

Wasp WLS 9500



WLS 9500
Product Reference Guide
April 2006

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Introduction

The *WLS 9500 Product Reference Guide* provides general instructions for setting up, operating, maintaining, and troubleshooting the WLS 9500 scanner. The scanner includes the following variations of the scanner:

Notational Conventions

The following conventions are used in this document:

- 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.



Service Information

If you have a problem with your equipment, contact the Wasp Technologies. Before calling, have the model number, serial number, and several bar code symbols at hand.

Call the Support Center from a phone near the scanning equipment so that the service person can try to talk you through your problem. If the equipment is found to be working properly and the problem is symbol readability, the Support Center will request samples of your bar codes for analysis at our plant.

If your problem cannot be solved over the phone, you may need to return your equipment for servicing. If that is necessary, you will be given specific directions.



Note

Wasp Technologies 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 the original shipping container was not kept, contact Wasp Technologies to have another sent to you.

Wasp Support

For service information, warranty information or technical assistance contact or call Wasp Support at:

1400 10th Street
Plano, TX 75074
214-547-4100

Getting Started

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Introduction

The scanner combines excellent scanning performance and advanced ergonomics to provide the best value in a lightweight laser scanner. Whether used as a hand-held scanner or in hands-free mode in a stand, the scanner ensures comfort and ease of use for extended periods of time.

In addition to single-line laser scanning, the scanner supports multi-line rastering. Multi-line rastering allows the scanner to capture stacked RSS codes and increases angular tolerances, minimizing product orientation and hand movements. Multi-line rastering also allows the scanner to read poor quality bar codes. For more information about scanning modes and stacked RSS codes, see *Scan Pattern* on page 4-7 and *RSS* on page B-4.



The scanner does not currently support PDF217 bar codes and its variants.

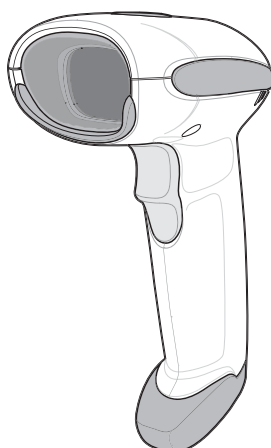


Figure 1-1. WLS 9500 Scanner

This scanner supports the following interfaces:

- Keyboard Wedge connection to a host. The host interprets scanned data as keystrokes. 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.
- USB connection to a host. The 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.

Unpacking

Remove the scanner from its packing and inspect it for damage. If the scanner was damaged in transit, call Wasp Technologies at the telephone number listed on [page xvi](#). **KEEP THE PACKING.** It is the approved shipping container and should be used if the equipment ever needs to be return for servicing.

Setting Up the Scanner

Installing the Interface Cable

To connect the interface cable:

1. Insert the interface cable's modular connector clip into the cable interface port on the bottom of the scanner handle.
(See [Figure 1-2](#).)
2. Gently tug the cable to ensure the connector is properly secured.
3. Connect the other end of the interface cable to the host. (See the specific host chapter for information on host connections.)

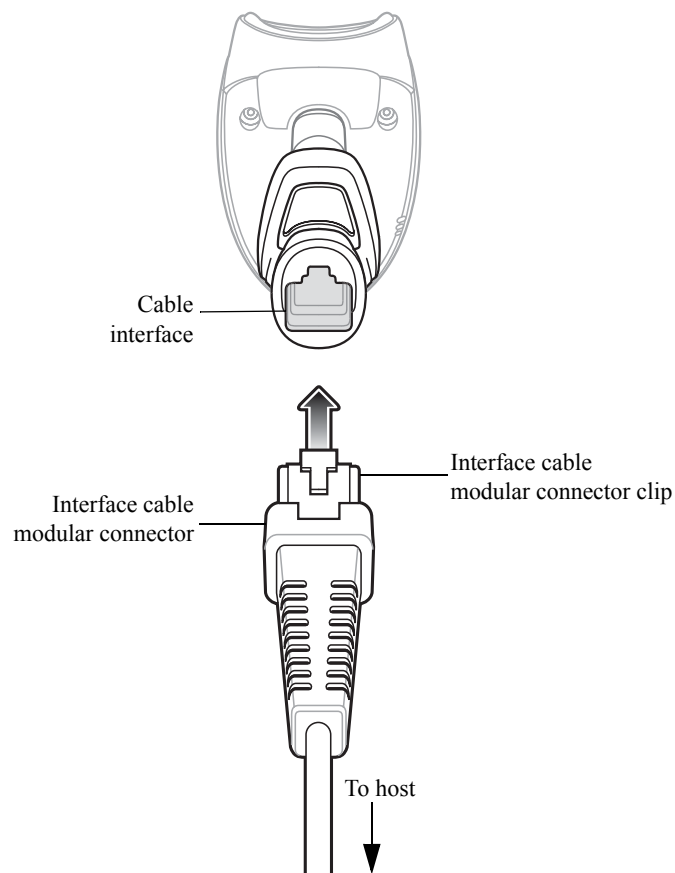


Figure 1-2. Installing the Cable



Note

Different cables are required for different hosts. The connectors illustrated in each host chapter are examples only. Actual connectors may be different than those illustrated, but the steps to connect the scanner remain the same.

2

Scanning

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Introduction

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

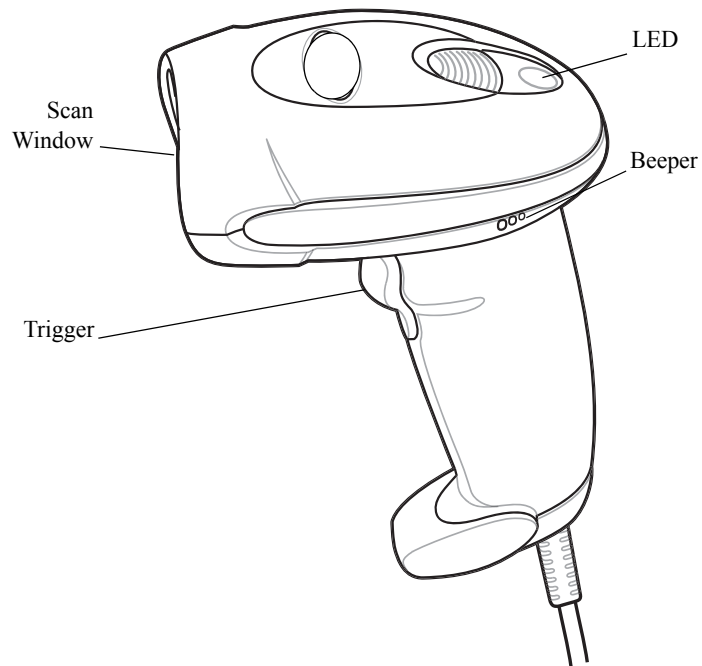


Figure 2-1. Parts

Beeper Definitions

The 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 scanner.

Table 2-1. Beeper Definitions

Beeper Sequence	Indication
Standard Use	
Low/medium/high beeps	Power up.
Short high beeps	A bar code symbol was decoded (if decode beeper is enabled).
4 long low beeps	A transmission error was detected in a scanned symbol. The data is ignored. This occurs if a unit is not properly configured. Check option setting.
5 low beeps	Conversion or format error.
Parameter Menu Scanning	
Short high beeps	Correct entry scanned or correct menu sequence performed.
Low/high beeps	Input error, incorrect bar code or “Cancel” scanned, wrong entry, incorrect bar code programming sequence; remain in program mode.
High/low beeps	Keyboard parameter selected. Enter value using bar code keypad.
High/low/high/low beeps	Successful program exit with change in the parameter setting.
Low/high/low/high beeps	Out of host parameter storage space. Scan <i>Default Parameters</i> on page 4-5.
Code 39 Buffering	
High/low beeps	New Code 39 data was entered into the buffer.
3 Beeps - long high beeps	Code 39 buffer is full.
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.
Host Specific	
USB only	
4 short high beeps	Scanner has not completed initialization. Wait several seconds and scan again.
Scanner gives a power-up beep after scanning a USB Device Type.	Communication with the bus must be established before the scanner can operate at the highest power level.
This power-up beep occurs more than once.	The USB bus may put the 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 host cold boots.

LED Definitions

In addition to beeper sequences, the scanner communicates with the user using a two-color LED display. [Table 2-2](#) defines LED colors that display during scanning.

Table 2-2. Standard LED Definitions

LED	Indication
Off	No power is applied to the scanner, or the scanner is on and ready to scan.
Green	A bar code was successfully decoded.

Table 2-2. Standard LED Definitions

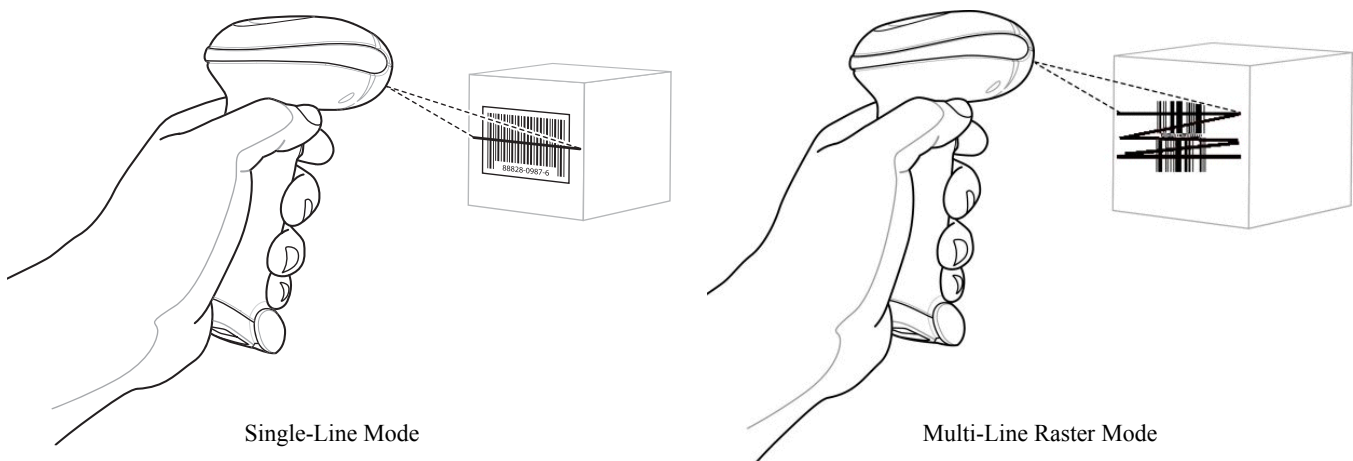
LED	Indication
Red	A data transmission error or scanner malfunction occurred.

Scanning in Hand-Held Mode

Install and program the scanner (see *Setting Up the Scanner on page I-4*). For assistance, contact the local supplier or Wasp Technologies.

To scan in hand-held mode:

1. Ensure all connections are secure. (See the host chapter for the scanner.)
2. Aim the scanner at the bar code.
3. Press the trigger.

**Figure 2-2. Scanning in Hand-Held Mode**

4. Upon successful decode, the scanner beeps and the LED turns green. (For more information about beeper and LED definitions, see [Table 2-1](#) and [Table 2-2](#).)



Scan line lengths vary depending on the scan line width selected (see *Scan Line Width on page 4-8*). A full scan line width is the default. Medium and short scan line widths are useful for scanning menus or pick-lists.

Aiming

On a typical UPC 100% hold the scanner between contact and 19 inches from the symbol (see *Decode Zone on page 2-10*). When scanning using a single-line scan mode, ensure the scan line crosses every bar and space of the symbol.

**Figure 2-3. Acceptable and Incorrect Single-Line Aiming**

When scanning using a multi-line scan mode, at least one scan line must cross every bar and space of the symbol.

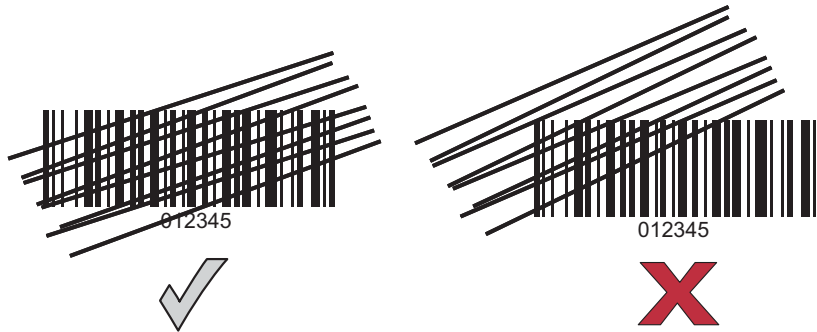


Figure 2-4. Acceptable and Incorrect Multi-Line Aiming

Regardless of the scan mode, the scan line is smaller when the 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 scanner, and those with larger bars or elements (mil size) farther from the scanner.

Do not hold the scanner directly over the bar code. Laser light reflecting *directly* back into the scanner from the bar code is known as specular reflection. This specular reflection can make decoding difficult.



Scan line lengths vary depending on the scan line width selected. A full scan line width is the default. Medium and short scan line widths are useful for scanning menus or pick-lists.

For more information about scan line widths and scanning modes, see [page 4-7](#) and [page 4-8](#), respectively.

The scanner can be tilted up to 65° forward or back and achieve a successful decode (Figure 2-5). Simple practice quickly shows what tolerances to work within.

