The order of elements in the expression is the order in which bar code data from each element transmits to the host. Elements are defined using one or more of the following methods:

By Region. This type of element limits decoding to a specific area within the digital scanner's field of view. Region coordinates are defined as the top left and bottom right corners of the region, expressed in percentages of the field of view. These can range from 0% to 100%, or 0x00 to 0x64 in hex, for both horizontal and vertical axes. A region element is constructed as:

[R] [4] [Top, Left] [Bottom, Right]

Where:

- [R] is the character R
- [4] is 0x04, indicating there are four bytes thereafter to describe the region
- [Top, Left] are two values representing the top left corner of the region
- [Bottom, Right] are two values representing the bottom right corner of the region

By Code Type. An element can specify a specific bar code symbology to find and decode somewhere in the field of view. A code type element is constructed as:

[C] [2] [Code Type]

Where:

- [C] is the character C
- [2] is 0x02, indicating there are two bytes thereafter to describe the code type
- [Code Type] is the desired symbology's parameter number (see *Chapter 11, Symbologies*). For single-byte parameter numbers, extend the value to two bytes by adding 00 before the parameter number.

Notes

When defining multicode expressions consider the following:

- Use the Code Type specifier if there are bar codes of more than one code type in view.
- Always use the Region specifier when there are multiple bar codes of the same code type.
- When transmission order is important (the first element in the expression transmits first), use either type to define the order.
- When there are unwanted bar codes in view, filter them out in one of two ways:
  - Use Code Type to specify only the target bar codes.
  - Use Region to identify only the target bar codes.
- If the expression does not contain a Region specifier, scanning angle and distance do not matter. If you specify a region you must scan in a fixed orientation and at a fixed distance. Because of this, it is preferable to use the Code Type specifier rather than the Region specifier.
- When defining regions:
  - Defining a region much larger than the bar code improves tolerance to scan distance and angle, but can cause a decode of a nearby bar code instead of the target bar code. Therefore, for best performance define larger regions when only a few bar codes are in view and those in view are widely separated.
  - Defining a region close to (or smaller than) the target bar code improves the probability of decoding this bar code rather than one nearby, but scan distance and angle must be more accurate. Therefore, for best performance define small regions when many bar codes are in view or those in view are close together.
- Use Region elements to improve decode speeds by reducing the image area to search for the target bar code.
- Specifying Code Type may also improve decode speeds for some code types.
- Although you can scan parameter bar codes when multicode mode is enabled, be aware of the following: If the multicode expression defined a region(s), to scan a parameter bar code you must position the bar code within the first region defined in the expression. In some cases, this first region is not the center of the image and aiming at the parameter bar code does not result in a successful decode.

The following examples show the multicode expressions in both hex and decimal formats, however in the sample figures the values are decimal. Be sure to use the correct base numbering system when creating an expression. A region specified as 0x00 0x00 0x64 0x32 represents a region with coordinates of Top-Left (0,0) and Bottom Right (100,50).

Example 1

To decode one Code 128 bar code anywhere in the image (even when bar codes of other types are in view), as in *Figure 4-3*, program the expression as follows:

The expression in decimal is (formatted for readability):

1 C 2 0 8 ;

To program the expression via scanning parameters the sequence is (spaces are for readability):

[MultiCode-Expression] 01 C 02 00 08 ; [End Of Message]

To program the expression via host command (SSI/SNAPI) the sequence is:

0x01 0x43 0x02 0x00 0x08 0x3b

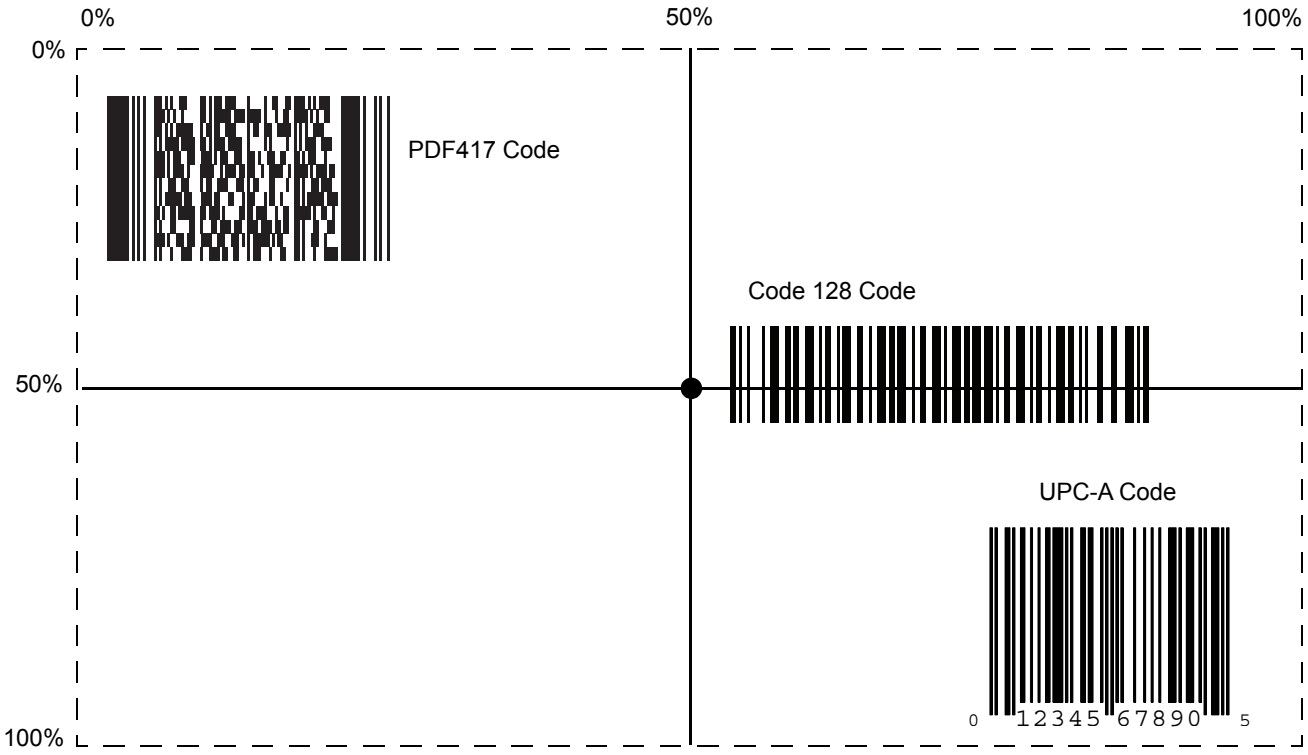


Figure 4-3 *Multicode Expression Example 1*

Example 2a

To decode a Code128 (Code Type=8) on the top half of the image and a PDF417 (Code Type=15) on the bottom half of the image, as in *Figure 4-4*, program the expression as follows:

The expression in decimal is (formatted for readability):

2 C 2 0 8 R 4 0 0 100 50 ; C 2 0 15 R 4 0 50 100 100 ;

To program the expression via scanning parameters the sequence is:

[MultiCode-Expression] 02 C 02 00 08 R 04 00 00 64 32 ; C 02 00 0F R 04 00 32 64 64 ; [End Of Message]

To program the expression via host command (SSI/SNAPI) the sequence is:

0x02 0x43 0x02 0x00 0x08 0x52 0x04 0x00 0x00 0x64 0x32 0x3B 0x43 0x02 0x00 0x0F 0x52 0x04 0x00 0x32 0x64 0x64 0x3B

Example 2b

In *Figure 4-4*, if the bottom PDF417 bar code must transmit first, reverse the sequence of the two bar codes:

The expression in decimal is (formatted for readability):

2 C 2 0 15 R 4 0 50 100 100 ; C 2 0 8 R 4 0 0 100 50 ;

To program the expression via scanning parameters the sequence is:

[MultiCode-Expression] 02 C 02 00 0F R 04 00 32 64 64 ; C 02 00 08 R 04 00 00 64 32 ; [End Of Message]

To program the expression via host command (SSI/SNAPI) the sequence is:

0x02 0x43 0x02 0x00 0x0F 0x52 0x04 0x00 0x32 0x64 0x64 0x3B 0x43 0x02 0x00 0x08 0x52 0x04 0x00 0x00 0x64 0x32 0x3B

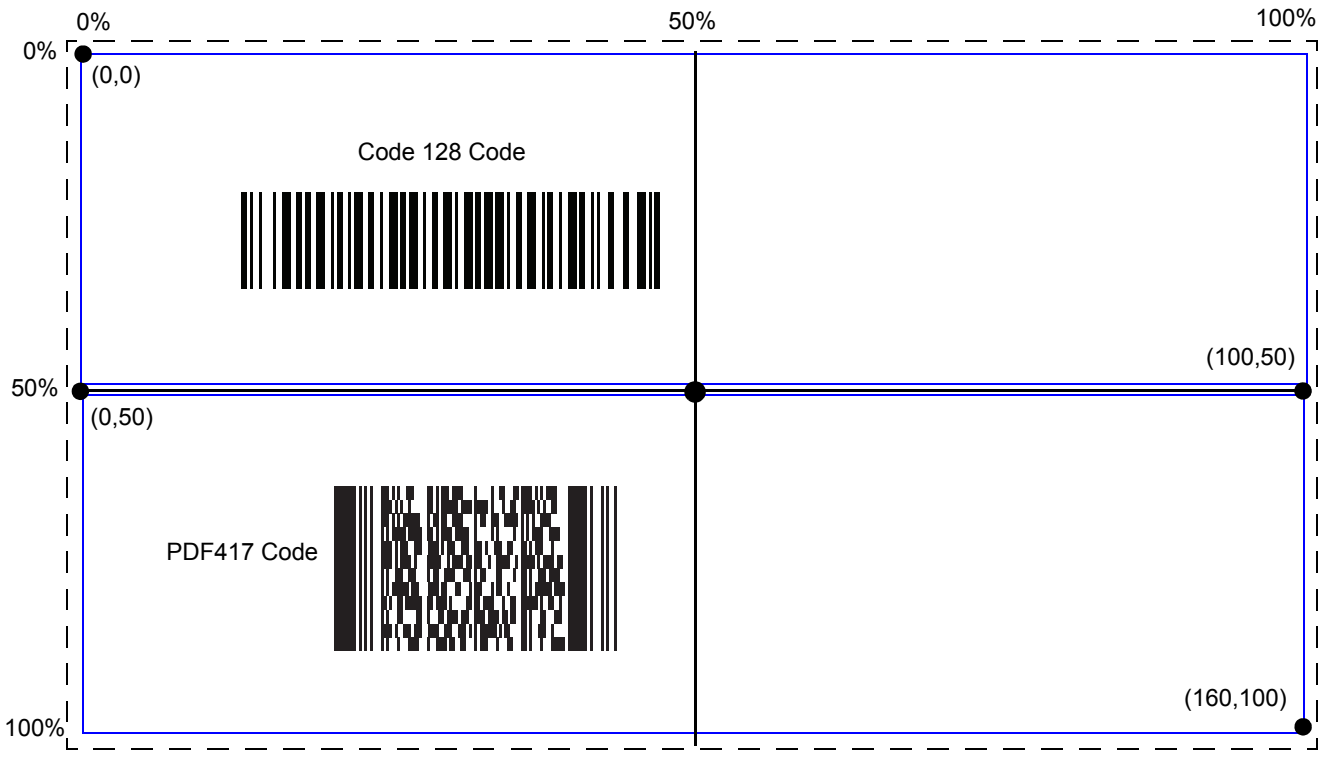


Figure 4-4 *Multicode Expression Example 2*

Example 3

To decode the set of three bar codes while excluding the center Code 128 bar code, as in *Figure 4-5*, the expression is:

The expression in decimal is (formatted for readability):

3 C 2 0 15 R 4 0 0 50 50 ; C 2 [F0 24] R 4 70 0 100 40 ; C 2 0 8 R 4 65 60 100 100 ;

To program the expression via scanning parameters the sequence is:

[MultiCode-Expression] 03 C 02 00 0F R 04 00 00 32 32 ; C 02 F0 24 R 04 46 00 64 28 ;
C 02 00 08 R 04 41 3C 64 64 ; [End Of Message]

To program the expression via host command (SSI/SNAPI) the sequence is:

0x03 0x43 0x02 0x00 0x0F 0x52 0x04 0x00 0x00 0x32 0x32 0x3B 0x43 0x02 0xF0 0x24 0x52 0x04 0x46 0x00 0x64 0x28 0x3B 0x43 0x02 0x00 0x08 0x52 0x04 0x41 0x3C 0x64 0x64 0x3B

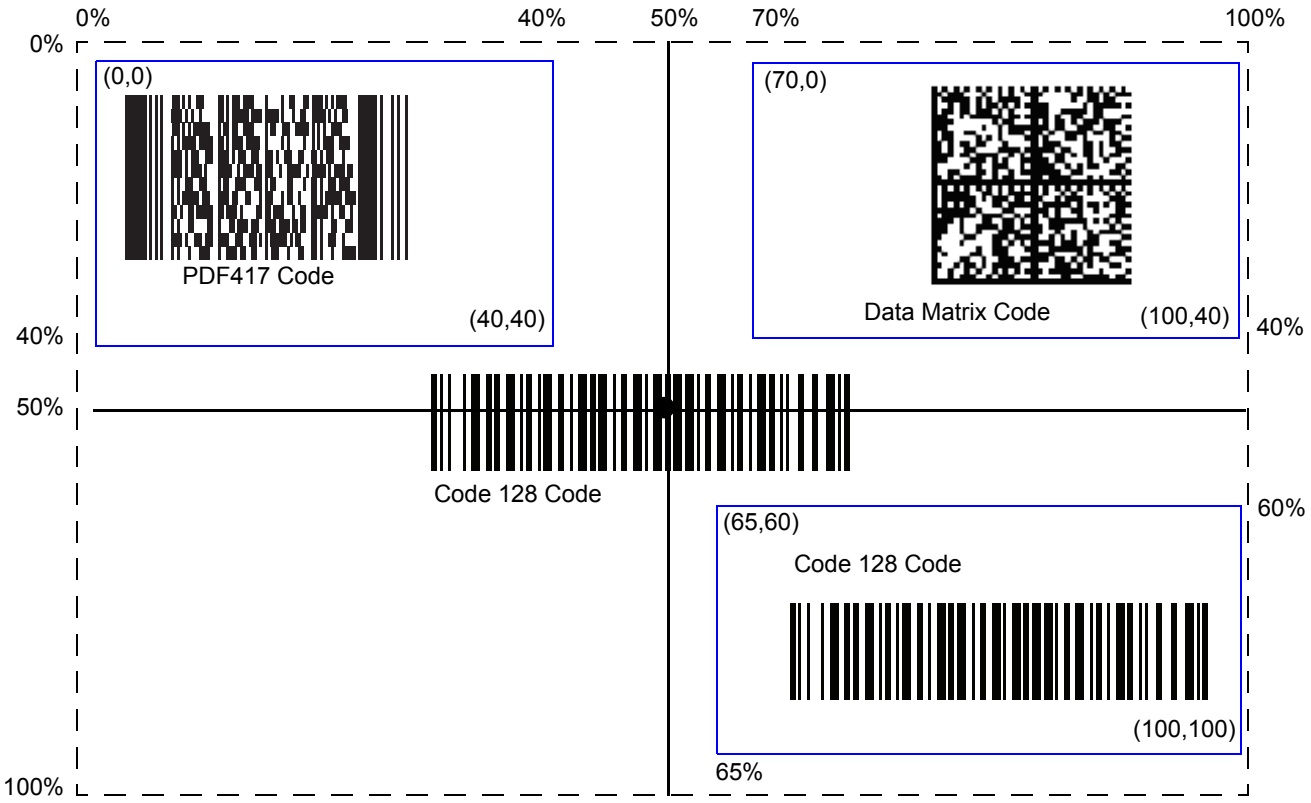


Figure 4-5 *Multicode Expression Example 3*

Multicode Mode Concatenation

Parameter # 717

Enable this parameter to transmit multiple decoded bar codes, as specified by the *Multicode Expression*, as one bar code. Use the *Multicode Concatenation Symbology* parameter to specify how the concatenated bar codes transmit.

Disable this to transmit decoded bar codes separately.

NOTE When using Multicode Mode Concatenation, disable *Transmit Code ID Character on page 4-49* and check digits.

Enable Multicode Mode Concatenation (1)

***Disable Multicode Mode Concatenation (0)**

Multicode Concatenation Symbology

Parameter # 722

Use this parameter to specify how to transmit the concatenated bar codes decoded as specified by the *Multicode Expression*. *Multicode Mode Concatenation* must be enabled to use this option.

Concatenation as Code 128
(1)

***Concatenation as PDF417**
(2)

Concatenation as Data Matrix
(3)

Concatenation as Maxicode
(4)

Multicode Troubleshooting

Troubleshooting Multicode Expression Programming

Use the following suggestions if encountering problems programming a multicode expression:

- Ensure the expression is valid. Invalid expressions are rejected during programming. When an expression is rejected the previous expression remains intact. If after programming the expression the digital scanner can still decode any bar code, the expression was possibly rejected.
- When programming the multicode expression via parameter bar code, the digital scanner generates beeps. If any of the following beeps do not sound during programming, an error occurred (see *Table 2-1 on page 2-2* and *Table 2-2 on page 2-4* for error indicators):
  - Scanning the **Multicode Expression** bar code produces a two-tone (same pitch) beep.
  - Scanning each value of the expression produces a two-tone (same pitch) beep.
  - Scanning the **End Of Message** bar code produces a four-tone (high-low-high-low) beep.
- Check the expression for syntax errors.
- Try programming a simple expression to ensure the syntax is correct. See *Examples of Simple Multicode Expressions*.
- Review *Notes on page 4-41* for additional hints.

Troubleshooting Multicode Mode Scanning and Decoding

Use the following suggestions if encountering problems using multicode mode:

- If the digital scanner appears to decode any single bar code instead of the intended multiple bar codes, ensure you enabled *Multicode Mode on page 4-39*. Programming the multicode expression does not enable multicode mode.
- When specifying **Region**, ensure:
  - Coordinates are within range the 0-100 decimal (or 0x00 - 0x64 hexadecimal).
  - Top, Left is above Bottom, Right. Top, Left is 0,0 (0x00, 0x00 hexadecimal), and Bottom, Right is 100,100 (0x64, 0x64 hexadecimal).
  - Regions for two or more bar codes do not overlap.
- When specifying **Code Type** ensure the digital scanner supports the code type. Try decoding a single bar code without using multicode. If it does not decode try enabling the bar code type. See *Chapter 11, Symbologies*.
- Experiment with simpler expressions, then add to it until you discover the source of the error. For example try the simplest expression (see *Examples of Simple Multicode Expressions*) and make sure you can scan a single bar code. If so, extend the expression by adding a second bar code, specifying a region, or specifying the code type. Verify that the digital scanner can decode this new expression. Continue adding to the expression until it fails to decode as expected, indicating the source of the error.
- Review *Notes on page 4-41* for additional hints.

Examples of Simple Multicode Expressions

The simplest multicode expression is:

- One bar code of any type, anywhere in the image.
- To program this use: **[MultiCode-Expression] 01 ; [End Of Message]**

Another simple multicode expression is:

- One Code 128 bar code, anywhere in the image.
- To program this use: **[MultiCode-Expression] 01 C 02 00 08 ; [End Of Message]**

Miscellaneous Scanner Parameters

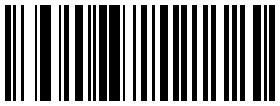
Transmit Code ID Character

Parameter # 45

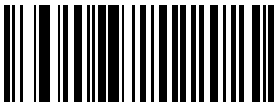
A Code ID character identifies the code type of a scanned bar code. This is useful when decoding more than one code type. In addition to any single character prefix already selected, the Code ID character is inserted between the prefix and the decoded symbol.

Select no Code ID character, a Symbol Code ID character, or an AIM Code ID character. For Code ID Characters, see *Symbol Code Identifiers on page E-1* and *AIM Code Identifiers on page E-3*.

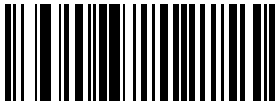
NOTE If you enable Symbol Code ID Character or AIM Code ID Character, and enable *Transmit "No Read" Message on page 4-53*, the digital scanner appends the code ID for Code 39 to the NR message.



Symbol Code ID Character
(2)



AIM Code ID Character
(1)



***None**
(0)

Prefix/Suffix Values

Key Category Parameter # P = 99, S1 = 98, S2 = 100

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

You can append a prefix and/or one or two suffixes to scan data for use in data editing. To set a value for a prefix or suffix, scan a four-digit number (i.e., four bar codes from *Appendix G, Numeric Bar Codes*) that corresponds to that value. See *Table I-1 on page I-1* for the four-digit codes.

When using host commands to set the prefix or suffix, set the key category parameter to 1, then set the 3-digit decimal value. See *Table I-1 on page I-1* for the four-digit codes.

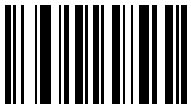
To correct an error or change a selection, scan *Cancel on page G-2*.

NOTE To use Prefix/Suffix values, first set the *Scan Data Transmission Format on page 4-51*.

Scan Prefix
(7)

Scan Suffix 1
(6)

Scan Suffix 2
(8)



Data Format Cancel

Scan Data Transmission Format

Parameter # 235

To change the scan data format, scan one of the following eight bar codes corresponding to the desired format.

NOTE If using this parameter do not use ADF rules to set the prefix/suffix.

To set values for the prefix and/or suffix, see *Prefix/Suffix Values on page 4-50*.

***Data As Is**
(0)

<DATA> <SUFFIX 1>
(1)

<DATA> <SUFFIX 2>
(2)

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

<PREFIX> <DATA >
(4)

Scan Data Transmission Format (continued)

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

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

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

FN1 Substitution Values

Key Category Parameter # 103

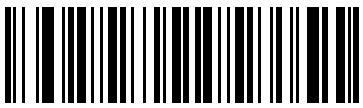
Decimal Value Parameter # 109

The wedge and USB HID keyboard hosts support a FN1 Substitution feature. Enabling this substitutes any FN1 character (0x1b) in an EAN128 bar code with a value. This value defaults to 7013 (Enter key).

When using host commands to set the FN1 substitution value, set the key category parameter to 1, then set the 3-digit keystroke value. See the ASCII character set table for the current host interface for the desired value.

To select a FN1 substitution value via bar code menus:

1. Scan the bar code below.



Set FN1 Substitution Value

2. Locate the keystroke desired for FN1 substitution in the ASCII character set table in the appropriate host interface chapter. Enter the 4-digit ASCII value by scanning each digit in *Appendix G, Numeric Bar Codes*.

To correct an error or change the selection, scan *Cancel on page G-2*.

See *USB Keyboard FN 1 Substitution on page 6-13* to enable FN1 substitution for the USB HID keyboard.

Transmit “No Read” Message

Parameter # 94

Scan a bar code below to select whether or not to transmit a No Read message. Enable this to transmit the characters NR when a successful decode does not occur before trigger release or the **Decode Session Timeout** expires. See *Decode Session Timeout on page 4-30*. Disable this to send nothing to the host if a symbol does not decode.

NOTE If you enable **Transmit No Read**, and also enable Symbol Code ID Character or AIM Code ID Character for *Transmit Code ID Character on page 4-49*, the digital scanner appends the code ID for Code 39 to the NR message.

Enable No Read
(1)

***Disable No Read**
(0)

CHAPTER 5 IMAGING PREFERENCES

Introduction

You can program the digital scanner to perform various functions, or activate different features. This chapter describes imaging preference features and provides programming bar codes for selecting these features.

NOTE Only the Symbol Native API (SNAPI) with Imaging interface supports image capture. See *USB Device Type on page 6-5* to enable this host.

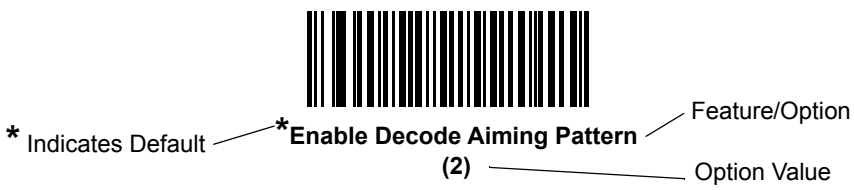
The digital scanner ships with the settings in *Imaging Preferences Parameter Defaults on page 5-2* (also see *Appendix A, Standard Default Parameters* for all host device and miscellaneous defaults). If the default values suit requirements, programming is not necessary.

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

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

If not using a USB cable, select a host type after the power-up beeps sound. See *Chapter 6, USB Interface* and *Chapter 7, RS-232 Interface* for specific host information. This is only necessary upon the first power-up when connecting to a new host.

To return all features to default values, scan the *Set Default Parameter on page 4-5*. Throughout the programming bar code menus, asterisks (*) indicate default values.



Scanning Sequence Examples

In most cases scanning one bar code sets the parameter value. For example, to disable image capture illumination, scan the **Disable Image Capture Illumination** bar code under *Image Capture Illumination on page 5-5*. The digital scanner issues a fast warble beep and the LED turns green, signifying a successful parameter entry.

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

Errors While Scanning

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

Imaging Preferences Parameter Defaults

Table 5-1 lists the defaults for imaging preferences parameters. To change the default values, scan the appropriate bar codes in this guide. These new values replace the standard default values in memory. To recall the default parameter values, scan the *Set Default Parameter on page 4-5*.

NOTE See *Appendix A, Standard Default Parameters* for all user preferences, hosts, symbologies, and miscellaneous default parameters.

Table 5-1 *Imaging Preferences Parameter Defaults*

Parameter	Parameter Number	Default	Page Number
Imaging Preferences			
Operational Modes	N/A	N/A	*5-4*
Image Capture Illumination	361	Enable	*5-5*
Gain / Exposure Priority for Snapshot Mode	562	Autodetect	*5-6*
Snapshot Mode Timeout	323	0 (30 seconds)	*5-7*
Snapshot Aiming Pattern	300	Enable	*5-7*
Image Cropping	301	Disable	*5-8*
Crop to Pixel Addresses	315 316 317 318	0 top 0 left 479 bottom 751 right	*5-9*
Image Size (Number of Pixels)	302	Full	*5-10*
Image Brightness (Target White)	390	180	*5-11*
JPEG Image Options	299	Quality	*5-11*
JPEG Target File Size	561	160 kB	*5-12*

Table 5-1 *Imaging Preferences Parameter Defaults (Continued)*

Parameter	Parameter Number	Default	Page Number
JPEG Quality and Size Value	305	65	*5-12*
Image Enhancement	564	Off (0)	*5-13*
Image File Format Selection	304	JPEG	*5-14*
Image Rotation	665	0	*5-15*
Bits per Pixel (BPP)	303	8 BPP	*5-16*
Signature Capture	93	Disable	*5-17*
Signature Capture Image File Format Selection	313	JPEG	*5-18*
Signature Capture Bits per Pixel (BPP)	314	8 BPP	*5-19*
Signature Capture Width	366	400	*5-20*
Signature Capture Height	367	100	*5-20*
Signature Capture JPEG Quality	421	65	*5-20*
Video View Finder	324	Disable	*5-21*
Video View Finder Image Size	329	1700 bytes	*5-21*

Imaging Preferences

The parameters in this chapter control image capture characteristics. Image capture occurs in all modes of operation, including decode and snapshot.

Operational Modes

The digital scanner has two modes of operation:

- Decode Mode
- Snapshot Mode.

Decode Mode

By default, when you pull the trigger the digital scanner attempts to locate and decode enabled bar codes within its field of view. The digital scanner remains in this mode until it decodes a bar code or you release the trigger.

Snapshot Mode

Use Snapshot Mode to capture a high-quality image and transmit it to the host. To temporarily enter this mode scan the **Snapshot Mode** bar code. While in this mode the digital scanner blinks the green LED at 1-second intervals to indicate it is not in standard operating (decode) mode.

In Snapshot Mode, the digital scanner turns on its laser aiming pattern to highlight the area to capture in the image. The next trigger pull instructs the digital scanner to capture a high quality image and transmit it to the host. A short time may pass (less than 2 seconds) between when the trigger is pulled and the image is captured as the digital scanner adjusts to the lighting conditions. Hold the digital scanner steady until the image is captured, denoted by a single beep.

If you do not press the trigger within the Snapshot Mode Timeout period, the digital scanner returns to Decode Mode. Use *Snapshot Mode Timeout on page 5-7* to adjust this timeout period. The default timeout period is 30 seconds.

To disable the laser aiming pattern during Snapshot Mode, see *Snapshot Aiming Pattern on page 5-7*.

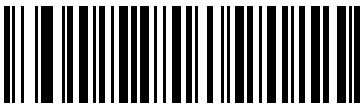
Snapshot Mode

Image Capture Illumination

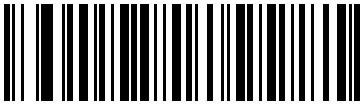
Parameter # 361

Selecting **Enable Image Capture Illumination** causes illumination to turn on during every image capture. Disable illumination to prevent the digital scanner from using illumination.

Enabling illumination usually results in superior images. The effectiveness of illumination decreases as the distance to the target increases.



***Enable Image Capture Illumination (1)**



Disable Image Capture Illumination (0)

Gain/Exposure Priority for Snapshot Mode

Parameter # 562

This parameter alters the digital scanner's gain exposure priority when it acquires an image in Snapshot Mode in auto exposure mode.

- Scan **Low Exposure Priority** to set a mode in which the digital scanner favors higher gain over exposure to capture an image. This results in an image that is less susceptible to motion blur at the expense of noise artifacts. However, for most applications, the amount of noise is acceptable.
- Scan **Low Gain Priority** to set a mode in which the digital scanner favors longer exposure time rather than higher gain to capture an image. This ensures that the image is less noisy and produces fewer artifacts during post processing activities like image enhancement (sharpening). The mode is recommended for fixed mount / fixed object image capture since the image acquired is susceptible to motion blur.
- Scan **Autodetect** (default) to set a mode in which the digital scanner automatically selects Gain Priority or Low Exposure Priority mode for Snapshot Mode. If the digital scanner is in a magnetic read switch enabled stand (or it is configured in Blink Mode), it uses Low Gain Priority mode. Otherwise, it uses the Low Exposure Priority mode.

Low Gain Priority
(0)

Low Exposure Priority
(1)

*** Autodetect**
(2)

Snapshot Mode Timeout

Parameter # 323

This parameter sets the amount of time the digital scanner remains in Snapshot Mode. The digital scanner exits Snapshot Mode when you pull the trigger, or when the Snapshot Mode Timeout elapses. To set this timeout value, scan the bar code below followed by a bar code from *Appendix G, Numeric Bar Codes*. The default value is 0 which represents 30 seconds; values increment by 30. For example, 1 = 60 seconds, 2 = 90 seconds, etc.

Snapshot Mode Timeout

Snapshot Aiming Pattern

Parameter # 300

Select **Enable Snapshot Aiming Pattern** to project the aiming pattern when in Snapshot Mode, or **Disable Snapshot Aiming Pattern** to turn the aiming pattern off.

***Enable Snapshot Aiming Pattern**
(1)

Disable Snapshot Aiming Pattern
(0)

Image Cropping

Parameter # 301

This parameter crops a captured image. Select **Disable Image Cropping** to present the full 752 x 480 pixels. Select **Enable Image Cropping** to crop the image to the pixel addresses set in *Crop to Pixel Addresses on page 5-9*.

Enable Image Cropping
(1)

***Disable Image Cropping**
(Use Full 752 x 480 Pixels)
(0)

Crop to Pixel Addresses

Parameter # 315 (Top)
Parameter # 316 (Left)
Parameter # 317 (Bottom)
Parameter # 318 (Right)

If you selected **Enable Image Cropping**, set the pixel addresses from (0,0) to (751,479) to crop to.

Columns are numbered from 0 to 751, rows from 0 to 479. Specify four values for Top, Left, Bottom, and Right, where Top and Bottom correspond to row pixel addresses, and Left and Right correspond to column pixel addresses. For example, for a 4 row x 8 column image in the extreme bottom-right section of the image set the following values:

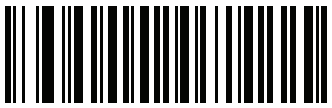
Top = 476, Bottom = 479, Left = 744, Right = 751

To set the crop to pixel address, scan each pixel address bar code below followed by three numeric bar codes representing the value. Leading zeros are required. For example, to crop the top pixel address to 3, scan 0, 0, 3. See *Appendix G, Numeric Bar Codes* for numeric bar codes.

✓ ***NOTE*** The digital scanner has a cropping resolution of 4 pixels. Setting the cropping area to less than 4 pixels (after resolution adjustment, see *Image Size (Number of Pixels) on page 5-10*) transfers the entire image.

Top Pixel Address
(0 - 479 Decimal)

Left Pixel Address
(0 - 751 Decimal)



Bottom Pixel Address
(0 - 479 Decimal)

Right Pixel Address
(0 - 751 Decimal)

Image Size (Number of Pixels)

Parameter # 302

This option alters image resolution before compression. Multiple pixels are combined to one pixel, resulting in a smaller image containing the original content with reduced resolution.

Select one of the following values:

Resolution Value	Uncropped Image Size
Full	752 x 480
1/2	376 x 240
1/4	180 x 120

***Full Resolution**
(0)

1/2 Resolution
(1)

1/4 Resolution
(3)

Image Brightness (Target White)

Parameter # 390

Type: Byte

Range: 1 - 240

This parameter sets the Target White value used in Snapshot and Video Viewfinder mode when using auto exposure. White and black are defined as 240 decimal and 1, respectively. Setting the value to the factory default of 180 sets the white level of the image to ~180.

To set the Image Brightness parameter, scan **Image Brightness** below followed by three numeric bar codes representing the value. Leading zeros are required. For example, to set an Image Brightness value of 99, scan 0, 9, 9. See *Appendix G, Numeric Bar Codes* for numeric bar codes.

***180**

Image Brightness
(3 digits)

JPEG Image Options

Parameter # 299

Select an option to optimize JPEG images for either size or for quality. Scan the **JPEG Quality Selector** bar code to enter a quality value; the digital scanner then selects the corresponding image size. Scan the **JPEG Size Selector** bar code to enter a size value; the digital scanner then selects the best image quality.

***JPEG Quality Selector**
(1)

JPEG Size Selector
(0)

JPEG Target File Size

Parameter # 561

Type: Word

Range: 5-350

This parameter defines the target JPEG file size in terms 1 Kilobytes (1024 bytes). The default value is 160 kB which represents 160 Kilobytes.

CAUTION JPEG compress may take 10 to 15 seconds based on the amount of information in the target image. Scanning **JPEG Quality Selector** (default setting) on *page 5-11* produces a compressed image that is consistent in quality and compression time.

To set the JPEG Target File Size parameter, scan **JPEG Target File Size** below followed by three numeric bar codes representing the value. Leading zeros are required. For example, to set an Image Brightness value of 99, scan 0, 9, 9 in *Appendix G, Numeric Bar Codes*.

JPEG Target File Size
(3 digits)

JPEG Quality and Size Value

JPEG Quality = Parameter # 305

If you selected **JPEG Quality Selector**, scan the **JPEG Quality Value** bar code followed by 3 bar codes from *Appendix G, Numeric Bar Codes* corresponding to a value from 5 to 100, where 100 represents the highest quality image.

JPEG Quality Value
(Default: 065)
(5 - 100 Decimal)

Image Enhancement

Parameter # 564

This parameter configures the digital scanner's Image Enhance feature. This feature uses a combination of edge sharpening and contrast enhancement to produce an image that is visually pleasing.

The levels of image enhancement are:

- Off (0) - Default
- Low (1)
- Med (2)
- High (3).

***Off**
(0)

Low
(1)

Medium
(2)

High
(3)

Image File Format Selector

Parameter # 304

Select an image format appropriate for the system (BMP, TIFF, or JPEG). The digital scanner stores captured images in the selected format.

BMP File Format
(3)

***JPEG File Format**
(1)

TIFF File Format
(4)

Image Rotation

Parameter # 665

This parameter controls the rotation of the image by 0, 90,180, or 270 degrees.

***Rotate 0°**
(0)

Rotate 90°
(1)

Rotate 180°
(2)

Rotate 270°
(3)

Bits Per Pixel

Parameter # 303

Select the number of significant bits per pixel (BPP) to use when capturing an image. Select **1 BPP** for a black and white image, **4 BPP** to assign 1 of 16 levels of grey to each pixel, or **8 BPP** to assign 1 of 256 levels of grey to each pixel.

NOTE The digital scanner ignores these settings for JPEG file formats, which only support **8 BPP**.

The digital scanner ignores 1 BPP for TIFF file formats, which only support **4 BPP** and **8 BPP**. 1 BPP is coerced to 4 BPP for TIFF file formats.

1 BPP
(0)

4 BPP
(1)

***8 BPP**
(2)

Signature Capture

Parameter # 93

A signature capture bar code is a special-purpose symbology which delineates a signature capture area in a document with a machine-readable format. The recognition pattern is variable so it can optionally provide an index to various signatures. The region inside the bar code pattern is considered the signature capture area. See *Appendix J, Signature Capture Code* for more information.