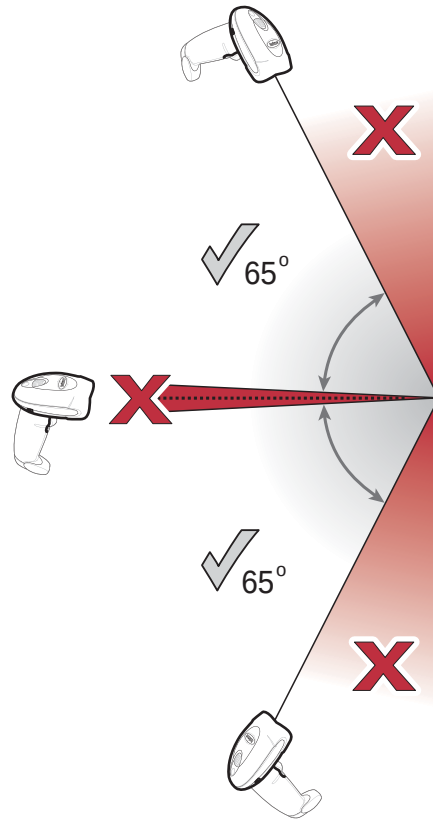


Figure 2-5. Maximum Tilt Angles and Dead Zone

Scanning in Hands-Free Mode

The optional Intellistand adds greater flexibility to scanning operation. When the scanner is seated in the stand's "cup," the scanner's built-in sensor places the scanner in hands-free mode. When the scanner is removed from the stand, it automatically switches modes to operate in its normal hand-held triggered mode.

Assemble the Stand

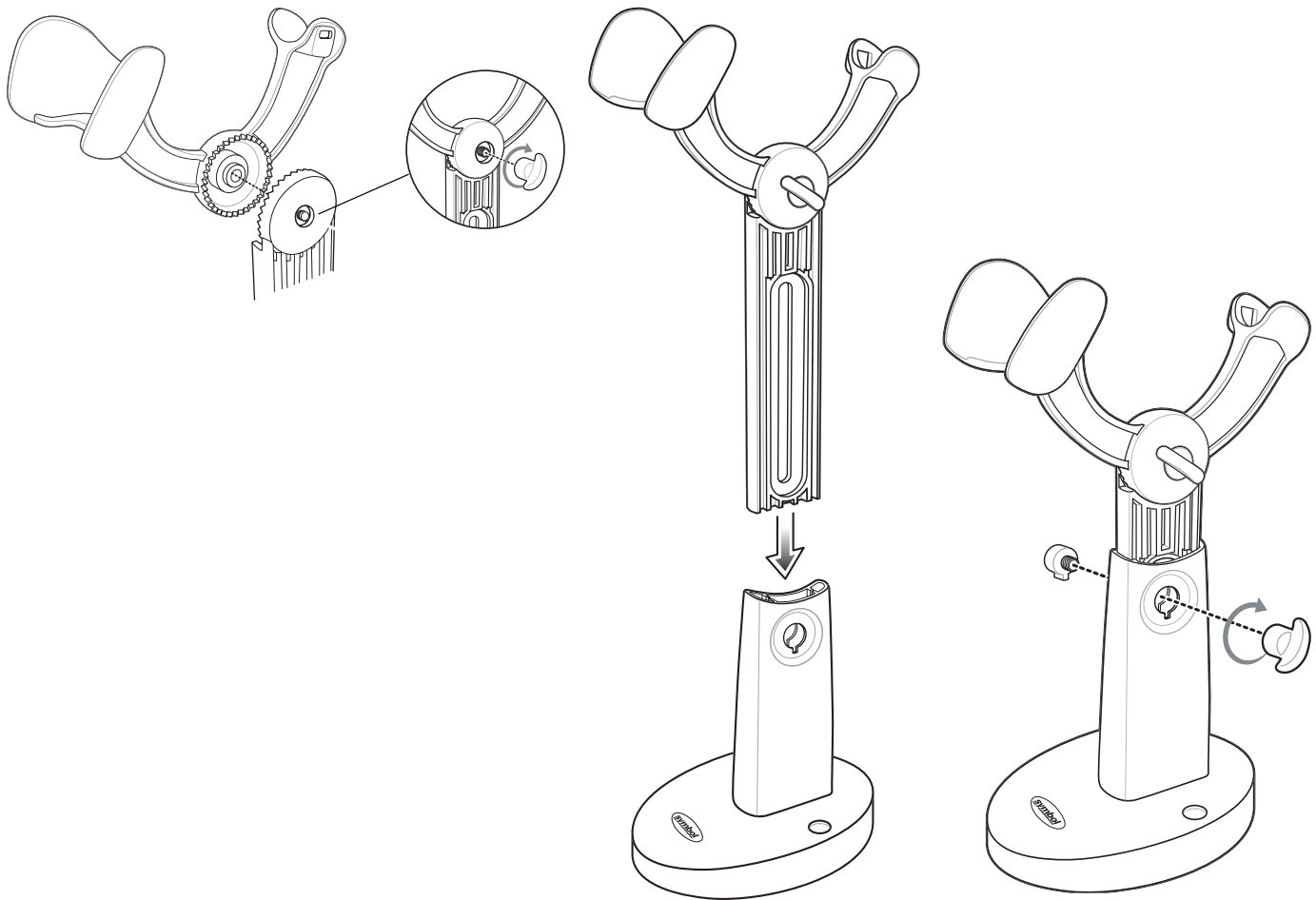


Figure 2-6. Assembling the WLS 9500 Hands Free Stand

Scanning with the WLS 9500 Hands Free Stand

When the scanner is placed in the Intellistand, the scan pattern selected in hand-held triggered mode continues (see *Scan Pattern* on page 4-7).

To operate the scanner in the WLS 9500 Hands Free Stand:

1. Ensure the scanner is properly connected to the host (see the appropriate host chapter for information on host connections).
2. Insert the scanner in Intellistand by placing the front of the scanner into the stand's "cup."

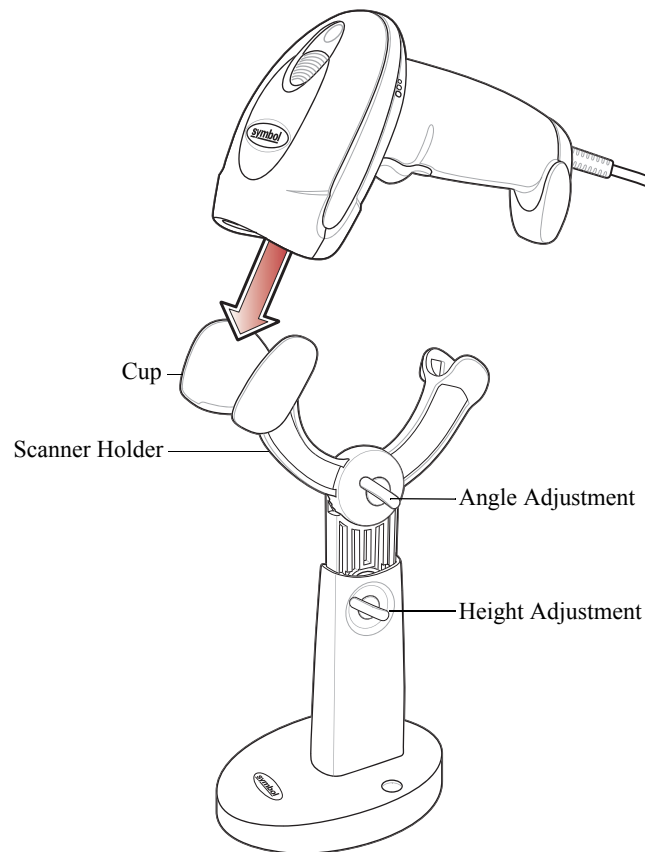


Figure 2-7. Inserting the Scanner in the WLS 9500 Hands Free Stand

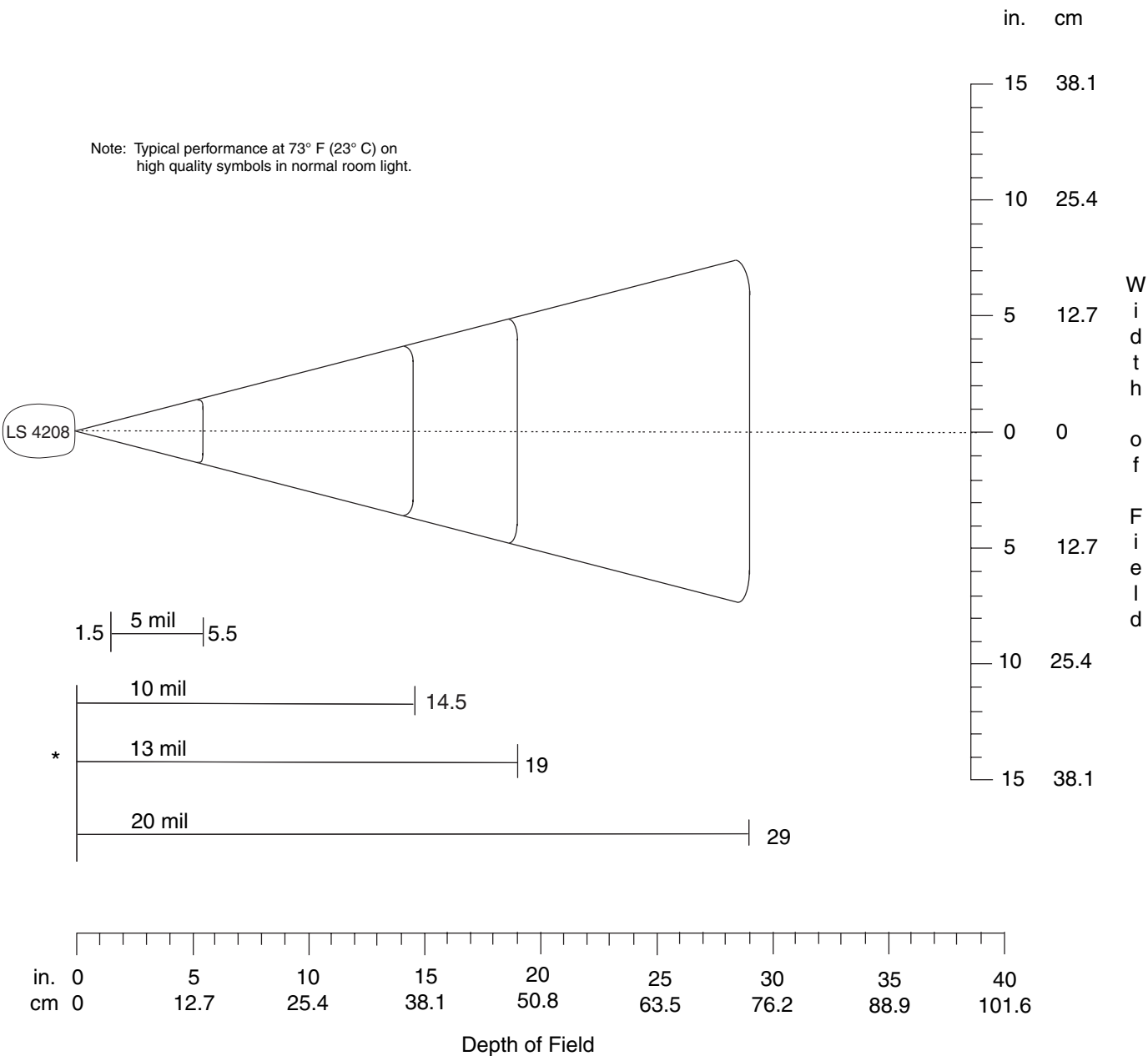
3. Use the WLS 9500 Hands Free Stand's adjustment knobs to adjust the height and angle of the scanner.
4. Present the bar code.



When the bar code is in view, the scanner emits a full scan line. After 3 minutes, the scanner automatically switches to a reduced scan line. After 1 hour, the scanner automatically switches to blink mode.

5. Upon successful decode, the scanner beeps and the LED turns green. For more information about beeper and LED definitions, see [Table 2-1](#) and [Table 2-2](#).

Decode Zone



*Minimum distance determined by symbol length and scan angle

Figure 2-8. WLS 9500 Decode Zone

Maintenance, Troubleshooting & Technical Specifications

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Introduction

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

Maintenance

Cleaning the exit window is the only maintenance required. A dirty window may affect scanning accuracy.

- Do not allow any 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
Beeper Indications		
The scanner emits frequent beeps.	No power to the scanner.	Check the system power. If the configuration requires a power supply, re-connect the power supply.
	Incorrect host interface cable is used.	Verify that the correct host interface cable is used. If not, connect the correct host interface cable.
	Interface/power cables are loose.	Check for loose cable connections and re-connect cables.
Scanner emits low/high beeps.	Input error, incorrect bar code or Cancel bar code was scanned.	Scan the correct numeric bar codes within range for the parameter programmed.
Scanner emits low/high/low beeps.	The Code 39 buffer was erased or there was an attempt to clear or transmit an empty buffer.	Normal when scanning the Code 39 Buffering Clear Buffer bar code or upon attempt to transmit an empty Code 39 buffer.
Scanner emits low/high/low/high beeps.	Out of host parameter storage space.	Scan <i>Default Parameters on page 4-5</i> .
	Out of memory for ADF rules.	Reduce the number of ADF rules or the number of steps in the ADF rules.
Scanner emits high/low beeps.	The scanner is buffering Code 39 data.	Normal.
Scanner emits four long low beeps.	A transmission error was detected in a scanned symbol. The data is ignored.	This occurs if a unit is not properly configured. Check option setting.
Scanner emits four short high beeps (USB only).	Scanner has not completed initialization.	Wait several seconds and scan again.
Decoding Bar Codes		
Scanner emits the laser, but does not decode the bar code.	Scanner is not programmed for the correct bar code type.	Program the scanner to read that type of bar code. See <i>Chapter 7, Symbolologies</i> .
	Bar code symbol is unreadable.	Scan test symbols of the same bar code type to determine if the bar code is defaced.
	Distance between scanner and bar code is incorrect.	Move the scanner closer to or further from the bar code. See <i>Decode Zone on page 2-10</i> .