Output File Format

Decoding a signature capture bar code de-skews the signature image and converts the image to a BMP, JPEG, or TIFF file format. The output data includes the file descriptor followed by the formatted signature image.

File Descriptor			Signature Image
Output Format (1 byte)	Signature Type (1 byte)	Signature Image Size (4 bytes) (BIG Endian)	
JPEG - 1 BMP - 3 TIFF - 4	1-8	0x00000400	0x00010203….

To enable or disable Signature Capture, scan the appropriate bar code below.

Enable Signature Capture (1)

***Disable Signature Capture (0)**

Signature Capture File Format Selector

Parameter # 313

Select a signature file format appropriate for the system (BMP, TIFF, or JPEG). The digital scanner stores captured signatures in the selected format.

BMP Signature Format
(3)

***JPEG Signature Format**
(1)

TIFF Signature Format
(4)

Signature Capture Bits Per Pixel

Parameter # 314

Select the number of significant bits per pixel (BPP) to use when capturing a signature. Select **1 BPP** for a black and white image, **4 BPP** to assign 1 of 16 levels of grey to each pixel, or **8 BPP** to assign 1 of 256 levels of grey to each pixel.

✓ ***NOTE*** The digital scanner ignores these settings for JPEG file formats, which only support **8 BPP**.

1 BPP
(0)

4 BPP
(1)

***8 BPP**
(2)

Signature Capture Width

Parameter # 366

The aspect ratio of the Signature Capture Width and Signature Capture Height parameters must match that of the signature capture area. For example, a 4 x 1 inch signature capture area would require a 4 to 1 aspect ratio of width to height.

To set the width of the signature capture box, scan the **Signature Capture Width** bar code, followed by 3 bar codes from *Appendix G, Numeric Bar Codes* corresponding to a value in the range of 001 to 752 decimal. A minimum value of 16 is recommended.

Signature Capture Width
(Default: 400)
(001 - 752 Decimal)

Signature Capture Height

Parameter # 367

To set the height of the signature capture box, scan the **Signature Capture Height** bar code, followed by 3 bar codes from *Appendix G, Numeric Bar Codes* corresponding to a value in the range of 001 to 480 decimal. A minimum value of 16 is recommended.

Signature Capture Height (Default: 100)
(001 - 480 Decimal)

Signature Capture JPEG Quality

Parameter # 421

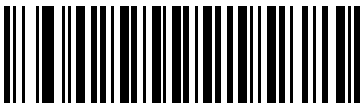
Scan the **JPEG Quality Value** bar code followed by 3 bar codes from *Appendix G, Numeric Bar Codes* corresponding to a value from 005 to 100, where 100 represents the highest quality image.

JPEG Quality Value (Default: 065)
(5 - 100 Decimal)

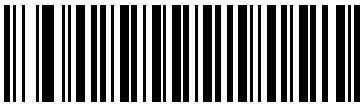
Video View Finder

Parameter # 324

Select **Enable Video View Finder** to project the video view finder, or **Disable Video View Finder** to turn the video view finder off.



***Disable Video View Finder**
(0)



Enable Video View Finder
(1)

Video View Finder Image Size

Parameter # 329

Select the number of 100-byte blocks. Values range from 800 to 3000 bytes. Selecting a smaller value transmits more frames per second; selecting a larger value increases video quality.

To set the Video View Finder Image Size, scan the bar code below followed by two bar codes from *Appendix G, Numeric Bar Codes* corresponding to the 100-byte value from 800 to 3000 bytes. For example, to select 1500 bytes, enter 1, 5. To select 900 bytes, enter 0, 9.

Video View Finder Image Size

CHAPTER 6 USB INTERFACE

Introduction

This chapter describes how to set up the digital scanner with a USB host. The digital scanner connects directly to a USB host, or a powered USB hub, which powers it. No additional power supply is required.

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

*Indicates Default — ***North American Standard USB Keyboard** — Feature/Option

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

Connecting a USB Interface

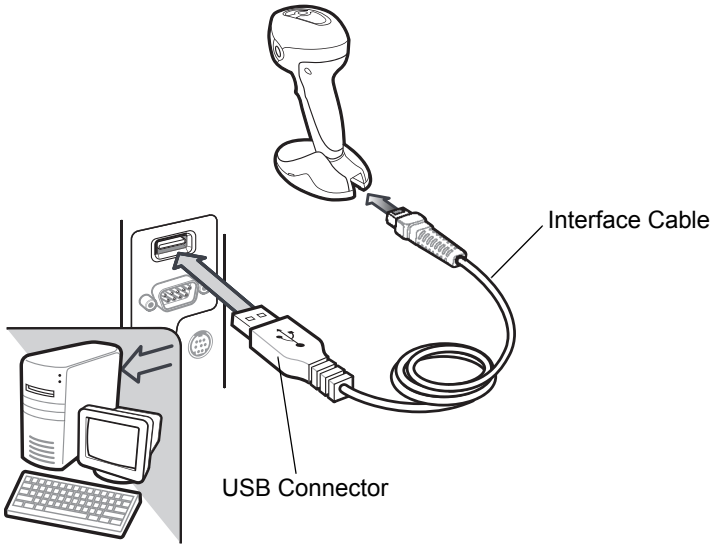


Figure 6-1 *USB Connection*

The digital scanner connects with USB-capable hosts including:

- Desktop PCs and notebooks
  - Apple™ iMac, G4, iBooks (North America only)
  - IBM SurePOS terminals
- Sun, IBM, and other network computers that support more than one keyboard.

The following operating systems support the digital scanner through USB:

- Windows® 98, 2000, ME, XP
- MacOS 8.5 - MacOS 10.3
- IBM 4690 OS.

The digital scanner also interfaces with other USB hosts which support USB Human Interface Devices (HID).

To set up the digital scanner:

NOTE Interface cables vary depending on configuration. The connectors illustrated in *Figure 6-1* are examples only. The connectors may be different than those illustrated, but the steps to connect the digital scanner are the same.

For digital scanners with the optional RFID module, connection requires a power supply.

1. Connect the modular connector of the USB interface cable to the cable interface port on the digital scanner (see *Installing the Interface Cable on page 1-3*).
2. Plug the series A connector in the USB host or hub, or plug the Plus Power connector in an available port of the IBM SurePOS terminal.
3. Select the USB device type by scanning the appropriate bar code from *USB Device Type on page 6-5*.

4. On first installation when using Windows, the software prompts to select or install the Human Interface Device driver. To install this driver, provided by Windows, click **Next** through all the choices and click **Finished** on the last choice. The digital scanner powers up during this installation.
5. To modify any other parameter options, scan the appropriate bar codes in this chapter.

If problems occur with the system, see *Troubleshooting on page 3-2*.

USB Parameter Defaults

Table 6-1 lists the defaults for USB host parameters. To change any option, scan the appropriate bar code(s) provided in the Parameter Descriptions section beginning on page *6-5*.

NOTE See *Appendix A, Standard Default Parameters* for all user preferences, hosts, symbologies, and miscellaneous default parameters.

Table 6-1 *USB Interface Parameter Defaults*

Parameter	Default	Page Number
USB Host Parameters		
USB Device Type	USB Keyboard HID	*6-5*
Symbol Native API (SNAPI) Status Handshaking	Enable	*6-7*
USB Keystroke Delay	No Delay	*6-7*
Simulated Caps Lock	Disable	*6-8*
USB CAPS Lock Override	Disable	*6-8*
USB Ignore Unknown Characters	Enable	*6-9*
USB Convert Unknown to Code 39	Disable	*6-9*
USB Ignore Beep Directive	Honor	*6-10*
USB Ignore Type Directive	Honor	*6-10*
Emulate Keypad	Disable	*6-11*
Emulate Keypad with Leading Zero	Disable	*6-11*
Quick Keypad Emulation	Disable	*6-12*
USB FN1 Substitution	Disable	*6-13*
Function Key Mapping	Disable	*6-13*
Simulated Caps Lock	Disable	*6-8*
Convert Case	None	*6-14*
USB Static CDC	Enable	*6-14*
CDC Beep on BEL	Enable	*6-15*
Direct I/O Beeps	Honor	*6-15*

Table 6-1 *USB Interface Parameter Defaults (Continued)*

Parameter	Default	Page Number
USB Polling Interval	3 msec	*6-16*
Fast HID Keyboard	Enable	*6-18*
IBM Specification Level	Version 0 (Original)	*6-18*

USB Host Parameters

USB Device Type

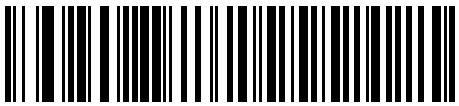
Select the desired USB device type. After selecting the device type, see *Appendix B, Country Codes* to select a keyboard type.

✓ ***NOTE*** When changing USB Device Types, the digital scanner automatically resets and issues the standard startup beep sequences.

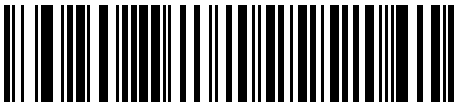
✓ ***NOTE*** Select **IBM Hand-Held USB** to disable data transmission when an IBM register issues a Scan Disable command. Aim, illumination, and decoding is still permitted. Select **OPOS (IBM Hand-Held with Full Disable)** to completely shut off the scanner when an IBM register issues a Scan Disable command, including aim, illumination, decoding, and data transmission.

✓ ***NOTE*** Before selecting **CDC COM Port Emulation**, install the CDC INF file on the host to ensure the scanner does not stall during power up (due to a failure to enumerate USB). If the scanner stalls, to recover it:

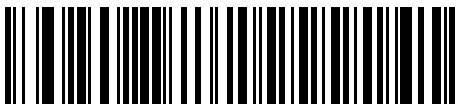
1) Install the CDC INF file
   or
2) After power-up, hold the trigger for 10 seconds, which allows the scanner to power up using an alternate USB configuration. Upon power-up, scan another **USB Device Type**.



***USB Keyboard HID**



IBM Table Top USB

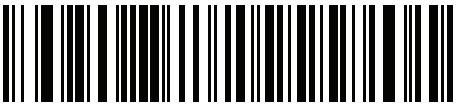


IBM Hand-Held USB

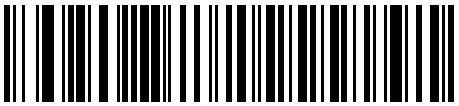
OPOS
(IBM Hand-Held with Full Disable)

USB Device Type (continued)

Simple COM Port Emulation



CDC COM Port Emulation



SSI over USB CDC

Symbol Native API (SNAPI) with Imaging Interface

Symbol Native API (SNAPI) without Imaging Interface

Symbol Native API (SNAPI) Status Handshaking

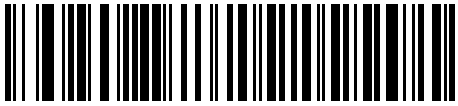
After selecting a SNAPI interface as the USB device type, select whether to enable or disable status handshaking.

***Enable SNAPI Status Handshaking**

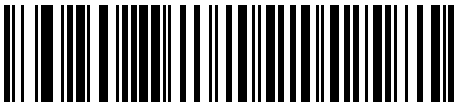
Disable SNAPI Status Handshaking

USB Keystroke Delay

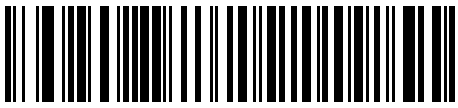
This parameter sets the delay, in milliseconds, between emulated keystrokes. Scan a bar code below to increase the delay when hosts require a slower transmission of data.



***No Delay**



Medium Delay (20 msec)

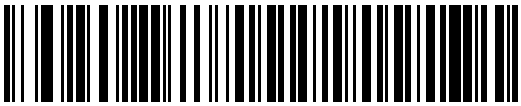


Long Delay (40 msec)

Simulated Caps Lock

Enable this to invert upper and lower case characters on the bar code as if the Caps Lock state is enabled on the keyboard. This inversion occurs regardless of the keyboard's **Caps Lock** state. Note that this only applies to alpha characters.

***Disable Simulated Caps Lock**



Enable Simulated Caps Lock

USB CAPS Lock Override

This option applies only to the HID Keyboard Emulation device. Enable this to preserve the case of the data regardless of the state of the **Caps Lock** key. This setting is always enabled for the Japanese, Windows (ASCII) keyboard type and can not be disabled.

Override Caps Lock Key (Enable)

***Do Not Override Caps Lock Key (Disable)**

NOTE If both Simulated Caps Lock and Caps Lock Override are enabled, Caps Lock Override takes precedence.

USB Ignore Unknown Characters

This option applies only to the HID Keyboard Emulation device and IBM device. Unknown characters are characters the host does not recognize. Select **Send Bar Codes With Unknown Characters** to send all bar code data except for unknown characters. The digital scanner issues no error beeps.

Select **Do Not Send Bar Codes With Unknown Characters**, for IBM devices, to prevent sending bar codes containing at least one unknown character are to the host, or for HID Keyboard Emulation devices, this sends the bar code characters up to the unknown character. The digital scanner issues an error beep.

***Send Bar Codes with Unknown Characters (Transmit)**

Do Not Send Bar Codes with Unknown Characters (Disable)

USB Convert Unknown to Code 39

This option applies only to the IBM Handheld, IBM Tabletop, and OPOS devices. Scan a bar code below to enable or disable converting unknown bar code type data to Code 39.

***Disable Convert Unknown to Code 39**

Enable Convert Unknown to Code 39

USB Ignore Beep Directive

This applies only to IBM handheld, IBM tabletop, and OPOS devices. Scan one of the following bar codes to honor or ignore a beep directive. All directives are still acknowledged as if they were processed.

***Honor USB Beep Directive**

Ignore USB Beep Directive

USB Ignore Type Directive

This applies only to IBM handheld, IBM tabletop, and OPOS devices. Scan one of the following bar codes to honor or ignore a code type enable/disable directive. All directives are still acknowledged as if they were processed.

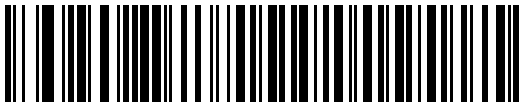
***Honor USB Ignore Type Directive**

Ignore USB Ignore Type Directive

Emulate Keypad

Enable this to send all characters as ASCII sequences over the numeric keypad. For example ASCII A transmits as “ALT make” 0 6 5 “ALT Break”.

***Disable Keypad Emulation**



Enable Keypad Emulation

Emulate Keypad with Leading Zero

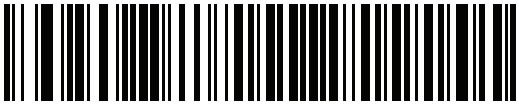
Enable this to send character sequences sent over the numeric keypad as ISO characters which have a leading zero. For example ASCII A transmits as “ALT MAKE” 0 0 6 5 “ALT BREAK”.

***Disable Keypad Emulation with Leading Zero**

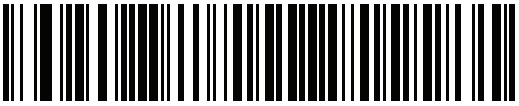
Enable Keypad Emulation with Leading Zero

Quick Keypad Emulation

This option applies only to the USB Keyboard (HID) device and if *Emulate Keypad* is enabled. This parameter enables a quicker method of keypad emulation where ASCII sequences are only sent for ASCII characters not found on the keyboard. The default value is **Disable**.



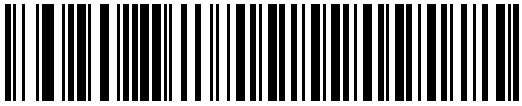
Enable



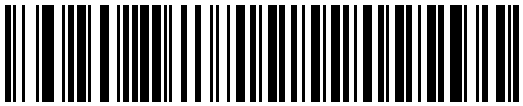
***Disable**

USB Keyboard FN 1 Substitution

This option applies only to the USB HID Keyboard Emulation device. Enable this to replace any FN 1 characters in an EAN 128 bar code with a user-selected Key Category and value (see *FN1 Substitution Values on page 4-52* to set the Key Category and Key Value).



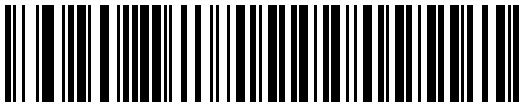
Enable



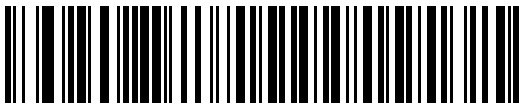
***Disable**

Function Key Mapping

ASCII values under 32 are normally sent as a control-key sequences (see *Table 6-2 on page 6-19*). Enable this parameter to send the keys in bold in place of the standard key mapping. Table entries that do not have a bold entry remain the same whether or not you enable this parameter.



***Disable Function Key Mapping**



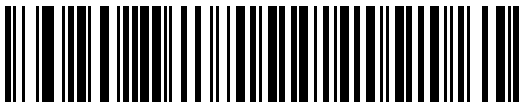
Enable Function Key Mapping

Convert Case

Enable this to convert all bar code data to the selected case.

***No Case Conversion**

Convert All to Upper Case

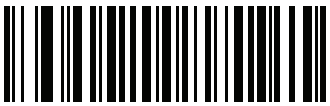


Convert All to Lower Case

USB Static CDC

When disabled, each device connected consumes another COM port (first device = COM1, second device = COM2, third device = COM3, etc.)

When enabled, each device connects to the same COM port.



***Enable USB Static CDC**

Disable USB Static CDC

CDC Beep on <BEL>

If you enable this parameter, the digital scanner issues a beep when it detects a <BEL> character in USB CDC communications. <BEL> indicates an illegal entry or other important event.

.

***Enable CDC Beep on <BEL>**

Disable CDC Beep on <BEL>

Direct I/O Beep

Scan one of the following bar codes to honor or ignore a Direct IO Beep from the USB host. If you select **Ignore Direct IO Beep**, the scanner does not sound beeps on this command. All directives are still acknowledged to the USB host as if they were processed.

***Honor Direct IO Beep**

Ignore Direct IO Beep

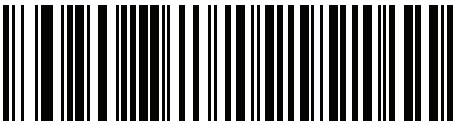
USB Polling Interval

This option speeds up the USB Keyboard HID Device. Scan one of the following bar codes to set the polling interval, which is the rate at which data can be sent between the image and the host computer. A lower number indicates a faster data rate. The default is 3 msec.

Changing the polling interval re-initializes the imager.

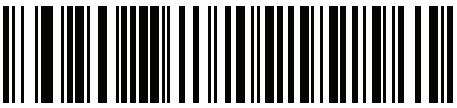
CAUTION Ensure the host can support the selected data rate. Selecting a data rate that is too fast for the host may result in lost data.

1 msec



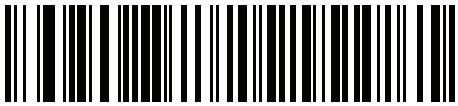
2 msec

***3 msec**

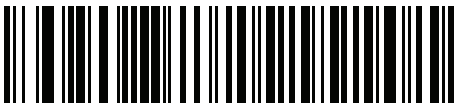


4 msec

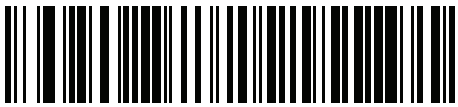
USB Polling Interval (continued)



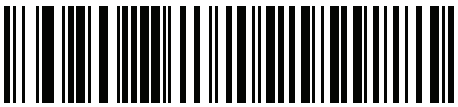
5 msec



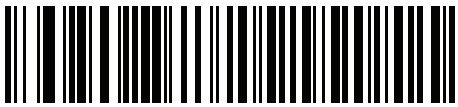
6 msec



7 msec



8 msec

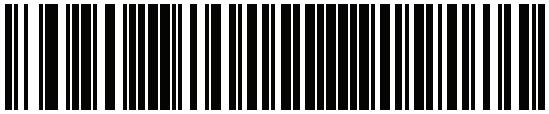


9 msec

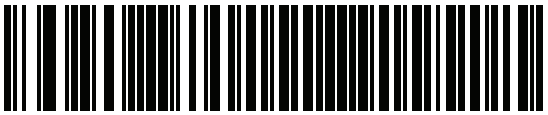
Fast HID Keyboard

This option transmits USB Keyboard HID data at a faster rate.

NOTE **Quick Emulation** overrides **Fast HID**.



***Enable**



Disable

IBM Specification Level

When the IBM Specification Level is set to **Version 0 (Original)**, the following code types are sent as Unknown:

- Data Matrix
- QR Code
- MicroQR Code
- Aztec

When the level is set to **Version 2.2**, the code types are sent with the appropriate IBM identifiers.

***IBM Specification Level Version 0 (Original)**

IBM Specification Level Version 2.2

ASCII Character Set for USB

Table 6-2 *USB Prefix/Suffix Values*

Prefix/ Suffix Value	Full ASCII Code 39 Encode Char.acter	Keystroke
1000	%U	CTRL 2
1001	$A	CTRL A
1002	$B	CTRL B
1003	$C	CTRL C
1004	$D	CTRL D
1005	$E	CTRL E
1006	$F	CTRL F
1007	$G	CTRL G
1008	$H	CTRL H/**BACKSPACE**[1]
1009	$I	CTRL I/**HORIZONTAL TAB**[1]
1010	$J	CTRL J
1011	$K	CTRL K
1012	$L	CTRL L
1013	$M	CTRL M/**ENTER**[1]
1014	$N	CTRL N
1015	$O	CTRL O
1016	$P	CTRL P
1017	$Q	CTRL Q
1018	$R	CTRL R
1019	$S	CTRL S
1020	$T	CTRL T
1021	$U	CTRL U
1022	$V	CTRL V
1023	$W	CTRL W
1024	$X	CTRL X
1025	$Y	CTRL Y

[1]The keystroke in bold transmits only if you enable *Function Key Mapping on page 6-13*. Otherwise, the unbolded keystroke transmits.

Table 6-2 *USB Prefix/Suffix Values (Continued)*

Prefix/ Suffix Value	Full ASCII Code 39 Encode Char.acter	Keystroke
1026	$Z	CTRL Z
1027	%A	CTRL [/**ESC**[1]
1028	%B	CTRL \
1029	%C	CTRL]
1030	%D	CTRL 6
1031	%E	CTRL -
1032	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
1049	1	1
1050	2	2
1051	3	3
1052	4	4
1053	5	5
1054	6	6

[1]The keystroke in bold transmits only if you enable *Function Key Mapping on page 6-13*. Otherwise, the unbolded keystroke transmits.

Table 6-2 *USB Prefix/Suffix Values (Continued)*

Prefix/ Suffix Value	Full ASCII Code 39 Encode Char.acter	Keystroke
1055	7	7
1056	8	8
1057	9	9
1058	/Z	:
1059	%F	;
1060	%G	<
1061	%H	=
1062	%I	>
1063	%J	?
1064	%V	@
1065	A	A
1066	B	B
1067	C	C
1068	D	D
1069	E	E
1070	F	F
1071	G	G
1072	H	H
1073	I	I
1074	J	J
1075	K	K
1076	L	L
1077	M	M
1078	N	N
1079	O	O
1080	P	P
1081	Q	Q
1082	R	R
1083	S	S

[1]The keystroke in bold transmits only if you enable *Function Key Mapping on page 6-13*. Otherwise, the unbolded keystroke transmits.

Table 6-2 *USB Prefix/Suffix Values (Continued)*

Prefix/ Suffix Value	Full ASCII Code 39 Encode Char.acter	Keystroke
1084	T	T
1085	U	U
1086	V	V
1087	W	W
1088	X	X
1089	Y	Y
1090	Z	Z
1091	%K	[
1092	%L	\
1093	%M	]
1094	%N	^
1095	%O	_
1096	%W	`
1097	+A	a
1098	+B	b
1099	+C	c
1100	+D	d
1101	+E	e
1102	+F	f
1103	+G	g
1104	+H	h
1105	+I	i
1106	+J	j
1107	+K	k
1108	+L	l
1109	+M	m
1110	+N	n
1111	+O	o
1112	+P	p

[1]The keystroke in bold transmits only if you enable *Function Key Mapping on page 6-13*. Otherwise, the unbolded keystroke transmits.

Table 6-2 *USB Prefix/Suffix Values (Continued)*

Prefix/ Suffix Value	Full ASCII Code 39 Encode Char.acter	Keystroke
1113	+Q	q
1114	+R	r
1115	+S	s
1116	+T	t
1117	+U	u
1118	+V	v
1119	+W	w
1120	+X	x
1121	+Y	y
1122	+Z	z
1123	%P	{
1124	%Q	|
1125	%R	}
1126	%S	~

[1]The keystroke in bold transmits only if you enable *Function Key Mapping on page 6-13*. Otherwise, the unbolded keystroke transmits.

Table 6-3 *USB ALT Key Character Set*

ALT Keys	Keystroke
2064	ALT 2
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
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

Table 6-4 *USB 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
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

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 6-4 *USB GUI Key Character Set (Continued)*

GUI Key	Keystroke
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
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 6-5 *USB F Key Character Set*

F Keys	Keystroke
5001	F1
5002	F2
5003	F3
5004	F4
5005	F5
5006	F6
5007	F7
5008	F8
5009	F9
5010	F10
5011	F11
5012	F12
5013	F13
5014	F14
5015	F15
5016	F16
5017	F17
5018	F18
5019	F19
5020	F20
5021	F21
5022	F22
5023	F23
5024	F24

Table 6-6 *USB Numeric Keypad 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 6-7 *USB Extended Keypad Character Set*

Extended Keypad	Keystroke
7001	Break
7002	Delete
7003	PgUp
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	Down Arrow
7017	Left Arrow
7018	Right Arrow

CHAPTER 7 RS-232 INTERFACE

Introduction

This chapter describes how to set up the digital scanner with an RS-232 host. Use the RS-232 interface to connect the digital scanner to point-of-sale devices, host computers, or other devices with an available RS-232 port (e.g., com port).

If your host does not appear in *Table 7-2*, refer to the documentation for the host device to set communication parameters to match the host.

✓ ***NOTE*** The digital scanner uses TTL RS-232 signal levels, which interface with most system architectures. For system architectures requiring RS-232C signal levels, Zebra offers different cables providing TTL-to-RS-232C conversion. Contact Zebra support for more information.

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

* Indicates Default — ***Baud Rate 57,600** — Feature/Option

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

Connecting an RS-232 Interface

Connect the digital scanner directly to the host computer.

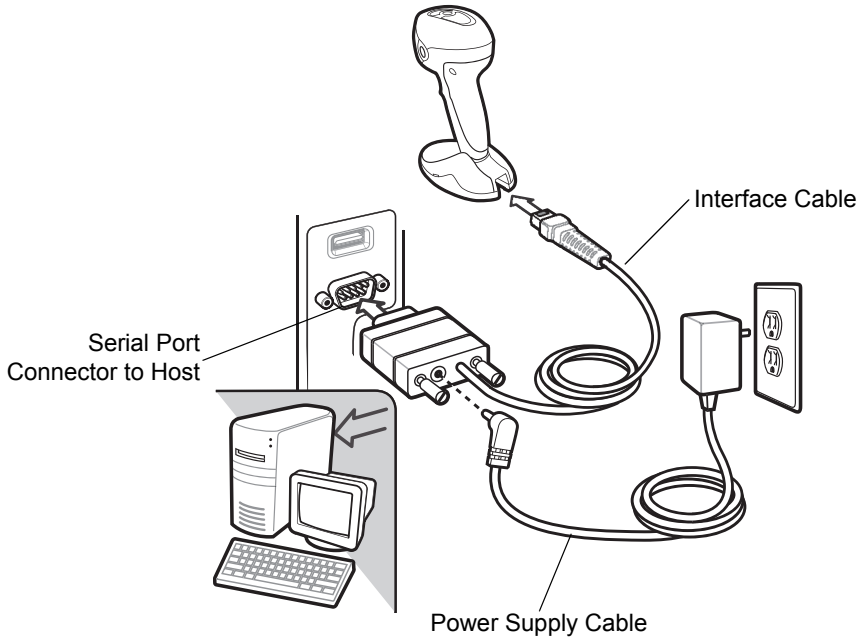


Figure 7-1 *RS-232 Direct Connection*

NOTE Interface cables vary depending on configuration. The connectors illustrated in *Figure 7-1* are examples only. The connectors may be different than those illustrated, but the steps to connect the digital scanner are the same.

1. Attach the modular connector of the RS-232 interface cable to the cable interface port on the digital scanner (see *Installing the Interface Cable on page 1-3*).
2. Connect the other end of the RS-232 interface cable to the serial port on the host.
3. Connect the power supply to the serial connector end of the RS-232 interface cable. Plug the power supply into an appropriate outlet.
4. Select the RS-232 host type by scanning the appropriate bar code from *RS-232 Host Types on page 7-6*.
5. To modify any other parameter options, scan the appropriate bar codes in this chapter.

RS-232 Parameter Defaults

Table 7-1 lists the defaults for RS-232 host parameters. To change any option, scan the appropriate bar code(s) provided in the RS-232 Host Parameters section beginning on page *7-4*.

NOTE See *Appendix A, Standard Default Parameters* for all user preferences, hosts, symbologies, and miscellaneous default parameters.

Table 7-1 *RS-232 Host Default Table*

Parameter	Default	Page Number
RS-232 Host Parameters		
RS-232 Host Types	Standard	*7-6*
Baud Rate	9600	*7-8*
Parity Type	None	*7-9*
Data Bits	8-Bit	*7-9*
Check Receive Errors	Enable	*7-10*
Hardware Handshaking	None	*7-10*
Software Handshaking	None	*7-12*
Host Serial Response Time-out	2 Sec	*7-14*
RTS Line State	Low RTS	*7-15*
Beep on <BEL>	Disable	*7-15*
Intercharacter Delay	0 msec	*7-16*
Nixdorf Beep/LED Options	Normal Operation	*7-17*
Ignore Unknown Characters	Send Bar Code	*7-17*
Note: The DS9808 supports one stop bit only.		

RS-232 Host Parameters

Various RS-232 hosts use their own parameter default settings. Selecting standard, ICL, Fujitsu, Wincor-Nixdorf Mode A, Wincor-Nixdorf Mode B, OPOS/JPOS, Olivetti, Omron, or Common Use Terminal Equipment (CUTE-LP/LG bar code readers) sets the defaults listed in *Table 7-2*.

Table 7-2 *Terminal Specific RS-232*

Parameter	ICL	Fujitsu	Wincor-Nixdorf Mode A	Wincor-Nixdorf Mode B/OPOS/JPOS	Olivetti	Omron	CUTE
Transmit Code ID	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Data Transmission Format	Data/Suffix	Data/Suffix	Data/Suffix	Data/Suffix	Prefix/Data/Suffix	Data/Suffix	Prefix/Data/Suffix
Suffix	CR (1013)	CR (1013)	CR (1013)	CR (1013)	ETX (1002)	CR (1013)	CR (1013) ETX (1002)
Baud Rate	9600	9600	9600	9600	9600	9600	9600
Parity	Even	None	Odd	Odd	Even	None	Even
Hardware Handshaking	RTS/CTS Option 3	None	RTS/CTS Option 3	RTS/CTS Option 3	None	None	None
Software Handshaking	None	None	None	None	ACK/NAK	None	None
Serial Response Time-out	9.9 Sec.	2 Sec.	9.9 Sec.	9.9 Sec.	9.9 Sec.	9.9 Sec.	9.9 Sec.
Stop Bit Select	One	One	One	One	One	One	One
ASCII Format	8-Bit	8-Bit	8-Bit	8-Bit	7-Bit	8-Bit	7-Bit
Beep On <BEL>	Disable	Disable	Disable	Disable	Disable	Disable	Disable
RTS Line State	High	Low	Low	Low = No data to send	Low	High	High
Prefix	None	None	None	None	STX (1003)	None	STX (1003)

In the Nixdorf Mode B, if CTS is low, scanning is disabled. When CTS is high, scanning is enabled.
If you scan Nixdorf Mode B without connecting the digital scanner to the proper host, it may appear unable to scan. If this happens, scan a different RS-232 host type within 5 seconds of cycling power to the digital scanner.
The CUTE host disables all parameter scanning, including Set Defaults. If you inadvertently select CUTE, scan **Enable Parameter Bar Code Scanning (1) on page 4-6*, then change the host selection.

RS-232 Host Parameters (continued)

Selecting ICL, Fujitsu, Wincor-Nixdorf Mode A, Wincor-Nixdorf Mode B, OPOS/JPOS, Olivetti, Omron, or Common Use Terminal Equipment (CUTE-LP/LG bar code readers) enables the transmission of code ID characters listed in *Table 7-3*. These code ID characters are not programmable and are separate from the Transmit Code ID feature. Do not enable the Transmit Code ID feature for these terminals.

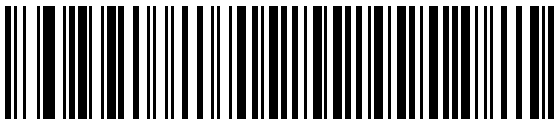
Table 7-3 *Terminal Specific Code ID Characters*

Code Type	ICL	Fujitsu	Wincor-Nixdorf Mode A	Wincor-Nixdorf Mode B/ OPOS/JPOS	Olivetti	Omron	CUTE
UPC-A	A	A	A	A	A	A	A
UPC-E	E	E	C	C	C	E	None
EAN-8/JAN-8	FF	FF	B	B	B	FF	None
EAN-13/JAN-13	F	F	A	A	A	F	A
Bookland EAN	F	F	A	A	A	F	None
Code 39	C <len>	None	M	M	M <len>	C <len>	3
Code 39 Full ASCII	None	None	M	M	None	None	3
Trioptic	None	None	None	None	None	None	None
Code 32	None	None	None	None	None	None	None
Codabar	N <len>	None	N	N	N <len>	N <len>	None
Code 128	L <len>	None	K	K	K <len>	L <len>	5
GS1-128	L <len>	None	P	P	P <len>	L <len>	5
Code 93	None	None	L	L	L <len>	None	None
I 2 of 5	I <len>	None	I	I	I <len>	I <len>	1
D 2 of 5	H <len>	None	H	H	H <len>	H <len>	2
MSI	None	None	O	O	O <len>	None	None
Code 11	None	None	None	None	None	None	None
IATA	H<len>	None	H	H	H<len>	H<len>	2
GS1 Databar Variants	None	None	E	E	None	None	None
PDF417	None	None	Q	Q	None	None	6
MicroPDF417	None	None	S	S	None	None	6
Data Matrix	None	None	R	R	None	None	4
Maxicode	None	None	T	T	None	None	None
QR Codes	None	None	U	U	None	None	7
Aztec/Aztec Rune	None	None	V	V	None	None	8

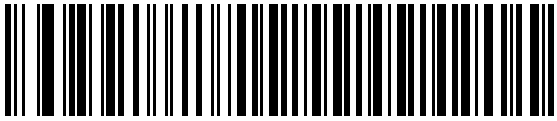
RS-232 Host Types

To select an RS-232 host interface, scan one of the following bar codes.

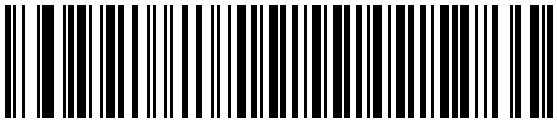
Standard RS-232[1]



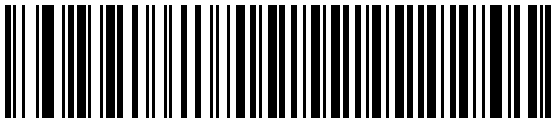
ICL RS-232



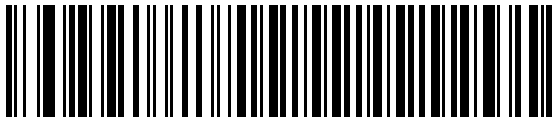
Wincor-Nixdorf RS-232 Mode A



Wincor-Nixdorf RS-232 Mode B



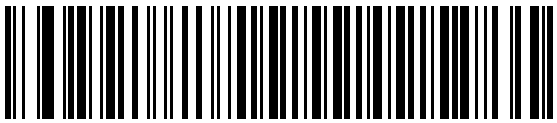
Olivetti ORS4500



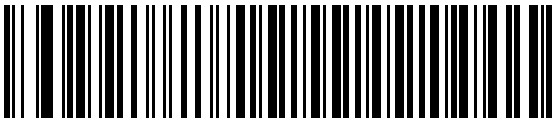
Omron

[1]Scanning Standard RS-232 activates the RS-232 driver, but does not change port settings (e.g., parity, data bits, handshaking). Selecting another RS-232 host type bar code changes these settings.

RS-232 Host Types (continued)



OPOS/JPOS



Fujitsu RS-232

CUTE [1]

[1]The CUTE host disables all parameter scanning, including Set Defaults. If you inadvertently select CUTE, scan *Enable Parameter Bar Code Scanning (1) on page 4-6, then change the host selection.