Table 3-1. Troubleshooting (Continued)

Problem	Possible Causes	Possible Solutions
	The scan line is not crossing every bar and space of the symbol.	Move the symbol until the scan line is within the acceptable aiming pattern. See Figure 2-3 on page 2-5 .
Scanner decodes bar code, but does not transmit the data to the host.	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.	Check for loose cable connection and re-connect cable.
Scanner emits five long low beep after a bar code is decoded.	Conversion or format error was detected. The scanner’s conversion parameters are not properly configured.	Ensure the scanner’s conversion parameters are properly configured.
	Conversion or format error was detected. A bar code was scanned with characters that can't be sent for that host.	Change the bar code, or change to a host that can support the bar code.
Host Displays		
Host displays scanned data incorrectly.	Scanner is not programmed to work with the host.	Ensure the proper host is selected. Scan the appropriate host type programming bar code.
		For RS-232, set the scanner's communication parameters to match the host's settings.
		For a USB HID keyboard or Keyboard Wedge configuration, program the system for the correct keyboard type and language, and turn off the CAPS LOCK key.
		Program the proper editing options (e.g., ADF, UPC-E to UPC-A Conversion).
		Check the scanner’s host type parameters or editing options.
Trigger		
Nothing happens when the trigger is pulled.	No power to the scanner.	Check the system power. If the configuration requires a power supply, re-connect the power supply.
	Interface/power cables are loose.	Check for loose cable connections and re-connect cables.
The laser does not appear when the trigger is pulled.	No power to the scanner.	Check the system power. If the configuration requires a power supply, re-connect the power supply.
	Incorrect host interface cable is used.	Verify that the correct host interface cable is used. If not, connect the correct host interface cable.
	Interface/power cables are loose.	Check for loose cable connections and re-connect cables.



If after performing these checks the symbol still does not scan, contact the distributor or call Wasp Technologies. See [page xvi](#) for the telephone number.

Technical Specifications

Table 3-2. Technical Specifications

Item	Description
Physical Characteristics	
Dimensions:	6.7 in. H x 3.7 in. L x 2.7 in. W (17 cm H x 9.3 cm L x 6.8 cm W)
Weight (without cable)	Approximately 6.4 oz. (181 g)
Voltage & Current	5 +/-10%VDC @ 140 mA (Stand by: <35 mA)
Color	Twilight Black
Performance Characteristics	
Light Source (Laser)	650nm laser diode
Motor Frequency	50Hz
Decode Rate	200 decodes per second
Roll Tolerance	± 35°
Pitch Tolerance	± 60°
Yaw Tolerance	± 60°
Nominal Working Distance	13 mil (100% UPC/EAN): 0 to 19 in. (48.25 cm) 5 mil (Code 39): 1.5 to 5.5 in. (3.8 cm to 13.97 cm) (See <i>Decode Zone</i> on page 2-10)
Print Contrast Minimum	25% minimum reflectance
Multi-Line Aiming Coverage	At 5 in. reading distance: ~ 0.5 in. (1.3 cm) At 10 in. reading distance: ~ 1 in. (2.5 cm)
Motion Tolerances	Horizontal Velocity: 200 in. (508 cm) / sec Vertical Velocity: 200 in. (508 cm) / sec Angular Velocity: 200 in. (508 cm) / sec
Decode Capability	UPC/EAN and with supplementals, Code 39, Code 39 Full ASCII, Trioptic Code 39, RSS Variants, UCC/EAN 128, Code 128, Code 128 Full ASCII, Code 93, Codabar (NW1), Interleaved 2 of 5, Discrete 2 of 5 MSI, Codell, IATA, Bookland EAN, Code 32
Interfaces Supported	Keyboard Wedge; USB (Standard, Macintosh);
User Environment	
Operating Temperature	32° to 122° F (0° to 50° C)
Storage Temperature	-40° to 158° F (-40° to 70° C)
Humidity	5% to 95%, non-condensing
Drop Specifications	Withstands multiple 6 ft./1.825 m drops to concrete
Ambient Light Immunity	Immune to normal artificial indoor and natural outdoor (direct sunlight) lighting conditions
Beeper Volume	User-selectable: three levels
Beeper Tone	User-selectable: three tones

Table 3-2. Technical Specifications (Continued)

Item	Description
ESD	15 kV air discharge 8 kV indirect discharge
Regulatory	
Electrical Safety	UL1950, CSA C22.2 No. 950, EN60950/IEC950
Laser Safety	CDRH Class II, IEC Class 2
EMI/RFI	FCC Part 15 Class B, ICES-003 Class B, European Union EMC Directive, Australian SMA

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Introduction

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

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

If not using a Synapse or 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 their default values, see *Default Parameters on page 4-5*. Throughout the programming bar code menus, default values are indicated with asterisks (*).



* Indicates Default — * **High Frequency** — Feature/Option

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 4-6*. The 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, when an error is made during a scanning sequence, just re-scan the correct parameter.

User Preferences Parameter Defaults

Table 4-1 lists the defaults for user preferences parameters. To change any option, scan the appropriate bar code(s) provided in the User Preferences section beginning on page 4-5.



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

Table 4-1. User Preferences Default Table

Parameter	Default	Page Number
User Preferences		
Set Default Parameter	Restore Defaults	4-5
Beeper Tone	Medium	4-6
Beeper Volume	High	4-6
Power Mode	Continuous On	4-7
Scan Pattern	Multi-line Always Raster	4-7
Scan Line Width	Full Width	4-8
Laser On Time	3.0 Sec	4-8
Beep After Good Decode	Enable	4-9

User Preferences

Default Parameters

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

- **Restore Defaults** - Resets all default parameters as follows:
 - If custom default values were configured (see **Write to Custom Defaults**), the custom default values are set for all parameters each time the **Restore Defaults** bar code below is scanned.
 - If no custom default values were configured, the factory default values are set for all parameters each time the **Restore Defaults** bar code below is scanned. (For factory default values, see [Table A-1](#) beginning on [page A-1.](#))
- **Set Factory Defaults** - Scan the **Set Factory Defaults** bar code below to eliminate all custom default values and set the scanner to factory default values. (For factory default values, see [Table A-1](#) beginning on [page A-1.](#))
- **Write to Custom Defaults** - Custom default parameters can be configured to set unique default values for all parameters. After changing all parameters to the desired default values, scan the **Write to Custom Defaults** bar code below to configure custom defaults.



*Restore Defaults



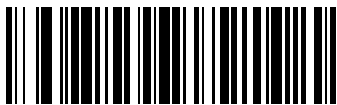
Set Factory Defaults



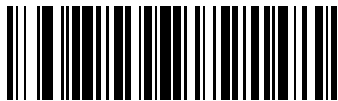
Write to Custom Defaults

Beeper Tone

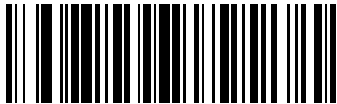
To select a decode beep frequency (tone), scan the **Low Frequency**, **Medium Frequency**, or **High Frequency** bar code.



Low Frequency



***Medium Frequency
(Optimum Settings)**



High Frequency

Beeper Volume

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



Low Volume



Medium Volume



***High Volume**

Power Mode

This parameter determines whether or not power remains on after a decode attempt. When in reduced power mode, the scanner enters into a low power consumption mode to preserve battery life after each decode attempt. When in continuous power mode, power remains on after each decode attempt.



*Continuous On



Reduced Power Mode

Scan Pattern

This parameter determines the pattern (mode) of scanning. Scan the appropriate bar code below to set the scanning mode.

- **Single-line Only** - Scan **Single-line Only** for a single-line scan mode. The laser has no up and down scan line movement (no raster). (For an example of a single-line scan, see [Figure 2-3 on page 2-5](#).)
- **Multi-line Smart Raster** - Scan **Multi-line Smart Raster** for a scan line begins as a single line and moves up and down (rasters) when a partial scan of a bar code is detected, or no bar code is decoded 500 ms after the trigger is pulled. Upon seeing a stacked RSS code, the scanner immediately rasters. (For an example of a multi-line scan, see [Figure 2-4 on page 2-6](#).)
- **Multi-line Always Raster** (default) - Scan **Multi-line Always Raster** for rastering (up and down scan line movement) to begin immediately.



Single-line Only
(No Raster)



Multi-line Smart Raster



*Multi-line Always Raster

Scan Line Width

Scan a bar code below to set the scan line width.



***Full Width**



Medium Width



Small Width

Laser On Time

This parameter sets the maximum time that decode processing continues during a scan attempt. It is programmable in 0.1 second increments from 0.5 to 9.9 seconds. The default Laser On Time is 3.0 seconds.

To set a Laser On Time, scan the bar code below. Next, scan two numeric bar codes beginning on page [C-1](#) in [Appendix C, Numeric Bar Codes](#) that correspond to the desired on time. Single digit numbers must have a leading zero. For example, to set an On Time of 0.5 seconds, scan the bar code below, then scan the “0” and “5” bar codes. If an error is made, or the selection needs to be changed, scan **Cancel** on page [C-4](#).



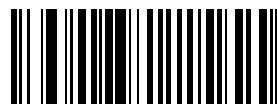
Laser On Time

Beep After Good Decode

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



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



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

Keyboard Wedge Interface

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Introduction

This chapter describes how to set up a Keyboard Wedge interface with the scanner. With this interface, the 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, default values are indicated with asterisks (*).



* Indicates Default *North American — Feature/Option

Connecting a Keyboard Wedge Interface

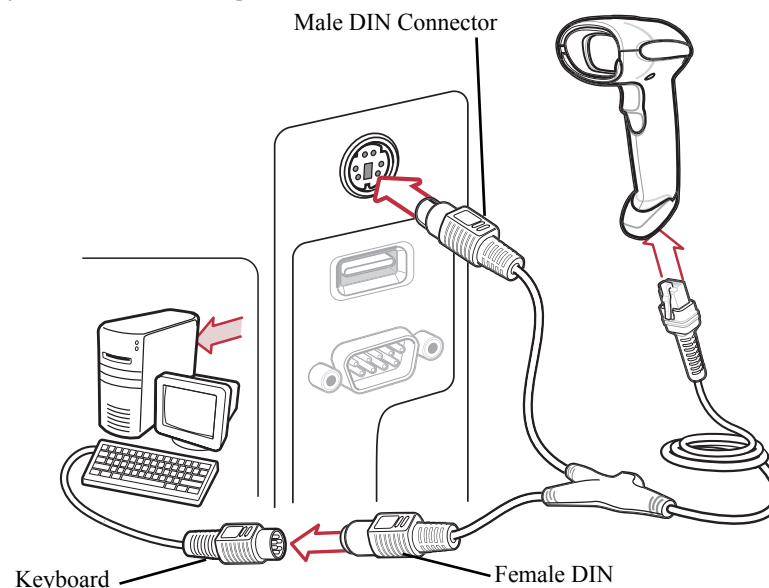


Figure 5-1. Keyboard Wedge Connection with Y-cable

To connect the Keyboard Wedge interface Y-cable:



Interface cables vary depending on configuration. The connectors illustrated in [Figure 5-1](#) are examples only. The connectors may be different than those illustrated, but the steps to connect the scanner remain 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 scanner. (See *Installing the Interface Cable* on page 1-4.)
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 Parameters* on page 5-5.

9. To modify any other parameter options, scan the appropriate bar codes in this chapter.

Keyboard Wedge Parameter Defaults

Table 5-1 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 [page 5-5](#).



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

Table 5-1. Keyboard Wedge Host Default Table

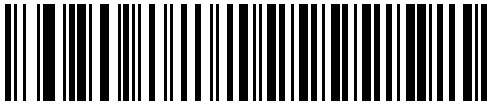
Parameter	Default	Page Number
Keyboard Wedge Host Parameters		
Keyboard Wedge Host Type	IBM PC/AT& IBM PC Compatibles ¹	5-5
Country Types (Country Codes)	North American	5-6
Ignore Unknown Characters	Send	5-7
Keystroke Delay	No Delay	5-8
Intra-Keystroke Delay	Disable	5-8
Alternate Numeric Keypad Emulation	Disable	5-9
Caps Lock On	Disable	5-9
Caps Lock Override	Disable	5-9
Convert Wedge Data	No Convert	5-10
Function Key Mapping	Disable	5-10
FN1 Substitution	Disable	5-11
Send and Make Break	Send	5-11
¹ User selection is required to configure this interface and this is the most common selection.		



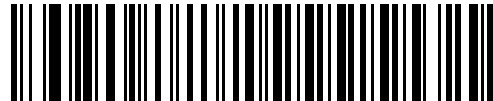
Keyboard Wedge Host Parameters

Keyboard Wedge Host Types

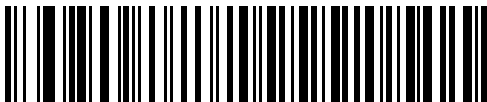
Select the Keyboard Wedge host by scanning one of the bar codes below.



IBM PC/AT & IBM PC Compatibles¹



IBM AT Notebook



NCR 7052

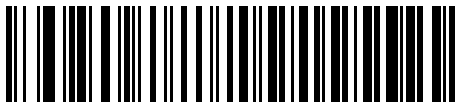


¹User selection is required to configure this interface and this is the most common selection.

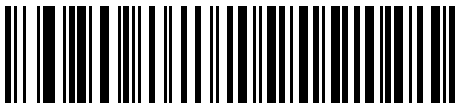
Note

Keyboard Wedge Country Types (Country Codes)

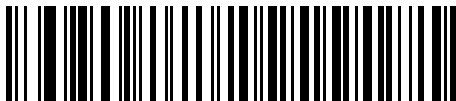
Scan the bar code corresponding to the keyboard type. If the keyboard type is not listed, see *Alternate Numeric Keypad Emulation* on page 5-9.



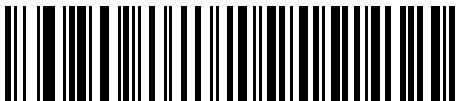
***North American**



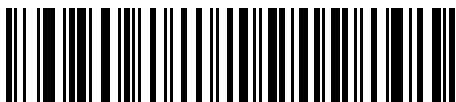
German Windows



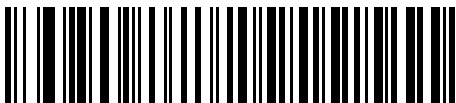
French Windows



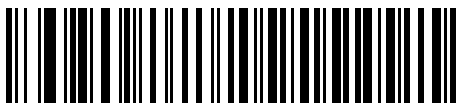
French Canadian Windows 95/98



French Canadian Windows XP/2000



Spanish Windows



Italian Windows



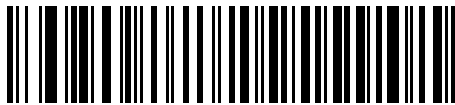
Keyboard Wedge Country Types (continued)



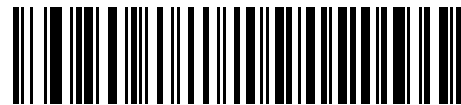
Swedish Windows



UK English Windows



Japanese Windows



Portuguese-Brazilian Windows

Ignore Unknown Characters

Unknown characters are characters the host does not recognize. When **Send Bar Codes With Unknown Characters** is selected, all bar code data is sent except for unknown characters, and no error beeps sound on the scanner. When **Do Not Send Bar Codes With Unknown Characters** is selected, bar code data is sent up to the first unknown character, then the scanner issues an error beep.



***Send Bar Codes with Unknown Characters**



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)



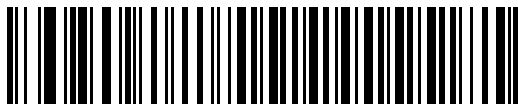
Long Delay (40 msec)

Intra-Keystroke Delay

When enabled, an additional delay is inserted between each emulated key depression and release. This sets the Keystroke Delay parameter to a minimum of 5 msec as well.



Enable Intra-Keystroke Delay



***Disable Intra-Keystroke Delay**

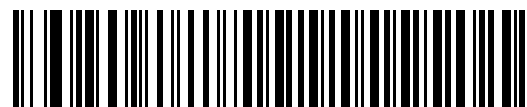


Alternate Numeric Keypad Emulation

This allows emulation of most other country keyboard types not listed in *Keyboard Wedge Country Types (Country Codes)* on page 5-6 in a Microsoft® operating system environment.



Enable Alternate Numeric Keypad



***Disable Alternate Numeric Keypad**

Caps Lock On

When enabled, the scanner emulates keystrokes as if the Caps Lock key is always pressed. Note that if both **Caps Lock On** and **Caps Lock Override** are enabled, **Caps Lock Override** takes precedence



Enable Caps Lock On



***Disable Caps Lock On**

Caps Lock Override

When enabled, on AT or AT Notebook hosts, the keyboard ignores the state of the Caps Lock key. Therefore, an 'A' in the bar code is sent as an 'A' no matter what the state of the keyboard's Caps Lock key.

Note that if both **Caps Lock On** and **Caps Lock Override** are enabled, **Caps Lock Override** takes precedence.



Enable Caps Lock Override



***Disable Caps Lock Override**

Convert Wedge Data

When enabled, the scanner will 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 5-2 on page 5-13](#)). When this parameter is enabled, the keys in bold are sent in place of the standard key mapping. Table entries that do not have a bold entry remain the same whether or not this parameter is enabled.



Enable Function Key Mapping

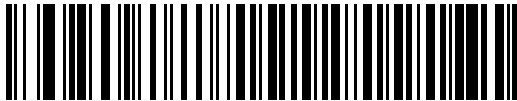


***Disable Function Key Mapping**

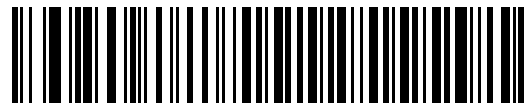


FN1 Substitution

When enabled, the scanner replaces FN1 characters in an EAN128 bar code with a keystroke chosen by the user (see *FN1 Substitution Values on page 8-8*).



Enable FN1 Substitution



***Disable FN1 Substitution**

Send Make and Break

When enabled, the scan codes for releasing a key are not sent.



***Send Make and Break Scan Codes**



Send Make Scan Code Only

Keyboard Maps

The following keyboard maps are provided for prefix/suffix keystroke parameters. To program the prefix/suffix values, see the bar codes on page 8-5.

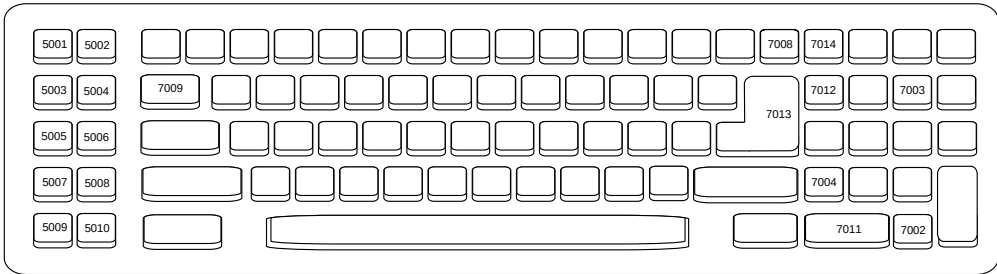


Figure 5-2. IBM PC/AT

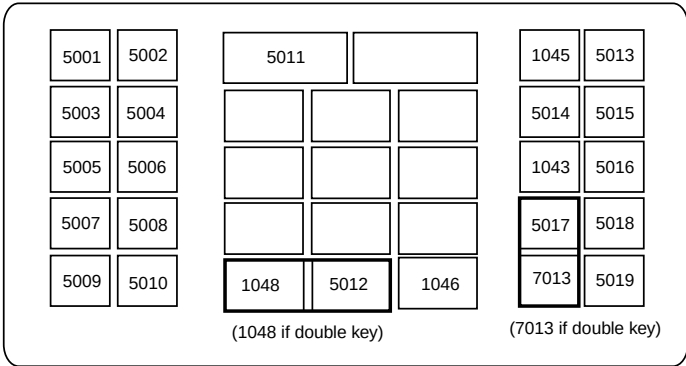


Figure 5-3. NCR 7052 32-KEY

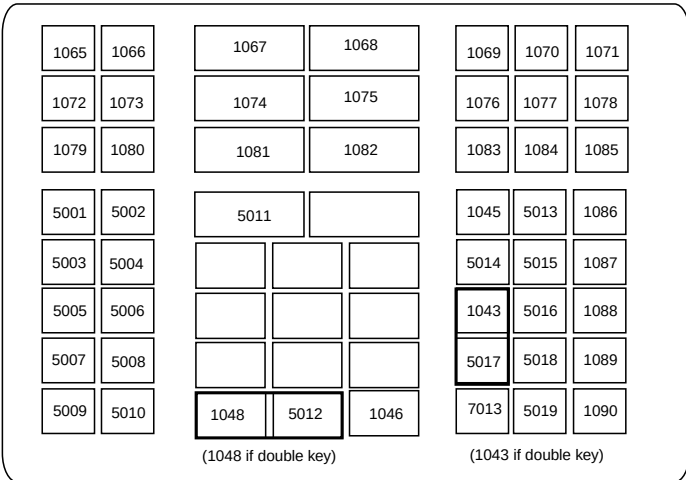


Figure 5-4. NCR 7052 58-KEY



ASCII Character Set for Keyboard Wedge



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, when Code 39 Full ASCII is enabled and a **+B** is scanned, it is interpreted as **b**, **%J** as **?**, and **%V** as **@**. Scanning **ABC%I** outputs the keystroke equivalent of **ABC >**.

Table 5-2. Keyboard Wedge ASCII Character Set

ASCII Value	Full ASCII Code 39 Encode Character	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
1024	\$X	CTRL X
1025	\$Y	CTRL Y
1026	\$Z	CTRL Z

¹The keystroke in bold is sent only if the “Function Key Mapping” is enabled. Otherwise, the unbolded keystroke is sent.

Table 5-2. Keyboard Wedge ASCII Character Set (Continued)

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
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
1055	7	7
1056	8	8
1057	9	9
1058	/Z	:
1059	%F	;
¹ The keystroke in bold is sent only if the “Function Key Mapping” is enabled. Otherwise, the unbolded keystroke is sent.		

**Table 5-2. Keyboard Wedge ASCII Character Set (Continued)**

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
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
1090	Z	Z
1091	%K	[
1092	%L	\

¹The keystroke in bold is sent only if the “Function Key Mapping” is enabled. Otherwise, the unbolded keystroke is sent.

Table 5-2. Keyboard Wedge ASCII Character Set (Continued)

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
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
1121	+Y	y
1122	+Z	z
1123	%P	{
1124	%Q	
1125	%R	}
¹ The keystroke in bold is sent only if the “Function Key Mapping” is enabled. Otherwise, the unbolded keystroke is sent.		

**Table 5-2. Keyboard Wedge ASCII Character Set (Continued)**

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
1126	%S	~
^l The keystroke in bold is sent only if the “Function Key Mapping” is enabled. Otherwise, the unbolded keystroke is sent.		

Table 5-3. 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
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 5-4. Keyboard Wedge GIU 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
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

**Table 5-4. Keyboard Wedge GIU Key Character Set (Continued)**

GUI Keys	Keystrokes
3090	GUI Z

Table 5-5. Keyboard Wedge 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 5-6. Keyboard Wedge Numeric Keypad Character Set

Numeric Keypad	Keystroke
6042	*
6043	+

Table 5-6. Keyboard Wedge Numeric Keypad Character Set (Continued)

Numeric Keypad	Keystroke
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 5-7. 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



Table 5-7. Keyboard Wedge Extended Keypad Character Set (Continued)

Extended Keypad	Keystroke
7016	Dn Arrow
7017	Left Arrow
7018	Right Arrow

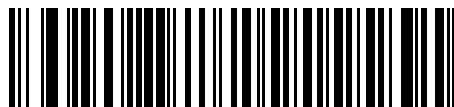
USB Interface

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USB Device Type	7-5
USB Country Keyboard Types (Country Codes)	7-6
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USB CAPS Lock Override	7-8
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Function Key Mapping	7-10
Simulated Caps Lock	7-11
Convert Case	7-11
ASCII Character Set for USB	7-12

Introduction

This chapter covers the connection and setup of the scanner to a USB host. The scanner attaches directly to a USB host, or a powered USB hub, and is powered by it. No additional power supply is required.

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



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

Connecting a USB Interface

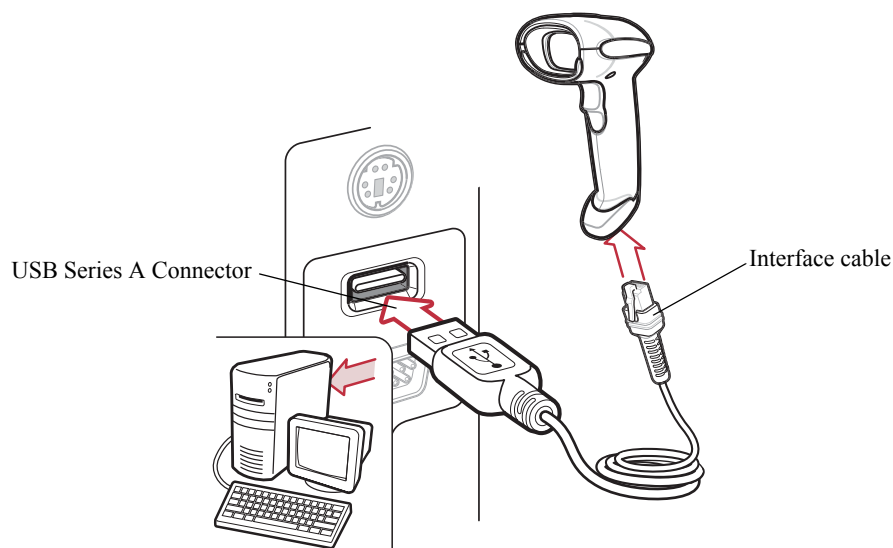


Figure 6-1. USB Connection

The scanner connects with USB capable hosts including:

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

The following operating systems support the scanner through USB:

- Windows 98, 2000, ME, XP
- MacOS 8.5 and above

The scanner will also interface with other USB hosts which support USB Human Interface Devices (HID). For more information on USB technology, hosts, and peripheral devices, visit www.waspbarcode.com.