Baud Rate

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

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

***Baud Rate 9600**

Baud Rate 19,200

Baud Rate 38,400

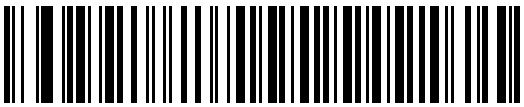
Baud Rate 57,600

Baud Rate 115,200

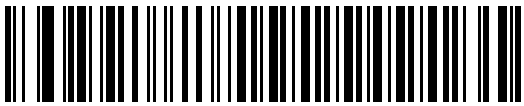
Parity

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

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



Odd

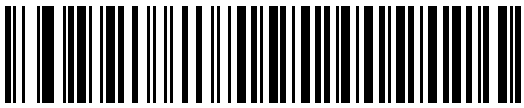


Even

***None**

Data Bits

This parameter allows the digital scanner to interface with devices requiring a 7-bit or 8-bit ASCII protocol.

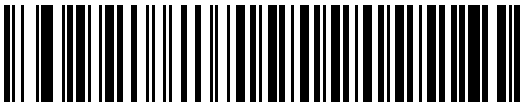


7-Bit

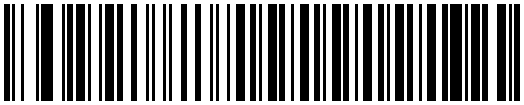
***8-Bit**

Check Receive Errors

Select whether or not to check the parity, framing, and overrun of received characters. The parity value of received characters is verified against the parity parameter selected above.



***Check For Received Errors**



Do Not Check For Received Errors

Hardware Handshaking

The data interface consists of an RS-232 port designed to operate either with or without the hardware handshaking lines, *Request to Send* (RTS), and *Clear to Send* (CTS).

Disable Standard RTS/CTS handshaking to transmit scan data as it becomes available. Select Standard RTS/CTS handshaking to transmit scan data according to the following sequence:

- The digital scanner reads the CTS line for activity. If CTS is asserted, the scanner waits up to Host Serial Response Time-out for the host to de-assert the CTS line. If, after Host Serial Response Time-out (default), the CTS line is still asserted, the scanner sounds a transmit error, and discards any scanned data.
- When the CTS line is de-asserted, the digital scanner asserts the RTS line and waits up to Host Serial Response Time-out for the host to assert CTS. When the host asserts CTS, the scanner transmits data. If, after Host Serial Response Time-out (default), the CTS line is not asserted, the scanner sounds a transmit error, and discards the data.
- When data transmission completes, the digital scanner de-asserts RTS 10 msec after sending the last character.
- The host should respond by negating CTS. The digital scanner checks for a de-asserted CTS upon the next transmission of data.

During the transmission of data, the CTS line should be asserted. If CTS is deasserted for more than 50 ms between characters, the digital scanner aborts transmission, sounds a transmission error, and discards the data.

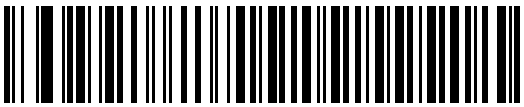
If this communication sequence fails, the digital scanner issues an error indication. In this case, the data is lost and must be rescanned.

If hardware handshaking and software handshaking are both enabled, hardware handshaking takes precedence.

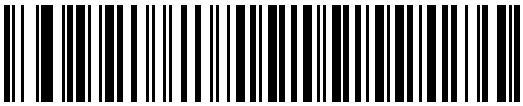
NOTE The DTR signal is jumpered to the active state.

Hardware Handshaking (continued)

- **None**: Scan this bar code to disable hardware handshaking.
- **Standard RTS/CTS**: Scan this bar code to select Standard RTS/CTS Hardware Handshaking.
- **RTS/CTS Option 1**: If you select RTS/CTS Option 1, the digital scanner asserts RTS before transmitting and ignores the state of CTS. The scanner de-asserts RTS when the transmission completes.
- **RTS/CTS Option 2**: If you select Option 2, RTS is always high or low (user-programmed logic level). However, the digital scanner waits for CTS to be asserted before transmitting data. If CTS is not asserted within Host Serial Response Time-out (default), the scanner issues an error indication and discards the data.
- **RTS/CTS Option 3**: If you select Option 3, the digital scanner asserts RTS prior to any data transmission, regardless of the state of CTS. The scanner waits up to Host Serial Response Time-out (default) for CTS to be asserted. If CTS is not asserted during this time, the scanner issues an error indication and discards the data. The digital scanner de-asserts RTS when transmission is complete.

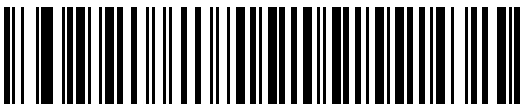


***None**

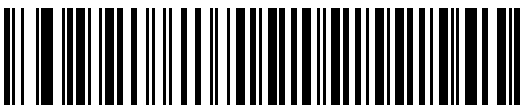


Standard RTS/CTS

RTS/CTS Option 1



RTS/CTS Option 2



RTS/CTS Option 3

Software Handshaking

This parameter offers control of the data transmission process in addition to, or instead of, that offered by hardware handshaking. There are five options.

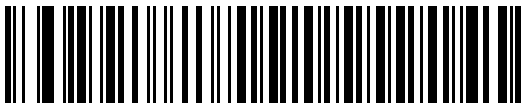
If software handshaking and hardware handshaking are both enabled, hardware handshaking takes precedence.

- **None**: Select this to transmit data immediately. The digital scanner expects no response from the host.
- **ACK/NAK**: If you select this option, after transmitting data, the digital scanner expects either an ACK or NAK response from the host. When it receives a NAK, the scanner transmits the same data again and waits for either an ACK or NAK. After three unsuccessful attempts to send data after receiving NAKs, the digital scanner issues an error indication and discards the data.

  The digital scanner waits up to the programmable Host Serial Response Time-out to receive an ACK or NAK. If the scanner does not get a response in this time, it issues an error indication and discards the data. There are no retries when a time-out occurs.
- **ENQ**: If you select this option, the digital scanner waits for an ENQ character from the host before transmitting data. If it does not receive an ENQ within the Host Serial Response Time-out, the digital scanner issues an error indication and discards the data. The host must transmit an ENQ character at least every Host Serial Response Time-out to prevent transmission errors.
- **ACK/NAK with ENQ**: This combines the two previous options. For re-transmissions of data, due to a NAK from the host, an additional ENQ is not required.
- **XON/XOFF**: An XOFF character turns the digital scanner transmission off until the scanner receives an XON character. There are two situations for XON/XOFF:
  - The digital scanner receives an XOFF before has data to send. When the scanner has data to send, it waits up to Host Serial Response Time-out for an XON character before transmission. If it does not receive the XON within this time, the digital scanner issues an error indication and discards the data.
  - The digital scanner receives an XOFF during a transmission. Data transmission then stops after sending the current byte. When the digital scanner receives an XON character, it sends the rest of the data message. The digital scanner waits indefinitely for the XON.

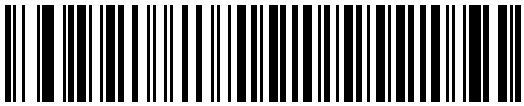
Software Handshaking (continued)

*None

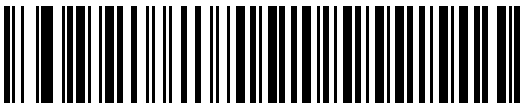


ACK/NAK

ENQ



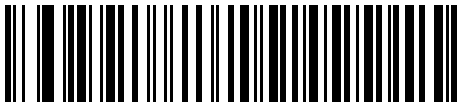
ACK/NAK with ENQ



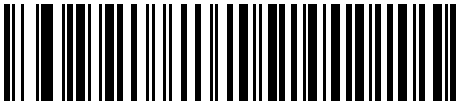
XON/XOFF

Host Serial Response Time-out

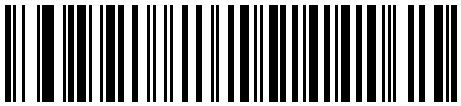
This parameter specifies how long the digital scanner waits for an ACK, NAK, or CTS before determining that a transmission error occurred. This only applies when in one of the ACK/NAK software handshaking modes, or RTS/CTS hardware handshaking mode.



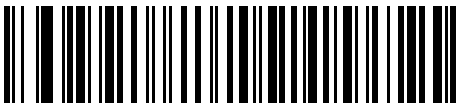
***Minimum: 2 Sec**



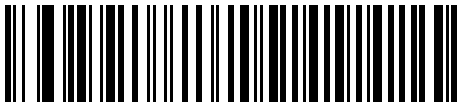
Low: 2.5 Sec



Medium: 5 Sec



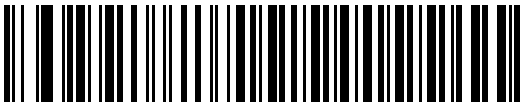
High: 7.5 Sec



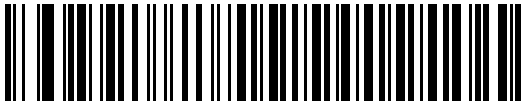
Maximum: 9.9 Sec

RTS Line State

This parameter sets the idle state of the Serial Host RTS line. Scan a bar code below to select **Low RTS** or **High RTS** line state.



***Host: Low RTS**

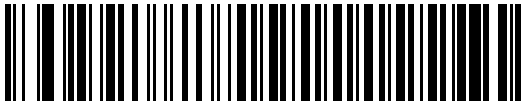


Host: High RTS

Beep on <BEL>

If you enable this parameter, the digital scanner issues a beep when it detects a <BEL> character on the RS-232 serial line. <BEL> indicates an illegal entry or other important event.

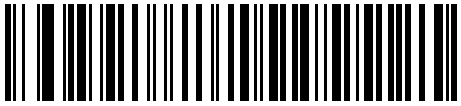
Beep On <BEL> Character (Enable)



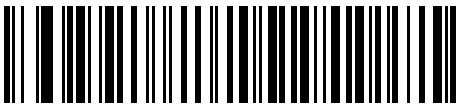
***Do Not Beep On <BEL> Character (Disable)**

Intercharacter Delay

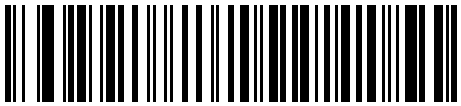
This parameter specifies the intercharacter delay inserted between character transmissions.



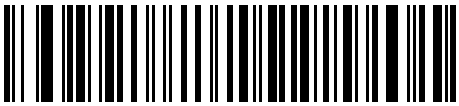
***Minimum: 0 msec**



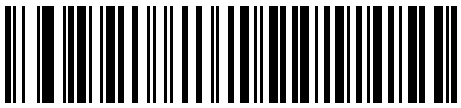
Low: 25 msec



Medium: 50 msec



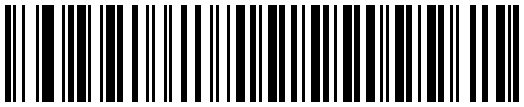
High: 75 msec



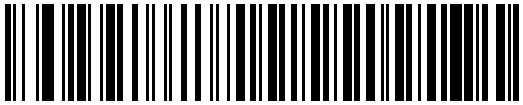
Maximum: 99 msec

Nixdorf Beep/LED Options

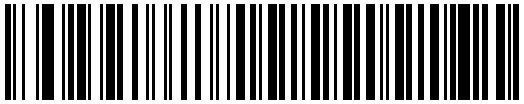
If you selected Nixdorf Mode B, this indicates when the digital scanner beeps and turns on its LED after a decode.



***Normal Operation**
(Beep/LED immediately after decode)



Beep/LED After Transmission

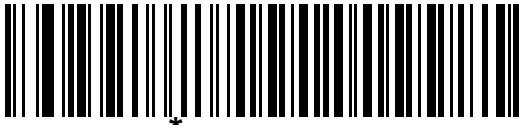


Beep/LED After CTS Pulse

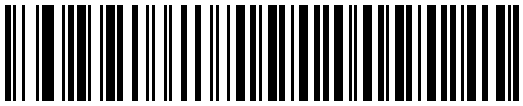
Ignore Unknown Characters

Unknown characters are characters the host does not recognize. Select **Send Bar Codes with Unknown Characters** to send all bar code data except for unknown characters. The digital scanner issues no error beeps.

Select **Do Not Send Bar Codes With Unknown Characters** to send bar code data up to the first unknown character. The digital scanner issues an error beep.



***Send Bar Code**
(with unknown characters)



Do Not Send Bar Codes
(with unknown characters)

ASCII Character Set for RS-232

You can assign the values in *Table 7-4* as prefixes or suffixes for ASCII character data transmission.

Table 7-4 *Prefix/Suffix Values*

Prefix/Suffix Value	Full ASCII Code 39 Encode Character	ASCII Character
1000	%U	NUL
1001	$A	SOH
1002	$B	STX
1003	$C	ETX
1004	$D	EOT
1005	$E	ENQ
1006	$F	ACK
1007	$G	BELL
1008	$H	BCKSPC
1009	$I	HORIZ TAB
1010	$J	LF/NW LN
1011	$K	VT
1012	$L	FF
1013	$M	CR/ENTER
1014	$N	SO
1015	$O	SI
1016	$P	DLE
1017	$Q	DC1/XON
1018	$R	DC2
1019	$S	DC3/XOFF
1020	$T	DC4
1021	$U	NAK
1022	$V	SYN
1023	$W	ETB
1024	$X	CAN
1025	$Y	EM
1026	$Z	SUB
1027	%A	ESC

Table 7-4 *Prefix/Suffix Values (Continued)*

Prefix/Suffix Value	Full ASCII Code 39 Encode Character	ASCII Character
1028	%B	FS
1029	%C	GS
1030	%D	RS
1031	%E	US
1032	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
1049	1	1
1050	2	2
1051	3	3
1052	4	4
1053	5	5
1054	6	6
1055	7	7
1056	8	8
1057	9	9
1058	/Z	:

Table 7-4 *Prefix/Suffix Values (Continued)*

Prefix/Suffix Value	Full ASCII Code 39 Encode Character	ASCII Character
1059	%F	;
1060	%G	<
1061	%H	=
1062	%I	>
1063	%J	?
1064	%V	@
1065	A	A
1066	B	B
1067	C	C
1068	D	D
1069	E	E
1070	F	F
1071	G	G
1072	H	H
1073	I	I
1074	J	J
1075	K	K
1076	L	L
1077	M	M
1078	N	N
1079	O	O
1080	P	P
1081	Q	Q
1082	R	R
1083	S	S
1084	T	T
1085	U	U
1086	V	V
1087	W	W
1088	X	X
1089	Y	Y

Table 7-4 *Prefix/Suffix Values (Continued)*

Prefix/Suffix Value	Full ASCII Code 39 Encode Character	ASCII Character
1090	Z	Z
1091	%K	[
1092	%L	\
1093	%M	]
1094	%N	^
1095	%O	_
1096	%W	`
1097	+A	a
1098	+B	b
1099	+C	c
1100	+D	d
1101	+E	e
1102	+F	f
1103	+G	g
1104	+H	h
1105	+I	i
1106	+J	j
1107	+K	k
1108	+L	l
1109	+M	m
1110	+N	n
1111	+O	o
1112	+P	p
1113	+Q	q
1114	+R	r
1115	+S	s
1116	+T	t
1117	+U	u
1118	+V	v
1119	+W	w
1120	+X	x

Table 7-4 *Prefix/Suffix Values (Continued)*

Prefix/Suffix Value	Full ASCII Code 39 Encode Character	ASCII Character
1121	+Y	y
1122	+Z	z
1123	%P	{
1124	%Q	|
1125	%R	}
1126	%S	~
1127		Undefined
7013		ENTER

CHAPTER 8 IBM 468X / 469X INTERFACE

Introduction

This chapter describes how to set up the digital scanner with an IBM 468X/469X host.

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

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

Connecting to an IBM 468X/469X Host

Connect the digital scanner directly to the host interface.

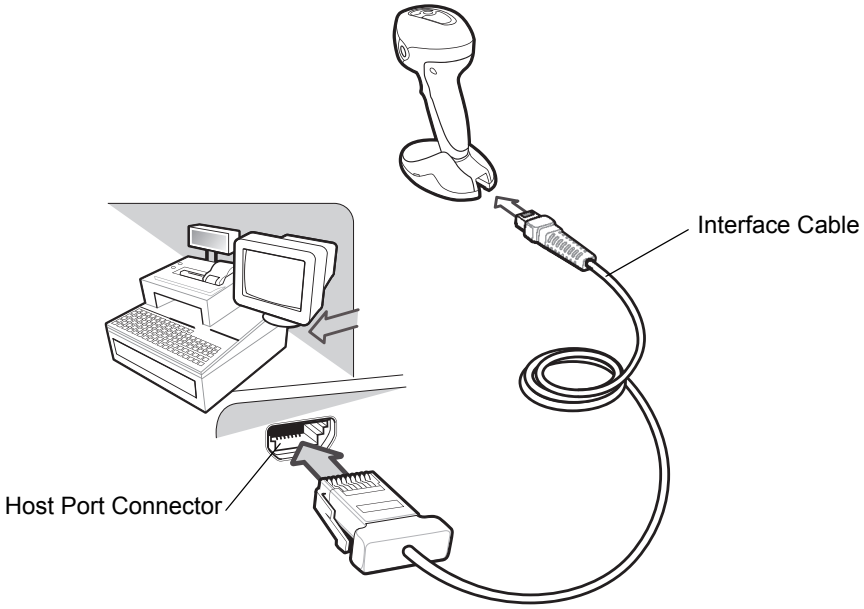


Figure 8-1 *IBM Direct Connection*

NOTE Interface cables vary depending on configuration. The connectors illustrated in *Figure 8-1* are examples only. The connectors may be different than those illustrated, but the steps to connect the digital scanner are the same.

1. Attach the modular connector of the IBM 46XX interface cable to the cable interface port on the digital scanner. See *Installing the Interface Cable on page 1-3*.
2. Connect the other end of the IBM 46XX interface cable to the appropriate port on the host (typically Port 9).
3. Select the port address by scanning the appropriate bar code from *Port Address on page 8-4*.
4. To modify any other parameter options, scan the appropriate bar codes in this chapter.

NOTE The only required configuration is the port address. The IBM system typically controls other digital scanner parameters.

IBM Parameter Defaults

Table 8-1 lists the defaults for IBM host parameters. To change any option, scan the appropriate bar code(s) provided in the Parameter Descriptions section beginning on page *8-4*.

NOTE See *Appendix A, Standard Default Parameters* for all user preferences, hosts, symbologies, and miscellaneous default parameters.

Table 8-1 *IBM Host Default Table*

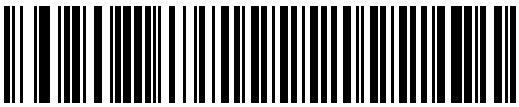
Parameter	Default	Page Number
IBM 468X/469X Host Parameters		
Port Address	None Selected	*8-4*
Convert Unknown to Code 39	Disable	*8-5*
Ignore Beep Directive	Honor	*8-5*
Ignore Configuration Directive	Honor	*8-6*
IBM-485 Specification Version	Original Specification	*8-6*

IBM 468X/469X Host Parameters

Port Address

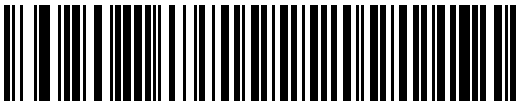
This parameter sets the IBM 468X/469X port used.

NOTE Scanning one of these bar codes enables the RS-485 interface on the digital scanner.



None Selected

Hand-Held Scanner Emulation (Port 9B)



Non-IBM Scanner Emulation (Port 5B)

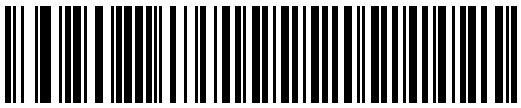
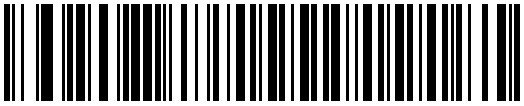


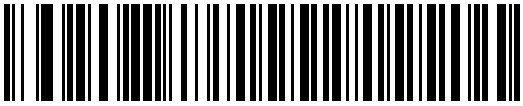
Table Top Scanner Emulation (Port 17)

Convert Unknown to Code 39

Scan a bar code below to enable or disable the conversion of unknown bar code type data to Code 39.



Enable Convert Unknown to Code 39

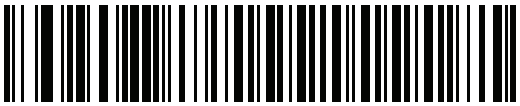


***Disable Convert Unknown to Code 39**

Ignore Beep Directive

Scan one of the following bar codes to honor or ignore a beep directive made over the IBM RS-485 bus. All directives are still acknowledged to the IBM RS-485 host as if they were processed.

***Honor Beep Directive**



Ignore Beep Directive

Ignore Configuration Directive

Scan one of the following bar codes to honor or ignore a code type enable/disable directive made over the IBM RS-485 bus. All directives are still acknowledged to the IBM RS-485 host as if they were processed.

***Honor Configuration Directive**

Ignore Configuration Directive

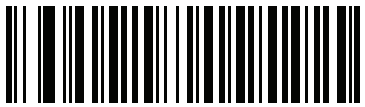
IBM-485 Specification Version

Parameter # 1729

The IBM interface specification version selected defines how code types are reported over the IBM interface.

Scan **Original Specification** to report only symbologies historically supported on each individual port as known. Scan Version 2.0 to report all symbologies covered in the newer IBM specification as known with their respective code types.

***Original Specification**
(0)



Version 2.0
(1)

CHAPTER 9 KEYBOARD WEDGE INTERFACE

Introduction

This chapter describes how to set up a Keyboard Wedge interface with the digital scanner. With this interface, the digital scanner is connected between the keyboard and host computer, and translates bar code data into keystrokes. The host computer accepts the keystrokes as if they originated from the keyboard. This mode adds bar code reading functionality to a system designed for manual keyboard input. Keyboard keystrokes are simply passed through.

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

* Indicates Default — ***North American** — Feature/Option

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

Connecting a Keyboard Wedge Interface

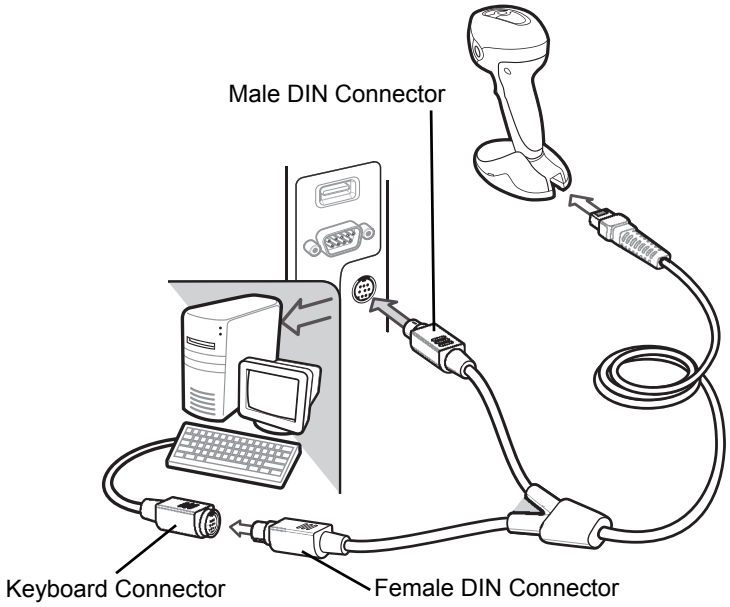


Figure 9-1 *Keyboard Wedge Connection with Y-cable*

To connect the Keyboard Wedge interface Y-cable:

NOTE Interface cables vary depending on configuration. The connectors illustrated in *Figure 9-1* are examples only. The connectors may be different than those illustrated, but the steps to connect the digital scanner are the same.

1. Turn off the host and unplug the keyboard connector.
2. Attach the modular connector of the Y-cable to the cable interface port on the digital scanner. See *Installing the Interface Cable on page 1-3*.
3. Connect the round male DIN host connector of the Y-cable to the keyboard port on the host device.
4. Connect the round female DIN keyboard connector of the Y-cable to the keyboard connector.
5. If needed, attach the optional power supply to the connector in the middle of the Y-cable.
6. Ensure that all connections are secure.
7. Turn on the host system.
8. Select the Keyboard Wedge host type by scanning the appropriate bar code from *Keyboard Wedge Host Types on page 9-4*.
9. To modify any other parameter options, scan the appropriate bar codes in this chapter.

Keyboard Wedge Parameter Defaults

Table 9-1 lists the defaults for Keyboard Wedge host parameters. To change any option, scan the appropriate bar code(s) in the Keyboard Wedge Host Parameters section beginning on page *9-4*.

NOTE See *Appendix A, Standard Default Parameters* for all user preferences, hosts, symbologies, and miscellaneous default parameters.

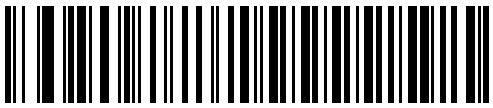
Table 9-1 *Keyboard Wedge Host Default Table*

Parameter	Default	Page Number
Keyboard Wedge Host Parameters		
Keyboard Wedge Host Type	IBM PC/AT& IBM PC Compatibles	*9-4*
Ignore Unknown Characters	Transmit	*9-5*
Keystroke Delay	No Delay	*9-5*
Intra-Keystroke Delay	Disable	*9-6*
Alternate Numeric Keypad Emulation	Disable	*9-6*
Simulated Caps Lock	Disable	*9-7*
Caps Lock Override	Disable	*9-7*
Convert Wedge Data	No Convert	*9-8*
Function Key Mapping	Disable	*9-8*
FN1 Substitution	Disable	*9-9*
Send and Make Break	Send	*9-9*

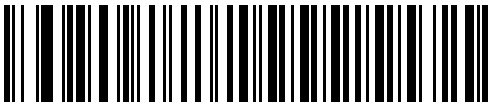
Keyboard Wedge Host Parameters

Keyboard Wedge Host Types

Select the Keyboard Wedge host by scanning one of the bar codes below. After selecting the host, see *Appendix B, Country Codes* to select a keyboard type.



IBM PC/AT & IBM PC Compatibles



IBM AT Notebook

Ignore Unknown Characters

Unknown characters are characters the host does not recognize. Select **Send Bar Codes With Unknown Characters** to send all bar code data except for unknown characters. The digital scanner issues no error beeps.

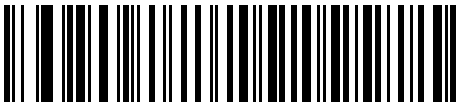
Select **Do Not Send Bar Codes With Unknown Characters** to send bar code data up to the first unknown character. The digital scanner issues an error beep.

***Send Bar Codes with Unknown Characters (Transmit)**

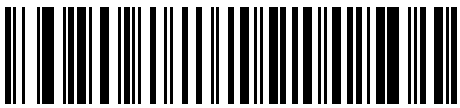
Do Not Send Bar Codes with Unknown Characters

Keystroke Delay

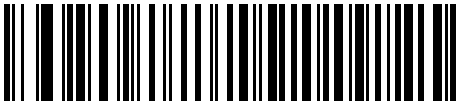
This is the delay in milliseconds between emulated keystrokes. Scan a bar code below to increase the delay when hosts require a slower transmission of data.



***No Delay**



Medium Delay (20 msec)



Long Delay (40 msec)

Intra-Keystroke Delay

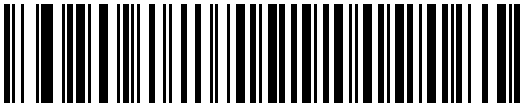
Enable this to insert an additional delay between each emulated key depression and release. This sets the Keystroke Delay parameter to a minimum of 5 msec as well.

Enable

***Disable**

Alternate Numeric Keypad Emulation

This allows emulation of most other country keyboard types not listed in *Appendix B, Country Codes* in a Microsoft® operating system environment.



Enable Alternate Numeric Keypad

***Disable Alternate Numeric Keypad**

Simulated Caps Lock

Enable this to invert upper and lower case characters on the bar code as if the Caps Lock state is enabled on the keyboard. This inversion occurs regardless of the keyboard's **Caps Lock** state. Note that this only applies to alpha characters.

Enable Caps Lock On

***Disable Caps Lock On**

Caps Lock Override

Enable this on AT or AT Notebook hosts to preserve the case of the data regardless of the state of the **Caps Lock** key. Therefore, an 'A' in the bar code transmits as an 'A' regardless of the setting of the keyboard's **Caps Lock** key.

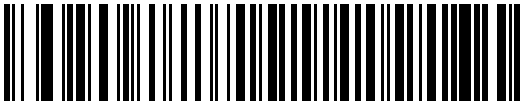
Enable Caps Lock Override

***Disable Caps Lock Override**

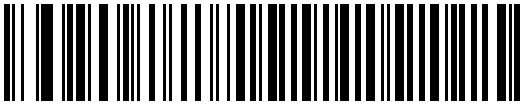
NOTE If both Simulated Caps Lock and Caps Lock Override are enabled, Caps Lock Override takes precedence.

Convert Wedge Data

Enable this to convert all bar code data to the selected case.



Convert to Upper Case



Convert to Lower Case

***No Convert**

Function Key Mapping

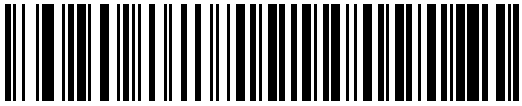
ASCII values under 32 are normally sent as control key sequences (see *Table 9-2 on page 9-11*). Enable this parameter to send the keys in bold in place of the standard key mapping. Table entries that do not have a bold entry remain the same whether or not you enable this parameter.

Enable

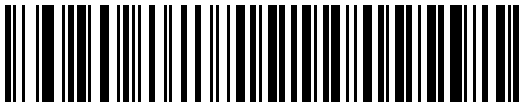
***Disable**

FN1 Substitution

Enable this to replace FN1 characters in an EAN128 bar code with a user-selected keystroke (see *FN1 Substitution Values on page 4-52*).



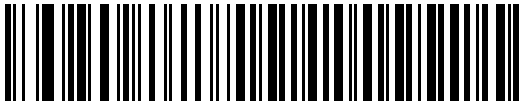
Enable



***Disable**

Send Make and Break

Enable this to prevent sending the scan codes for releasing a key.



***Send Make and Break Scan Codes**

Send Make Scan Code Only

NOTE Windows-based systems must use **Send Make and Break Scan Codes**.

Keyboard Maps

Refer to the following keyboard maps for prefix/suffix keystroke parameters. To program the prefix/suffix values, see the bar codes on *page 4-50*.

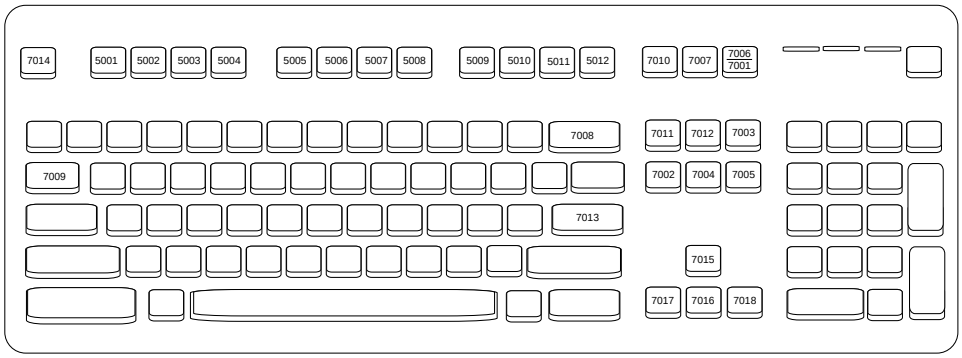


Figure 9-2 *IBM PS2 Type Keyboard*

ASCII Character Set for Keyboard Wedge

NOTE Code 39 Full ASCII interprets the bar code 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 9-2 *Keyboard Wedge ASCII Character Set*

ASCII Value	Full ASCII Code 39 Encode Char.acter	Keystroke
1001	$A	CTRL A
1002	$B	CTRL B
1003	$C	CTRL C
1004	$D	CTRL D
1005	$E	CTRL E
1006	$F	CTRL F
1007	$G	CTRL G
1008	$H	CTRL H/**BACKSPACE**[1]
1009	$I	CTRL I/**HORIZONTAL TAB**[1]
1010	$J	CTRL J
1011	$K	CTRL K
1012	$L	CTRL L
1013	$M	CTRL M/**ENTER**[1]
1014	$N	CTRL N
1015	$O	CTRL O
1016	$P	CTRL P
1017	$Q	CTRL Q
1018	$R	CTRL R
1019	$S	CTRL S
1020	$T	CTRL T
1021	$U	CTRL U
1022	$V	CTRL V
1023	$W	CTRL W

[1]The keystroke in bold transmits only if you enabled *Function Key Mapping on page 9-8*. Otherwise, the unbolded keystroke transmits.

Table 9-2 *Keyboard Wedge ASCII Character Set (Continued)*

ASCII Value	Full ASCII Code 39 Encode Char.acter	Keystroke
1024	$X	CTRL X
1025	$Y	CTRL Y
1026	$Z	CTRL Z
1027	%A	CTRL [/**ESC**[1]
1028	%B	CTRL \
1029	%C	CTRL]
1030	%D	CTRL 6
1031	%E	CTRL -
1032	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
1049	1	1
1050	2	2
1051	3	3
1052	4	4

[1]The keystroke in bold transmits only if you enabled *Function Key Mapping on page 9-8*. Otherwise, the unbolded keystroke transmits.

Table 9-2 *Keyboard Wedge ASCII Character Set (Continued)*

ASCII Value	Full ASCII Code 39 Encode Char.acter	Keystroke
1053	5	5
1054	6	6
1055	7	7
1056	8	8
1057	9	9
1058	/Z	:
1059	%F	;
1060	%G	<
1061	%H	=
1062	%I	>
1063	%J	?
1064	%V	@
1065	A	A
1066	B	B
1067	C	C
1068	D	D
1069	E	E
1070	F	F
1071	G	G
1072	H	H
1073	I	I
1074	J	J
1075	K	K
1076	L	L
1077	M	M
1078	N	N
1079	O	O
1080	P	P
1081	Q	Q

[1]The keystroke in bold transmits only if you enabled *Function Key Mapping on page 9-8*. Otherwise, the unbolded keystroke transmits.

Table 9-2 *Keyboard Wedge ASCII Character Set (Continued)*

ASCII Value	Full ASCII Code 39 Encode Char.acter	Keystroke
1082	R	R
1083	S	S
1084	T	T
1085	U	U
1086	V	V
1087	W	W
1088	X	X
1089	Y	Y
1090	Z	Z
1091	%K	[
1092	%L	\
1093	%M	]
1094	%N	^
1095	%O	_
1096	%W	‘
1097	+A	a
1098	+B	b
1099	+C	c
1100	+D	d
1101	+E	e
1102	+F	f
1103	+G	g
1104	+H	h
1105	+I	i
1106	+J	j
1107	+K	k
1108	+L	l
1109	+M	m
1110	+N	n

[1]The keystroke in bold transmits only if you enabled *Function Key Mapping on page 9-8*. Otherwise, the unbolded keystroke transmits.

Table 9-2 *Keyboard Wedge ASCII Character Set (Continued)*

ASCII Value	Full ASCII Code 39 Encode Char.acter	Keystroke
1111	+O	o
1112	+P	p
1113	+Q	q
1114	+R	r
1115	+S	s
1116	+T	t
1117	+U	u
1118	+V	v
1119	+W	w
1120	+X	x
1121	+Y	y
1122	+Z	z
1123	%P	{
1124	%Q	|
1125	%R	}
1126	%S	~

[1]The keystroke in bold transmits only if you enabled *Function Key Mapping on page 9-8*. Otherwise, the unbolded keystroke transmits.

Table 9-3 *Keyboard Wedge ALT Key Character Set*

ALT Keys	Keystroke
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
2074	ALT J
2075	ALT K

Table 9-3 *Keyboard Wedge ALT Key Character Set (Continued)*

ALT Keys	Keystroke
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

Table 9-4 *Keyboard Wedge GUI Key Character Set*

GUI Keys	Keystrokes
3000	Right Control Key
3048	GUI 0
3049	GUI 1
3050	GUI 2
3051	GUI 3
3052	GUI 4
3053	GUI 5
3054	GUI 6
3055	GUI 7
3056	GUI 8
3057	GUI 9
3065	GUI A
3066	GUI B
3067	GUI C

Table 9-4 *Keyboard Wedge GUI Key Character Set (Continued)*

GUI Keys	Keystrokes
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 9-5 *Keyboard Wedge F Key Character Set*

F Keys	Keystroke
5001	F1
5002	F2
5003	F3
5004	F4
5005	F5
5006	F6

Table 9-5 *Keyboard Wedge F Key Character Set (Continued)*

F Keys	Keystroke
5007	F7
5008	F8
5009	F9
5010	F10
5011	F11
5012	F12
5013	F13
5014	F14
5015	F15
5016	F16
5017	F17
5018	F18
5019	F19
5020	F20
5021	F21
5022	F22
5023	F23
5024	F24

Table 9-6 *Keyboard Wedge Numeric Keypad Character Set*

Numeric Keypad	Keystroke
6042	*
6043	+
6044	undefined
6045	-
6046	.
6047	/
6048	0
6049	1
6050	2
6051	3
6052	4

Table 9-6 *Keyboard Wedge Numeric Keypad Character Set (Continued)*

Numeric Keypad	Keystroke
6053	5
6054	6
6055	7
6056	8
6057	9
6058	Enter
6059	Num Lock

Table 9-7 *Keyboard Wedge Extended Keypad Character Set*

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

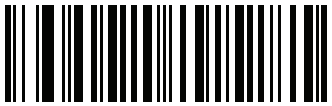
CHAPTER 10 OCR PROGRAMMING

Introduction

This chapter describes how to set up the digital scanner for OCR programming. The digital 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 bar code. 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.

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



* Indicates Default — ***Disable OCR-A** — Feature/Option

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

OCR Parameter Defaults

Table 10-1 lists the defaults for OCR parameters. To change any option, scan the appropriate bar code(s) provided in the Parameter Descriptions section beginning on *page 10-3*.

NOTE See *Appendix A, Standard Default Parameters* for all user preferences, hosts, symbologies, and miscellaneous default parameters.

Table 10-1 *OCR Programming Default Table*

Parameter	Parameter Number	Default	Page Number
OCR Programming Parameters			
OCR-A	680	Disable	*10-3*
OCR-A Variant	684	Full ASCII	*10-3*
OCR-B	681	Disable	*10-5*
OCR-B Variant	685	Full ASCII	*10-6*
MICR E13B	682	Disable	*10-10*
US Currency	683	Disable	*10-11*
OCR Orientation	687	0º	*10-11*
OCR Lines	691	1	*10-13*
OCR Minimum Characters	689	3	*10-13*
OCR Maximum Characters	690	100	*10-14*
OCR Subset	686	Selected font variant	*10-14*
OCR Quiet Zone	695	50	*10-15*
OCR Bright Illumination	701	Disable	*10-15*
OCR Template	547	54R	*10-16*
OCR Check Digit Modulus	688	1	*10-25*
OCR Check Digit Multiplier	700	121212121212	*10-26*
OCR Check Digit Validation	694	None	*10-27*
Inverse OCR	856	Regular	*10-32*

OCR Programming Parameters

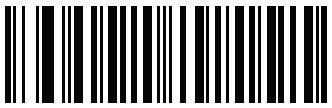
Enable/Disable OCR-A

Parameter # 680

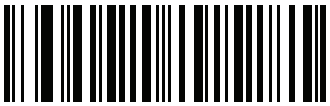
To enable or disable OCR-A, scan one of the following bar codes.

✓ ***NOTE*** OCR is not as secure as a bar code. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See *OCR Subset on page 10-14* and *OCR Template on page 10-16*.

✓ ***NOTE*** All OCR fonts are disabled by default.



Enable OCR-A
(1)



***Disable OCR-A**
(0)

OCR-A Variant

Parameter # 684

Font variant sets a processing algorithm and default character subset for the given font. To choose a variant, scan one of the following bar codes. Selecting the most appropriate font variant optimizes 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<>

OCR-A Variant (continued)

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 its default (OCR-A Full ASCII).

***OCR-A Full ASCII**
(0)

OCR-A Reserved 1
(1)

OCR-A Reserved 2
(2)

OCR-A Banking
(3)

Enable/Disable OCR-B

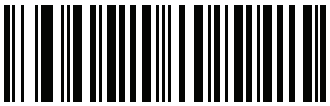
Parameter # 681

To enable or disable OCR-B, scan one of the following bar codes.

NOTE OCR is not as secure as a bar code. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See *OCR Subset on page 10-14* and *OCR Template on page 10-16*.

NOTE All OCR fonts are disabled by default.

Enable OCR-B
(1)



***Disable OCR-B**
(0)

OCR-B Variant

Parameter # 685

OCR-B has the following variants. Selecting the most appropriate font variant affects performance and accuracy.

- 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.

OCR-B Variant (continued)

To choose a variant, scan one of the following bar codes. Selecting the following OCR-B variants automatically sets the appropriate *OCR Lines on page 10-13*. 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 decoder in place (6.5 - 7.5”).

✓ ***NOTE*** Enable OCR-B before setting this parameter. If disabling OCR-B, set the variant to its default (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 Variant (continued)

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 Variant (continued)

OCR-B Visa Type B
(10)

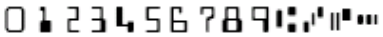
OCR-B ICAO Travel Documents
(11)

Enable/Disable MICR E13B

Parameter # 682

To enable or disable MICR E13B, scan one of the following bar codes.

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**

NOTE OCR is not as secure as a bar code. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See *OCR Subset on page 10-14* and *OCR Template on page 10-16*.

NOTE All OCR fonts are disabled by default.

Enable MICR E13B
(1)

***Disable MICR E13B**
(0)

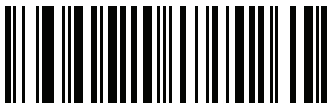
Enable/Disable US Currency Serial Number

Parameter # 683

To enable or disable US Currency Serial Number, scan one of the following bar codes.

NOTE OCR is not as secure as a bar code. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit. See *OCR Subset on page 10-14* and *OCR Template on page 10-16*.

NOTE All OCR fonts are disabled by default.



Enable US Currency
(1)

***Disable US Currency**
(0)

OCR Orientation

Parameter # 687

Select one of five options to specify the orientation of an OCR string to be read:

- 0^{o} to the imaging engine (default)
- 270^{o} clockwise (or 90^{o} counterclockwise) to the imaging engine
- 180^{o} (upside down) to the imaging engine
- 90^{o} clockwise to the imaging engine
- Omnidirectional

Setting an incorrect orientation can cause misdecodes.

OCR Orientation (continued)

***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

To select the number of OCR lines to decode, scan one of the following bar codes. Selecting Visas, TD1, or TD2 ID cards automatically sets the appropriate **OCR Lines**. Also see *OCR-B Variant on page 10-6*.

***OCR 1 Line**
(1)

OCR 2 Lines
(2)

OCR 3 Lines
(3)

OCR Minimum Characters

Parameter # 689

To select the minimum number of OCR characters (not including spaces) per line to decode, scan the following bar code, then scan a three-digit number between 003 and 100 using the bar codes in *Appendix G, Numeric Bar Codes* representing the number of OCR characters to decode. Strings of OCR characters less than the minimum are ignored. The default is 003.

OCR Minimum Characters

OCR Maximum Characters

Parameter # 690

To select the maximum number of OCR characters (including spaces) per line to decode, scan the following bar code, then scan a three-digit number between 003 and 100 using the bar codes in *Appendix G, Numeric Bar Codes* representing the number of OCR characters to decode. Strings of OCR characters greater than the maximum are ignored. The default is 100.

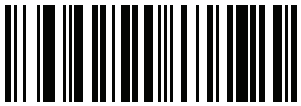
OCR Maximum Characters

OCR Subset

Parameter # 686

Set 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 set or modify the OCR font subset, first enable the appropriate OCR font(s). Next, scan the following bar code, then scan numbers and letters to form the OCR Subset from the alphanumeric keyboard in the *Advanced Data Formatting Guide*. Then scan **End of Message** in the *Advanced Data Formatting Guide*.



OCR Subset

To cancel an OCR subset, for OCR-A or OCR-B, scan OCR-A variant **Full ASCII**, or OCR-B variant **Full ASCII**.

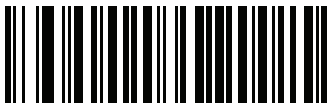
For MICR E13B or US Currency Serial Number, create a subset which includes all allowed characters in that character set, or scan an option from the *Set Default Parameter on page 4-5* and re-program the digital scanner.

OCR Quiet Zone

Parameter # 695

This option sets the OCR quiet zone. The digital 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 roughly 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.

To set a quiet zone, scan the following bar code, then scan a two-digit number using the numeric keypad in the *Advanced Data Formatting Guide*. The range of the quiet zone is 20 - 99 and the default is 50, indicating a six character width quiet zone.



OCR Quiet Zone

OCR Bright Illumination

Parameter # 701

When enabled, image contrast is improved for OCR scanning. Zebra recommends enabling this when the OCR string is longer than 20 characters, and for applications with busy backgrounds such as check or VISA reading.

Enable OCR Bright Illumination
(1)

***Disable OCR Bright Illumination**
(0)

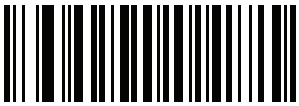
NOTE Enabling **OCR Bright Illumination** causes the aiming pattern to blink due to the lower frame rate setting.

OCR Template

Parameter # 547

This option 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 the *OCR Template* bar code, then bar codes corresponding to numbers and letters on the following pages to form the template expression. Then scan **End of Message** in the *Advanced Data Formatting Guide*. The default is **54R** which accepts any character OCR strings.



OCR Template

End of Message

Required Digit (9)

9

Only a numeric character is allowed in this position.

Template	Valid data	Valid data	Invalid data
99999	12987	30517	123AB

Required Alpha (A)

A

Only an alpha character is allowed in this position.

Template	Valid data	Valid data	Invalid data
AAA	ABC	WXY	12F

Require and Suppress (0)

It is required that any character in this position, including space or reject, is suppressed from the output.

Template	Incoming data	Output
990AA	12QAB	12AB

Optional Alphanumeric (1)

1

When this option appears in the template string, the data validator accepts an alphanumeric character 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<

Optional Alpha (2)

2

When this option appears in the template string, the data validator accepts an alpha character 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

Alpha or Digit (3)

3

The data validator requires an alphanumeric character in this position to validate the incoming data.

Template	Valid data	Valid data	Invalid data
33333	12ABC	WXY34	12AB<

Any Including Space & Reject (4)

4

The template accepts any character in this position, including space and reject. Rejects are represented as an underscore (_) in the output. This is a good selection for troubleshooting.

Template	Valid data	Valid data
99499	12$34	34 98

Any except Space & Reject (5)

5

The template accepts any character in this position except a space or reject.

Template	Valid data	Valid data	Invalid data
55999	A.123	*Z456	A BCD

Optional Digit (7)

7

When this option appears in the template string, the template accepts a numeric character 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

Digit or Fill (8)

8

The data validator accepts any numeric or fill character in this position.

Template	Valid data	Valid data	Valid data
88899	12345	>>789	<<789

Alpha or Fill (F)

F

The data validator accepts any alpha or fill character in this position.

Template	Valid data	Valid data	Valid data
AAAFF	ABCXY	LMN>>	ABC<5

Optional Space ( )

Space

When this option appears in the template string, the template accepts a space 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

Optional Small Special (.)

.

When this option appears in the template string, the data validator accepts a special character 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 the *Advanced Data Formatting Guide* 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)

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

String Extract (C)

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

Ignore to End of Field (D)

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

Skip Until (P1)

P

1

This operator allows skipping 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 (see *Literal String (" and +) on page 10-20*) 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"AA999	123PN9876	PN9876
	PN1234	PN1234
	X-PN3592	PN3592

Skip Until Not (P0)

P

0

This operator allows skipping 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 (see *Literal String (" and +) on page 10-20*) 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	5341

Template	Incoming data	Output
P0"PN"9999	PN3456	3456
	5341	5341
	PNPN7654	7654

Repeat Previous (R)

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

Scroll Until Match (S)

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

Multiple Templates

This feature sets up multiple templates for OCR decoding. To do this, follow the procedure described in *OCR Template on page 10-16* (scan the *OCR Template* bar code, then bar codes corresponding to numbers and letters to form the template expression, then **End of Message**) for each template in the multiple template string, using a capital letter **X** as a separator between the 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

This option sets 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 check digit is the end product of a calculation made on the incoming data. For check digit calculation, for example Modulus 10, alpha and numeric characters are assigned numeric weights (see *OCR Check Digit Multiplier on page 10-26*). The calculation is applied to the character weights and the resulting check digit is added to the end of the data. 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**.

To choose the Check Digit Modulus, such as 10 for modulo 10, scan the following bar code, then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in the *Advanced Data Formatting Guide*. The default is **1**.

OCR Check Digit

OCR Check Digit Multiplier

Parameter # 700

This option sets OCR check digit multipliers for the character positions. For check digit validation, each character in scanned data has an equivalent weight used in the check digit calculation. DS9808 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.

121212121212 (default)

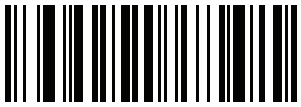
123456789A (for ISBN, Product Add Right to Left. See *OCR Check Digit Validation on page 10-27*)

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 modulo 11 for its check digit. In this case, 132 is divisible by 11, so it passes the check digit.

To set the check digit multiplier, scan the following bar code, then scan numbers and letters to form the multiplier string from the alphanumeric keyboard in the *Advanced Data Formatting Guide*. Then scan **End of Message** in the *Advanced Data Formatting Guide*.



OCR Check Digit Multiplier

OCR Check Digit Validation

Parameter # 694

Use **OCR Check Digit Validation** to protect against scanning errors by applying a check digit validation scheme. The following is a list of options.

None

No check digit validation, indicating no check digit is applied. This is the default.

***No Check Digit**
(0)

Product Add Left to Right

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 10-26*). 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.

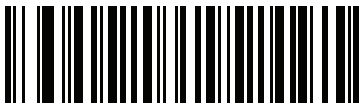
Example:

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

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 10-26*). 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.

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

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 10-26*). 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.

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

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 10-26*). 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.

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

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 10-26*). 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.

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

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 10-26*). 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.

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 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

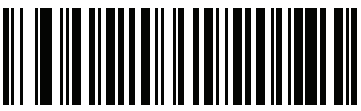
Sum of values: 41+10+1+2+3+11+19+12+5+13+6+14+7+1 = 145

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 (see *Table 10-2*), which in this example is 16, or **G**. The complete Supplier Labelling Data Structure, including the check digit, therefore is:

A 1 2 3 B J C 5 D 6 E 7 1 G

Table 10-2 *Table of 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

Inverse OCR is white or light words on a black or dark background. Select an option for decoding inverse OCR:

- **Regular Only** - decode regular OCR (black on white) strings only.
- **Inverse Only** - decode inverse OCR (white on black) strings only.
- **Autodiscriminate** - decodes both regular and inverse OCR strings.

***Regular Only**
(0)

Inverse Only
(1)

Autodiscriminate
(2)

CHAPTER 11 SYMBOLOGIES

Introduction

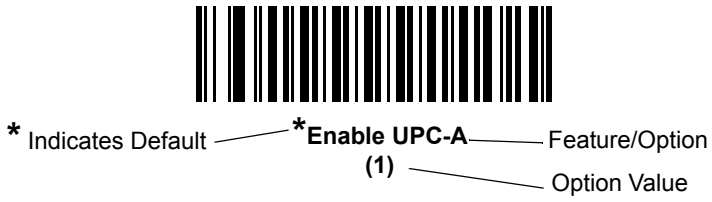
This chapter describes symbology features and provides programming bar codes for selecting these features. Before programming, follow the instructions in *Chapter 1, Getting Started*.

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

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

Select a host type (see each host chapter 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, scan the *Set Default Parameter on page 4-5*. Throughout the programming bar code menus, asterisks (*) indicate default values.



Scanning Sequence Examples

In most cases, scanning one bar code sets the parameter value. For example, to transmit bar code data without the UPC-A check digit, simply scan the **Do Not Transmit UPC-A Check Digit** bar code under *Transmit UPC-A Check Digit on page 11-17*. The digital scanner issues a fast warble beep and the LED turns green, signifying a successful parameter entry.

Other parameters, such as **Set Length(s) for D 2 of 5** require scanning several bar codes. See the individual parameter, such as **Set Length(s) for D 2 of 5**, for this procedure.

Errors While Scanning

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

Symbology Parameter Defaults

Table 11-1 lists the defaults for all symbologies parameters. To change the default values, scan the appropriate bar codes in this guide. These new values replace the standard default values in memory. To recall the default parameter values, scan the *Set Default Parameter on page 4-5*.

NOTE See *Appendix A, Standard Default Parameters* for all user preferences, hosts, and miscellaneous default parameters.

Table 11-1 *Parameter Defaults*

Parameter	Parameter Number	Default	Page Number
Disable All Code Types			*11-8*
UPC/EAN			
UPC-A	1	Enable	*11-9*
UPC-E	2	Enable	*11-9*
UPC-E1	12	Disable	*11-10*
EAN-8/JAN 8	4	Enable	*11-10*
EAN-13/JAN 13	3	Enable	*11-11*
Bookland EAN	83	Disable	*11-11*
Decode UPC/EAN/JAN Supplementals (2 and 5 digits)	16	Ignore	*11-13*
User-Programmable Supplementals Supplemental 1: Supplemental 2:	 579 580		*11-15*
UPC/EAN/JAN Supplemental Redundancy	80	10	*11-15*
Decode UPC/EAN/JAN Supplemental AIM ID	672	Combined	*11-16*
UPC Reduced Quiet Zone	1289	Disable	*11-17*
Transmit UPC-A Check Digit	40	Enable	*11-17*
Transmit UPC-E Check Digit	41	Enable	*11-17*
Transmit UPC-E1 Check Digit	42	Enable	*11-18*
UPC-A Preamble	34	System Character	*11-19*
UPC-E Preamble	35	System Character	*11-19*
UPC-E1 Preamble	36	System Character	*11-21*

Table 11-1 *Parameter Defaults (Continued)*

Parameter	Parameter Number	Default	Page Number
Convert UPC-E to A	37	Disable	*11-22*
Convert UPC-E1 to A	38	Disable	*11-22*
EAN-8/JAN-8 Extend	39	Disable	*11-23*
Bookland ISBN Format	576	ISBN-10	*11-24*
UCC Coupon Extended Code	85	Disable	*11-25*
Coupon Report	730	New Coupon Symbols	*11-26*
ISSN EAN	617	Disable	*11-27*
Code 128			
Code 128	8	Enable	*11-28*
Set Length(s) for Code 128	209, 210	1 to 55	*11-28*
GS1-128 (formerly UCC/EAN-128)	14	Enable	*11-29*
ISBT 128	84	Enable	*11-30*
ISBT Concatenation	577	Disable	*11-31*
Check ISBT Table	578	Enable	*11-32*
ISBT Concatenation Redundancy	223	10	*11-32*
Code 128 Security Level	751	Security Level 1	*11-33*
Code 128 Reduced Quiet Zone	1208	Disable	*11-34*
Ignore Code 128 <FNC4>	1254	Disable	*11-34*
Code 39			
Code 39	0	Enable	*11-35*
Trioptic Code 39	13	Disable	*11-35*
Convert Code 39 to Code 32 (Italian Pharmacy Code)	86	Disable	*11-36*
Code 32 Prefix	231	Disable	*11-36*
Set Length(s) for Code 39	18, 19	1 to 55	*11-37*
Code 39 Check Digit Verification	48	Disable	*11-38*
Transmit Code 39 Check Digit	43	Disable	*11-38*
Code 39 Full ASCII Conversion	17	Disable	*11-39*
Code 39 Security Level	750	Security Level 1	*11-40*
Code 39 Reduced Quiet Zone	1209	Disable	*11-41*
Buffer Code 39	113	Disable	*11-41*

Table 11-1 *Parameter Defaults (Continued)*

Parameter	Parameter Number	Default	Page Number
Code 93			
Code 93	9	Disable	*11-44*
Set Length(s) for Code 93	26, 27	4 to 55	*11-45*
Code 11			
Code 11	10	Disable	*11-46*
Set Lengths for Code 11	28, 29	4 to 55	*11-47*
Code 11 Check Digit Verification	52	Disable	*11-48*
Transmit Code 11 Check Digit(s)	47	Disable	*11-49*
Interleaved 2 of 5 (ITF)			
Interleaved 2 of 5 (ITF)	6	Enable	*11-50*
Set Lengths for I 2 of 5	22, 23	6 to 55	*11-50*
I 2 of 5 Check Digit Verification	49	Disable	*11-52*
Transmit I 2 of 5 Check Digit	44	Disable	*11-52*
Convert I 2 of 5 to EAN 13	82	Disable	*11-53*
I 2 of 5 Security Level	1121	Security Level 1	*11-54*
I 2 of 5 Reduced Quiet Zone	1210	Disable	*11-55*
Discrete 2 of 5 (DTF)			
Discrete 2 of 5	5	Disable	*11-56*
Set Length(s) for D 2 of 5	20, 21	12	*11-56*
Codabar (NW - 7)			
Codabar	7	Disable	*11-58*
Set Lengths for Codabar	24, 25	4 to 55	*11-59*
CLSI Editing	54	Disable	*11-60*
NOTIS Editing	55	Disable	*11-60*
Codabar Upper or Lower Case Start/Stop Characters Transmission	855	Upper Case	*11-61*
MSI			
MSI	11	Disable	*11-62*
Set Length(s) for MSI	30, 31	4 to 55	*11-62*
MSI Check Digits	50	One	*11-64*
Transmit MSI Check Digit	46	Disable	*11-64*

Table 11-1 *Parameter Defaults (Continued)*

Parameter	Parameter Number	Default	Page Number
MSI Check Digit Algorithm	51	Mod 10/Mod 10	*11-65*
MSI Reduced Quiet Zone	1392	Disable	*11-65*
Chinese 2 of 5			
Chinese 2 of 5	408	Disable	*11-66*
Matrix 2 of 5			
Matrix 2 of 5	618	Disable	*11-66*
Matrix 2 of 5 Lengths	619, 620	4 to 55	*11-67*
Matrix 2 of 5 Check Digit	622	Disable	*11-68*
Transmit Matrix 2 of 5 Check Digit	623	Disable	*11-68*
Korean 3 of 5			
Korean 3 of 5	581	Disable	*11-69*
Inverse 1D	586	Regular	*11-70*
Postal Codes			
US Postnet	89	Disable	*11-71*
US Planet	90	Disable	*11-71*
Transmit US Postal Check Digit	95	Enable	*11-72*
UK Postal	91	Disable	*11-72*
Transmit UK Postal Check Digit	96	Enable	*11-73*
Japan Postal	290	Disable	*11-73*
Australia Post	291	Disable	*11-74*
Australia Post Format	718	Autodiscriminate	*11-75*
Netherlands KIX Code	326	Disable	*11-76*
USPS 4CB/One Code/Intelligent Mail	592	Disable	*11-76*
UPU FICS Postal	611	Disable	*11-77*
Mailmark	1337	Disable	*11-77*
GS1 DataBar			
GS1 DataBar Omnidirectional	338	Enable	*11-78*
GS1 DataBar Limited	339	Enable	*11-78*
GS1 DataBar Expanded	340	Enable	*11-79*
Convert GS1 DataBar to UPC/EAN	397	Disable	*11-79*
GS1 DataBar Security Level	1706	Level 1	*11-80*

Table 11-1 *Parameter Defaults (Continued)*

Parameter	Parameter Number	Default	Page Number
GS1 DataBar Limited Margin Check	728	Level 3	*11-81*
Composite			
Composite CC-C	341	Disable	*11-82*
Composite CC-A/B	342	Disable	*11-82*
Composite TLC-39	371	Disable	*11-83*
Composite Inverse	1113	Regular	*11-83*
UPC Composite Mode	344	Never Linked	*11-84*
Composite Beep Mode	398	Beep As Each Code Type is Decoded	*11-85*
GS1-128 Emulation Mode for UCC/EAN Composite Codes	427	Disable	*11-85*
2D Symbologies			
PDF417	15	Enable	*11-86*
MicroPDF417	227	Disable	*11-86*
Code 128 Emulation	123	Disable	*11-87*
Data Matrix	292	Enable	*11-88*
Data Matrix Inverse	588	Inverse Autodetect	*11-88*
GS1 Data Matrix	1336	Disable	*11-89*
Maxicode	294	Disable	*11-89*
QR Code	293	Enable	*11-90*
GS1 QR	1343	Disable	*11-90*
MicroQR	573	Enable	*11-91*
Aztec	574	Enable	*11-92*
Aztec Inverse	589	Regular	*11-92*
Han Xin	1167	Disable	*11-93*
Han Xin Inverse	1168	Regular	*11-93*
Symbology-Specific Security Levels			
Redundancy Level	78	1	*11-94*
Security Level	77	1	*11-96*
1D Quiet Zone Level	1288	1	*11-97*
Intercharacter Gap Size	381	Normal	*11-98*
Report Version			*11-98*

Table 11-1 *Parameter Defaults (Continued)*

Parameter	Parameter Number	Default	Page Number
Macro PDF			
Flush Macro PDF Buffer	N/A	N/A	*11-99*
Abort Macro PDF Entry	N/A	N/A	*11-99*

Disable All Code Types

To disable all symbologies, scan the bar code below. This is useful when enabling only a few code types.

Disable All Code Types

UPC/EAN

Enable/Disable UPC-A

Parameter # 1

To enable or disable UPC-A, scan the appropriate bar code below.

***Enable UPC-A**
(1)

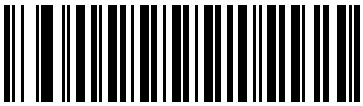
Disable UPC-A
(0)

Enable/Disable UPC-E

Parameter # 2

To enable or disable UPC-E, scan the appropriate bar code below.

***Enable UPC-E**
(1)



Disable UPC-E
(0)

Enable/Disable UPC-E1

Parameter # 12

UPC-E1 is disabled by default.

To enable or disable UPC-E1, scan the appropriate bar code below.

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

Enable UPC-E1
(1)

***Disable UPC-E1**
(0)

Enable/Disable EAN-8/JAN-8

Parameter # 4

To enable or disable EAN-8/JAN-8, scan the appropriate bar code below.

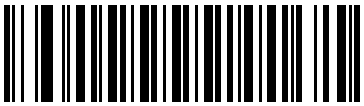
***Enable EAN-8/JAN-8**
(1)

Disable EAN-8/JAN-8
(0)

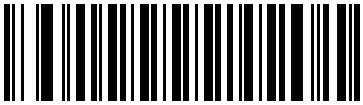
Enable/Disable EAN-13/JAN-13

Parameter # 3

To enable or disable EAN-13/JAN-13, scan the appropriate bar code below.



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



Disable EAN-13/JAN-13
(0)

Enable/Disable Bookland EAN

Parameter # 83

To enable or disable Bookland EAN, scan the appropriate bar code below.

Enable Bookland EAN
(1)

*Disable Bookland EAN
(0)

NOTE If you enable Bookland EAN, select a *Bookland ISBN Format on page 11-24*. Also select either Decode UPC/EAN Supplementals, Autodiscriminate UPC/EAN Supplementals, or Enable 978/979 Supplemental Mode in *Decode UPC/EAN/JAN Supplementals on page 11-12*.

Decode UPC/EAN/JAN Supplementals

Parameter # 16

Supplementals are bar codes appended according to specific format conventions (e.g., UPC A+2, UPC E+2, EAN 13+2). The following options are available:

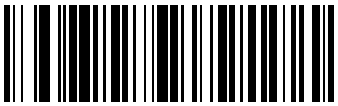
- If you select **Ignore UPC/EAN with Supplementals**, and the digital scanner is presented with a UPC/EAN plus supplemental symbol, the scanner decodes UPC/EAN and ignores the supplemental characters.
- If you select **Decode UPC/EAN with Supplementals**, the digital scanner only decodes UPC/EAN symbols with supplemental characters, and ignores symbols without supplementals.
- If you select **Autodiscriminate UPC/EAN Supplementals**, the digital scanner decodes UPC/EAN symbols with supplemental characters immediately. If the symbol does not have a supplemental, the digital scanner must decode the bar code the number of times set via *UPC/EAN/JAN Supplemental Redundancy on page 11-15* before transmitting its data to confirm that there is no supplemental.
- If you select one of the following **Supplemental Mode** options, the digital scanner immediately transmits EAN-13 bar codes starting with that prefix that have supplemental characters. If the symbol does not have a supplemental, the digital scanner must decode the bar code the number of times set via *UPC/EAN/JAN Supplemental Redundancy on page 11-15* before transmitting its data to confirm that there is no supplemental. The digital scanner transmits UPC/EAN bar codes 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 bar codes, see *Enable/Disable Bookland EAN on page 11-11* to enable Bookland EAN, and select a format using *Bookland ISBN Format on page 11-24*.

  - **Enable 977 Supplemental Mode**
  - **Enable 414/419/434/439 Supplemental Mode**
  - **Enable 491 Supplemental Mode**
  - **Enable Smart Supplemental Mode** - applies to EAN-13 bar codes starting with any prefix listed previously.
  - **Supplemental User-Programmable Type 1** - applies to EAN-13 bar codes starting with a 3-digit user-defined prefix. Set this 3-digit prefix using *User-Programmable Supplementals on page 11-15*.
  - **Supplemental User-Programmable Type 1 and 2 -** applies to EAN-13 bar codes starting with either of two 3-digit user-defined prefixes. Set the 3-digit prefixes using *User-Programmable Supplementals on page 11-15*.
  - **Smart Supplemental Plus User-Programmable 1** - applies to EAN-13 bar codes starting with any prefix listed previously or the user-defined prefix set using *User-Programmable Supplementals on page 11-15*.
  - **Smart Supplemental Plus User-Programmable 1 and 2 -** applies to EAN-13 bar codes starting with any prefix listed previously or one of the two user-defined prefixes set using *User-Programmable Supplementals on page 11-15*.

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

Decode UPC/EAN/JAN Supplementals (continued)



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

***Ignore Supplementals (0)**

Autodiscriminate UPC/EAN/JAN Supplementals (2)

Enable 378/379 Supplemental Mode (4)

Enable 978/979 Supplemental Mode (5)

Enable 977 Supplemental Mode (7)

Decode UPC/EAN/JAN Supplementals (continued)

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

Supplemental 1: Parameter # 579

Supplemental 2: Parameter # 580

If you selected a Supplemental User-Programmable option from *Decode UPC/EAN/JAN Supplementals on page 11-12*, select **User-Programmable Supplemental 1** to set the 3-digit prefix. Then select the 3 digits using the numeric bar codes beginning on *page G-1*. Select **User-Programmable Supplemental 2** to set a second 3-digit prefix. Then select the 3 digits using the numeric bar codes beginning on *page G-1*.

User-Programmable Supplemental 1

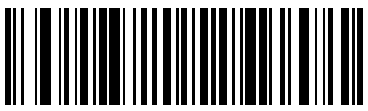
User-Programmable Supplemental 2

UPC/EAN/JAN Supplemental Redundancy

Parameter # 80

If you selected **Autodiscriminate UPC/EAN/JAN Supplementals**, this option adjusts the number of times to decode a symbol without supplementals before transmission. The range is from two to thirty times. Five or above is recommended when decoding a mix of UPC/EAN/JAN symbols with and without supplementals. The default is 10.

Scan the bar code below to set a decode redundancy value. Next, scan two numeric bar codes in *Appendix G, Numeric Bar Codes*. Enter a leading zero for single digit numbers. To correct an error or change a selection, scan *Cancel on page G-2*.



UPC/EAN/JAN Supplemental Redundancy

UPC/EAN/JAN Supplemental AIM ID Format

Parameter # 672

Select an output format when reporting UPC/EAN/JAN bar codes with Supplementals with *Transmit Code ID Character on page 4-49* set to **AIM Code ID Character**:

- **Separate** - transmit UPC/EAN with supplementals with separate AIM IDs but one transmission, i.e.:

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

- **Combined** – transmit UPC/EAN with supplementals with one AIM ID and one transmission, i.e.:

  ]E3<data+supplemental data>

- **Separate Transmissions** - transmit UPC/EAN with supplementals with separate AIM IDs and separate transmissions, i.e.:

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

Separate
(0)

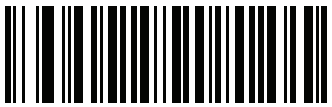
***Combined**
(1)

Separate Transmissions
(2)

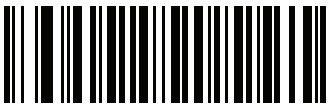
UPC Reduced Quiet Zone

Parameter # 1289

Scan one of the following bar codes to enable or disable decoding UPC bar codes with reduced quiet zones. If you select **Enable**, select a *1D Quiet Zone Level on page 11-97*.



Enable UPC Reduced Quiet Zone
(1)



***Disable UPC Reduced Quiet Zone**
(0)

Transmit UPC-A Check Digit

Parameter # 40

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate bar code below to transmit the bar code data with or without the UPC-A check digit. It is always verified to guarantee the integrity of the data.

***Transmit UPC-A Check Digit**
(1)

Do Not Transmit UPC-A Check Digit
(0)

Transmit UPC-E Check Digit

Parameter # 41

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate bar code below to transmit the bar code data with or without the UPC-E check digit. It is always verified to guarantee the integrity of the data.

***Transmit UPC-E Check Digit**
(1)

Do Not Transmit UPC-E Check Digit
(0)

Transmit UPC-E1 Check Digit

Parameter # 42

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate bar code below to transmit the bar code data with or without the UPC-E1 check digit. It is always verified to guarantee the integrity of the data.

***Transmit UPC-E1 Check Digit**
(1)

Do Not Transmit UPC-E1 Check Digit
(0)

UPC-A Preamble

Parameter # 34

Preamble characters are part of the UPC symbol, and include Country Code and System Character. There are three options for transmitting a UPC-A preamble to the host device: transmit System Character only, transmit System Character and Country Code (“0” for USA), and transmit no preamble. Select the appropriate option to match the host system.

No Preamble (<DATA>)
(0)

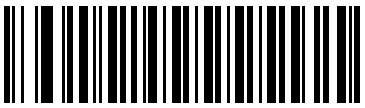
***System Character (<SYSTEM CHARACTER> <DATA>)**
(1)

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

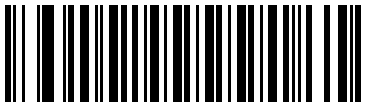
UPC-E Preamble

Parameter # 35

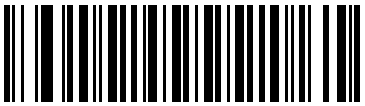
Preamble characters are part of the UPC symbol, and include Country Code and System Character. There are three options for transmitting a UPC-E preamble to the host device: transmit System Character only, transmit System Character and Country Code (“0” for USA), and transmit no preamble. Select the appropriate option to match the host system.



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

Preamble characters are part of the UPC symbol, and include Country Code and System Character. There are three options for transmitting a UPC-E1 preamble to the host device: transmit System Character only, transmit System Character and Country Code (“0” for USA), and transmit no preamble. Select the appropriate option to match the host system.

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

Enable this to convert 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 (e.g., Preamble, Check Digit).

Disable this to transmit UPC-E decoded data as UPC-E data, without conversion.

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

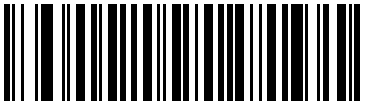
***Do Not Convert UPC-E to UPC-A (Disable)**
(0)

Convert UPC-E1 to UPC-A

Parameter # 38

Enable this to convert UPC-E1 decoded data to UPC-A format before transmission. After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

Disable this to transmit UPC-E1 decoded data as UPC-E1 data, without conversion.



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

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

EAN-8/JAN-8 Extend

Parameter # 39

Enable this parameter to add five leading zeros to decoded EAN-8 symbols to make them compatible in format to EAN-13 symbols.

Disable this to transmit EAN-8 symbols as is.

Enable EAN/JAN Zero Extend (1)

***Disable EAN/JAN Zero Extend (0)**

Bookland ISBN Format

Parameter # 576

If you enabled Bookland EAN using *Enable/Disable Bookland EAN on page 11-11*, select one of the following formats for Bookland data:

- **Bookland ISBN-10** - The digital 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 digital scanner reports Bookland data (starting with either 978 or 979) as EAN-13 in 13-digit format to meet the 2007 ISBN-13 protocol.

***Bookland ISBN-10**
(0)

Bookland ISBN-13
(1)

✓ ***NOTE*** For Bookland EAN to function properly, first enable Bookland EAN using *Enable/Disable Bookland EAN on page 11-11*, then select either Decode UPC/EAN Supplementals, Autodiscriminate UPC/EAN Supplementals, or Enable 978/979 Supplemental Mode in *Decode UPC/EAN/JAN Supplementals on page 11-12*.

UCC Coupon Extended Code

Parameter # 85

Enable this parameter to decode UPC-A bar codes starting with digit ‘5’, EAN-13 bar codes starting with digit ‘99’, and UPC-A/GS1-128 Coupon Codes. UPCA, EAN-13, and GS1-128 must be enabled to scan all types of Coupon Codes.

Enable UCC Coupon Extended Code (1)

***Disable UCC Coupon Extended Code (0)**

✓ ***NOTE*** See *UPC/EAN/JAN Supplemental Redundancy on page 11-15* to control autodiscrimination of the GS1-128 (right half) of a coupon code.