To set up the scanner:



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 scanner remain the same.

1. Attach the modular connector of the USB interface cable to the cable interface port on the scanner (see *Installing the Interface Cable* on page 1-4).
2. Plug the series A connector in the USB host or hub.
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 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 3-3.

USB Parameter Defaults

[Table 6-1](#) lists the defaults for USB host parameters. If any option needs to be changed, scan the appropriate bar code(s) provided in the Parameter Descriptions section beginning on page 6-5.



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

Table 6-1. USB Host Default Table

Parameter	Default	Page Number
USB Host Parameters		
USB Device Type	HID Keyboard Emulation	6-5
USB Country Keyboard Types (Country Codes)	North American	6-6
USB Keystroke Delay	No Delay	6-8
USB CAPS Lock Override	Disable	6-8
USB Ignore Unknown Characters	Send	6-9
Emulate Keypad	Disable	6-9
USB FN1 Substitution	Disable	6-10
Function Key Mapping	Disable	6-10
Simulated Caps Lock	Disable	6-11
Convert Case	No Case Conversion	6-11

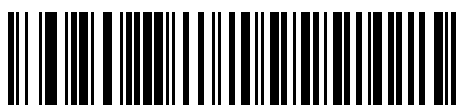
USB Host Parameters

USB Device Type

Select the desired USB device type.



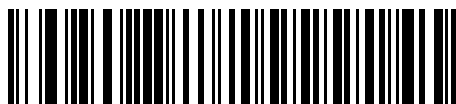
When changing USB Device Types, the scanner automatically restarts. The scanner issues the standard startup beep sequences.



***HID Keyboard Emulation**



IBM Table Top USB



IBM Hand-Held USB



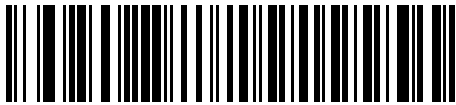
USB OPOS Handheld

USB Country Keyboard Types (Country Codes)

Scan the bar code corresponding to the keyboard type. This setting applies only to the USB HID Keyboard Emulation device.



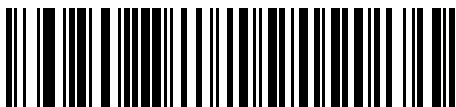
When changing USB country keyboard types the scanner automatically resets. The scanner issues the standard startup beep sequences.



***North American Standard USB Keyboard**



German Windows



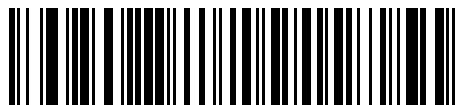
French Windows



French Canadian Windows 95/98

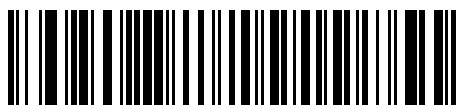


French Canadian Windows 2000/XP



Spanish Windows

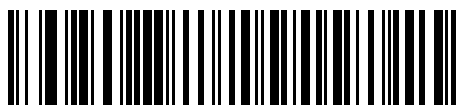
USB Country Keyboard Types (Country Codes continued)



Italian Windows



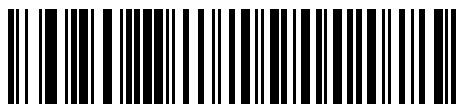
Swedish Windows



UK English Windows



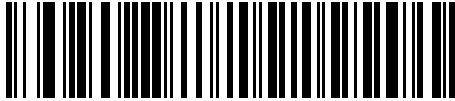
Japanese Windows (ASCII)



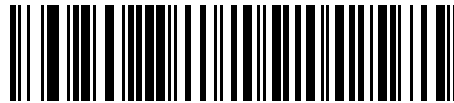
Portuguese-Brazilian Windows

USB Keystroke Delay

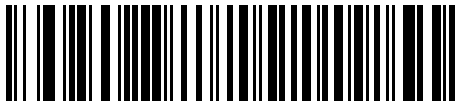
This parameter sets the delay, in milliseconds, between emulated keystrokes. Scan a bar code below to increase the delay when hosts require a slower transmission of data.



***No Delay**



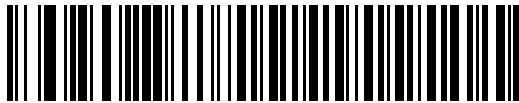
Medium Delay (20 msec)



Long Delay (40 msec)

USB CAPS Lock Override

This option applies only to the HID Keyboard Emulation device. When enabled, the case of the data is preserved 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)**



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. When **Send Bar Codes With Unknown Characters** is selected, all bar code data is sent except for unknown characters, and no error beeps sound. When **Do Not Send Bar Codes With Unknown Characters** is selected, bar code data is sent up to the first unknown character, then the scanner issues an error beep.



***Send Bar Codes with Unknown Characters**



Do Not Send Bar Codes with Unknown Characters

Emulate Keypad

When enabled, all characters are sent as ASCII sequences over the numeric keypad. For example ASCII A would be sent as “ALT make” 0 6 5 “ALT Break.”



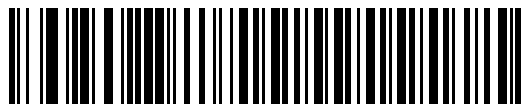
***Disable Keypad Emulation**



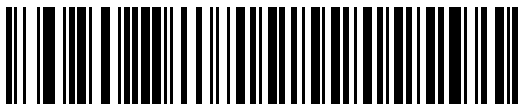
Enable Keypad Emulation

USB Keyboard FN 1 Substitution

This option applies only to the USB HID Keyboard Emulation device. When enabled, this allows replacement of any FN 1 characters in an EAN 128 bar code with a Key Category and value chosen by the user (see *FN1 Substitution Values on page 13-8* to set the Key Category and Key Value).



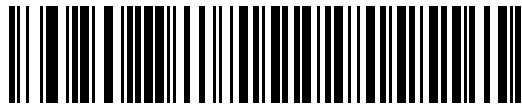
Enable FN1 Substitution



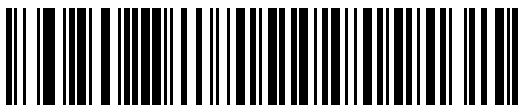
***Disable FN1 Substitution**

Function Key Mapping

ASCII values under 32 are normally sent as a control-key sequences (see *Table 6-2 on page 6-12*). When this parameter is enabled, the keys in bold are sent in place of the standard key mapping. Table entries that do not have a bold entry remain the same whether or not this parameter is enabled.



***Disable Function Key Mapping**

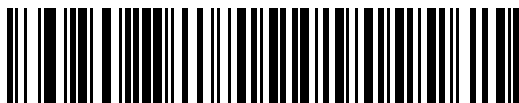


Enable Function Key Mapping



Simulated Caps Lock

When enabled, the scanner will invert upper and lower case characters on the scanner bar code as if the Caps Lock state is enabled on the keyboard. This inversion is done regardless of the current state of the keyboard's Caps Lock state.



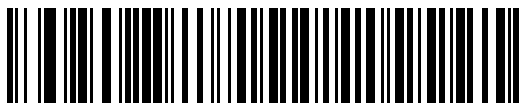
***Disable Simulated Caps Lock**



Enable Simulated Caps Lock

Convert Case

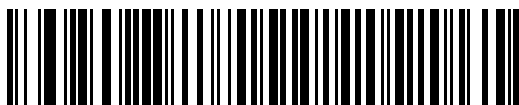
When enabled, the scanner will convert all bar code data to the selected case.



***No Case Conversion**



Convert All to Upper Case



Convert All to Lower Case

ASCII Character Set for USB

Table 6-2. ASCII Character Set for USB

ASCII Value	Full ASCII Code 39 Encode Character	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
1026	\$Z	CTRL Z
1027	%A	CTRL [/ESC ¹
1028	%B	CTRL \
1029	%C	CTRL]
¹ The keystroke in bold is sent only if the “Function Key Mapping” is enabled. Otherwise, the unbolded keystroke is sent.		

Table 6-2. ASCII Character Set for USB (Continued)

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
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
1055	7	7
1056	8	8
1057	9	9
1058	/Z	:
1059	%F	;
1060	%G	<
1061	%H	=
1062	%I	>

¹The keystroke in bold is sent only if the “Function Key Mapping” is enabled. Otherwise, the unbolded keystroke is sent.

Table 6-2. ASCII Character Set for USB (Continued)

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
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
1090	Z	Z
1091	%K	[
1092	%L	\
1093	%M	]
1094	%N	^
1095	%O	_
¹ The keystroke in bold is sent only if the “Function Key Mapping” is enabled. Otherwise, the unbolded keystroke is sent.		

Table 6-2. ASCII Character Set for USB (Continued)

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
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
1121	+Y	y
1122	+Z	z
1123	%P	{
1124	%Q	
1125	%R	}
1126	%S	~
¹ The keystroke in bold is sent only if the “Function Key Mapping” is enabled. Otherwise, the unbolded keystroke is sent.		

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
3082	GUI R
3083	GUI S
3084	GUI T
3085	GUI U
3086	GUI V
3087	GUI W

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
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

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Transmit UPC-E Check Digit	12-13
Transmit UPC-E1 Check Digit	12-14
UPC-A Preamble	12-14
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Code 11	12-31
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Introduction

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

The scanner is shipped with the settings shown in the *Symbology Parameter Defaults on page 7-6* (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 scanner is powered down.

If not using a Synapse or 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 appropriate default bar code on [page 4-5](#). Throughout the programming bar code menus, default values are indicated with asterisks (*).



* Indicates Default — * Enable UPC-A — Feature/Option

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 7-13*. The 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 7-1 lists the defaults for all symbologies parameters. To change any option, scan the appropriate bar code(s) provided in the Symbologies Parameters section beginning on 7-9.



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

Table 7-1. Symbology Parameter Defaults

Parameter	Default	Page Number
UPC/EAN		
UPC-A	Enable	7-9
UPC-E	Enable	7-9
UPC-E1	Disable	7-10
EAN-8/JAN 8	Enable	7-10
EAN-13/JAN 13	Enable	7-10
Bookland EAN	Disable	7-11
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Transmit UPC-A Check Digit	Enable	7-13
Transmit UPC-E Check Digit	Enable	7-13
Transmit UPC-E1 Check Digit	Enable	7-15
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UCC/EAN-128	Enable	7-20
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Code 39		
Code 39	Enable	7-22
Trioptic Code 39	Disable	7-22
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Code 32 Prefix	Disable	7-23
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Table 7-1. Symbology Parameter Defaults (Continued)

Parameter	Default	Page Number
Code 39 Check Digit Verification	Disable	7-25
Transmit Code 39 Check Digit	Disable	7-26
Code 39 Full ASCII Conversion	Disable	7-27
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Code 93	Disable	7-31
Set Length(s) for Code 93	4 to 55	7-31
Code 11		
Code 11	Disable	7-33
Set Lengths for Code 11	4 to 55	7-33
Code 11 Check Digit Verification	Disable	7-35
Transmit Code 11 Check Digit(s)	Disable	7-35
Interleaved 2 of 5 (ITF)		
Interleaved 2 of 5 (ITF)	Enable	7-36
Set Lengths for I 2 of 5	14	7-36
I 2 of 5 Check Digit Verification	Disable	7-37
Transmit I 2 of 5 Check Digit	Disable	7-38
Convert I 2 of 5 to EAN 13	Disable	7-38
Discrete 2 of 5 (DTF)		
Discrete 2 of 5	Disable	7-39
Set Length(s) for D 2 of 5	12	7-39
Chinese 2 of 5		
Enable/Disable Chinese 2 of 5	Disable	7-41
Codabar (NW - 7)		
Codabar	Disable	7-42
Set Lengths for Codabar	5 to 55	7-42
CLSI Editing	Disable	7-43
NOTIS Editing	Disable	7-44
MSI		
MSI	Disable	7-45
Set Length(s) for MSI	2 to 55	7-45
MSI Check Digits	One	7-46
Transmit MSI Check Digit	Disable	7-47
MSI Check Digit Algorithm	Mod 10/Mod 10	7-47

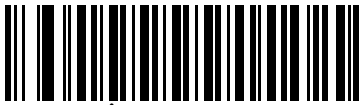
Table 7-1. Symbology Parameter Defaults (Continued)

Parameter	Default	Page Number
RSS (Reduced Space Symbology)		
RSS 14	Disable	7-48
RSS Limited	Disable	7-48
RSS Expanded	Disable	7-48
Convert RSS to UPC/EAN	Disable	7-49
Symbology - Specific Security Levels		
Redundancy Level	1	7-50
Security Levels	0	7-52
Bi-directional Redundancy	Disable	7-53

UPC/EAN

Enable/Disable UPC-A/UPC-E

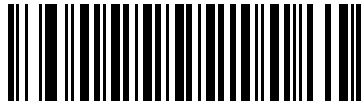
To enable or disable UPC-A or UPC-E, scan the appropriate bar code below.



*Enable UPC-A



Disable UPC-A



*Enable UPC-E



Disable UPC-E

Enable/Disable UPC-E1

UPC-E1 is disabled by default.

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



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



Enable UPC-E1



***Disable UPC-E1**

Enable/Disable EAN-13/EAN-8

To enable or disable EAN-13 or EAN-8, scan the appropriate bar code below.



***Enable EAN-13**



Disable EAN-13



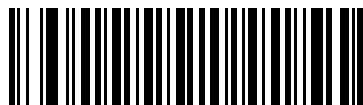
***Enable EAN-8**



Disable EAN-8

Enable/Disable Bookland EAN

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



Enable Bookland EAN



*Disable Bookland EAN

Decode UPC/EAN/JAN Supplementals

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

- If **Decode UPC/EAN/JAN Only With Supplementals** is selected, UPC/EAN symbols without supplementals are not decoded.
- If **Ignore Supplementals** is selected, and the scanner is presented with a UPC/EAN/JAN with a supplemental, the UPC/EAN/JAN is decoded and the supplemental bar code is ignored.
- An **Autodiscriminate Option** is also available. If this option is selected, choose an appropriate [UPC/EAN/JAN Supplemental Redundancy](#) value from the next page. A value of 5 or more is recommended.
- Select **Enable 378/379 Supplemental Mode** to delay only EAN-13/JAN-13 bar codes starting with a '378' or '379' prefix by the supplemental search process. All other UPC/EAN/JAN bar codes are exempted from the search and are reported instantly upon decode.
- Select **Enable 978 Supplemental Mode** to delay only EAN-13/JAN-13 bar codes starting with a '978' prefix by the supplemental search process. All other UPC/EAN bar codes are exempted from the search and are reported instantly upon their decode.
- Select **Enable Smart Supplemental Mode** to delay only EAN-13/JAN-13 bar codes starting with a '378', '379', or '978' prefix by the supplemental search process. All other UPC/EAN bar codes are exempted from the search and are reported instantly upon their decode.

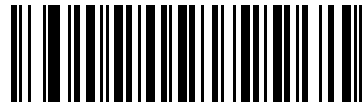


To minimize the risk of invalid data transmission, select either to decode or ignore supplemental characters.

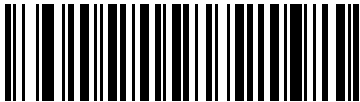
Decode UPC/EAN/JAN Supplementals (continued)



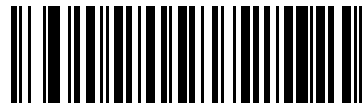
Decode UPC/EAN/JAN Only With Supplementals



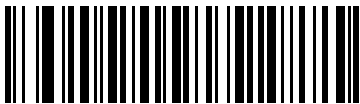
***Ignore Supplementals**



Autodiscriminate UPC/EAN/JAN Supplementals



Enable 378/379 Supplemental Mode



Enable 978 Supplemental Mode

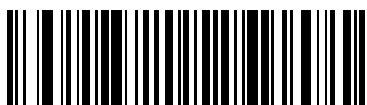


Enable Smart Supplemental Mode

UPC/EAN/JAN Supplemental Redundancy

With **Autodiscriminate UPC/EAN/JAN Supplementals** selected, this option adjusts the number of times a symbol without supplementals is decoded before transmission. The range is from two to thirty times. Five or above is recommended when decoding a mix of UPC/EAN symbols with and without supplementals, and the autodiscriminate option is selected. The default is set at 7.

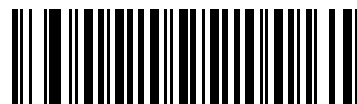
Scan the bar code below to set a decode redundancy value. Next, scan two numeric bar codes in [Appendix C, Numeric Bar Codes](#). Single digit numbers must have a leading zero. To correct an error or change a selection, scan **Cancel** on page C-4.



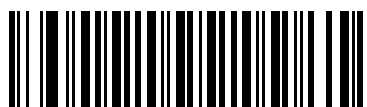
UPC/EAN/JAN Supplemental Redundancy

Transmit UPC-A Check Digit

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.



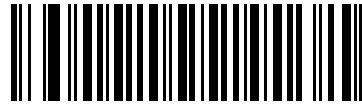
*Transmit UPC-A Check Digit



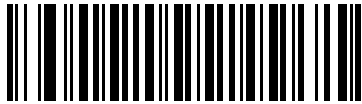
Do Not Transmit UPC-A Check Digit

Transmit UPC-E Check Digit

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**



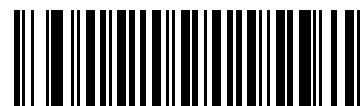
Do Not Transmit UPC-E Check Digit

Transmit UPC-E1 Check Digit

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**



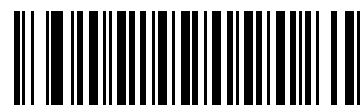
Do Not Transmit UPC-E1 Check Digit

UPC-A Preamble

Preamble characters are part of the UPC symbol consisting of Country Code and System Character. Three options are given for transmitting UPC-A preamble to the host device: transmit System Character only, transmit System Character and Country Code ("0" for USA), and no preamble transmitted. Scan a bar code below to match the host system.



**No Preamble
<DATA>**



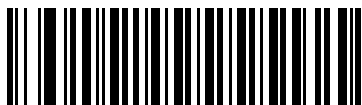
***System Character
<SYSTEM CHARACTER> <DATA>**



**System Character & Country Code
< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>**

UPC-E Preamble

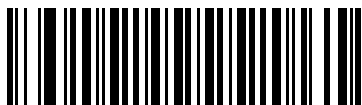
Preamble characters are part of the UPC symbol consisting of Country Code and System Character. Three options are given for transmitting UPC-E preamble to the host device: transmit System Character only, transmit System Character and Country Code ("0" for USA), and no preamble transmitted. Scan a bar code below to match the host system.



No Preamble
(<DATA>)



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



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

UPC-E1 Preamble

Preamble characters are part of the UPC symbol consisting of Country Code and System Character. Three options are given for transmitting UPC-E1 preamble to the host device: transmit System Character only, transmit System Character and Country Code ("0" for USA), and no preamble transmitted. Scan a bar code below to match the host system.



**No Preamble
(<DATA>)**



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



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

Convert UPC-E to UPC-A

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).

When disabled, UPC-E decoded data is transmitted as UPC-E data, without conversion.



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

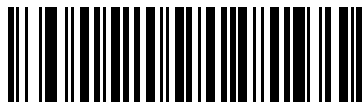


***Do Not Convert UPC-E to UPC-A
(Disable)**

Convert UPC-E1 to UPC-A

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).

When disabled, UPC-E1 decoded data is transmitted as UPC-E1 data, without conversion.



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

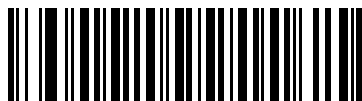


***Do Not Convert UPC-E1 to UPC-A
(Disable)**

EAN-8/JAN-8 Extend

When enabled, this parameter adds five leading zeros to decoded EAN-8 symbols to make them compatible in format to EAN-13 symbols.

When disabled, EAN-8 symbols are transmitted as is.



Enable EAN/JAN Zero Extend



***Disable EAN/JAN Zero Extend**

UCC Coupon Extended Code

When enabled, this parameter decodes UPCA bar codes starting with digit '5', EAN-13 bar codes starting with digit '99', and UPCA/EAN-128 Coupon Codes. UPCA, EAN-13 and EAN-128 must be enabled to scan all types of Coupon Codes.



Enable UCC Coupon Extended Code



***Disable UCC Coupon Extended Code**

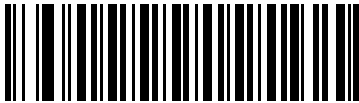


Use the *Decode UPC/EAN Supplemental Redundancy* parameter to control autodiscrimination of the EAN128 (right half) of a coupon code.

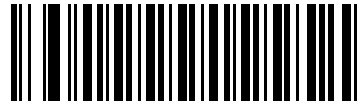
Code 128

Enable/Disable Code 128

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



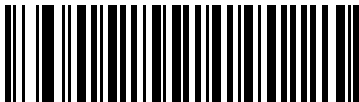
***Enable Code 128**



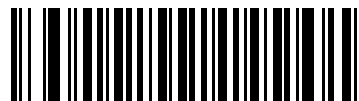
Disable Code 128

Enable/Disable UCC/EAN-128

To enable or disable UCC/EAN-128, scan the appropriate bar code below.



***Enable UCC/EAN-128**



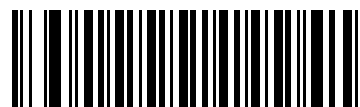
Disable UCC/EAN-128

Enable/Disable ISBT 128

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



***Enable ISBT 128**

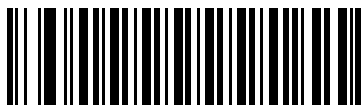


Disable ISBT 128

Code 39

Enable/Disable Code 39

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



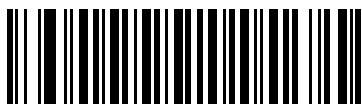
***Enable Code 39**



Disable Code 39

Enable/Disable Trioptic Code 39

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



***Disable Trioptic Code 39**



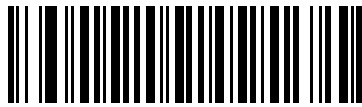
Trioptic Code 39 and Code 39 Full ASCII cannot be enabled simultaneously.

Convert Code 39 to Code 32

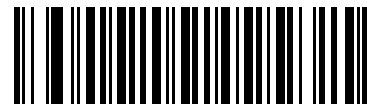
Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry. Scan the appropriate bar code below to enable or disable converting Code 39 to Code 32.



Code 39 must be enabled for this parameter to function.



Enable Convert Code 39 to Code 32



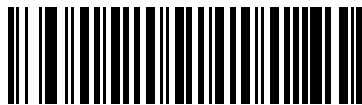
***Disable Convert Code 39 to Code 32**

Code 32 Prefix

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



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



Enable Code 32 Prefix



***Disable Code 32 Prefix**

Set Lengths for Code 39

he 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 a Range** or **Any Length** are the preferred options.



When setting lengths for different bar code types by scanning single digit numbers, single digit numbers must always be preceded by a leading zero.

- **One Discrete Length** - Select this option to decode only Code 39 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only Code 39 symbols with 14 characters, scan **Code 39 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or change the selection, scan **Cancel** on page [C-4](#).
- **Two Discrete Lengths** - Select this option to decode only Code 39 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only those Code 39 symbols containing either 2 or 14 characters, select **Code 39 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**. To correct an error or change the selection, scan **Cancel** on page [C-4](#).
- **Length Within Range** - Select this option to decode a Code 39 symbol with a specific length range. Select lengths using numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode Code 39 symbols containing between 4 and 12 characters, first scan **Code 39 - Length Within Range**. Then scan **0, 4, 1**, and **2** (single digit numbers must always be preceded by a leading zero). To correct an error or change the selection, scan **Cancel** on page [C-4](#).

- **Any Length** - Select this option to decode Code 39 symbols containing any number of characters within the scanner capability.



Code 39 - One Discrete Length



Code 39 - Two Discrete Lengths



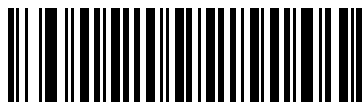
Code 39 - Length Within Range



Code 39 - Any Length

Code 39 Check Digit Verification

When this feature is enabled, the scanner checks the integrity of all Code 39 symbols to verify that the data complies with specified check digit algorithm. Only Code 39 symbols which include a modulo 43 check digit are decoded. Enable this feature if the Code 39 symbols contain a Modulo 43 check digit.



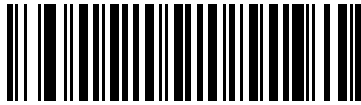
Enable Code 39 Check Digit



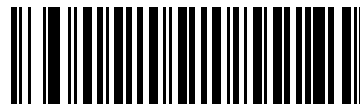
***Disable Code 39 Check Digit**

Transmit Code 39 Check Digit

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



**Transmit Code 39 Check Digit
(Enable)**



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



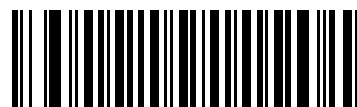
Code 39 Check Digit Verification must be enabled for this parameter to function.

Code 39 Full ASCII Conversion

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



*Disable Code 39 Full ASCII



Trioptic Code 39 and Code 39 Full ASCII cannot be enabled simultaneously.

Code 39 Full ASCII to Full ASCII Correlation is host-dependent and is described in the ASCII Character Set table for the appropriate interface. See *ASCII Character Set for Keyboard Wedge* on page 5-13, *ASCII Character Set for RS-232* on page 6-18 and *ASCII Character Set for USB* on page 6-12 for the appropriate interface.

Code 39 Buffering (Scan & Store)

This feature allows the 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.

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

When the **Do Not Buffer Code 39** option is selected, all decoded Code 39 symbols are transmitted immediately without being stored in the buffer.

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



Buffer Code 39
(Enable)



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

While there is data in the transmission buffer, selecting **Do Not Buffer Code 39** is not allowed. 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 7-29](#)) or clear the buffer.

Buffer Data

To buffer data, Code 39 buffering must be enabled and a Code 39 symbol must be read with a space immediately following the start pattern.

- Unless the data overflows the transmission buffer, the scanner issues a low/high beep to indicate successful decode and buffering. (For overflow conditions, see [Overfilling Transmission Buffer](#).)
- The 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 scanner issues a short high/low/high beep.
- The scanner erases the transmission buffer.
- No transmission occurs.



Clear Buffer



Note

Because the Clear Buffer contains only the dash (minus) character, set the Code 39 length to include length 1 before scanning this bar code.

Transmit Buffer

There are two methods to transmit the Code 39 buffer.

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



Transmit Buffer

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



Note

Because the Transmit Buffer contains only a plus (+) character, set the Code 39 length to include length 1 before scanning this bar code.