Coupon Report

Parameter # 730

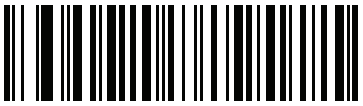
Traditional coupon symbols (old coupon symbols) are composed of two bar codes: UPC/EAN and Code128. A new coupon symbol is composed of a single Databar Expanded bar code. The new coupon format offers more options for purchase values (up to $999.99) and supports complex discount offers such as a second purchase requirement.

An interim coupon symbol also exists that contains both types of bar codes: UPC/EAN and Databar Expanded. This format accommodates both retailers that do not recognize or use the additional information included in the new coupon symbol, as well as those who can process new coupon symbols.

Scan a bar code below to select one of the following options for decoding coupon symbols:

- **Old Coupon Symbols** - Scanning an old coupon symbol reports both UPC and Code 128, scanning an interim coupon symbol reports UPC, and scanning a new coupon symbol reports nothing (no decode).
- **New Coupon Symbols** - Scanning an old coupon symbol reports either UPC or Code 128, and scanning an interim coupon symbol or a new coupon symbol reports Databar Expanded.
- **Both Coupon Formats** - Scanning an old coupon symbol reports both UPC and Code 128, and scanning an interim coupon symbol or a new coupon symbol reports Databar Expanded.

Old Coupon Symbols
(0)



***New Coupon Symbols**
(1)

Both Coupon Formats
(2)

ISSN EAN

Parameter # 617

To enable or disable ISSN EAN, scan the appropriate bar code below.

Enable ISSN EAN
(1)

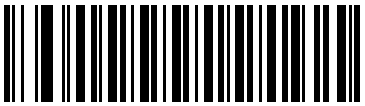
***Disable ISSN EAN**
(0)

Code 128

Enable/Disable Code 128

Parameter # 8

To enable or disable Code 128, scan the appropriate bar code below.



***Enable Code 128**
(1)

Disable Code 128
(0)

Set Lengths for Code 128

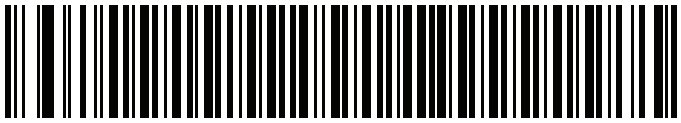
Parameter # L1 = 209, L2 = 210

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 128 to any length, one or two discrete lengths, or lengths within a specific range. The default is **Length Within Range:** 1 to 55.

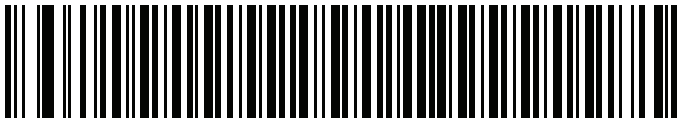
NOTE When setting lengths, enter a leading zero for single digit numbers.

- **One Discrete Length** - Decode only Code 128 symbols containing a selected length. Select the length using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Code 128 symbols with 14 characters, scan **Code 128 - One Discrete Length**, and then scan **1**, **4**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Two Discrete Lengths** - Decode only Code 128 symbols containing either of two lengths. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Code 128 symbols containing either 2 or 14 characters, select **Code 128 - Two Discrete Lengths**, and then scan **0**, **2**, **1**, **4**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Length Within Range** - Decode Code 128 symbols with a specific length range. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode Code 128 symbols containing between 4 and 12 characters, scan **Code 128 - Length Within Range**, and then scan **0**, **4**, **1, 2**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Any Length** - Decode Code 128 symbols containing any number of characters within the digital scanner's capability.

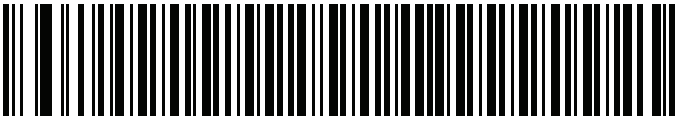
Set Lengths for Code 128 (continued)



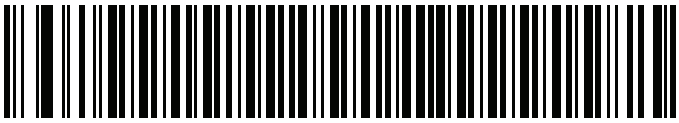
Code 128 - One Discrete Length



Code 128 - Two Discrete Lengths



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



Code 128 - Any Length

Enable/Disable GS1-128 (formerly UCC/EAN-128)

Parameter # 14

To enable or disable GS1-128, scan the appropriate bar code below.

***Enable GS1-128**
(1)

Disable GS1-128
(0)

Enable/Disable ISBT 128

Parameter # 84

ISBT 128 is a variant of Code 128 used in the blood bank industry. Scan a bar code below to enable or disable ISBT 128. If necessary, the host must perform concatenation of the ISBT data.

***Enable ISBT 128**
(1)

Disable ISBT 128
(0)

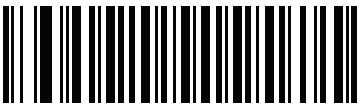
ISBT Concatenation

Parameter # 577

Select an option for concatenating pairs of ISBT code types:

- If you select **Disable ISBT Concatenation**, the digital scanner does not concatenate pairs of ISBT codes it encounters.
- If you select **Enable ISBT Concatenation**, there must be two ISBT codes in order for the digital scanner to decode and perform concatenation. The digital scanner does not decode single ISBT symbols.
- If you select **Autodiscriminate ISBT Concatenation**, the digital scanner decodes and concatenates pairs of ISBT codes immediately. If only a single ISBT symbol is present, the digital scanner must decode the symbol the number of times set via *ISBT Concatenation Redundancy on page 11-32* before transmitting its data to confirm that there is no additional ISBT symbol.

***Disable ISBT Concatenation**
(0)



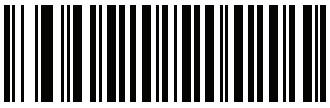
Enable ISBT Concatenation
(1)

Autodiscriminate ISBT Concatenation
(2)

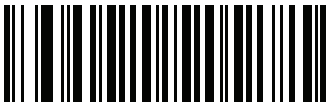
Check ISBT Table

Parameter # 578

The ISBT specification includes a table that lists several types of ISBT bar codes that are commonly used in pairs. If you set **ISBT Concatenation** to **Enable**, enable **Check ISBT Table** to concatenate only those pairs found in this table. Other types of ISBT codes are not concatenated.



***Enable Check ISBT Table**
(1)



Disable Check ISBT Table
(0)

ISBT Concatenation Redundancy

Parameter # 223

If you set **ISBT Concatenation** to **Autodiscriminate,** use this parameter to set the number of times the digital scanner must decode an ISBT symbol before determining that there is no additional symbol.

Scan the bar code below, then scan two numeric bar codes in *Appendix G, Numeric Bar Codes* to set a value between 2 and 20. Enter a leading zero for single digit numbers. To correct an error or change a selection, scan *Cancel on page G-2*. The default is 10.

ISBT Concatenation Redundancy

Code 128 Security Level

Parameter # 751

Code 128 bar codes are vulnerable to misdecodes by the nature of the symbol, especially when **Any Length** is set for Code 128 bar codes. The digital scanner offers four levels of decode security for Code 128 bar codes. There is an inverse relationship between security and digital scanner aggressiveness. Increasing the level of security may result in reduced aggressiveness in scanning, so select only the level of security necessary.

- **Code 128 Security Level 0:** This setting allows the digital scanner to operate in its most aggressive state, while providing sufficient security in decoding the most in-spec bar codes.
- **Code 128 Security Level 1:** A bar code must be successfully read twice, and satisfy certain safety requirements before being decoded. This default setting eliminates most misdecodes.
- **Code 128 Security Level 2:** Select this option with higher safety requirements to the bar codes if **Security Level 1** fails to eliminate misdecodes.
- **Code 128Security Level 3:** If you selected **Security Level 2**, and misdecodes still occur, select this security level. The highest safety requirements are applied. A bar code must be successfully read three times before being decoded.

> ***NOTE*** Selecting this option is an extreme measure against mis-decoding severely out-of-spec bar codes. Selecting this level of security significantly impairs the decoding ability of the digital scanner. If this level of security is required, it is recommended that you try to improve the quality of the bar codes.

Code 128Security 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

Scan one of the following bar codes to enable or disable decoding Code 128 bar codes with reduced quiet zones. If you select **Enable**, select a *1D Quiet Zone Level on page 11-97*.

Enable Code 128 Reduced Quiet Zone
(1)

***Disable Code 128 Reduced Quiet Zone**
(0)

Ignore Code 128 <FNC4>

Parameter # 1254

This feature applies to Code 128 bar codes with an embedded <FNC4> character. Enable this to strip the <FNC4> character from the decode data. The remaining characters are sent to the host unchanged. When disabled, the <FNC4> character is processed normally as per Code 128 standard.

Enable Ignore Code 128 <FNC4>
(1)

***Disable Ignore Code 128 <FNC4>**
(0)

Code 39

Enable/Disable Code 39

Parameter # 0

To enable or disable Code 39, scan the appropriate bar code below.

*Enable Code 39
(1)

Disable Code 39
(0)

Enable/Disable Trioptic Code 39

Parameter # 13

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. To enable or disable Trioptic Code 39, scan the appropriate bar code below.

Enable Trioptic Code 39
(1)

*Disable Trioptic Code 39
(0)

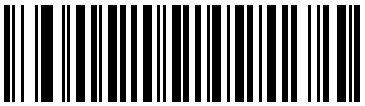
NOTE You cannot enable Trioptic Code 39 and Code 39 Full ASCII simultaneously.

Convert Code 39 to Code 32

Parameter # 86

Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry. Scan the appropriate bar code below to enable or disable converting Code 39 to Code 32.

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



Enable Convert Code 39 to Code 32
(1)

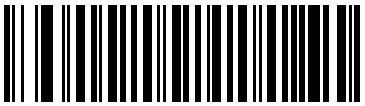
***Disable Convert Code 39 to Code 32**
(0)

Code 32 Prefix

Parameter # 231

Scan the appropriate bar code below to enable or disable adding the prefix character “A” to all Code 32 bar codes.

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



Enable Code 32 Prefix
(1)

***Disable Code 32 Prefix**
(0)

Set Lengths for Code 39

Parameter # L1 = 18, L2 = 19

The length of a code refers to the number of characters (i.e., 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 option is **Length Within Range**, 1 to 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. Select the length using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Code 39 symbols with 14 characters, scan **Code 39 - One Discrete Length**, and then scan **1, 4**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Two Discrete Lengths** - Decode only Code 39 symbols containing either of two lengths. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Code 39 symbols containing either 2 or 14 characters, select **Code 39 - Two Discrete Lengths**, and then scan **0**, **2**, **1**, **4**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Length Within Range** - Decode Code 39 symbols with a specific length range. Select lengths using bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode Code 39 symbols containing between 4 and 12 characters, first scan **Code 39 - Length Within Range**, and then scan **0**, **4**, **1, 2**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Any Length** - Decode Code 39 symbols containing any number of characters within the digital scanner's capability.

Code 39 - One Discrete Length

Code 39 - Two Discrete Lengths

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

Code 39 - Any Length

Code 39 Check Digit Verification

Parameter # 48

Enable this feature to check 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 feature if the Code 39 symbols contain a Modulo 43 check digit.

Enable Code 39 Check Digit
(1)

***Disable Code 39 Check Digit**
(0)

Transmit Code 39 Check Digit

Parameter # 43

Scan a bar code below to transmit Code 39 data with or without the check digit.

Transmit Code 39 Check Digit (Enable)
(1)

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

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

Code 39 Full ASCII Conversion

Parameter # 17

Code 39 Full ASCII is a variant of Code 39 which pairs characters to encode the full ASCII character set. To enable or disable Code 39 Full ASCII, scan the appropriate bar code below.

Enable Code 39 Full ASCII
(1)

***Disable Code 39 Full ASCII**
(0)

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

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 the *ASCII Character Set for USB on page 6-19* or the *ASCII Character Set for RS-232 on page 7-18*.

Code 39 Security Level

Parameter # 750

The digital scanner offers four levels of decode security for Code 39. Select increasing levels of security for decreasing levels of bar code quality. There is an inverse relationship between security and digital scanner aggressiveness, so choose only that level of security necessary for any given application.

- **Code 39 Security Level 0:** This setting allows the digital scanner to operate in its most aggressive state, while providing sufficient security in decoding most “in-spec” bar codes.
- **Code 39 Security Level 1:** This default setting eliminates most misdecodes.
- **Code 39 Security Level 2:** Select this option if Security level 1 fails to eliminate misdecodes.
- **Code 39 Security Level 3:** If you selected Security Level 2 and misdecodes still occur, select this security level. Be advised, selecting this option is an extreme measure against mis-decoding severely out of spec bar codes. Selecting this level of security significantly impairs the decoding ability of the digital scanner. If you need this level of security, try to improve the quality of the bar codes.

Code 39 Security Level 0
(0)

***Code 39 Security Level 1**
(1)

Code 39 Security Level 2
(2)

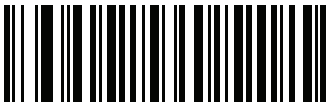
Code 39 Security Level 3
(3)

Code 39 Reduced Quiet Zone

Parameter # 1209

Scan one of the following bar codes to enable or disable decoding Code 39 bar codes with reduced quiet zones. If you select **Enable**, select a *1D Quiet Zone Level on page 11-97*.

Enable Code 39 Reduced Quiet Zone
(1)



***Disable Code 39 Reduced Quiet Zone**
(0)

Code 39 Buffering - Scan & Store

Parameter # 113

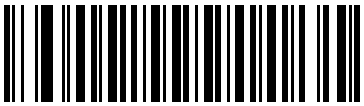
This feature allows the digital scanner to accumulate data from multiple Code 39 symbols.

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 transmission. The leading space is not buffered.

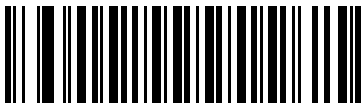
Decoding a Code 39 symbol with no leading space transmits in sequence all buffered data in a first-in first-out format, plus the “triggering” symbol. See the following pages for further details.

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 configuring the digital scanner to decode Code 39 symbology only.



Buffer Code 39 (Enable)
(1)



***Do Not Buffer Code 39 (Disable)**
(0)

While there is data in the transmission buffer, you cannot select **Do Not Buffer Code 39**. The buffer holds 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 on page 11-42*) or clear the buffer.

Buffer Data

To buffer data, enable Code 39 buffering 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 on page 11-43*.)
- 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** bar code below, which contains only 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.

Clear Buffer

NOTE The Clear Buffer contains only the dash (minus) character. 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.

1. Scan the **Transmit Buffer** bar code below, which includes only a start character, a plus (+), and a stop character.
2. The digital scanner transmits and clears the buffer.
   - The digital scanner issues a low/high beep.

Transmit Buffer

3. Scan a Code 39 bar code with a leading character other than a space.
   - The digital scanner appends new decode data to buffered data.
   - The digital scanner transmits and clears the buffer.
   - The digital scanner signals that it transmitted the buffer with a low/high beep.
   - The digital 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:

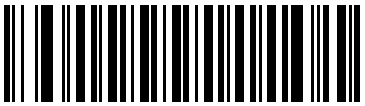
- A short low/high/low beep signals that the buffer is empty.
- No transmission occurs.
- The buffer remains empty.

Code 93

Enable/Disable Code 93

Parameter # 9

To enable or disable Code 93, scan the appropriate bar code below.



Enable Code 93
(1)

***Disable Code 93**
(0)

Set Lengths for Code 93

Parameter # L1 = 26, L2 = 27

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 93 to any length, one or two discrete lengths, or lengths within a specific range. The default option is **Length Within Range**, 4 to 55.

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

- **One Discrete Length** - Decode only Code 93 symbols containing a selected length. Select the length using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Code 93 symbols with 14 characters, scan **Code 93 - One Discrete Length**, and then scan **1, 4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Two Discrete Lengths** - Decode only Code 93 symbols containing either of two lengths. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Code 93 symbols containing either 2 or 14 characters, select **Code 93 - Two Discrete Lengths**, and then scan **0**, **2**, **1**, **4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Length Within Range** - Decode Code 93 symbols with a specific length range. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode Code 93 symbols containing between 4 and 12 characters, first scan **Code 93 - Length Within Range**, and then scan **0**, **4**, **1, 2**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Any Length** - Decode Code 93 symbols containing any number of characters within the digital scanner's capability.

Code 93 - One Discrete Length

Code 93 - Two Discrete Lengths

***Code 93 - Length Within Range**
(Default: 4 to 55)

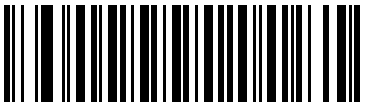
Code 93 - Any Length

Code 11

Code 11

Parameter # 10

To enable or disable Code 11, scan the appropriate bar code below.



Enable Code 11
(1)

***Disable Code 11**
(0)

Set Lengths for Code 11

Parameter # L1 = 28, L2 = 29

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 11 to any length, one or two discrete lengths, or lengths within a specific range. The default option is **Length Within Range**, 4 to 55.

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

- **One Discrete Length** - Decode only Code 11 symbols containing a selected length. Select the length using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Code 11 symbols with 14 characters, scan **Code 11 - One Discrete Length**, and then scan **1, 4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Two Discrete Lengths** - Decode only Code 11 symbols containing either of two selected lengths. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Code 11 symbols containing either 2 or 14 characters, select **Code 11 - Two Discrete Lengths**, and then scan **0**, **2**, **1**, **4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Length Within Range** - Decode Code 11 symbols with a specific length range. Select lengths using bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode Code 11 symbols containing between 4 and 12 characters, first scan **Code 11 - Length Within Range**, and then scan **0**, **4**, **1, 2**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Any Length** - Decode Code 11 symbols containing any number of characters within the digital scanner's capability.

Code 11 - One Discrete Length

Code 11 - Two Discrete Lengths

***Code 11 - Length Within Range**
(Default: 4 to 55)

Code 11 - Any Length

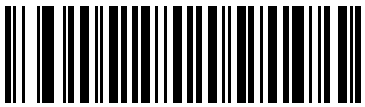
Code 11 Check Digit Verification

Parameter # 52

This feature allows the digital scanner to check the integrity of all Code 11 symbols to verify that the data complies with the specified check digit algorithm. This selects the check digit mechanism for the decoded Code 11 bar code. The options are to check for one check digit, check for two check digits, or disable the feature.

To enable this feature, scan the bar code below corresponding to the number of check digits encoded in the Code 11 symbols.

***Disable**
(0)



One Check Digit
(1)

Two Check Digits
(2)

Transmit Code 11 Check Digits

Parameter # 47

This feature selects whether or not to transmit the Code 11 check digit(s).

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

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

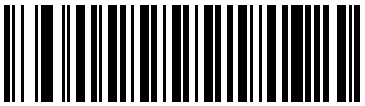
NOTE Code 11 Check Digit Verification must be enabled for this parameter to function.

Interleaved 2 of 5 (ITF)

Enable/Disable Interleaved 2 of 5

Parameter # 6

To enable or disable Interleaved 2 of 5, scan the appropriate bar code below, and select an Interleaved 2 of 5 length from the following pages.



***Enable Interleaved 2 of 5 (1)**

Disable Interleaved 2 of 5 (0)

Set Lengths for Interleaved 2 of 5

Parameter # L1 = 22, L2 = 23

The length of a code refers to the number of characters (i.e., 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 option is **Length Within Range**, 6 to 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. Select the length using the bar codes in *Appendix G, Numeric Bar Codes*. 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 correct an error or to change the selection, scan *Cancel on page G-2*.
- **Two Discrete Lengths** - Decode only I 2 of 5 symbols containing either of two selected lengths. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only I 2 of 5 symbols containing either 2 or 14 characters, select **I 2 of 5 - Two Discrete Lengths**, and then scan **0**, **2**, **1**, **4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Length Within Range** - Decode I 2 of 5 symbols with a specific length range. Select lengths using bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode I 2 of 5 symbols containing between 4 and 12 characters, first scan **I 2 of 5 - Length Within Range**, and then scan **0**, **4**, **1, 2**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Any Length** - Decode I 2 of 5 symbols containing any number of characters within the digital scanner's capability.

Set Lengths for Interleaved 2 of 5 (continued)

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 bar code. To prevent this, select specific lengths (I 2 of 5 - One Discrete Length, Two Discrete Lengths) for I 2 of 5 applications.

I 2 of 5 - One Discrete Length

I 2 of 5 - Two Discrete Lengths

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

I 2 of 5 - Any Length

I 2 of 5 Check Digit Verification

Parameter # 49

Enable this feature to check 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**
(0)

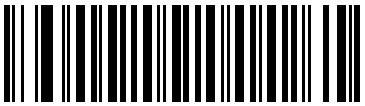
USS Check Digit
(1)

OPCC Check Digit
(2)

Transmit I 2 of 5 Check Digit

Parameter # 44

Scan the appropriate bar code below to transmit I 2 of 5 data with or without the check digit.



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

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

Convert I 2 of 5 to EAN-13

Parameter # 82

Enable this parameter to convert 14-character I 2 of 5 codes to EAN-13, and transmit to the host as EAN-13. To accomplish this, 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)**

I 2 of 5 Security Level

Parameter # 1121

Interleaved 2 of 5 bar codes are vulnerable to misdecodes, particularly when I 2 of 5 Lengths is set to **Any Length**. The digital scanner offers four levels of decode security for Interleaved 2 of 5 bar codes. There is an inverse relationship between security and digital 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:** This setting allows the digital scanner to operate in its most aggressive state, while providing sufficient security in decoding most in-spec bar codes.
- **I 2 of 5 Security Level 1:** A bar code 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:** Select this option with greater bar code 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 bar code must be successfully read three times before being decoded.

✓ ***NOTE*** Selecting this option is an extreme measure against mis-decoding severely out-of-spec bar codes. Selecting this level of security significantly impairs the decoding ability of the digital scanner. If this level of security is required, try to improve the quality of the bar codes.

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)

I 2 of 5 Reduced Quiet Zone

Parameter # 1210

Scan one of the following bar codes to enable or disable decoding I 2 of 5 bar codes with reduced quiet zones. If you select **Enable**, select a *1D Quiet Zone Level on page 11-97*.

Enable I 2 of 5 Reduced Quiet Zone (1)

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

Discrete 2 of 5 (DTF)

Enable/Disable Discrete 2 of 5

Parameter # 5

To enable or disable Discrete 2 of 5, scan the appropriate bar code below.

Enable Discrete 2 of 5
(1)

***Disable Discrete 2 of 5**
(0)

Set Lengths for Discrete 2 of 5

Parameter # L1 = 20, L2 = 21

The length of a code refers to the number of characters (i.e., 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 option is **One Discrete Length**: 12.

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

- **One Discrete Length** - Decode only D 2 of 5 symbols containing a selected length. Select the length using the bar codes in *Appendix G, Numeric Bar Codes*. 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 correct an error or to change the selection, scan *Cancel on page G-2*.
- **Two Discrete Lengths** - Decode only D 2 of 5 symbols containing either of two selected lengths. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only D 2 of 5 symbols containing either 2 or 14 characters, select **D 2 of 5 - Two Discrete Lengths**, and then scan **0**, **2**, **1**, **4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Length Within Range** - Decode D 2 of 5 symbols with a specific length range. Select lengths using bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode D 2 of 5 symbols containing between 4 and 12 characters, first scan **D 2 of 5 - Length Within Range**, and then scan **0**, **4**, **1, 2**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Any Length** - Decode D 2 of 5 symbols containing any number of characters within the digital scanner's capability.

Set Lengths for Discrete 2 of 5 (continued)

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 bar code. To prevent this, select specific lengths (**D 2 of 5 - One Discrete Length, Two Discrete Lengths**) for D 2 of 5 applications.

***D 2 of 5 - One Discrete Length (Default: 12)**

D 2 of 5 - Two Discrete Lengths

D 2 of 5 - Length Within Range

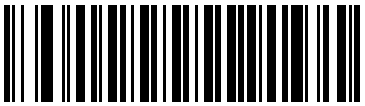
D 2 of 5 - Any Length

Codabar (NW - 7)

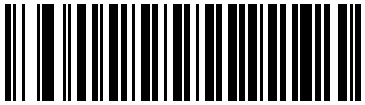
Enable/Disable Codabar

Parameter # 7

To enable or disable Codabar, scan the appropriate bar code below.



Enable Codabar
(1)



***Disable Codabar**
(0)

Set Lengths for Codabar

Parameter # L1 = 24, L2 = 25

The length of a code refers to the number of characters (i.e., 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 option is **Length Within Range**, 4 to 55.

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

- **One Discrete Length** - Decode only Codabar symbols containing a selected length. Select the length using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Codabar symbols with 14 characters, scan **Codabar - One Discrete Length**, and then scan **1, 4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Two Discrete Lengths** - Decode only Codabar symbols containing either of two selected lengths. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Codabar symbols containing either 2 or 14 characters, select **Codabar - Two Discrete Lengths**, and then scan **0**, **2**, **1**, **4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Length Within Range** - Decode Codabar symbols with a specific length range. Select lengths using bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode Codabar symbols containing between 4 and 12 characters, first scan **Codabar - Length Within Range**, and then scan **0**, **4**, **1, 2**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Any Length** - Decode Codabar symbols containing any number of characters within the digital scanner's capability.

Codabar - One Discrete Length

Codabar - Two Discrete Lengths

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

Codabar - Any Length

CLSI Editing

Parameter # 54

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

NOTE Symbol length does not include start and stop characters.

Enable CLSI Editing
(1)

***Disable CLSI Editing**
(0)

NOTIS Editing

Parameter # 55

Enable this parameter to strip the start and stop characters from a decoded Codabar symbol. Enable this feature if the host system requires this data format.

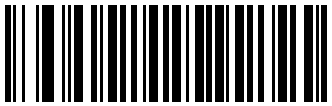
Enable NOTIS Editing
(1)

***Disable NOTIS Editing**
(0)

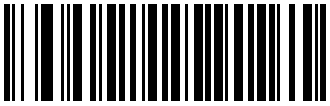
Codabar Upper or Lower Case Start/Stop Characters Transmission

Parameter # 855

Select whether to transmit upper case or lower case Codabar start/stop characters.



***Upper Case**
(0)



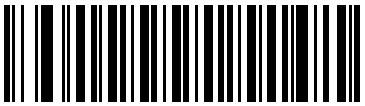
Lower Case
(1)

MSI

Enable/Disable MSI

Parameter # 11

To enable or disable MSI, scan the appropriate bar code below.



Enable MSI
(1)

***Disable MSI**
(0)

Set Lengths for MSI

Parameter # L1 = 30, L2 = 31

The length of a code refers to the number of characters (i.e., 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 option is **Length Within Range**, 4 to 55.

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

- **One Discrete Length** - Decode only MSI symbols containing a selected length. Select the length using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only MSI symbols with 14 characters, scan **MSI - One Discrete Length**, and then scan **1, 4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Two Discrete Lengths** - Decode only MSI symbols containing either of two selected lengths. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only MSI symbols containing either 2 or 14 characters, select **MSI - Two Discrete Lengths**, and then scan **0**, **2**, **1**, **4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Length Within Range** - Decode MSI symbols with a specific length range. Select lengths using bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode MSI symbols containing between 4 and 12 characters, first scan **MSI - Length Within Range**, and then scan **0**, **4**, **1, 2**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Any Length** - Decode MSI symbols containing any number of characters within the digital scanner's capability.

Set Lengths for MSI (continued)

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 bar code. To prevent this, select specific lengths (**MSI - One Discrete Length, Two Discrete Lengths**) for MSI applications.

MSI - One Discrete Length

MSI - Two Discrete Lengths

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

MSI - Any Length

MSI Check Digits

Parameter # 50

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, scan the **Two MSI Check Digits** bar code to enable verification of the second check digit.

See *MSI Check Digit Algorithm on page 11-65* for the selection of second digit algorithms.

***One MSI Check Digit**
(0)

Two MSI Check Digits
(1)

Transmit MSI Check Digit(s)

Parameter # 46

Scan a bar code below to transmit MSI data with or without the check digit.

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

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

MSI Check Digit Algorithm

Parameter # 51

Two algorithms are possible for the verification of the second MSI check digit. Select the bar code below corresponding to the algorithm used to encode the check digit.

MOD 11/MOD 10
(0)

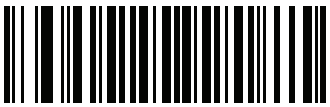
***MOD 10/MOD 10**
(1)

MSI Reduced Quiet Zone

Parameter # 1392

Scan one of the following bar codes to enable or disable decoding MSI bar codes with reduced quiet zones. If you select **Enable**, select a *1D Quiet Zone Level on page 11-97*.

***Disable MSI Reduced Quiet Zone**
(0)



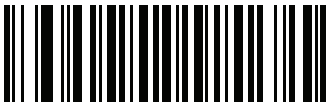
Enable MSI Reduced Quiet Zone
(1)

Chinese 2 of 5

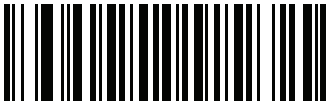
Enable/Disable Chinese 2 of 5

Parameter # 408

To enable or disable Chinese 2 of 5, scan the appropriate bar code below.



Enable Chinese 2 of 5
(1)



***Disable Chinese 2 of 5**
(0)

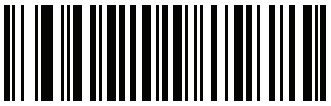
Matrix 2 of 5

Enable/Disable Matrix 2 of 5

Parameter # 618

To enable or disable Matrix 2 of 5, scan the appropriate bar code below.

Enable Matrix 2 of 5
(1)



***Disable Matrix 2 of 5**
(0)

Set Lengths for Matrix 2 of 5

Parameter # L1 = 619, L2 = 620

The length of a code refers to the number of characters (i.e., 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 option is **Length Within Range:** 4 to 55.

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

- **One Discrete Length** - Decode only Matrix 2 of 5 symbols containing a selected length. Select the length using the bar codes in *Appendix G, Numeric Bar Codes*. 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 correct an error or to change the selection, scan *Cancel on page G-2*.
- **Two Discrete Lengths** - Decode only Matrix 2 of 5 symbols containing either of two selected lengths. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode only Matrix 2 of 5 symbols containing either 2 or 14 characters, select **Matrix 2 of 5 - Two Discrete Lengths**, and then scan **0**, **2**, **1**, **4**. To correct an error or to change the selection, scan *Cancel on page G-2*.
- **Length Within Range** - Decode Matrix 2 of 5 symbols with a specific length range. Select lengths using the bar codes in *Appendix G, Numeric Bar Codes*. For example, to decode Matrix 2 of 5 symbols containing between 4 and 12 characters, first scan **Matrix 2 of 5 - Length Within Range**, and then scan **0**, **4**, **1, 2**. To correct an error or change the selection, scan *Cancel on page G-2*.
- **Any Length** - Decode Matrix 2 of 5 symbols containing any number of characters within the digital scanner's capability.

Matrix 2 of 5 - One Discrete Length

Matrix 2 of 5 - Two Discrete Lengths

***Matrix 2 of 5 - Length Within Range**
(Default: 4 to 55)

Matrix 2 of 5 - Any Length

Matrix 2 of 5 Check Digit

Parameter # 622

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate bar code below to transmit the bar code data with or without the 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

Scan a bar code below to transmit Matrix 2 of 5 data with or without the check digit.

Transmit Matrix 2 of 5 Check Digit
(1)

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

Korean 3 of 5

Enable/Disable Korean 3 of 5

Parameter # 581

To enable or disable Korean 3 of 5, scan the appropriate bar code below.

✓ ***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

Scan one of the following bar codes to set the 1D inverse decoder setting:

- **Regular Only** - The digital scanner decodes regular 1D bar codes only.
- **Inverse Only** - The digital scanner decodes inverse 1D bar codes only.
- **Inverse Autodetect** - The digital scanner decodes both regular and inverse 1D bar codes.

NOTE The Inverse 1D setting may impact Composite or Inverse Composite decoding. See *Composite Inverse on page 11-83*.

***Regular**
(0)

Inverse Only
(1)

Inverse Autodetect
(2)

Postal Codes

US Postnet

Parameter # 89

To enable or disable US Postnet, scan the appropriate bar code below.

Enable US Postnet
(1)

***Disable US Postnet**
(0)

US Planet

Parameter # 90

To enable or disable US Planet, scan the appropriate bar code below.

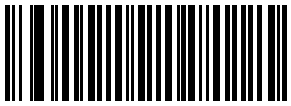
Enable US Planet
(1)

***Disable US Planet**
(0)

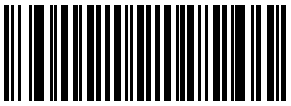
Transmit US Postal Check Digit

Parameter # 95

Select whether to transmit US Postal data, which includes both US Postnet and US Planet, with or without the check digit.



***Transmit US Postal Check Digit (1)**



Do Not Transmit US Postal Check Digit (0)

UK Postal

Parameter # 91

To enable or disable UK Postal, scan the appropriate bar code below.

Enable UK Postal (1)

***Disable UK Postal (0)**

Transmit UK Postal Check Digit

Parameter # 96

Select whether to transmit UK Postal data with or without the check digit.

***Transmit UK Postal Check Digit (1)**

Do Not Transmit UK Postal Check Digit (0)

Japan Postal

Parameter # 290

To enable or disable Japan Postal, scan the appropriate bar code below.

Enable Japan Postal (1)

***Disable Japan Postal (0)**

Australia Post

Parameter # 291

To enable or disable Australia Post, scan the appropriate bar code below.

Enable Australia Post
(1)

***Disable Australia Post**
(0)

Australia Post Format

Parameter # 718

To select one of the following formats for Australia Post, scan the appropriate bar code below:

- **Autodiscriminate** (or Smart mode) - Attempt to 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 http://www.auspost.com.au.

***Autodiscriminate**
(0)

Raw Format
(1)

Alphanumeric Encoding
(2)

Numeric Encoding
(3)

Netherlands KIX Code

Parameter # 326

To enable or disable Netherlands KIX Code, scan the appropriate bar code below.

Enable Netherlands KIX Code
(1)

***Disable Netherlands KIX Code**
(0)

USPS 4CB/One Code/Intelligent Mail

Parameter # 592

To enable or disable USPS 4CB/One Code/Intelligent Mail, scan the appropriate bar code below.

Enable USPS 4CB/One Code/Intelligent Mail
(1)

***Disable USPS 4CB/One Code/Intelligent Mail**
(0)

UPU FICS Postal

Parameter # 611

To enable or disable UPU FICS Postal, scan the appropriate bar code below.

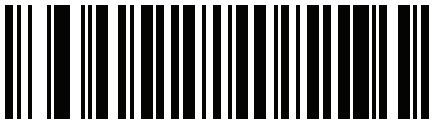
Enable UPU FICS Postal
(1)

***Disable UPU FICS Postal**
(0)

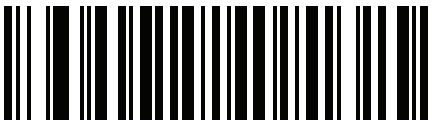
Mailmark

Parameter # 1337

To enable or disable Mailmark, scan the appropriate bar code below.



***Disable Mailmark**
(0)



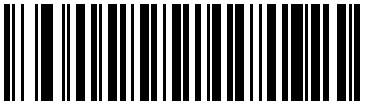
Enable Mailmark
(1)

GS1 DataBar

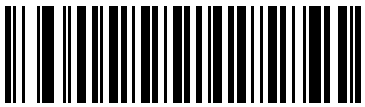
The variants of GS1 DataBar are DataBar Omnidirectional, DataBar Expanded, and DataBar Limited. The limited and expanded versions have stacked variants. Scan the appropriate bar codes to enable or disable each variant of GS1 DataBar.

GS1 DataBar Omnidirectional (formerly GS1 DataBar-14)

Parameter # 338



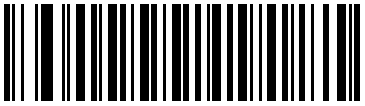
***Enable GS1 DataBar Omnidirectional (1)**



Disable GS1 DataBar Omnidirectional (0)

GS1 DataBar Limited

Parameter # 339



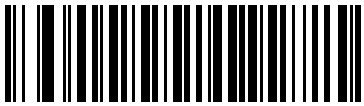
***Enable GS1 DataBar Limited (1)**

Disable GS1 DataBar Limited (0)

GS1 DataBar Expanded

Parameter # 340

*Enable GS1 DataBar Expanded
(1)



Disable GS1 DataBar Expanded
(0)

Convert GS1 DataBar to UPC/EAN

Parameter # 397

This parameter only applies to GS1 DataBar Omnidirectional and GS1 DataBar Limited symbols not decoded as part of a Composite symbol. Enable this to strip the leading '010' from DataBar-14 and DataBar Limited symbols encoding a single zero as the first digit, and report the bar code as EAN-13.

For bar codes beginning with two or more zeros but not six zeros, this parameter strips the leading '0100' and reports the bar code as UPC-A. The UPC-A Preamble parameter that transmits the system character and country code applies to converted bar codes. Note that neither the system character nor the check digit can be stripped.