Overfilling Transmission Buffer

The Code 39 buffer holds 200 characters. If the symbol just read results in an overflow of the transmission buffer:

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

Attempt to Transmit an Empty Buffer

If the symbol just read was 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.

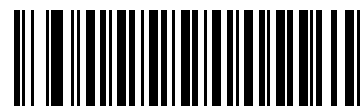
Code 93

Enable/Disable Code 93

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



Enable Code 93



*Disable Code 93

Set Lengths for Code 93

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.

- **One Discrete Length** - Select this option to decode only Code 93 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only Code 93 symbols with 14 characters, scan **Code 93 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Two Discrete Lengths** - Select this option to decode only Code 93 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only those Code 93 symbols containing either 2 or 14 characters, select **Code 93 - Two Discrete Lengths**, then scan **0**, **2**, **1**, and then **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Length Within Range** - Select this option to decode a Code 93 symbol with a specific length range. Select lengths using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode Code 93 symbols containing between 4 and 12 characters, first scan **Code 93 - Length Within Range**. Then scan **0**, **4**, **1**, and **2** (single digit numbers must always be preceded by a leading zero). To correct an error or change the selection, scan **Cancel** on page [C-4](#).
- **Any Length** - Scan this option to decode Code 93 symbols containing any number of characters within the scanner's capability.

Set Lengths for Code 93 (continued)



Code 93 - One Discrete Length



Code 93 - Two Discrete Lengths



Code 93 - Length Within Range



Code 93 - Any Length

Code 11

Code 11

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



Enable Code 11



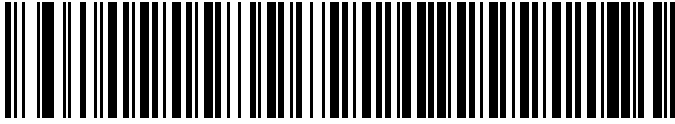
***Disable Code 11**

Set Lengths for Code 11

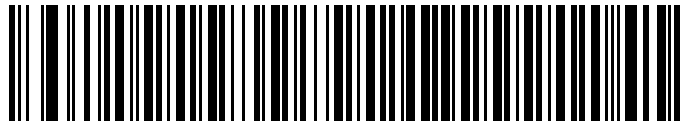
The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 11 to any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only Code 11 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only Code 11 symbols with 14 characters, scan **Code 11 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Two Discrete Lengths** - Select this option to decode only Code 11 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only those Code 11 symbols containing either 2 or 14 characters, select **Code 11 - Two Discrete Lengths**, then scan **0**, **2**, **1**, and then **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Length Within Range** - Select this option to decode a Code 11 symbol with a specific length range. Select lengths using numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode Code 11 symbols containing between 4 and 12 characters, first scan **Code 11 - Length Within Range**. Then scan **0**, **4**, **1**, and **2** (single digit numbers must always be preceded by a leading zero). To correct an error or change the selection, scan **Cancel** on page [C-4](#).
- **Any Length** - Scan this option to decode Code 11 symbols containing any number of characters within the scanner capability.

Set Lengths for Code 11 (continued)



Code 11 - One Discrete Length



Code 11 - Two Discrete Lengths



Code 11 - Length Within Range



Code 11 - Any Length

Code 11 Check Digit Verification

This feature allows the 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 your Code 11 symbols.



***Disable**



One Check Digit



Two Check Digits

Transmit Code 11 Check Digits

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



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



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



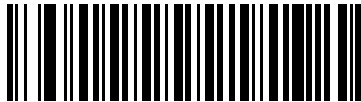
Note

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

Interleaved 2 of 5 (ITF)

Enable/Disable Interleaved 2 of 5

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



Disable Interleaved 2 of 5

Set Lengths for Interleaved 2 of 5

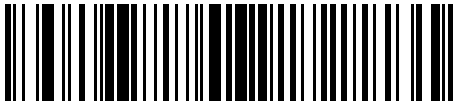
The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for I 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only I 2 of 5 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only I 2 of 5 symbols with 14 characters, scan **I 2 of 5 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Two Discrete Lengths** - Select this option to decode only I 2 of 5 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only those I 2 of 5 symbols containing either 2 or 14 characters, select **I 2 of 5 - Two Discrete Lengths**, then scan **0**, **2**, **1**, and then **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Length Within Range** - Select this option to decode an I 2 of 5 symbol with a specific length range. Select lengths using numeric bar codes in [Appendix C, 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**. Then scan **0**, **4**, **1**, and **2** (single digit numbers must always be preceded by a leading zero). To correct an error or change the selection, scan **Cancel** on page [C-4](#).
- **Any Length** - Scan this option to decode I 2 of 5 symbols containing any number of characters within the scanner capability.

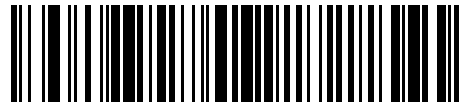


Due to the construction of the I 2 of 5 symbology, it is possible for a scan line covering only a portion of the code to be interpreted as a complete scan, yielding less data than is encoded in the bar code. To prevent this, select specific lengths (**I 2 of 5 - One Discrete Length - Two Discrete Lengths**)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

Set Lengths for Interleaved 2 of 5 (continued)



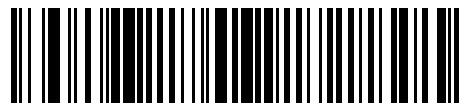
I 2 of 5 - One Discrete Length



I 2 of 5 - Two Discrete Lengths



I 2 of 5 - Length Within Range



I 2 of 5 - Any Length

I 2 of 5 Check Digit Verification

When this feature is enabled, the scanner checks 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**



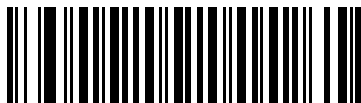
USS Check Digit



OPCC Check Digit

Transmit I 2 of 5 Check Digit

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



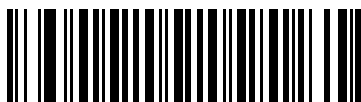
**Transmit I 2 of 5 Check Digit
(Enable)**



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

Convert I 2 of 5 to EAN-13

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)**



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

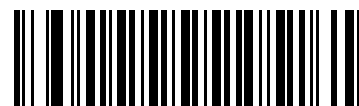
Discrete 2 of 5 (DTF)

Enable/Disable Discrete 2 of 5

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



Enable Discrete 2 of 5



*Disable Discrete 2 of 5

Set Lengths for Discrete 2 of 5

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.

- **One Discrete Length** - Select this option to decode only D 2 of 5 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only D 2 of 5 symbols with 14 characters, scan **D 2 of 5 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Two Discrete Lengths** - Select this option to decode only D 2 of 5 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only those D 2 of 5 symbols containing either 2 or 14 characters, select **D 2 of 5 - Two Discrete Lengths**, then scan **0**, **2**, **1**, and then **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Length Within Range** - Select this option to decode a D 2 of 5 symbol with a specific length range. Select lengths using numeric bar codes in [Appendix C, 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**. Then scan **0**, **4**, **1**, and **2** (single digit numbers must always be preceded by a leading zero). To correct an error or change the selection, scan **Cancel** on page [C-4](#).
- **Any Length** - Scan this option to decode D 2 of 5 symbols containing any number of characters within the scanner capability.



Note

Due to the construction of the D 2 of 5 symbology, it is possible for a scan line covering only a portion of the code to be interpreted 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.

Set Lengths for Discrete 2 of 5 (continued)



D 2 of 5 - One Discrete Length



D 2 of 5 - Two Discrete Lengths



D 2 of 5 - Length Within Range



D 2 of 5 - Any Length

Chinese 2 of 5

Enable/Disable Chinese 2 of 5

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



Enable Chinese 2 of 5

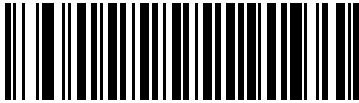


***Disable Chinese 2 of 5**

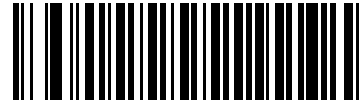
Codabar (NW - 7)

Enable/Disable Codabar

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



Enable Codabar



*Disable Codabar

Set Lengths for Codabar

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.

- **One Discrete Length** - Select this option to decode only Codabar symbols containing a selected length. Select the length using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only Codabar symbols with 14 characters, scan **Codabar - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Two Discrete Lengths** - Select this option to decode only Codabar symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only Codabar symbols containing either 2 or 14 characters, select **Codabar - Two Discrete Lengths**, then scan **0**, **2**, **1**, and then **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Length Within Range** - Select this option to decode a Codabar symbol with a specific length range. Select lengths using numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode Codabar symbols containing between 4 and 12 characters, first scan **Codabar - Length Within Range**. Then scan **0**, **4**, **1**, and **2** (single digit numbers must always be preceded by a leading zero). To correct an error or change the selection, scan **Cancel** on page [C-4](#).
- **Any Length** - Scan this option to decode Codabar symbols containing any number of characters within the scanner capability.

Set Lengths for Codabar (continued).



Codabar - One Discrete Length



Codabar - Two Discrete Lengths



Codabar - Length Within Range



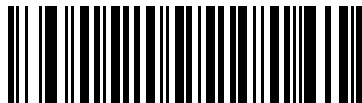
Codabar - Any Length

CLSI Editing

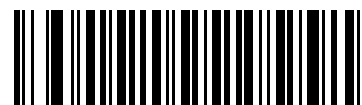
When enabled, this parameter strips the start and stop characters and inserts a space after the first, fifth, and tenth characters of a 14-character Codabar symbol. Enable this feature if your host system requires this data format.



Symbol length does not include start and stop characters.



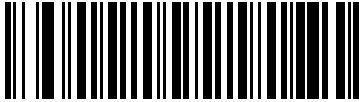
Enable CLSI Editing



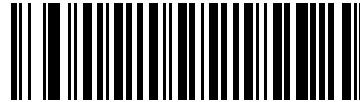
***Disable CLSI Editing**

NOTIS Editing

When enabled, this parameter strips the start and stop characters from a decoded Codabar symbol. Enable this feature if your host system requires this data format.



Enable NOTIS Editing



***Disable NOTIS Editing**

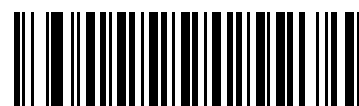
MSI

Enable/Disable MSI

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



Enable MSI



*Disable MSI

Set Lengths for MSI

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.

- **One Discrete Length** - Select this option to decode only MSI symbols containing a selected length. Select the length using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only MSI symbols with 14 characters, scan **MSI - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Two Discrete Lengths** - Select this option to decode only MSI symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode only MSI symbols containing either 2 or 14 characters, select **MSI - Two Discrete Lengths**, then scan **0**, **2**, **1**, and then **4**. To correct an error or to change the selection, scan **Cancel** on page [C-4](#).
- **Length Within Range** - Select this option to decode a MSI symbol with a specific length range. Select lengths using numeric bar codes in [Appendix C, Numeric Bar Codes](#). For example, to decode MSI symbols containing between 4 and 12 characters, first scan **MSI - Length Within Range**. Then scan **0**, **4**, **1**, and **2** (single digit numbers must always be preceded by a leading zero). To correct an error or change the selection, scan **Cancel** on page [C-4](#).
- **Any Length** - Scan this option to decode MSI symbols containing any number of characters within the scanner capability.



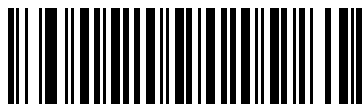
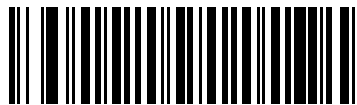
Note

Due to the construction of the MSI symbology, it is possible for a scan line covering only a portion of the code to be interpreted 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.

Set Lengths for MSI (continued)**MSI - One Discrete Length****MSI - Two Discrete Lengths****MSI - Length Within Range****MSI - Any Length*****MSI Check Digits***

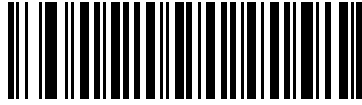
With MSI symbols, one check digit is mandatory and always verified by the reader. The second check digit is optional. If the MSI codes include two check digits, scan the **Two MSI Check Digits** bar code to enable verification of the second check digit.

See [MSI Check Digit Algorithm on page 7-47](#) for the selection of second digit algorithms.

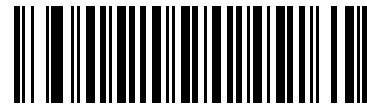
***One MSI Check Digit****Two MSI Check Digits**

Transmit MSI Check Digit(s)

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



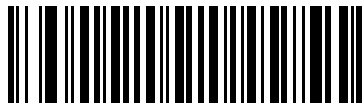
**Transmit MSI Check Digit(s)
(Enable)**



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

MSI Check Digit Algorithm

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 your check digit.



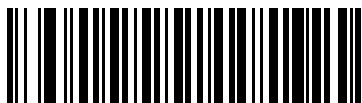
MOD 10/MOD 11



***MOD 10/MOD 10**

RSS (Reduced Space Symbology)

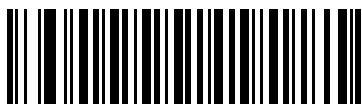
The variants of RSS are RSS 14, RSS Expanded and RSS Limited. RSS 14 and RSS Expanded include stacked versions. Scan the appropriate bar code below to enable or disable each variant of RSS.