Enable Convert GS1 DataBar to UPC/EAN
(1)

*Disable Convert GS1 DataBar to UPC/EAN
(0)

GS1 DataBar Security Level

Parameter # 1706

The digital scanner offers four levels of decode security for GS1 DataBar (GS1 DataBar Omnidirectional, GS1 DataBar Limited, GS1 DataBar Expanded) bar codes.

- **Security Level 0** - The digital scanner operates in its most aggressive state, while providing sufficient security decoding most in-spec bar codes.
- **Security Level 1** - This setting eliminates most misdecodes while maintaining reasonable aggressiveness.
- **Security Level 2** - Select this option with greater bar code 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 Limited Margin Check

Parameter # 728

The digital scanner offers four levels of decode security for GS1 DataBar Limited bar codes. There is an inverse relationship between the level of margin check and scanner aggressiveness. Increasing the level of margin check can reduce scanning aggressiveness, so select only the level of margin check necessary.

- **Margin Check Level 1** – No clear margin required. This complies with the original GS1 standard, yet can result in erroneous decoding of a DataBar Limited bar code when scanning some UPC symbols that start with digits **9** and **7**.
- **Margin Check Level 2** – Automatic risk detection. This level of margin check can result in erroneous decoding of DataBar Limited bar codes when scanning some UPC symbols. If a misdecode is detected, the scanner operates in Level 3 or Level 1.
- **Margin Check Level 3** – Margin check level reflects the newly proposed GS1 standard that requires a five times trailing clear margin.
- **Margin Check Level 4** – Security level extends beyond the standard required by GS1. This level of margin check requires a five times leading and trailing clear margin.

GS1 DataBar Limited Margin Check Level 1
(1)

GS1 DataBar Limited Margin Check Level 2
(2)

***GS1 DataBar Limited Margin Check Level 3**
(3)

GS1 DataBar Limited Margin Check Level 4
(4)

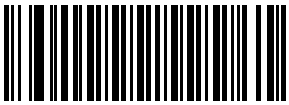
Composite

Composite CC-C

Parameter # 341

Scan a bar code below to enable or disable Composite bar codes of type CC-C.

Enable CC-C
(1)

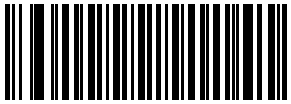


***Disable CC-C**
(0)

Composite CC-A/B

Parameter # 342

Scan a bar code below to enable or disable Composite bar codes of type CC-A/B.



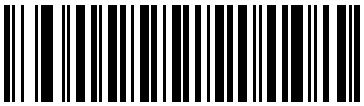
Enable CC-A/B
(1)

***Disable CC-A/B**
(0)

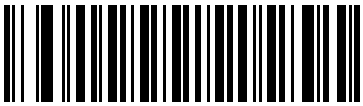
Composite TLC-39

Parameter # 371

Scan a bar code below to enable or disable Composite bar codes of type TLC-39.



Enable TLC39
(1)



***Disable TLC39**
(0)

Composite Inverse

Parameter # 1113

Select an option to set Composite for either regular decode or inverse decode.

- **Regular Only** - The scanner decodes regular Composite bar codes only. Before selecting this, set *Inverse 1D on page 11-70* to **Regular Only** or **Inverse Autodetect**.
- **Inverse Only** - The scanner decodes inverse Composite bar codes only. This mode only supports Composite Inverse that includes DataBar combined with CCAB, and does not support other 1D/2D combinations. Before selecting this, enable *Composite CC-A/B on page 11-82*, and set *Inverse 1D on page 11-70* to **Inverse Only** or **Inverse Autodetect.**

***Regular Only**
(1)

Inverse Only
(0)

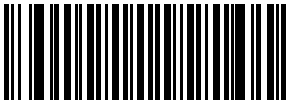
UPC Composite Mode

Parameter # 344

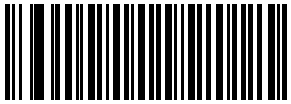
Select an option for linking UPC symbols with a 2D symbol during transmission as if they were one symbol:

- Select **UPC Never Linked** to transmit UPC bar codes regardless of whether a 2D symbol is detected.
- Select **UPC Always Linked** to transmit UPC bar codes and the 2D portion. If 2D is not present, the UPC bar code does not transmit.
- If you select **Autodiscriminate UPC Composites**, the digital scanner determines if there is a 2D portion, then transmits the UPC, as well as the 2D portion if present.

***UPC Never Linked**
(0)



UPC Always Linked
(1)



Autodiscriminate UPC Composites
(2)

Composite Beep Mode

Parameter # 398

To select the number of decode beeps when a composite bar code is decoded, scan the appropriate bar code.

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

Select whether to enable or disable this mode.

Enable GS1-128 Emulation Mode for UCC/EAN Composite Codes
(1)

***Disable GS1-128 Emulation Mode for UCC/EAN Composite Codes**
(0)

2D Symbologies

Enable/Disable PDF417

Parameter # 15

To enable or disable PDF417, scan the appropriate bar code below.

***Enable PDF417**
(1)

Disable PDF417
(0)

Enable/Disable MicroPDF417

Parameter # 227

To enable or disable MicroPDF417, scan the appropriate bar code below.

Enable MicroPDF417
(1)

***Disable MicroPDF417**
(0)

Code 128 Emulation

Parameter # 123

Enable this parameter to transmit data from certain MicroPDF417 symbols as Code 128. *AIM Code ID Character (1) on page 4-49* must be enabled 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

Scan a bar code below to enable or disable Code 128 Emulation.

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

To enable or disable Data Matrix, scan the appropriate bar code below.

***Enable Data Matrix**
(1)

Disable Data Matrix
(0)

Data Matrix Inverse

Parameter # 588

This parameter sets the Data Matrix inverse decoder setting. Options are:

- **Regular Only** - the digital scanner decodes regular Data Matrix bar codes only.
- **Inverse Only** - the digital scanner decodes inverse Data Matrix bar codes only.
- **Inverse Autodetect** - the digital scanner decodes both regular and inverse Data Matrix bar codes.

Regular
(0)

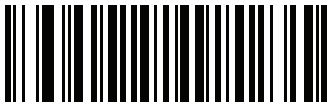
Inverse Only
(1)

***Inverse Autodetect**
(2)

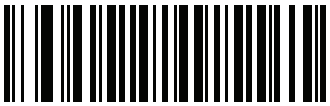
GS1 Data Matrix

Parameter # 1336

To enable or disable GS1 Data Matrix, scan the appropriate bar code below.



Enable GS1 Data Matrix
(1)



***Disable GS1 Data Matrix**
(0)

Maxicode

Parameter # 294

To enable or disable Maxicode, scan the appropriate bar code below.

Enable Maxicode
(1)

***Disable Maxicode**
(0)

QR Code

Parameter # 293

To enable or disable QR Code, scan the appropriate bar code below.

***Enable QR Code**
(1)

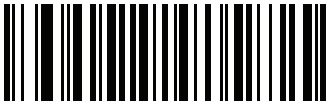
Disable QR Code
(0)

GS1 QR

Parameter # 1343

To enable or disable GS1 QR, scan the appropriate bar code below.

Enable GS1 QR
(1)



***Disable GS1 QR**
(0)

MicroQR

Parameter # 573

To enable or disable MicroQR, scan the appropriate bar code below.

***Enable MicroQR**
(1)

Disable MicroQR
(0)

Aztec

Parameter # 574

To enable or disable Aztec, scan the appropriate bar code below.

***Enable Aztec**
(1)

Disable Aztec
(0)

Aztec Inverse

Parameter # 589

This parameter sets the Aztec inverse decoder setting. Options are:

- **Regular Only** - the digital scanner decodes regular Aztec bar codes only.
- **Inverse Only** - the digital scanner decodes inverse Aztec bar codes only.
- **Inverse Autodetect** - the digital scanner decodes both regular and inverse Aztec bar codes.

***Regular**
(0)

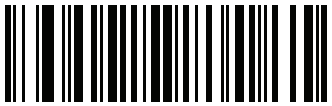
Inverse Only
(1)

Inverse Autodetect
(2)

Han Xin

Parameter # 1167

To enable or disable Han Xin, scan the appropriate bar code below.



Enable Han Xin
(1)

***Disable Han Xin**
(0)

Han Xin Inverse

Parameter # 1168

Select a Han Xin inverse decoder setting:

- **Regular Only** - the decoder decodes Han Xin bar codes with normal reflectance only.
- **Inverse Only** - the decoder decodes Han Xin bar codes with inverse reflectance only.
- **Inverse Autodetect** - the decoder decodes both regular and inverse Han Xin bar codes.

***Regular**
(0)

Inverse Only
(1)

Inverse Autodetect
(2)

Redundancy Level

Parameter # 78

The digital scanner offers four levels of decode redundancy. Select higher redundancy levels for decreasing levels of bar code quality. As redundancy levels increase, the digital scanner's aggressiveness decreases.

Select the redundancy level appropriate for the bar code quality.

Redundancy Level 1

The following code types must be successfully read twice before being decoded:

Table 11-2 *Redundancy Level 1 Codes*

Code Type	Code Length
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 following code types must be successfully read twice before being decoded:

Table 11-3 *Redundancy Level 2 Codes*

Code Type	Code Length
All	All

Redundancy Level 3

Code types other than the following must be successfully read twice before being decoded. The following codes must be read three times:

Table 11-4 *Redundancy Level 3 Codes*

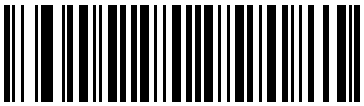
Code Type	Code Length
MSI	4 characters or less
D 2 of 5	8 characters or less
I 2 of 5	8 characters or less
Codabar	8 characters or less

Redundancy Level 4

The following code types must be successfully read three times before being decoded:

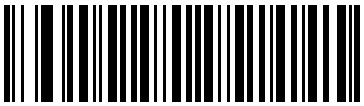
Table 11-5 *Redundancy Level 4 Codes*

Code Type	Code Length
All	All



***Redundancy Level 1**
(1)

Redundancy Level 2
(2)



Redundancy Level 3
(3)

Redundancy Level 4
(4)

Security Level

Parameter # 77

The digital scanner offers four levels of decode security for delta bar codes, which include the Code 128 family, UPC/EAN, and Code 93. Select increasing levels of security for decreasing levels of bar code quality. There is an inverse relationship between security and digital scanner aggressiveness, so choose only that level of security necessary for any given application.

- **Security Level 0:** This setting allows the digital scanner to operate in its most aggressive state, while providing sufficient security in decoding most “in-spec” bar codes.
- **Security Level 1:** This default setting eliminates most misdecodes.
- **Security Level 2:** Select this option 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. Be advised, selecting this option is an extreme measure against mis-decoding severely out of spec bar codes. Selecting this level of security significantly impairs the decoding ability of the digital scanner. If you need this level of security, try to improve the quality of the bar codes.

Security Level 0
(0)

***Security Level 1**
(1)

Security Level 2
(2)

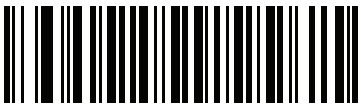
Security Level 3
(3)

1D Quiet Zone Level

Parameter # 1288

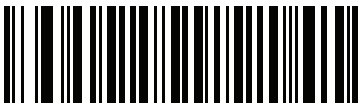
This feature sets the level of aggressiveness in decoding bar codes with a reduced quiet zone (the area in front of and at the end of a bar code), and applies to symbologies enabled by a Reduced Quiet Zone parameter. Because higher levels increase the decoding time and risk of misdecodes, Symbol Technologies strongly recommends enabling only the symbologies which require higher quiet zone levels, and leaving Reduced Quiet Zone disabled for all other symbologies. Options are:

- 0 - The digital scanner performs normally in terms of quiet zone.
- 1 - The digital scanner performs more aggressively in terms of quiet zone.
- 2 - The digital scanner only requires one side EB (end of bar code) for decoding.
- 3 - The digital scanner decodes anything in terms of quiet zone or end of bar code.



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

The Code 39 and Codabar symbologies have an intercharacter gap that is typically quite small. Due to various bar code-printing technologies, this gap can grow larger than the maximum size allowed, preventing the digital scanner from decoding the symbol. If this problem occurs, scan the **Large Intercharacter Gaps** parameter to tolerate these out-of-specification bar codes.

***Normal Intercharacter Gaps**
(6)

Large Intercharacter Gaps
(10)

Report Version

Scan the bar code below to report the version of software installed in the digital scanner.

Report Software Version

Macro PDF Features

Macro PDF is a special feature for concatenating multiple PDF symbols into one file. The scanner can decode symbols that are encoded with this feature, and can store more than 64 Kb of decoded data stored in up to 50 MacroPDF symbols.

CAUTION When printing, keep each Macro PDF sequence separate, as each sequence has unique identifiers. Do not mix bar codes from several Macro PDF sequences, even if they encode the same data. When scanning Macro PDF sequences, scan the entire Macro PDF sequence without interruption. If, when scanning a mixed sequence, the digital scanner emits two long low beeps (Low/Low) this indicates an inconsistent file ID or inconsistent symbology error.

Flush Macro Buffer

This 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 clears all currently-stored Macro PDF data in the buffer without transmission and aborts from Macro PDF mode.

Abort Macro PDF Entry

CHAPTER 12 123SCAN2

Introduction

123Scan is a software tool 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 bar code 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
    - Preferred Symbol
  - Modify data before transmission to a host using:
    - Advanced Data Formatting (ADF) - Scan one bar code per trigger pull
    - Multicode Data Formatting (MDF) - Scan many bar codes in one trigger pull
- Load parameter settings to a scanner via:
  - Bar code scanning:
    - Scan a paper bar code
    - Scan a bar code from a PC screen
    - Scan a bar code from a smart phone screen
  - Download over a USB cable:
    - Load settings to one scanner
    - Stage up to 10 scanners simultaneously

- Validate scanner setup:
  - View scanned data within the utility's Data View screen
  - Capture an image and save to a PC within the utility's Data View screen
  - Review settings using the Parameter Report
  - Clone settings from an already deployed scanner
- Upgrade scanner firmware:
  - Load settings to one scanner
  - Stage up to 10 scanners simultaneously with a power USB hub
- View statistics such as:
  - Asset tracking information
  - Time and usage information
  - Bar codes scanned by symbology
  - Battery diagnostics
  - Communication diagnostics
- Generate the following reports:
  - Barcode Report - Programming bar code, included parameter settings, and supported scanner models
  - Parameter Report - Lists parameters programmed within a configuration file
  - Activity Report - Lists activities performed on a scanner(s)
  - Inventory Report - Lists scanner asset tracking information
  - Validation Report - Printout of scanned data
  - Statistics Report - Lists all statistics retrieved from the scanner

For more information go to: http://www.zebra.com/123Scan.

Communication with 123Scan

Use a USB cable to connect the scanner to a Windows host computer running 123Scan.

123Scan Requirements

- Host computer running Windows
- Scanner
- USB cable

123Scan Information

For more information on123Scan, go to: http://www.zebra.com/123Scan

For a 1 minute tour of 123Scan, go to: http://www.zebra.com/ScannerHowToVideos

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

- 123Scan configuration utility (described in this chapter)
- How-to-videos

Scanner SDK, Other Software Tools, and Videos

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

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

- 123Scan configuration utility
- SDKs
  - Scanner SDK for Windows
  - Scanner SDK for Android
  - Scanner SDK for iOS
  - Scanner SDK for Linux
- Drivers
  - OPOS driver
  - JPOS driver
  - TWAIN driver
  - USB CDC driver
  - Virtual COM port driver
- Scanner Management Service (SMS) for Remote Management
  - Windows
  - Linux
  - IBM 4690
- Mobile Apps
  - Scanner Control App
    - Android
    - iOS
    - Windows
    - Zebra AppGallery

- Scan-To-Connect Utility
  - Android
  - iOS
  - Windows
  - Zebra AppGallery
- How-To-Videos
- User documentation

CHAPTER 13 ADVANCED DATA FORMATTING

Introduction

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

For information and programming bar codes for ADF, refer to the *Advanced Data Formatting Programmer Guide*, p/n 72E-69680-xx.

CHAPTER 14 DRIVER'S LICENSE SET UP (DS9808-DL / DS9808-LL)

Introduction

The DS9808-DL and DS9808-LL digital scanner is capable of parsing out information from standard US driver's licenses and certain other American Association of Motor Vehicle Administrators (AAMVA) compliant ID cards. This is achieved using internally embedded algorithms, where scanning bar codes activates algorithms internally embedded in the digital scanner to produce formatted data. Use the formatted data for age verification, credit card application information, and more.

This chapter describes how to program the DS9808-DL/LL digital scanner to read and use the data contained in the 2D bar codes on US driver's licenses and AAMVA compliant ID cards.

Table 14-1 *DL Parsing Parameter Table*

Parameter	Default	Page Number
DL Parsing Parameters		
Driver's License Parsing	No Driver's License Parsing	*14-2*
Driver's License Parse Field Bar Codes	N/A	*14-4*
AAMVA Parse Field Bar Codes	N/A	*14-7*
Parsing Rule Example	N/A	*14-17*
Embedded Driver's License Parsing ADF Example	N/A	*14-21*
Field Update Procedure	N/A	*14-23*
User Preferences		
Set Default Parameter	N/A	*14-24*
Output Gender as M or F	N/A	*14-24*

Table 14-1 *DL Parsing Parameter Table (Continued)*

Parameter	Default	Page Number
Date Format	CCYYMMDD	*14-25*
No Separator	N/A	*14-26*
Send Keystroke Control Characters Keyboard Characters	N/A	*14-27* *14-27* *14-31*

Driver's License Parsing

There are two options available for programming the digital scanner:

- No driver's license parsing (default) - disables the feature.
- Embedded driver's license parsing.

  Scan the bar codes on the following pages in the order indicating the sequence of data fields that the digital scanner outputs. See *Parsing Driver's License Data Fields (Embedded Driver's License Parsing) on page 14-3* for more information.

  As jurisdictional updates become available, Zebra updates a series of bar codes on the web site: http://www.zebra.com/support.

  These bar codes contain embedded software. Scanning these in conjunction with the bar codes on *page 14-4* download jurisdictional software updates to the digital scanner. The updates reside in the digital scanner's Flash memory and apply when the digital scanner is next used.

Scan the appropriate bar code below to program the digital scanner.

***No Driver's License Parsing**

Embedded Driver's License Parsing

Parsing Driver's License Data Fields (Embedded Driver's License Parsing)

To begin programming a parsing rule:

1. Scan *Begin New Driver's License Parse Rule on page 14-4*.
2. Scan any of the field bar codes on the following pages, or ***Send Keystroke (Control Characters and Keyboard Characters) on page 14-27*** to complete the parsing rule.
3. After entering the entire rule, scan *Save Driver's License Parse Rule on page 14-4* to save the rule.

> ***NOTE*** Only ONE driver's license parsing rule may be stored in memory at any time. Saving a new rule replaces the prior rule.

To abort the programming sequence at any time during programming, scan *Quit Entering Driver's License Rule on page 14-4*. Any previously saved rule is retained.

To erase a programmed saved rule, scan *Erase Driver's License Parse Rules on page 14-4*.

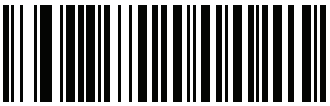
Embedded Driver's License Parsing Criteria - Code Type

After specifying the fields and their order for the parsed driver's license, you can also apply standard ADF rules to the parsed data using the **Parsed Driver's License** criterion bar code in the *Advanced Data Formatting Programmer Guide.*

> ***NOTE*** Only create standard ADF rules on parsed driver's license data when configured for Embedded Driver's License Parsing.

See *Embedded Driver's License Parsing ADF Example on page 14-21* for a sample ADF rule using this code type criterion.

Driver's License Parse Field Bar Codes



Begin New Driver's License Parse Rule

Save Driver's License Parse Rule

Quit Entering Driver's License Rule

Erase Driver's License Parse Rules

Driver's License Parse Field Bar Codes (continued)

The parse fields currently supported begin below. Not all IDs present data in the same format. For example, some IDs may have separate fields for first name, last name, and middle initial, and others may have a single field with the entire name. In addition, some IDs may expire on the subject's birth date and the actual expiration date field may only indicate the year. In order to present data in a consistent format, the following nine bar codes return data that may be calculated from the actual data contained within the ID bar code.

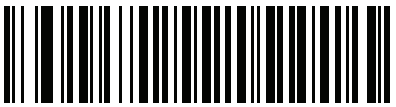
First Name

Middle Name/Initial

Last Name

Name Suffix

Name Prefix



Expiration Date

Birth Date

Driver's License Parse Field Bar Codes (continued)

Issue Date

ID Number (Formatted)

AAMVA Parse Field Bar Codes

AAMVA Issuer ID

Full Name

Last Name

First Name

Middle Name / Initial

Name Suffix

Name Prefix

AAMVA Parse Field Bar Codes (continued)

Mailing Address Line 1

Mailing Address Line 2

Mailing Address City

Mailing Address State

Mailing Address Postal Code

Home Address Line 1

Home Address Line 2

AAMVA Parse Field Bar Codes (continued)

Home Address City

Home Address State

Home Address Postal Code

License ID Number

License Class

License Restrictions

License Endorsements

AAMVA Parse Field Bar Codes (continued)

Height (Feet and/or Inches)

Height (Centimeters)

Weight (Pounds)

Weight (Kilograms)

Eye Color

Hair Color

License Expiration Date

AAMVA Parse Field Bar Codes (continued)

Birth Date

Gender

License Issue Date

License Issue State

Social Security Number

Permit Class

Permit Expiration Date

AAMVA Parse Field Bar Codes (continued)

Permit ID Number

Permit Issue Date

Permit Restrictions

Permit Endorsements

AKA Social Security Name

AKA Full Name

AKA Last Name

AKA First Name

AAMVA Parse Field Bar Codes (continued)

AKA Middle Name / Initial

AKA Name Suffix

AKA Name Prefix

AKA Birth Date

Issue Timestamp

Number of Duplicates

Medical Codes

AAMVA Parse Field Bar Codes (continued)

Organ Donor

Nonresident

Customer ID

Weight Range

Document Discriminator

Country

Federal Commission Codes

AAMVA Parse Field Bar Codes (continued)

Place of Birth

Audit Information

Inventory Control

Race / Ethnicity

Std Vehicle Class

Std Endorsements

Std Restrictions

AAMVA Parse Field Bar Codes (continued)

Class Description

Endorsement Description

Restrictions Description

Height in Inches

Height in Centimeters

Parser Version ID Bar Code

Include this field to emit embedded parser software version identification

Parser Version ID

Parsing Rule Example

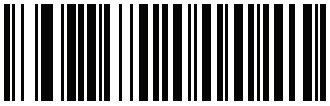
Scan the following bar codes in sequence to program the digital scanner to extract and transmit first, middle, and last names; mailing address line 1; mailing address line 2; mailing address city; mailing address state; mailing address postal code; and, date of birth. Then, scan a driver's license bar code.

NOTE This example applies to RS-232. To use this example with a USB interface, scan *Enable Function Key Mapping on page 6-13* in place of the **Send Control M (Carriage Return)** bar codes.

1

Embedded Driver's License Parsing

2



Begin New Driver's License Parse Rule

3

First Name

4

Send Space

5

Middle Name / Initial

6

Send Space

Parsing Rule Example (continued)

7

Last Name

8

Send Enter Key

9

Mailing Address Line 1

10

Send Space

11

Mailing Address Line 2

12

Send Enter Key

Parsing Rule Example (continued)

13

Mailing Address City

14

Send Space

15

Mailing Address State

16

Send Space

17

Mailing Address Postal Code

Parsing Rule Example (continued)

18

Send Enter Key

19

Birth Date

20

Send Enter Key

21

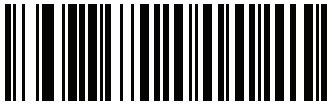
Save Driver's Licence Parse Rule

Embedded Driver's License Parsing ADF Example

This example creates a parsing rule for parsed data configured to result in the format:

Last Name, First Name

1



Begin New Driver's License Parse Rule

2

Last Name

3

Send ,

4

Send Space

5

First Name

6

Save Driver's Licence Parse Rule

Then, in order to limit the full name to 15 characters, create the following ADF rule:

1

Begin New Rule

2

Criterion: Parsed Driver's License

3

Action: Send Next 15 Characters

4

Save Rule

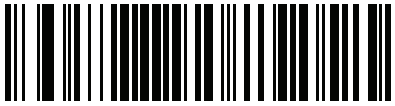
For a license belonging to Michael Williams, the parsed data is Williams, Michael and Williams, Micha after applying the previous ADF rule.

Field Update Procedure

Scan the following bar codes in order to perform a field update.

This update COMPLETELY REPLACES prior updates and overrides any embedded parsing software programmed in the digital scanner.

1. Scan **Field Update Start**.



Field Update Start

2. Scan the entire set of PDF bar codes provided separately.

3. Scan **Field Update End**.

Field Update End

Scan **Erase all Field Updates** to completely remove all previous updates. It is not necessary to scan this bar code before performing a normal field update. Scanning this bar code ensures that only the parsing software currently in the digital scanner is used for parsing.

Erase all Field Updates

User Preferences

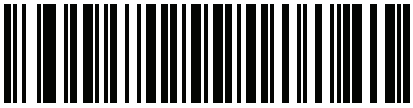
Set Default Parameter

Scan this bar code to return all parameters to the default values listed in *Table A-1 on page A-1*.

***Set All Defaults**

Output Gender as M or F

Scan this bar code to report the gender as **M** or **F** instead of a numeric value**.**



Output gender as M or F

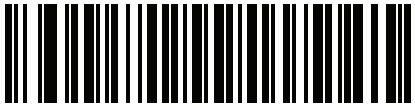
Date Format

Use these bar codes to select the date format that is displayed. Date fields include the following:

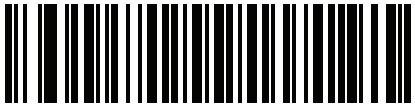
- **CCYY** = 4-digit year (**CC**=2-digit century [00-99], **YY**=2-digit year in the century [00-99])
- **MM** = 2-digit month [01-12]
- **DD** = 2-digit day of the month [00-31]

The default is Date Format **CCYYMMDD**.

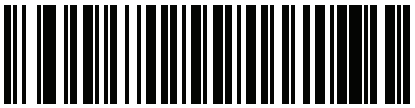
NOTE To specify a date separator, i.e., a character separating each field of the date, scan the **Send <character>** bar code that corresponds to the alphanumeric character to use as the date separator immediately following the date format bar code. To select no date separator, scan the **No Separator** DL parsing rule immediately following the date format bar code.



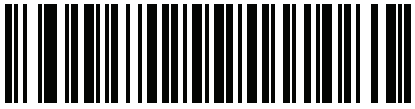
***CCYYMMDD**



CCYYDDMM

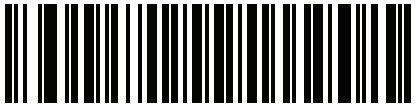


MMDDCCYY



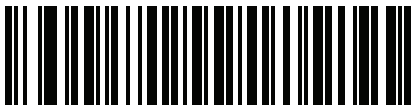
MMCCYYDD

DDMMCCYY

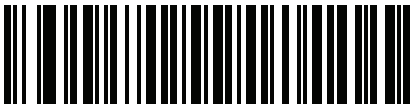


DDCCYYMM

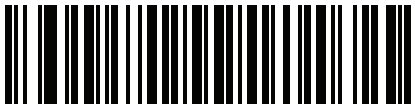
Date Format (continued)



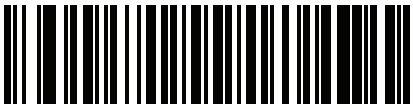
YYMMDD



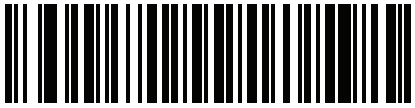
YYDDMM



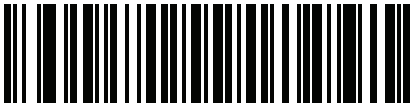
MMDDYY



MMYYDD



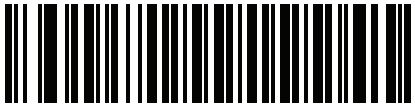
DDMMYY



DDYYMM

No Separator

Scan this bar code immediately following a date format bar code to use no separator character between the date fields.



No Separator

Send Keystroke (Control Characters and Keyboard Characters)

Control Characters

Scan a **Send** bar code for the keystroke to send.

Send Control A

Send Control B

Send Control C

Send Control D

Send Control E

Send Control F

Send Control G

Send Control H

Control Characters (continued)

Send Control I

Send Control J

Send Control K

Send Control L

Send Control M

Send Control N

Send Control O

Send Control P

Control Characters (continued)

Send Control Q

Send Control R

Send Control S

Send Control T

Send Control U

Send Control V

Send Control W

Control Characters (continued)

Send Control X

Send Control Y

Send Control Z

Send Control [

**Send Control **

Send Control]

Send Control 6

Send Control -

Keyboard Characters

Scan a **Send** bar code for the keyboard characters to send.

Send Space

Send !

Send “

Send #

Keyboard Characters (continued)

Send $

Send %

Send &

Send ‘

Send (

Send)

Send *

Keyboard Characters (continued)

Send +

Send ,

Send -

Send .

Send /

Send 0

Send 1

Keyboard Characters (continued)

Send 2

Send 3

Send 4

Send 5

Send 6

Send 7

Send 8

Keyboard Characters (continued)

Send 9

Send :

Send ;

Send <

Send =

Send >

Send ?

Keyboard Characters (continued)

Send @

Send A

Send B

Send C

Send D

Send E

Send F

Keyboard Characters (continued)

Send G

Send H

Send I

Send J

Send K

Send L

Send M

Keyboard Characters (continued)

Send N

Send O

Send P

Send Q

Send R

Send S

Send T

Keyboard Characters (continued)

Send U

Send V

Send W

Send X

Send Y

Send Z

Send [

Keyboard Characters (continued)

Send \

Send]

Send ^

Send _

Send `

Send a

Send b

Keyboard Characters (continued)

Send c

Send d

Send e

Send f

Send g

Send h

Send i

Keyboard Characters (continued)

Send j

Send k

Send l

Send m

Send n

Send o

Send p

Keyboard Characters (continued)

Send q

Send r

Send s

Send t

Send u

Send v

Send w

Keyboard Characters (continued)

Send x

Send y

Send z

Send {

Send |

Send }

Send ~

Keyboard Characters (continued)

Send Tab Key

Send Enter Key

APPENDIX A STANDARD DEFAULT PARAMETERS

Table A-1 *Standard Default Parameters Table*

Parameter	Parameter Number	Default	Page Number
User Preferences			
Set Default Parameter	N/A	Set Defaults	*4-5*
Parameter Bar Code Scanning	236	Enable	*4-6*
Beep After Good Decode	56	Enable	*4-6*
Beeper Tone	145	Medium	*4-7*
Beeper Volume	140	High	*4-8*
Beeper Duration	628	Medium	*4-9*
Suppress Power-up Beeps	721	Do not suppress	*4-9*
Hands-Free Mode	630	Enable	*4-10*
Presentation Performance Mode	650	Standard	*4-11*
Time Delay to Presentation Idle Mode	663	1 Minute	*4-13*
Time Delay to Presentation Sleep Mode	662	1 Hour	*4-15*
Low Power Mode	128	Disable	*4-17*
Time Delay to Low Power Mode	146	1 Hour	*4-18*
Hand-Held Trigger Mode	138	Auto Aim	*4-20*
Multifunction Triggering (DS9808-LR/LL Only)		Single Trigger	*4-21*
Trigger A	631	Laser Preferred Decoding	*4-22*
Trigger B	632	Trigger A value	*4-23*

[1]User selection is required to configure this interface and this is the most common selection.

Table A-1 *Standard Default Parameters Table (Continued)*

Parameter	Parameter Number	Default	Page Number
Trigger A + B	633	Ignore	*4-24*
Laser Preferred Timeout	637	1.5 seconds	*4-25*
Dual Trigger Debounce Timeout	634	0.05 seconds	*4-25*
Dual Trigger Processing	635	Wait	*4-26*
Host Trigger Mode	636	Imager Decoding	*4-26*
Picklist Mode	402	Disabled Always	*4-28*
Continuous Bar Code Read	649	Disable	*4-29*
Unique Bar Code Reporting	723	Enable	*4-29*
Decode Session Timeout	136	9.9 Sec	*4-30*
Timeout Between Decodes, Same Symbol	137	0.5 Sec	*4-30*
Timeout Between Decodes, Different Symbols	144	0.1 Sec	*4-31*
Fuzzy 1D Processing	514	Enable	*4-31*
Decode Mirror Images	537	Auto	*4-32*
Mobile Phone/Display Mode	716	Disable	*4-33*
PDF Prioritization	719	Disable	*4-34*
PDF Prioritization Timeout	720	200 ms	*4-34*
Hand-Held Decode Aiming Pattern	306	Enable	*4-35*
Hands-Free Decode Aiming Pattern	590	Enable for PDF	*4-36*
Presentation Mode Field of View	609	Full	*4-37*
Decoding Illumination	298	Enable	*4-38*
Product ID (PID) Type	1281	Host Type Unique	*4-38*
Multicode Mode	677	Disable	*4-39*
Multicode Expression	661	1	*4-40*
Multicode Mode Concatenation	717	Disable	*4-45*
Multicode Concatenation Symbology	722	Concatenate as PDF417	*4-46*

[1]User selection is required to configure this interface and this is the most common selection.

Table A-1 *Standard Default Parameters Table (Continued)*

Parameter	Parameter Number	Default	Page Number
Miscellaneous Options			
Transmit Code ID Character	45	None	*4-49*
Prefix Value	99, 105	7013 <CR><LF>	*4-50*
Suffix 1 Value Suffix 2 Value	98, 104 100, 106	7013 <CR><LF>	*4-50*
Scan Data Transmission Format	235	Data as is	*4-51*
FN1 Substitution Values	103, 109	Set	*4-52*
Transmit “No Read” Message	94	Disable	*4-53*
Imaging Preferences			
Operational Modes	N/A	N/A	*5-4*
Image Capture Illumination	361	Enable	*5-5*
Gain / Exposure Priority for Snapshot Mode	562	Autodetect	*5-6*
Snapshot Mode Timeout	323	0 (30 seconds)	*5-7*
Snapshot Aiming Pattern	300	Enable	*5-7*
Image Cropping	301	Disable	*5-8*
Crop to Pixel Addresses	315 316 317 318	0 top 0 left 479 bottom 751 right	*5-9*
Image Size (Number of Pixels)	302	Full	*5-10*
Image Brightness (Target White)	390	180	*5-11*
JPEG Image Options	299	Quality	*5-11*
JPEG Target File Size	561	160 kB	*5-12*
JPEG Quality and Size Value	305	65	*5-12*
Image Enhancement	564	Off (0)	*5-13*
Image File Format Selection	304	JPEG	*5-14*
Image Rotation	665	0	*5-15*
Bits per Pixel (BPP)	303	8 BPP	*5-16*
Signature Capture	93	Disable	*5-17*
Signature Capture Image File Format Selection	313	JPEG	*5-18*
Signature Capture Bits per Pixel (BPP)	314	8 BPP	*5-19*

[1]User selection is required to configure this interface and this is the most common selection.

Table A-1 *Standard Default Parameters Table (Continued)*

Parameter	Parameter Number	Default	Page Number
Signature Capture Width	366	400	*5-20*
Signature Capture Height	367	100	*5-20*
Signature Capture JPEG Quality	421	65	*5-20*
Video View Finder	324	Disable	*5-21*
Video View Finder Image Size	329	1700 bytes	*5-21*
USB Host Parameters			
USB Device Type	N/A	USB Keyboard HID	*6-5*
Symbol Native API (SNAPI) Status Handshaking	N/A	Enable	*6-7*
USB Keystroke Delay	N/A	No Delay	*6-7*
Simulated Caps Lock	N/A	Disable	*6-8*
USB CAPS Lock Override	N/A	Disable	*6-8*
USB Ignore Unknown Characters	N/A	Enable	*6-9*
USB Convert Unknown to Code 39	N/A	Disable	*6-9*
USB Ignore Beep Directive	N/A	Honor	*6-10*
USB Ignore Type Directive	N/A	Honor	*6-10*
Emulate Keypad	N/A	Disable	*6-11*
Emulate Keypad with Leading Zero	N/A	Disable	*6-11*
Quick Keypad Emulation	N/A	Disable	*6-12*
USB Keyboard FN1 Substitution	N/A	Disable	*6-13*
Function Key Mapping	N/A	Disable	*6-13*
Convert Case	N/A	No Case Conversion	*6-14*
USB Static CDC	N/A	Enable	*6-14*
CDC Beep on BEL	N/A	Enable	*6-15*
Direct I/O Beeps	N/A	Honor	*6-15*
USB Polling Interval	N/A	3 msec	*6-16*
Fast HID Keyboard	N/A	Enable	*6-18*
IBM Specification Level	N/A	Version 0 (Original)	*6-18*

[1]User selection is required to configure this interface and this is the most common selection.

Table A-1 *Standard Default Parameters Table (Continued)*

Parameter	Parameter Number	Default	Page Number
RS-232 Host Parameters			
RS-232 Host Types	N/A	Standard[1]	*7-6*
Baud Rate	N/A	9600	*7-8*
Parity Type	N/A	None	*7-9*
Data Bits	N/A	8-Bit	*7-9*
Check Receive Errors	N/A	Enable	*7-10*
Hardware Handshaking	N/A	None	*7-10*
Software Handshaking	N/A	None	*7-12*
Host Serial Response Time-out	N/A	2 Sec	*7-14*
RTS Line State	N/A	Low RTS	*7-15*
Beep on <BEL>	N/A	Disable	*7-15*
Intercharacter Delay	N/A	0 msec	*7-16*
Nixdorf Beep/LED Options	N/A	Normal Operation	*7-17*
Ignore Unknown Characters	N/A	Send Bar Code	*7-17*
IBM 468X/469X Host Parameters			
Port Address	N/A	None Selected	*8-4*
Convert Unknown to Code 39	N/A	Disable	*8-5*
Ignore Beep Directive	N/A	Honor	*8-5*
Ignore Configuration Directive	N/A	Honor	*8-6*
IBM-485 Specification Version	1729	Original Specification	*8-6*
Keyboard Wedge Host Parameters			
Keyboard Wedge Host Type	N/A	IBM PC/AT& IBM PC Compatibles[1]	*9-4*
Ignore Unknown Characters	N/A	Transmit	*9-5*
Keystroke Delay	N/A	No Delay	*9-5*
Intra-Keystroke Delay	N/A	Disable	*9-6*
Alternate Numeric Keypad Emulation	N/A	Disable	*9-6*
Simulated Caps Lock	N/A	Disable	*9-7*
Caps Lock Override	N/A	Disable	*9-7*
Convert Wedge Data	N/A	No Convert	*9-8*

[1]User selection is required to configure this interface and this is the most common selection.

Table A-1 *Standard Default Parameters Table (Continued)*

Parameter	Parameter Number	Default	Page Number
Function Key Mapping	N/A	Disable	*9-8*
FN1 Substitution	N/A	Disable	*9-9*
Send and Make Break	N/A	Send	*9-9*
OCR Programming Parameters			
OCR-A	680	Disable	*10-3*
OCR-A Variant	684	Full ASCII	*10-3*
OCR-B	681	Disable	*10-6*
OCR-B Variant	685	Full ASCII	*10-6*
MICR E13B	682	Disable	*10-10*
US Currency	683	Disable	*10-11*
OCR Orientation	687	0º	*10-11*
OCR Lines	691	1	*10-13*
OCR Minimum Characters	689	3	*10-13*
OCR Maximum Characters	690	100	*10-14*
OCR Subset	686	Selected font variant	*10-14*
OCR Quiet Zone	695	50	*10-15*
OCR Bright Illumination	701	Disable	*10-15*
OCR Template	547	54R	*10-16*
OCR Check Digit Modulus	688	1	*10-25*
OCR Check Digit Multiplier	700	121212121212	*10-26*
OCR Check Digit Validation	694	None	*10-27*
Inverse OCR	856	Regular	*10-32*
Disable All Code Types			*11-8*
UPC/EAN			
UPC-A	1	Enable	*11-9*
UPC-E	2	Enable	*11-9*
UPC-E1	12	Disable	*11-10*
EAN-8/JAN 8	4	Enable	*11-10*
EAN-13/JAN 13	3	Enable	*11-11*

[1]User selection is required to configure this interface and this is the most common selection.

Table A-1 *Standard Default Parameters Table (Continued)*

Parameter	Parameter Number	Default	Page Number
Bookland EAN	83	Disable	*11-11*
Decode UPC/EAN/JAN Supplementals (2 and 5 digits)	16	Ignore	*11-12*
User-Programmable Supplementals Supplemental 1: Supplemental 2:	 579 580		*11-15*
UPC/EAN/JAN Supplemental Redundancy	80	10	*11-15*
Decode UPC/EAN/JAN Supplemental AIM ID	672	Combined	*11-16*
UPC Reduced Quiet Zone	1289	Disable	*11-17*
Transmit UPC-A Check Digit	40	Enable	*11-17*
Transmit UPC-E Check Digit	41	Enable	*11-18*
Transmit UPC-E1 Check Digit	42	Enable	*11-18*
UPC-A Preamble	34	System Character	*11-19*
UPC-E Preamble	35	System Character	*11-20*
UPC-E1 Preamble	36	System Character	*11-21*
Convert UPC-E to A	37	Disable	*11-22*
Convert UPC-E1 to A	38	Disable	*11-22*
EAN-8/JAN-8 Extend	39	Disable	*11-25*
Bookland ISBN Format	576	ISBN-10	*11-24*
UCC Coupon Extended Code	85	Disable	*11-25*
Coupon Report	730	New Coupon Symbols	*11-26*
ISSN EAN	617	Disable	*11-27*
Code 128			
Code 128	8	Enable	*11-28*
Set Length(s) for Code 128	209, 210	1 to 55	*11-28*
GS1-128	14	Enable	*11-29*
ISBT 128	84	Enable	*11-30*
ISBT Concatenation	577	Disable	*11-31*
Check ISBT Table	578	Enable	*11-32*
ISBT Concatenation Redundancy	223	10	*11-32*
Code 128 Security Level	751	Security Level 1	*11-33*

[1]User selection is required to configure this interface and this is the most common selection.

Table A-1 *Standard Default Parameters Table (Continued)*

Parameter	Parameter Number	Default	Page Number
Code 128 Reduced Quiet Zone	1208	Disable	*11-34*
Ignore Code 128 <FNC4>	1254	Disable	*11-34*
Code 39			
Code 39	0	Enable	*11-35*
Trioptic Code 39	13	Disable	*11-35*
Convert Code 39 to Code 32 (Italian Pharmacy Code)	86	Disable	*11-36*
Code 32 Prefix	231	Disable	*11-36*
Set Length(s) for Code 39	18, 19	1 to 55	*11-37*
Code 39 Check Digit Verification	48	Disable	*11-38*
Transmit Code 39 Check Digit	43	Disable	*11-38*
Code 39 Full ASCII Conversion	17	Disable	*11-39*
Code 39 Security Level	750	Security Level 1	*11-40*
Code 39 Reduced Quiet Zone	1209	Disable	*11-41*
Buffer Code 39	113	Disable	*11-41*
Code 93			
Code 93	9	Disable	*11-44*
Set Length(s) for Code 93	26, 27	4 to 55	*11-45*
Code 11			
Code 11	10	Disable	*11-46*
Set Lengths for Code 11	28, 29	4 to 55	*11-47*
Code 11 Check Digit Verification	52	Disable	*11-48*
Transmit Code 11 Check Digit(s)	47	Disable	*11-49*
Interleaved 2 of 5 (ITF)			
Interleaved 2 of 5 (ITF)	6	Enable	*11-50*
Set Lengths for I 2 of 5	22, 23	6 to 55	*11-50*
I 2 of 5 Check Digit Verification	49	Disable	*11-52*
Transmit I 2 of 5 Check Digit	44	Disable	*11-52*
Convert I 2 of 5 to EAN 13	82	Disable	*11-53*
I 2 of 5 Security Level	1121	Security Level 1	*11-54*

[1]User selection is required to configure this interface and this is the most common selection.

Table A-1 *Standard Default Parameters Table (Continued)*

Parameter	Parameter Number	Default	Page Number
I 2 of 5 Reduced Quiet Zone	1210	Disable	*11-55*
Discrete 2 of 5 (DTF)			
Discrete 2 of 5	5	Disable	*11-56*
Set Length(s) for D 2 of 5	20, 21	12	*11-56*
Codabar (NW - 7)			
Codabar	7	Disable	*11-58*
Set Lengths for Codabar	24, 25	4 to 55	*11-59*
CLSI Editing	54	Disable	*11-60*
NOTIS Editing	55	Disable	*11-60*
Codabar Upper or Lower Case Start/Stop Characters Transmission	855	Upper Case	*11-61*
MSI			
MSI	11	Disable	*11-62*
Set Length(s) for MSI	30, 31	4 to 55	*11-62*
MSI Check Digits	50	One	*11-64*
Transmit MSI Check Digit	46	Disable	*11-64*
MSI Check Digit Algorithm	51	Mod 10/Mod 10	*11-65*
MSI Reduced Quiet Zone	1392	Disable	*11-65*
Chinese 2 of 5			
Chinese 2 of 5	408	Disable	*11-66*
Matrix 2 of 5			
Matrix 2 of 5	618	Disable	*11-66*
Matrix 2 of 5 Lengths	619, 620	4 to 55	*11-67*
Matrix 2 of 5 Check Digit	622	Disable	*11-68*
Transmit Matrix 2 of 5 Check Digit	623	Disable	*11-68*
Korean 3 of 5			
Korean 3 of 5	581	Disable	*11-69*
Inverse 1D	586	Regular	*11-70*

[1]User selection is required to configure this interface and this is the most common selection.

Table A-1 *Standard Default Parameters Table (Continued)*

Parameter	Parameter Number	Default	Page Number
Postal Codes			
US Postnet	89	Disable	*11-71*
US Planet	90	Disable	*11-71*
Transmit US Postal Check Digit	95	Enable	*11-72*
UK Postal	91	Disable	*11-72*
Transmit UK Postal Check Digit	96	Enable	*11-73*
Japan Postal	290	Disable	*11-73*
Australia Post	291	Disable	*11-74*
Australia Post Format	718	Autodiscriminate	*11-75*
Netherlands KIX Code	326	Disable	*11-76*
USPS 4CB/One Code/Intelligent Mail	592	Disable	*11-76*
UPU FICS Postal	611	Disable	*11-77*
Mailmark	1337	Disable	*11-77*
GS1 DataBar			
GS1 DataBar Omnidirectional	338	Enable	*11-78*
GS1 DataBar Limited	339	Enable	*11-78*
GS1 DataBar Expanded	340	Enable	*11-79*
Convert GS1 DataBar to UPC/EAN	397	Disable	*11-79*
GS1 DataBar Security Level	1706	Level 1	*11-80*
GS1 DataBar Limited Margin Check	728	Level 3	*11-81*
Composite			
Composite CC-C	341	Disable	*11-82*
Composite CC-A/B	342	Disable	*11-82*
Composite TLC-39	371	Disable	*11-83*
Composite Inverse	1113	Regular	*11-83*
UPC Composite Mode	344	Never Linked	*11-84*
Composite Beep Mode	398	Beep As Each Code Type is Decoded	*11-85*
GS1-128 Emulation Mode for UCC/EAN Composite Codes	427	Disable	*11-85*

[1]User selection is required to configure this interface and this is the most common selection.

Table A-1 *Standard Default Parameters Table (Continued)*

Parameter	Parameter Number	Default	Page Number
2D Symbologies			
PDF417	15	Enable	*11-86*
MicroPDF417	227	Disable	*11-86*
Code 128 Emulation	123	Disable	*11-87*
Data Matrix	292	Enable	*11-88*
Data Matrix Inverse	588	Inverse Autodetect	*11-88*
GS1 Data Matrix	1336	Disable	*11-89*
Maxicode	294	Disable	*11-89*
QR Code	293	Enable	*11-90*
GS1 QR	1343	Disable	*11-90*
MicroQR	573	Enable	*11-91*
Aztec	574	Enable	*11-92*
Aztec Inverse	589	Regular	*11-92*
Han Xin	1167	Disable	*11-93*
Han Xin Inverse	1168	Regular	*11-93*
Symbology-Specific Security Levels			
Redundancy Level	78	1	*11-94*
Security Level	77	1	*11-96*
1D Quiet Zone Level	1288	1	*11-97*
Intercharacter Gap Size	381	Normal	*11-98*
Report Version			*11-98*
Macro PDF			
Flush Macro PDF Buffer	N/A	N/A	*11-99*
Abort Macro PDF Entry	N/A	N/A	*11-99*

[1]User selection is required to configure this interface and this is the most common selection.

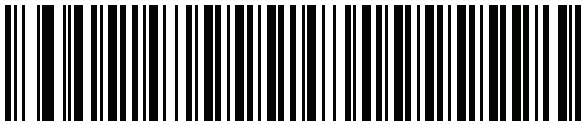
APPENDIX B COUNTRY CODES

Introduction

This chapter provides instructions for programming the keyboard to interface with a USB or keyboard wedge host. The host powers the scanner. For host setup information, see *Chapter 6, USB Interface* and *Chapter 9, Keyboard Wedge Interface*.

To select a code page for the country keyboard type, see *Appendix C, Country Code Pages*.

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



*Indicates Default — ***US English (North American)** — Feature/Option

USB and Keyboard Wedge Country Keyboard Types (Country Codes)

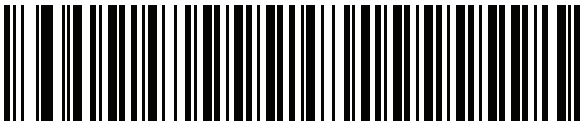
Scan the bar code corresponding to the keyboard type. For a USB host, this setting applies only to the USB Keyboard (HID) device. If the keyboard type is not listed, see *Emulate Keypad on page 6-11* for the USB HID host. For a keyboard wedge host, see *Alternate Numeric Keypad Emulation on page 9-6*.

NOTE When changing USB country keyboard types the digital scanner automatically resets and issues the standard startup beep sequences.

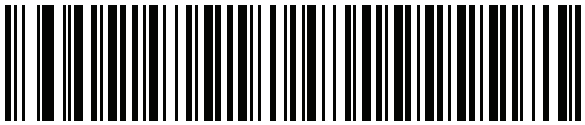
NOTE For best results when using international keyboards, enable *Quick Keypad Emulation on page 6-12*.

IMPORTANT 1. Some country keyboard bar code types are specific to certain Windows Operating Systems (i.e., XP, and Win 7 or higher). Bar codes requiring a specific Windows OS are noted so in their bar code captions.

2. Use the **French International** bar code for Belgian French keyboards.

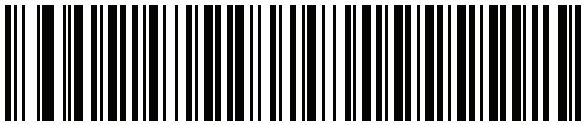


***US English (North American)**

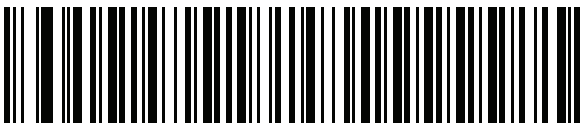


US English (Mac)

Albanian

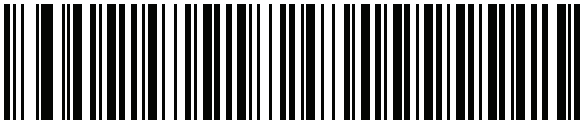


Arabic (101)

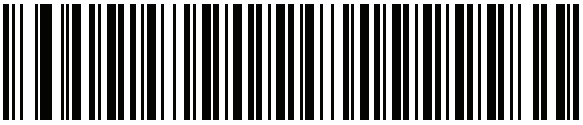


Arabic (102)

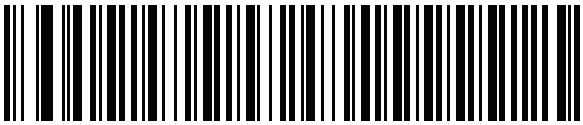
Country Codes (Continued)



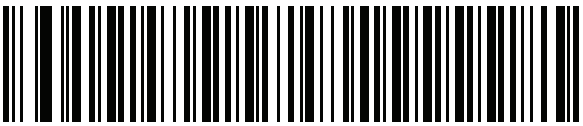
Arabic (102) AZERTY



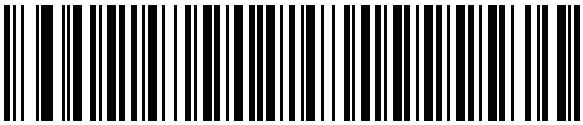
Azeri (Latin)



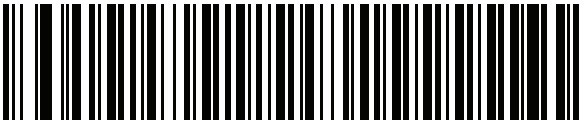
Azeri (Cyrillic)



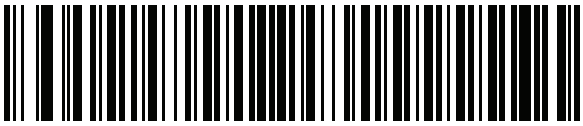
Belarusian



Bosnian (Latin)

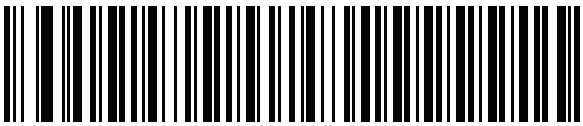


Bosnian (Cyrillic)

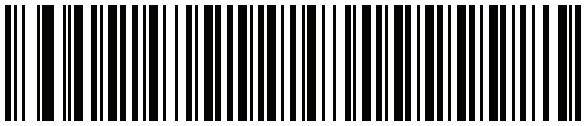


Bulgarian (Latin)

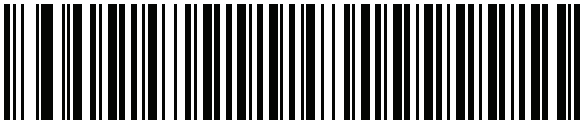
Country Codes (Continued)



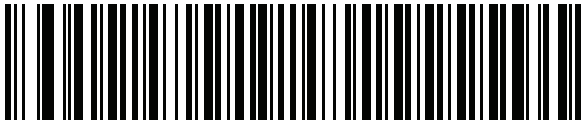
Bulgarian Cyrillic (Typewriter)
(Bulgarian -Windows XP
Typewriter - Win 7 or higher)



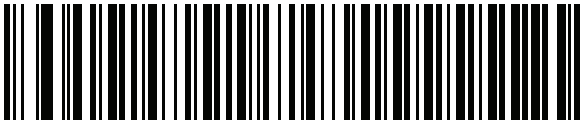
Canadian French Win7



Canadian French (Legacy)

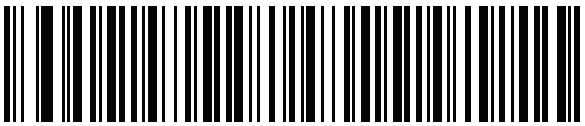


Canadian Multilingual Standard

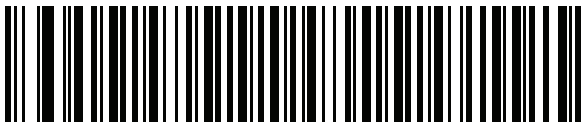


Chinese (ASCII)

Country Codes (Continued)

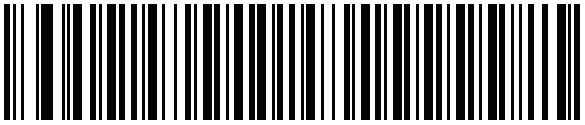


Chinese (Simplified)*

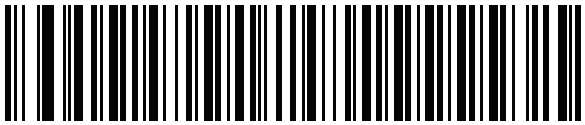


Chinese (Traditional)*

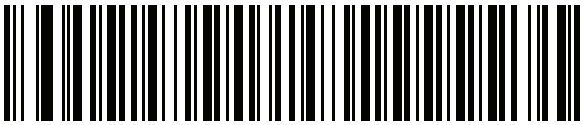
*For CJK keyboard types, see *Appendix D, CJK Decode Control*.



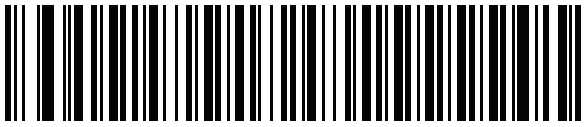
Croatian



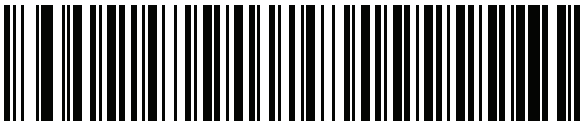
Czech



Czech (Programmer)

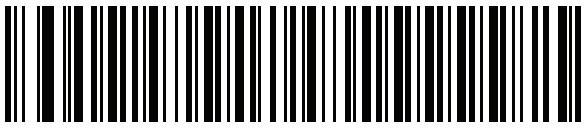


Czech (QWERTY)

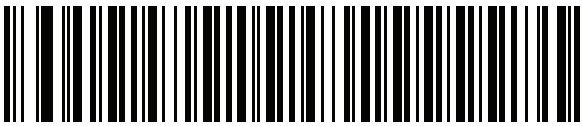


Danish

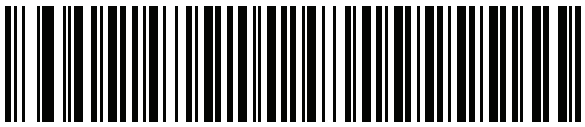
Country Codes (Continued)



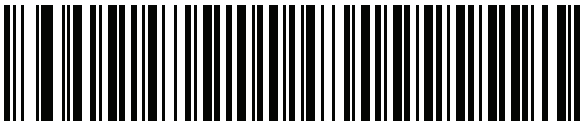
Dutch (Netherlands)



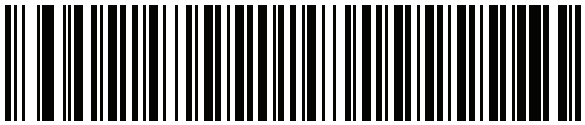
Estonian



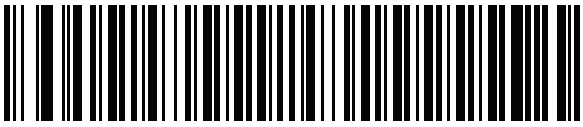
Faeroese



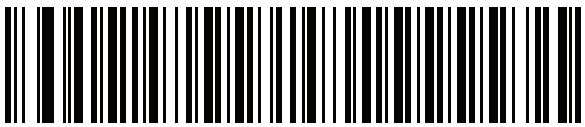
Finnish



French (France)

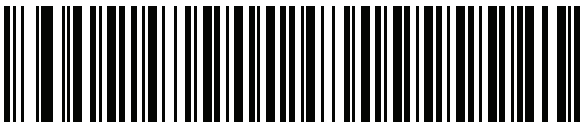


French International (Belgian French)



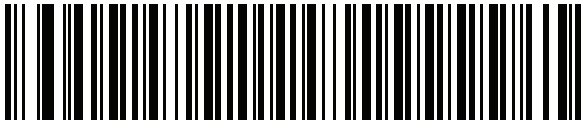
French (Canada) 95/98

Country Codes (Continued)

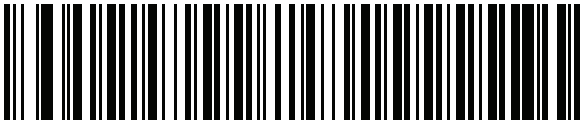


French (Canada) 2000/XP*

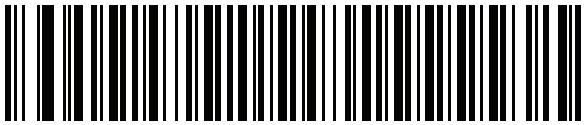
*Note that there is also a country code bar code for *Canadian Multilingual Standard on page B-4*. Be sure to select the appropriate bar code for your host system.



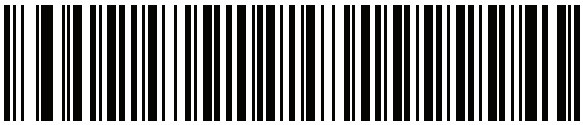
Galician



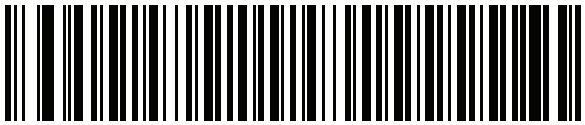
German



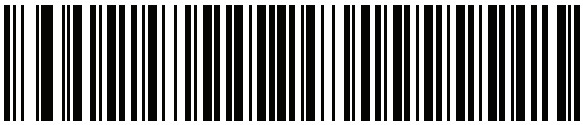
Greek Latin



Greek (220) Latin

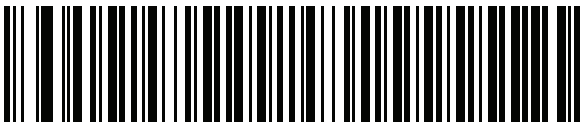


Greek (319) Latin

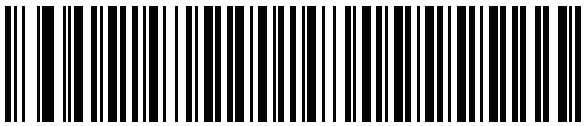


Greek

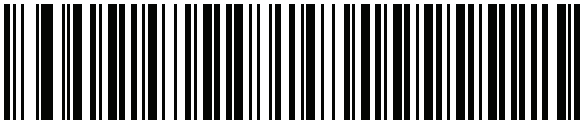
Country Codes (Continued)



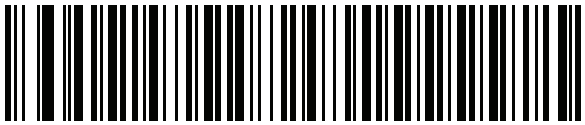
Greek (220)



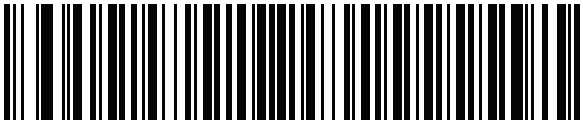
Greek (319)



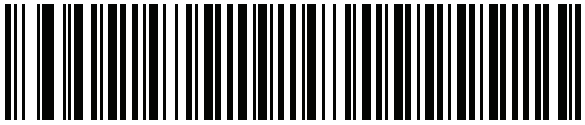
Greek Polytonic



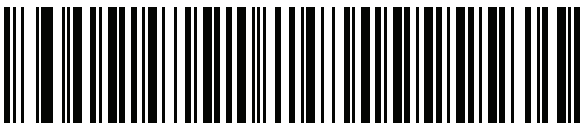
Hebrew Israel



Hungarian

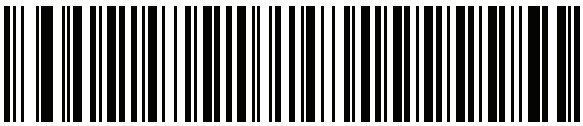


Hungarian_101KEY

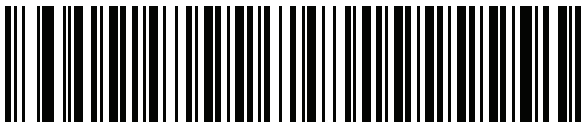


Icelandic

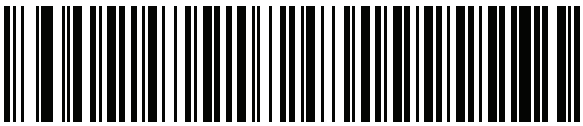
Country Codes (Continued)



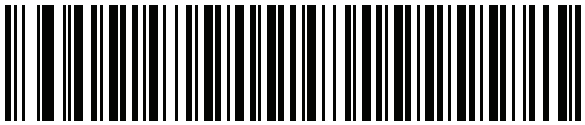
Irish



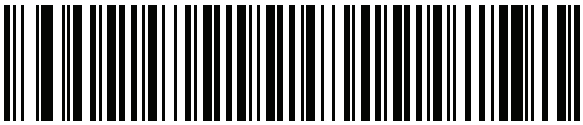
Italian



Italian (142)

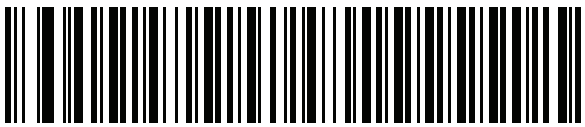


Japanese (ASCII)

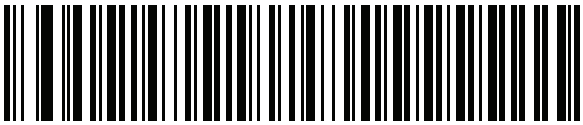


Japanese (SHIFT-JIS)*

*For CJK keyboard types, see *Appendix D, CJK Decode Control*.

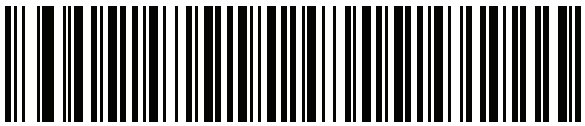


Kazakh



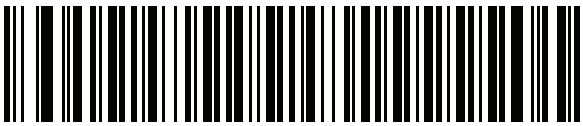
Korean (ASCII)

Country Codes (Continued)

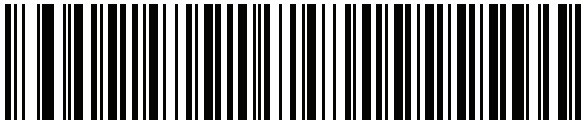


Korean (Hangul)*

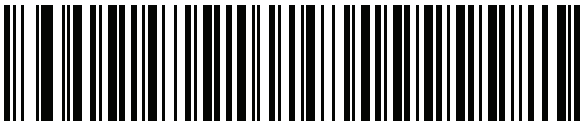
*For CJK keyboard types, see *Appendix D, CJK Decode Control*.



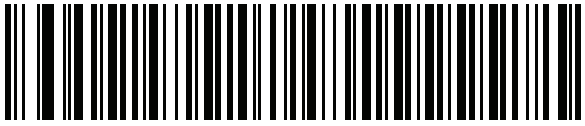
Kyrgyz



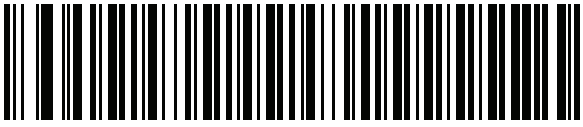
Latin American



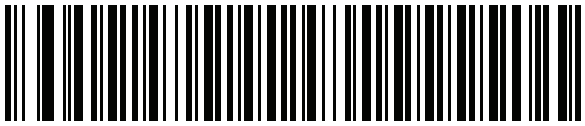
Latvian



Latvian (QWERTY)

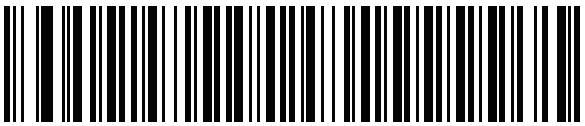


Lithuanian

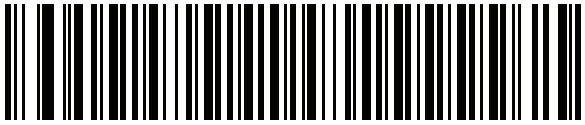


Lithuanian (IBM)

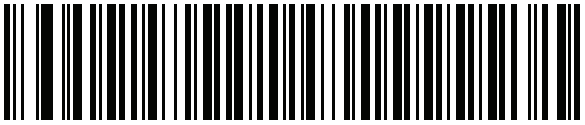
Country Codes (Continued)



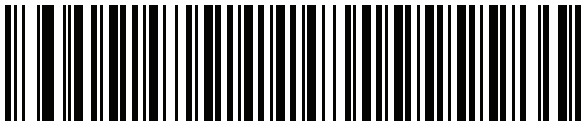
Macedonian (FYROM)



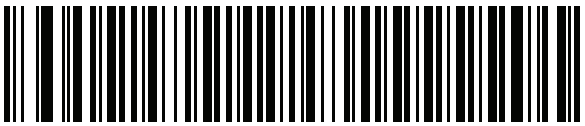
Maltese_47KEY



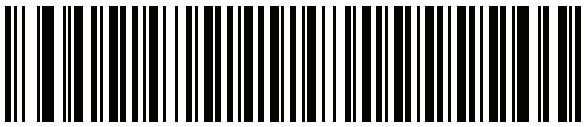
Mongolian



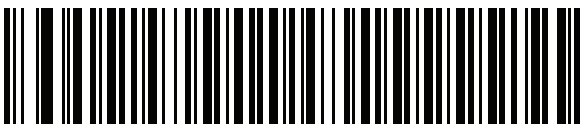
Norwegian



Polish (214)

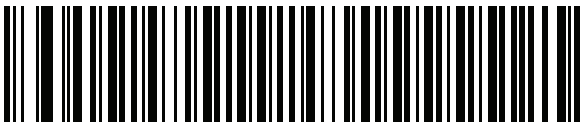


Polish (Programmer)

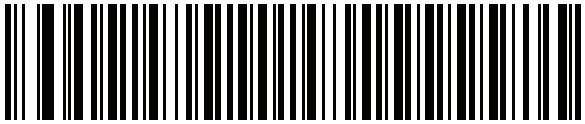


Portuguese (Brazil)
(Windows XP)

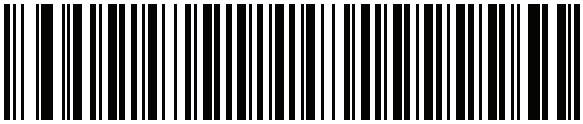
Country Codes (Continued)



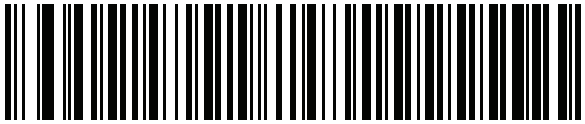
Portuguese (Brazilian ABNT)



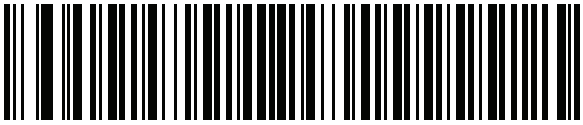
Portuguese (Brazilian ABNT2)



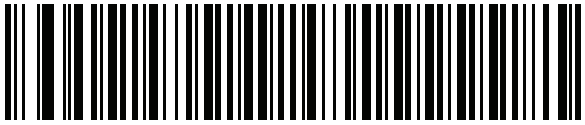
Portuguese (Portugal)



Romanian
(Windows XP)

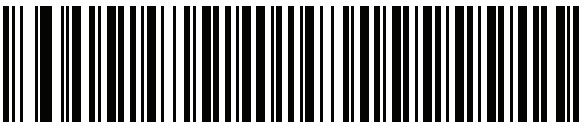


Romanian (Legacy)
(Win 7 or higher)

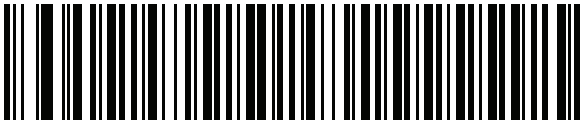


Romanian (Standard)
(Win 7 or higher)

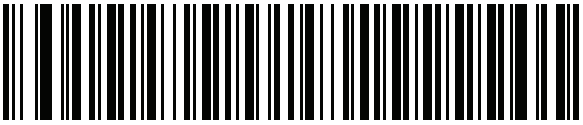
Country Codes (Continued)



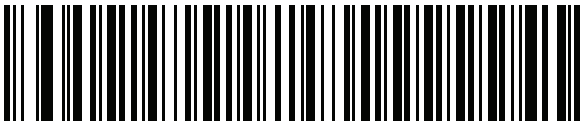
Romanian (Programmer)
(Win 7 or higher)



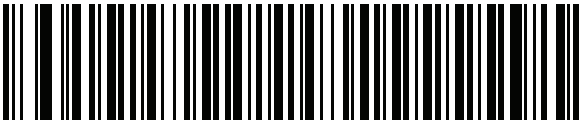
Russian



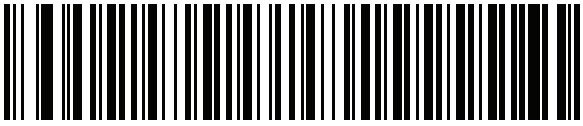
Russian (Typewriter)



Serbian (Latin)

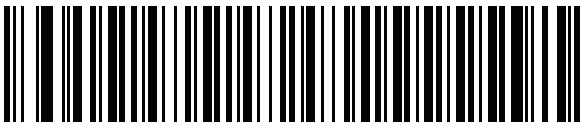


Serbian (Cyrillic)

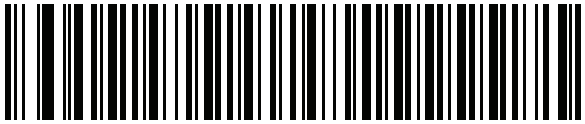


Slovak

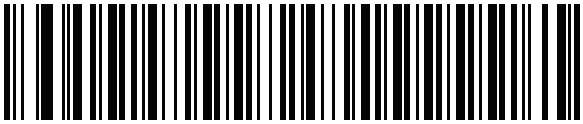
Country Codes (Continued)



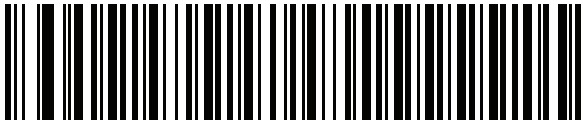
Slovak (QWERTY)



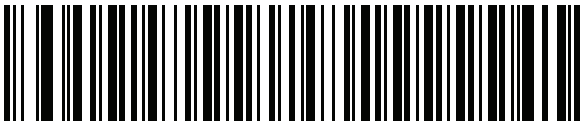
Slovenian



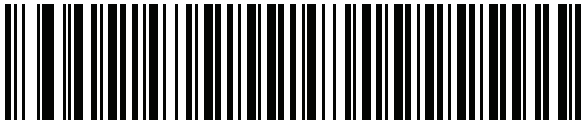
Spanish



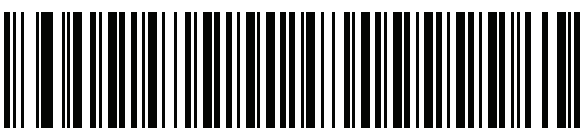
Spanish (Variation)



Swedish

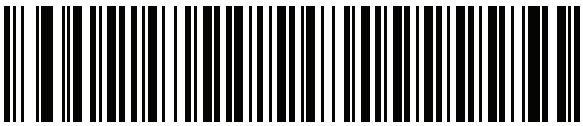


Swiss French

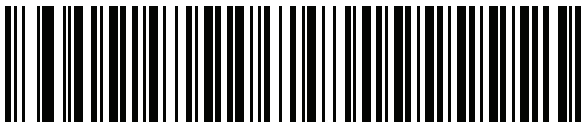


Swiss German

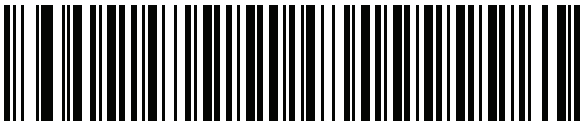
Country Codes (Continued)



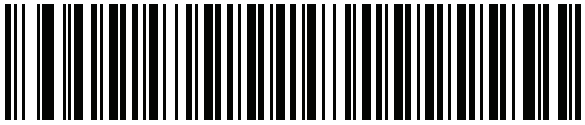
Tatar



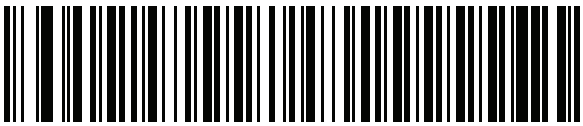
Thai (Kedmanee)



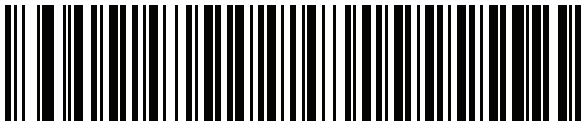
Turkish F



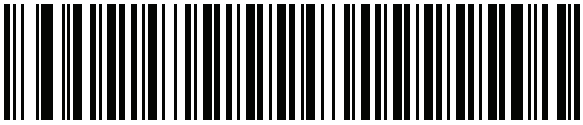
Turkish Q



UK English

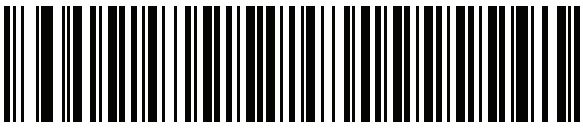


Ukrainian

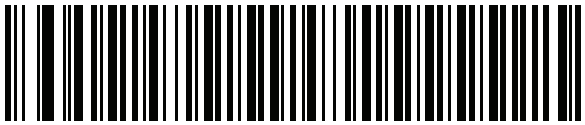


US Dvorak

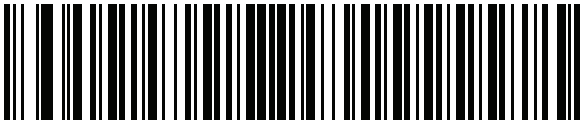
Country Codes (Continued)



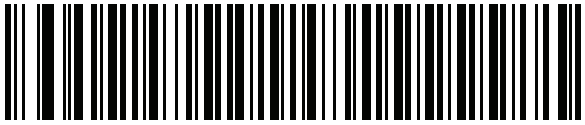
US Dvorak Left



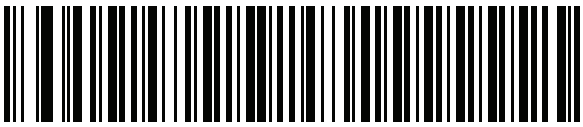
US Dvorak Right



US International



Uzbek



Vietnamese

APPENDIX C COUNTRY CODE PAGES

Introduction

This chapter provides bar codes for selecting code pages for the country keyboard type selected in *Appendix B, Country Codes*. If the default code page in *Table C-1* is appropriate for your selected country keyboard type, you do not need to scan a country code page bar code.

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

Table C-1 lists the code page default for each country keyboard.

Table C-1 *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

Table C-1 *Country Code Page Defaults*

Country Keyboard	Code Page Default
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
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 (Canada) 95/98	Windows 1252
French (Canada) 2000/XP	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

Table C-1 *Country Code Page Defaults*

Country Keyboard	Code Page Default
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
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 Brazil	Windows 1252
Portuguese Brazilian ABNT	Windows 1252
Portuguese Brazilian ABNT2	Windows 1252
Portuguese Portugal	Windows 1252
Romanian	Windows 1250
Romanian Legacy	Windows 1250
Romanian Standard	Windows 1250

Table C-1 *Country Code Page Defaults*

Country Keyboard	Code Page Default
Romanian Programmer	Windows 1250
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
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 Bar Codes

Scan the bar code 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

Country Code Pages (Continued)

Windows 1255
Hebrew

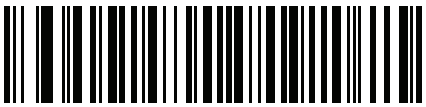
Windows 1256
Arabic

Windows 1257
Baltic

Windows 1258
Vietnamese

Windows 874
Thai

Country Code Pages (Continued)



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

Country Code Pages (Continued)

MS-DOS 437
Latin US

MS-DOS 737
Greek

MS-DOS 775
Baltic

MS-DOS 850
Latin 1

MS-DOS 852
Latin 2

Country Code Pages (Continued)

MS-DOS 855
Cyrillic

MS-DOS 857
Turkish

MS-DOS 860
Portuguese

MS-DOS 861
Icelandic

MS-DOS 862
Hebrew

Country Code Pages (Continued)

MS-DOS 863
French Canada

MS-DOS 865
Nordic

MS-DOS 866
Cyrillic

MS-DOS 869
Greek 2

Country Code Pages (Continued)

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

Country Code Pages (Continued)

ISO 8859-6
Arabic

ISO 8859-7
Greek

ISO 8859-8
Hebrew

ISO 8859-9
Latin 5, Turkish

ISO 8859-10
Latin 6, Nordic

Country Code Pages (Continued)

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

Country Code Pages (Continued)

UTF-8

UTF-16LE
UTF-16 Little Endian

UTF-16BE
UTF-16 Big Endian

Mac CP10000
Roman

APPENDIX D CJK DECODE CONTROL

Introduction

This appendix describes control parameters for CJK (Chinese, Japanese, Korean) bar code decode through USB HID Keyboard Emulation or Keyboard Wedge modes.

NOTE Because ADF does not support CJK character processing, there is no format manipulation for CJK output.

CJK Control Parameters

Unicode Output Control

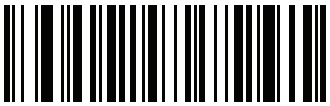
Parameter # 973

For a Unicode encoded CJK bar code, select one of the following options for unicode output:

- **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/CJK Decode Setup with Windows Host on page D-7*.

- **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 bar code, 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 with Windows Host on page D-7*.

- **Other options for CJK output** - With the following methods, the scanner sends the CJK character hexadecimal internal code (Nei Ma) value to host, or converts the CJK character to Unicode and sends the hexadecimal Unicode value to host. When using these methods, the Windows host must select the corresponding IME to accept the CJK character. See *Unicode/CJK Decode Setup with Windows Host on page D-7*.
  - **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)

(for Japanese Unicode Output, select Simplified Chinese Unicode IME on the Windows host)

CJK Output Method to Windows Host (continued

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) (17)

Chinese (Traditional) Big5 Output (Windows 7) (19)

Chinese (Traditional) Unicode Output (Windows XP) (18)

Chinese (Traditional) Unicode Output (Windows 7) (20)

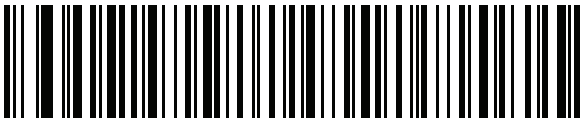
Non-CJK UTF Bar Code Output

Parameter # 960

Some country keyboard type layouts contain characters that do not exist in the default code page (see *Country Keyboard Type Missing Characters on page D-6*). Although the default code page can not encode these characters in a bar code, they can be encoded in the UTF-8 bar code. Scan this parameter bar code to output the Unicode values by emulation mode.

✓ ***NOTE*** Use this special country keyboard type to decode the non-CJK UTF-8 bar code. After decoding, re-configure the scanner to use the original country keyboard type.

Use US English IME on Windows. See *Unicode Output Control on page D-2*.



Non-CJK UTF-8 Emulation Output

Country Keyboard Type Missing Characters

Country keyboard type: **Tatar, Uzbek, Mongolian, Kyrgyz, Kazakh and Azeri**
Default code page: CP1251
Missing characters:

ғ	Ғ
ҳ	Ҳ
қ	Қ
h	H
ө	Ө
ә	Ә
ү	Ү
ң	Ң
ж	Ж
₮	
ң	Ң
ұ	Ұ
к	К
ч	Ч
к	К

Country keyboard type: **Romanian (Standard)**
Default code page: CP1250
Missing characters:

ș	Ș
ț	Ț

Country keyboard type: **Portuguese-Brazilian (ABNT), Portuguese-Brazilian (ABNT2)**
Default code page: CP1252
Missing character: ₢

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

To support the Unicode universal output method, set up the Windows host registry table as follows:

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

To add the desired CJK input language:

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.

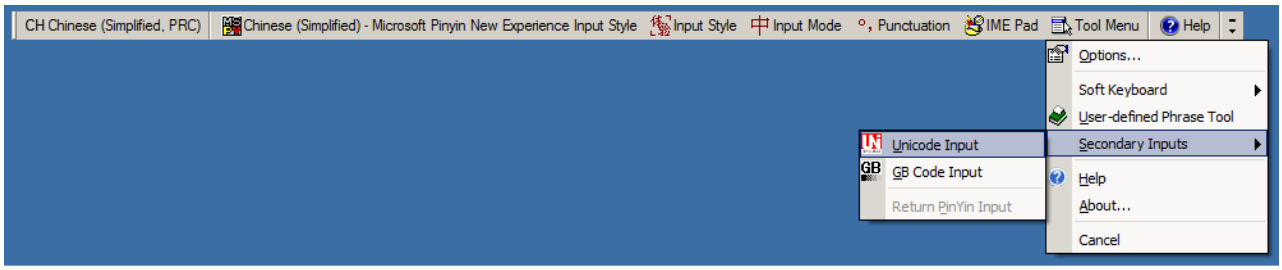
Selecting the Simplified Chinese Input Method on the Host

To select the Simplified Chinese input method:

- Select Unicode/GBK input on Windows XP: **Chinese (Simplified) - NeiMa**, then click the input bar to select **Unicode** or **GBK NeiMa** input.

Or

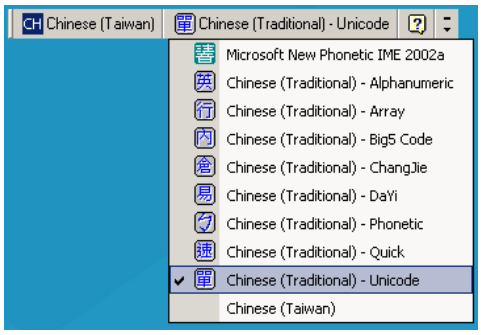
- Select Unicode/GBK input on Windows7: **Chinese (Simplified) - Microsoft Pinyin New Experience Input Style**, then select **Tool Menu > Secondary Inputs > Unicode Input** or **GB Code Input**.



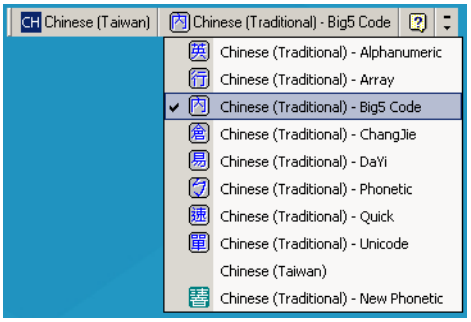
Selecting the Traditional Chinese Input Method on the Host

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.

APPENDIX E PROGRAMMING REFERENCE

Symbol Code Identifiers

Table E-1 *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
H	Code 11
J	MSI
K	GS1-128
L	Bookland EAN
M	Trioptic Code 39
N	Coupon Code
R	GS1 DataBar Family
S	Matrix 2 of 5
T	UCC Composite, TLC 39
U	Chinese 2 of 5

Table E-1 *Symbol Code Characters (Continued)*

Code Character	Code Type
V	Korean 3 of 5
X	ISSN EAN, PDF417, Macro PDF417, Micro PDF417
z	Aztec, Aztec Rune
P00	Data Matrix
P01	QR Code, MicroQR
P02	Maxicode
P03	US Postnet
P04	US Planet
P05	Japan Postal
P06	UK Postal
P08	Netherlands KIX Code
P09	Australia Post
P0A	USPS 4CB/One Code/Intelligent Mail
P0B	UPU FICS Postal
P0C	Mailmark
P0G	GS1 Data Matrix
P0H	Han Xin
P0Q	GS1 QR
P0X	Signature Capture

AIM Code Identifiers

Each AIM Code Identifier contains the three-character string **]cm** where:

] = Flag Character (ASCII 93)
c = Code Character (see *Table E-2*)
m = Modifier Character (see *Table E-3*)

Table E-2 *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
H	Code 11
h	Han Xin
I	Interleaved 2 of 5
L	PDF417, Macro PDF417, Micro PDF417
L2	TLC 39
M	MSI
Q	QR Code, MicroQR, GS1 QR
S	Discrete 2 of 5, IATA 2 of 5
U	Maxicode
z	Aztec, Aztec Rune
X	Bookland EAN, ISSN EAN, Trioptic Code 39, Chinese 2 of 5, Matrix 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 *Table E-3*.

Table E-3 *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 bar code with check character W, **A+I+MI+DW**, is transmitted as **]A7**AIMID where 7 = (3+4).	
Trioptic Code 39	0	No option specified at this time. Always transmit 0.
	Example: A Trioptic bar code 412356 is transmitted as **]X0**412356	
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 bar code with Function 1 character FNC1 in the first position, AIMID is transmitted as **]C1**AIMID	
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 bar code without check digit, 4123, is transmitted as **]I0**4123	
Codabar	0	No check digit processing.
	1	Reader has checked check digit.
	3	Reader has stripped check digit before transmission.
	Example: A Codabar bar code without check digit, 4123, is transmitted as **]F0**4123	
Code 93	0	No options specified at this time. Always transmit 0.
	Example: A Code 93 bar code 012345678905 is transmitted as **]G0**012345678905	
MSI	0	Check digits are sent.
	1	No check digit is sent.
	Example: An MSI bar code 4123, with a single check digit checked, is transmitted as **]M1**4123	

Table E-3 *Modifier Characters (Continued)*

Code Type	Option Value	Option
D 2 of 5	0	No options specified at this time. Always transmit 0.
	Example: A D 2 of 5 bar code 4123, is transmitted as **]S0**4123	
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 bar code 012345678905 is transmitted as **]E0**012345678905	
Bookland EAN	0	No options specified at this time. Always transmit 0.
	Example: A Bookland EAN bar code 123456789X is transmitted as **]X0**123456789X	
ISSN EAN	0	No options specified at this time. Always transmit 0.
	Example: An ISSN EAN bar code 123456789X is transmitted as **]X0**123456789X	
Code 11	0	Single check digit
	1	Two check digits
	3	Check characters validated but not transmitted.
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 bar code 0110012345678902 is transmitted as **]e**00110012345678902.	
EAN.UCC Composites (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.
	3	Data packet containing the data following an escape mechanism character. The data packet supports the ECI protocol.
		GS1-128 emulation Note: UPC portion of composite is transmitted using UPC rules.
	1	Data packet is a GS1-128 symbol (i.e., data is preceded with]JC1).

Table E-3 *Modifier Characters (Continued)*

Code Type	Option Value	Option
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 92_{DEC} has been doubled in transmission.
	1	Reader set to follow the ECI protocol (Extended Channel Interpretation). All data characters 92_{DEC} are doubled.
	2	Reader set for Basic Channel operation (no escape character transmission protocol). Data characters 92_{DEC} 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 bar code contains a GS1-128 symbol, and the first codeword is 903-907, 912, 914, 915.
	4	The bar code contains a GS1-128 symbol, and the first codeword is in the range 908-909.
	5	The bar code contains a GS1-128 symbol, and the first codeword is in the range 910-911.
	Example: A PDF417 bar code 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 E-3 *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.

APPENDIX F SAMPLE BAR CODES

Code 39

UPC/EAN

UPC-A, 100%

EAN-13, 100%

Code 128

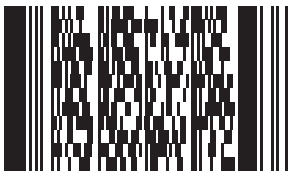
Interleaved 2 of 5

GS1 DataBar Omnidirectional

✓ ***NOTE*** DataBar Omnidirectional must be enabled to read the bar code below (see *GS1 DataBar Omnidirectional (formerly GS1 DataBar-14) on page 11-78*).

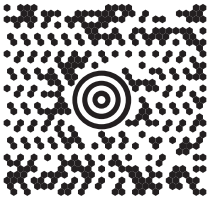
7612341562341

PDF417



Data Matrix

Maxicode



QR Code

Han Xin

US Postnet

UK Postal

APPENDIX G NUMERIC BAR CODES

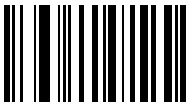
Numeric Bar Codes

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

0

1

2



3

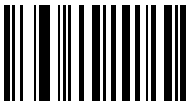
4

Numeric Bar Codes (continued)

5

6

7



8

9

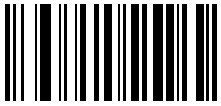
Cancel

To correct an error or change a selection, scan the bar code below.

Cancel

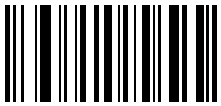
APPENDIX H ALPHANUMERIC BAR CODES

Alphanumeric Keyboard

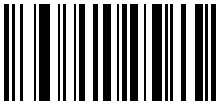


Space

#

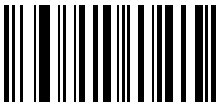


$



%

Alphanumeric Keyboard (continued)



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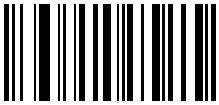

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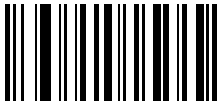

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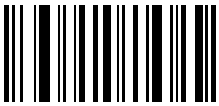

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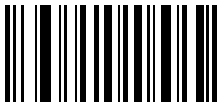

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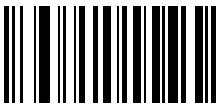

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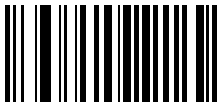

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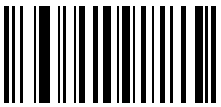

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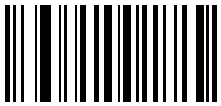

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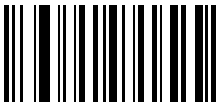

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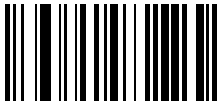

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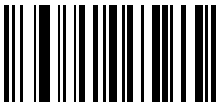

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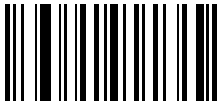

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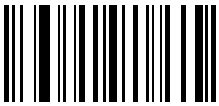

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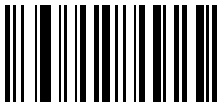

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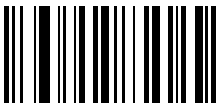

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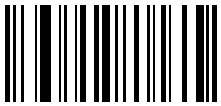

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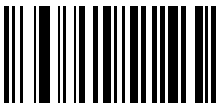

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Alphanumeric Keyboard (continued)

✓ ***NOTE*** The bar codes that follow should not be confused with those on the numeric keypad.

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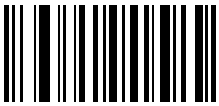

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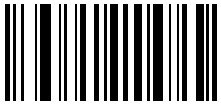

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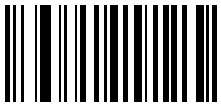

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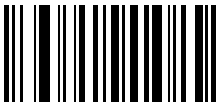
End of Message

Cancel

Alphanumeric Keyboard (continued)



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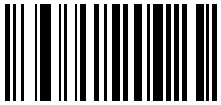

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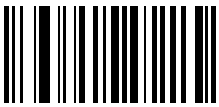

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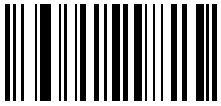

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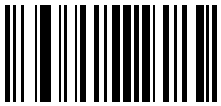

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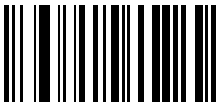

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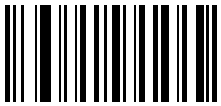

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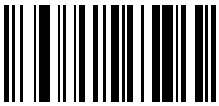

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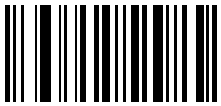

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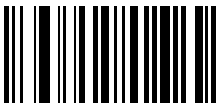

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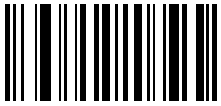

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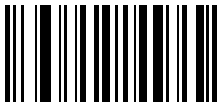

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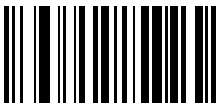

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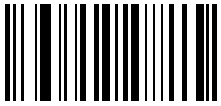

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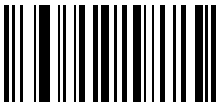

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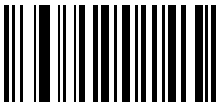

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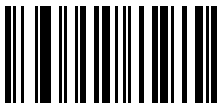

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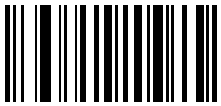

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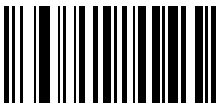

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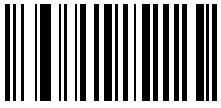

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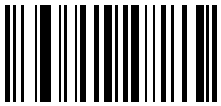

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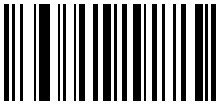

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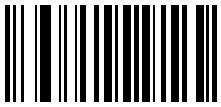

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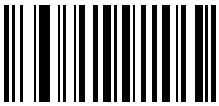

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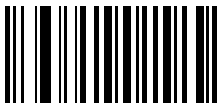

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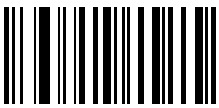

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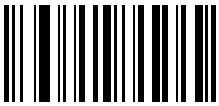

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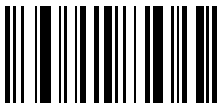

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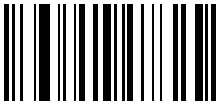

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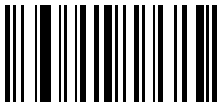

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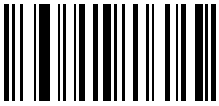

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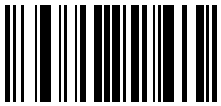

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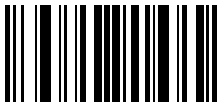

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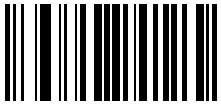

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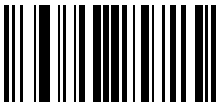

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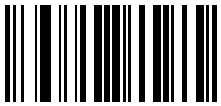

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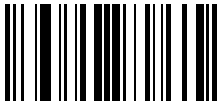

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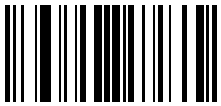
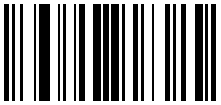


}



~

APPENDIX I ASCII CHARACTER SETS

Table I-1 *ASCII Value Table*

ASCII Value	Full ASCII Code 39 Encode Char	Keystroke
1000	%U	CTRL 2
1001	$A	CTRL A
1002	$B	CTRL B
1003	$C	CTRL C
1004	$D	CTRL D
1005	$E	CTRL E
1006	$F	CTRL F
1007	$G	CTRL G
1008	$H	CTRL H/**BACKSPACE**[1]
1009	$I	CTRL I/**HORIZONTAL TAB**[1]
1010	$J	CTRL J
1011	$K	CTRL K
1012	$L	CTRL L
1013	$M	CTRL M/**ENTER**[1]
1014	$N	CTRL N
1015	$O	CTRL O

The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the unbold keystroke transmits.

Table I-1 *ASCII Value Table (Continued)*

ASCII Value	Full ASCII Code 39 Encode Char	Keystroke
1016	$P	CTRL P
1017	$Q	CTRL Q
1018	$R	CTRL R
1019	$S	CTRL S
1020	$T	CTRL T
1021	$U	CTRL U
1022	$V	CTRL V
1023	$W	CTRL W
1024	$X	CTRL X
1025	$Y	CTRL Y
1026	$Z	CTRL Z
1027	%A	CTRL [
1028	%B	CTRL \
1029	%C	CTRL]
1030	%D	CTRL 6
1031	%E	CTRL -
1032	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	,

The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the unbold keystroke transmits.

Table I-1 *ASCII Value Table (Continued)*

ASCII Value	Full ASCII Code 39 Encode Char	Keystroke
1045	-	-
1046	.	.
1047	/o	/
1048	0	0
1049	1	1
1050	2	2
1051	3	3
1052	4	4
1053	5	5
1054	6	6
1055	7	7
1056	8	8
1057	9	9
1058	/Z	:
1059	%F	;
1060	%G	<
1061	%H	=
1062	%I	>
1063	%J	?
1064	%V	@
1065	A	A
1066	B	B
1067	C	C
1068	D	D
1069	E	E
1070	F	F
1071	G	G
1072	H	H
1073	I	I

The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the unbold keystroke transmits.

Table I-1 *ASCII Value Table (Continued)*

ASCII Value	Full ASCII Code 39 Encode Char	Keystroke
1074	J	J
1075	K	K
1076	L	L
1077	M	M
1078	N	N
1079	O	O
1080	P	P
1081	Q	Q
1082	R	R
1083	S	S
1084	T	T
1085	U	U
1086	V	V
1087	W	W
1088	X	X
1089	Y	Y
1090	Z	Z
1091	%K	[
1092	%L	\
1093	%M	]
1094	%N	^
1095	%O	_
1096	%W	‘
1097	+A	a
1098	+B	b
1099	+C	c
1100	+D	d
1101	+E	e
1102	+F	f

The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the unbold keystroke transmits.

Table I-1 *ASCII Value Table (Continued)*

ASCII Value	Full ASCII Code 39 Encode Char	Keystroke
1103	+G	g
1104	+H	h
1105	+I	i
1106	+J	j
1107	+K	k
1108	+L	l
1109	+M	m
1110	+N	n
1111	+O	o
1112	+P	p
1113	+Q	q
1114	+R	r
1115	+S	s
1116	+T	t
1117	+U	u
1118	+V	v
1119	+W	w
1120	+X	x
1121	+Y	y
1122	+Z	z
1123	%P	{
1124	%Q	I
1125	%R	}
1126	%S	~

The keystroke in bold transmits only if you enabled Function Key Mapping. Otherwise, the unbold keystroke transmits.

Table I-2 *ALT Key Standard Default Tables*

ALT Keys	Keystroke
2064	ALT 2
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
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

Table I-3 *USB 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
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

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 I-3 *USB GUI Key Character Set (Continued)*

GUI Key	Keystroke
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

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 I-4 *PF Key Standard Default Table*

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 I-5 *F key Standard Default Table*

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
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 I-6 *Numeric Key Standard Default Table*

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 I-7 *Extended Keypad Standard Default Table*

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

APPENDIX J SIGNATURE CAPTURE CODE

Introduction

CapCode, a signature capture code, is a special pattern that encloses a signature area on a document and allows a scanner to capture a signature.

There are several accepted patterns that allow automatic identification of different signatures on the same form. For example, on the federal tax return 1040 form there are three signature areas, one each for two joint filers, and one for a professional preparer. By using different patterns, a program can correctly identify all three, so they can be captured in any sequence and still be identified correctly.

Code Structure

Signature Capture Area

A CapCode is printed as two identical patterns on either side of a signature capture box, as shown in *Figure J-1*. Each pattern extends the full height of the signature capture box.

The box is optional, so you can omit it, replace it with a single baseline, or print a baseline with an "X" on top of it towards the left, as is customarily done in the US to indicate a request for signature. However, if an "X" or other markings are added in the signature box area, these are captured with the signature.

Figure J-1 *CapCode*

CapCode Pattern Structure

A CapCode pattern structure consists of a start pattern followed by a separator space, a signature capture box, a second separator space, and then a stop pattern. Assuming that X is the dimension of the thinnest element, the start and stop patterns each contains 9X total width in 4 bars and 3 spaces. A 7X quiet zone is required to the left and to the right of the CapCode pattern.

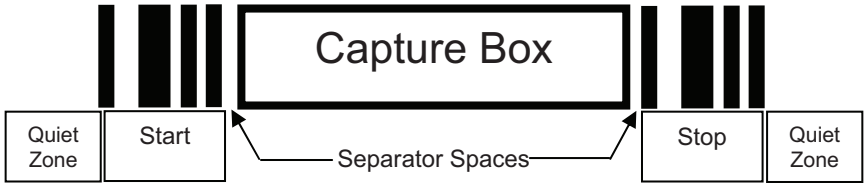


Figure J-2 *CapCode Structure*

The separator spaces on either side of the signature capture box can be between 1X and 3X wide.

Start / Stop Patterns

Table J-1 lists the accepted start / stop patterns. The bar and space widths are expressed as multiples of X. You must use the same pattern on either side of a signature capture box. The type value is reported with the captured signature to indicate the purpose of the signature captured.

Table J-1 *Start / Stop Pattern Definitions*

Bar/Space Patterns							Type
B	S	B	S	B	S	B	
1	1	2	2	1	1	1	2
1	2	2	1	1	1	1	5
2	1	1	2	1	1	1	7
2	2	1	1	1	1	1	8
3	1	1	1	1	1	1	9

Table J-2 lists selectable parameters used to generate the image of the captured signature.

Table J-2 *User Defined CapCode Parameters*

Parameter	Defined
Width	Number of pixels
Height	Number of pixels
Format	JPEG, BMP, TIFF
JPEG quality	1 (most compression) to 100 (best quality)
Bits Per Pixel (not applicable to JPEG format)	1 (2 levels)
	4 (16 levels)
	8 (256 levels)

BMP format does not use compression, JPEG and TIFF formats do.

Dimensions

The size of the signature capture box is determined by the height and separation of the start and stop patterns. The line width of the signature capture box is insignificant.

The thinnest element width, referred to here as X, is nominally 10 mils (1 mil = 0.0254 mm). Select this as an exact multiple of the pixel pitch of the printer used. For example, when using a 203 DPI (dots-per-inch) printer and printing 2 dots per module, the resulting X dimension is 9.85 mils.

Data Format

The scanner output is formatted according to *Table J-3*. Symbol scanners allow different user options to output or inhibit bar code type. Selecting "Symbol ID" as the bar code type for output identifies the CapCode with letter "i".

Table J-3 *Data Format*

File Format (1 byte)	Type (1 byte)	Image Size (4 bytes, BIG Endian)	Image Data
JPEG - 1 BMP - 3 TIFF - 4	See *Table J-1*, last column		(Same bytes as in a data file)

Additional Capabilities

Regardless of how the signature is captured, the output signature image is de-skewed and right-side up.

A scanner that captures signatures automatically determines whether it is scanning a signature or a bar code. You can disable the signature capturing capability in a scanner.

Signature Boxes

Figure J-3 illustrates the five acceptable signature boxes:

Type 2:

Type 5:

Type 7:

Type 8:

Type 9:

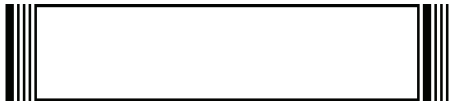


Figure J-3 *Acceptable Signature Boxes*

APPENDIX K NON-PARAMETER ATTRIBUTES

Introduction

This appendix defines non-parameter attributes.

Attributes

Model Number

Attribute #533

Model number of the scanner which matches the label of the device, for example **DS9808-SR2000R**.

Type	S
Size (Bytes)	18
User Mode Access	R
Values	Variable

Serial Number

Attribute #534

Unique serial number assigned at the time of manufacture, for example **M1J26F45V**.

Type	S
Size (Bytes)	16
User Mode Access	R
Values	Variable

Date of Manufacture

Attribute #535

Date of device manufacture, for example **30APR14**.

Type	S
Size (Bytes)	7
User Mode Access	R
Values	Variable

Date of First Programming

Attribute #614

Date of first electronic programming, for example **30APR14**.

Type	S
Size (Bytes)	7
User Mode Access	R
Values	Variable

Configuration Filename

Attribute #616

Identifies the device configuration. Scanning **Set Defaults** sets this value to factory defaults. Once set with this or another user-defined value, this value changes to **Modified** upon scanning any parameter bar code.

Type	S
Size (Bytes)	17
User Mode Access	RW
Values	Variable

Beeper/LED

Attribute #6000

Triggers the beeper/LED.

Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	See values in current RSM attribute dictionary

Parameter Defaults

Attribute #6001

This attribute initiates a parameter default command.

Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	0 = Restore Defaults 1 = Restore Factory Defaults 2 = Write Custom Defaults

Parameter Buffer

Attribute #6002

Retrieves entire parameter buffer.

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

Beep on Next Bootup

Attribute #6003

Enables or disables beep on next boot up of scanner.

Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	0 = Disable beep on next bootup 1 = Enable beep on next bootup

Reboot

Attribute #6004

Host requested reboot.

Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	N/A

Host Trigger Session

Attribute #6005

Triggers a decode session.

Type	X
Size (Bytes)	N/A
User Mode Access	W
Values	0 = Start Host Trigger Session 1 = Stop Host Trigger Session

Firmware Version

Attribute #20004

Internal tracking code for the scanner's operating system version. For example, **NBRFMAAC** or **PAAAABS00-007-R03D0**.

Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

Device Class

Attribute #20007

Description of the device's hardware, for example, **1D Laser**, **2D Laser, Imager**, or **Cordless 2D Imager**.

Type	S
Size (Bytes)	18
User Mode Access	R
Values	Variable

Scankit Version

Attribute #20008

Identifies the 1D decode package resident on the device, for example **SKIT4.33T02**.

Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

Combined Firmware Version

Attribute #20009

Reports firmware version of the multiple CPU's on the single product with space delimiters, for example **NBRPUAAA NBRPUDAA**.

Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

RSM Version

Attribute #20011

Identifies the RSM version resident in the device, for example **2.0**.

Type	S
Size (Bytes)	3
User Mode Access	R
Values	Variable

Top Level Release Name

Attribute #20012

Returns top level combined image firmware name, for example **CAAABS00-008-R00**.

Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

Imagekit Version

Attribute #20013

Identifies the 2D decode package resident in the device, for example **IMGKIT_4.04T02**.

Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

DL Parser Version ID

Attribute #20014

Returns current driver's license parsing version.

Type	S
Size (Bytes)	Variable
User Mode Access	R
Values	Variable

RFID_LAST_TAG_ID

Attribute #35001

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

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

RFID_TAG_ID

Attribute #35002

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

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

RFID_BANK

Attribute #35003

The desired tag bank.

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

RFID_DATA

Attribute #35004

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

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

RFID_OFFSET

Attribute #35005

Word offset into tag buffer.

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

RFID_LENGTH

Attribute #35006

Words of data to read from tag buffer.

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

RFID_PASSWORD

Attribute #35007

Binary password for privileged operations.

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

RFID_COMMAND

Attribute #35008

Execute command.

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

RFID_CMD_STATUS

Attribute #35009

Resulting status from executing a command.

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

RFIDCmdStatus is two bytes defined in the following table.

Bytes	Definition
0x0000	Success
0x0001	No RFID module
0x0002	Tag not found
0x0003	Timeout
0x0004	Tag CRC error
0x01xx	Tag backscatter error. LSB indicates the error code as per EPC protocol.
0x02xx	Tag access error. LSB indicates the error code.
0x03xx	Bad parameter. The LSB indicates which parameter: 1 = Command 2 = TagID 3 = Bank 4 = Data 5 = Offset 6 = Password

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