Enable RSS 14



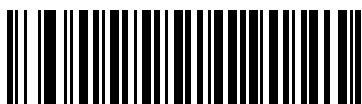
***Disable RSS 14**



Enable RSS Limited



***Disable RSS Limited**



Enable RSS Expanded



***Disable RSS Expanded**

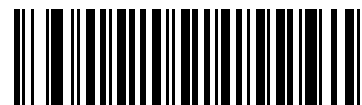
Convert RSS to UPC/EAN

This parameter only applies to RSS-14 and RSS Limited symbols not decoded as part of a Composite symbol. Enable this to strip the leading '010' from RSS-14 and RSS 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 RSS to UPC/EAN



***Disable Convert RSS to UPC/EAN**

Symbology - Specific Security Levels

Redundancy Level

The scanner offers four levels of decode redundancy. Select higher redundancy levels for decreasing levels of bar code quality. As redundancy levels increase, the 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:

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:

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:

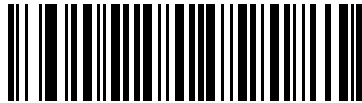
Code Type	Code Length
MSI	4 characters or less
D 2 of 5	8 characters or less
I 2 of 5	8 characters or less
Codabar	8 characters or less

Redundancy Level 4

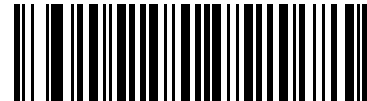
The following code types must be successfully read three times before being decoded:

Code Type	Code Length
All	All

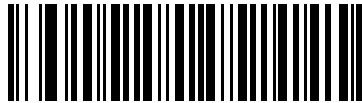
Redundancy Level (continued)



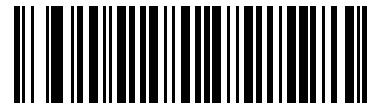
***Redundancy Level 1**



Redundancy Level 2



Redundancy Level 3

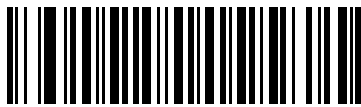


Redundancy Level 4

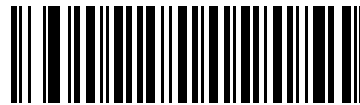
Security Level

The 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 scanner aggressiveness, so choose only that level of security necessary for any given application.

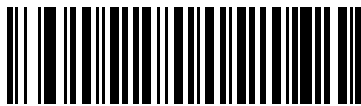
- **Security Level 0:** This default setting allows the scanner to operate in its most aggressive state, while providing sufficient security in decoding most “in-spec” bar codes.
- **Security Level 1:** Select this option if misdecodes occur. This security level should eliminate most misdecodes.
- **Security Level 2:** Select this option if Security level 1 fails to eliminate misdecodes.
- **Security Level 3:** If Security Level 2 was selected 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 scanner. If this level of security is necessary, try to improve the quality of the bar codes.



***Security Level 0**



Security Level 1



Security Level 2



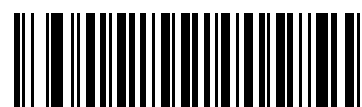
Security Level 3

Bi-directional Redundancy

Enable Bi-directional Redundancy to add security to linear code type security levels. When enabled, a bar code must be successfully scanned in both directions (forward and reverse) before reporting a good decode.



Enable Bi-directional Redundancy



***Disable Bi-directional Redundancy**

Symbology - Intercharacter Gap

The Code 39 and Codabar symbologies have an intercharacter gap that is customarily quite small. Due to various bar code printing technologies, this gap may grow larger than the maximum size allowed, causing the scanner to be unable to decode the symbol. If this problem is encountered, scan **Large Intercharacter Gaps** to tolerate out-of-specification bar codes.



***Normal Intercharacter Gaps**



Large Intercharacter Gaps

Miscellaneous Scanner Options

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Miscellaneous Parameter Defaults

[Table 8-1](#) lists the defaults for miscellaneous scanner options parameters. If you wish to change any option, scan the appropriate bar code(s) provided in the Miscellaneous Scanner Parameters section beginning on page [8-5](#).



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

Table 8-1. Miscellaneous Scanner Options Default Table

Parameter	Default	Page Number
Transmit Code ID Character	None	8-5
Prefix Value	7013 <CR><LF>	8-5
Suffix Value	7013 <CR><LF>	8-6
Scan Data Transmission Format	Data as is	8-6
FN1 Substitution Values	Set	8-8
Transmit “No Read” Message	Disable	8-8
Synapse Interface	Standard	13-9
Transmit Code ID Character	None	8-5

Miscellaneous Scanner Parameters

Transmit Code ID Character

A Code ID character identifies the code type of a scanned bar code. This may be useful when the scanner is 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-3* and *AIM Code Identifiers on page E-4*.



Symbol Code ID Character



AIM Code ID Character



*None

Prefix/Suffix Values

A prefix and/or one or two suffixes can be appended 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 C, Numeric Bar Codes](#)) that corresponds to that value. See *Table D-1 on page D-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 D-1 on page D-1* for the four-digit codes.

To correct an error or change a selection, scan **Cancel** on *page C-4*.



To use Prefix/Suffix values, first set the *Scan Data Transmission Format on page 8-6*.

Prefix/Suffix Values (continued)



Scan Prefix



Scan Suffix

Scan Data Transmission Format

To change the scan data format, scan **Scan Options** and one of the following four bar codes corresponding to the desired format:

- **Data As Is**
- **<DATA> <SUFFIX>**
- **<PREFIX> <DATA>**
- **<PREFIX> <DATA> <SUFFIX>**.

Scan **Enter** on page 8-7 to complete the change. To set values for the prefix and/or suffix, see *Prefix/Suffix Values on page 8-5*. Scan **Data Format Cancel** on page 8-7 to cancel the change.

If a carriage return/enter is required after each scanned bar code, scan the following bar codes in order:

1. **Scan Options**
2. **<DATA> <SUFFIX>**
3. **Enter** (on page 8-7).

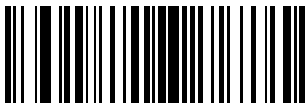
Scan Data Transmission Format (continued)



Scan Options



*Data As Is



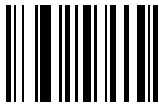
<DATA> <SUFFIX>



<PREFIX> <DATA>



<PREFIX> <DATA> <SUFFIX>



Enter



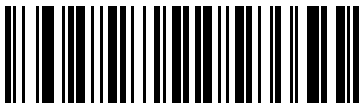
Data Format Cancel

FN1 Substitution Values

The Wedge and USB HID Keyboard hosts support an FN1 substitution feature. When enabled any FN1 character (0x1b) in an EAN128 bar code is substituted with a value. This value defaults to 7013 (Enter Key).

To select an FN1 substitution value via bar code menus:

1. Scan the bar code below.



***Set FN1 Substitution Value**

2. Look up the keystroke desired for FN1 Substitution in the *ASCII Value Standard Default Parameters Table* on [page D-1](#) for the currently installed host interface.
3. Enter the 4-digit substitution value by scanning each digit in [Appendix C, Numeric Bar Codes](#).

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

To enable FN1 substitution for keyboard wedge, scan the **Enable FN1 Substitution** bar code on [page 5-11](#).

To enable FN1 Substitution for USB HID keyboard, scan the **Enable FN1 Substitution** bar code on [page 6-10](#).

Transmit “No Read” Message

Scan a bar code below to select whether or not to transmit a No Read message. When enabled, the characters NR are transmitted when a bar code is not decoded. When disabled, if a symbol does not decode, nothing is sent to the host.



Enable No Read



***Disable No Read**

Standard Default Parameters

Table A-1. Standard Default Parameters Table

Parameter	Default	Page Number
User Preferences		
Set Default Parameter	Restore Defaults	4-5
Beeper Tone	Medium	4-6
Beeper Volume	High	4-6
Power Mode	Continuous On	4-7
Scan Pattern	Multi-line Always Raster	4-7
Scan Line Width	Full Width	4-8
Laser On Time	3.0 Sec	4-8
Beep After Good Decode	Enable	4-9
Keyboard Wedge Host Parameters		
Keyboard Wedge Host Type	IBM PC/AT& IBM PC Compatibles ¹	5-5
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	Default	Page Number
Country Types (Country Codes)	North American	5-3
Ignore Unknown Characters	Send	5-3
Keystroke Delay	No Delay	5-8
Intra-Keystroke Delay	Disable	5-8
Alternate Numeric Keypad Emulation	Disable	5-9
Caps Lock On	Disable	5-9
Caps Lock Override	Disable	5-9
Convert Wedge Data	No Convert	5-10
Function Key Mapping	Disable	5-10
FN1 Substitution	Disable	5-11
Send and Make Break	Send	5-11
USB Host Parameters		
USB Device Type	HID Keyboard Emulation	6-5
USB Country Keyboard Types (Country Codes)	North American	6-6
USB Keystroke Delay	No Delay	6-8
USB CAPS Lock Override	Disable	6-8
USB Ignore Unknown Characters	Send	6-9
Emulate Keypad	Disable	6-9
USB FN1 Substitution	Disable	6-10
Function Key Mapping	Disable	6-10
Simulated Caps Lock	Disable	6-11
Convert Case	No Case Conversion	6-11
UPC/EAN		
UPC-A	Enable	7-9
UPC-E	Enable	7-9
UPC-E1	Disable	7-10
EAN-8/JAN 8	Enable	7-10
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	Default	Page Number
EAN-13/JAN 13	Enable	7-10
Bookland EAN	Disable	7-11
Decode UPC/EAN/JAN Supplementals (2 and 5 digits)	Ignore	7-12
Decode UPC/EAN/JAN Supplemental Redundancy	7	7-12
Transmit UPC-A Check Digit	Enable	7-13
Transmit UPC-E Check Digit	Enable	7-13
Transmit UPC-E1 Check Digit	Enable	7-15
UPC-A Preamble	System Character	7-15
UPC-E Preamble	System Character	7-16
UPC-E1 Preamble	System Character	7-17
Convert UPC-E to A	Disable	7-17
Convert UPC-E1 to A	Disable	7-18
EAN-8/JAN-8 Extend	Disable	7-18
UCC Coupon Extended Code	Disable	7-19
Code 128		
Code 128	Enable	7-20
UCC/EAN-128	Enable	7-20
ISBT 128 (non-concatenated)	Enable	7-21
Code 39		
Code 39	Enable	7-22
Trioptic Code 39	Disable	7-22
Convert Code 39 to Code 32 (Italian Pharmacy Code)	Disable	7-23
Code 32 Prefix	Disable	7-23
Set Length(s) for Code 39	2 to 55	7-24
Code 39 Check Digit Verification	Disable	7-24
Transmit Code 39 Check Digit	Disable	7-26
Code 39 Full ASCII Conversion	Disable	7-27
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	Default	Page Number
Buffer Code 39	Disable	7-28
Code 93		
Code 93	Disable	7-31
Set Length(s) for Code 93	4 to 55	7-31
Code 11		
Code 11	Disable	7-33
Set Lengths for Code 11	4 to 55	7-33
Code 11 Check Digit Verification	Disable	7-35
Transmit Code 11 Check Digit(s)	Disable	7-35
Interleaved 2 of 5 (ITF)		
Interleaved 2 of 5 (ITF)	Enable	7-36
Set Lengths for I 2 of 5	14	7-36
I 2 of 5 Check Digit Verification	Disable	7-37
Transmit I 2 of 5 Check Digit	Disable	7-38
Convert I 2 of 5 to EAN 13	Disable	7-38
Discrete 2 of 5 (DTF)		
Discrete 2 of 5	Disable	7-39
Set Length(s) for D 2 of 5	12	7-39
Chinese 2 of 5		
Enable/Disable Chinese 2 of 5	Disable	7-41
Codabar (NW - 7)		
Codabar	Disable	7-42
Set Lengths for Codabar	5 to 55	7-42
CLSI Editing	Disable	7-43
NOTIS Editing	Disable	7-44
MSI		
MSI	Disable	7-45
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	Default	Page Number
Set Length(s) for MSI	2 to 55	7-45
MSI Check Digits	One	7-46
Transmit MSI Check Digit	Disable	7-47
MSI Check Digit Algorithm	Mod 10/Mod 10	7-47
RSS (Reduced Space Symbology)		
RSS 14	Disable	7-48
RSS Limited	Disable	7-48
RSS Expanded	Disable	7-48
Convert RSS to UPC/EAN	Disable	7-49
Symbology - Specific Security Levels		
Redundancy Level	1	7-51
Security Levels	0	7-52
Bi-directional Redundancy	Disable	7-53
Miscellaneous Scanner Options		
Transmit Code ID Character	None	8-5
Prefix Value	7013 <CR><LF>	8-5
Suffix Value	7013 <CR><LF>	8-5
Scan Data Transmission Format	Data As Is	8-7
FN1 Substitution Values	Set	8-8
Transmit "No Read" Message	Disable	8-8
¹ User selection is required to configure this interface and this is the most common selection.		



Sample Bar Codes

Code 39	C-3
UPC/EAN	C-3
UPC-A, 100%	C-3
EAN-13, 100%	C-3
Code 128	C-3
Interleaved 2 of 5	C-4
RSS	C-4
RSS	C-4
RSS-14	C-5

Code 39



UPC/EAN

UPC-A, 100%



EAN-13, 100%



Code 128



Interleaved 2 of 5



RSS



RSS variants must be enabled to read the bar codes below (see *RSS (Reduced Space Symbology)* on page 7-48).

RSS



10293847560192837465019283746029478450366523
(RSS Expanded Stacked)



1234890hjio9900mnb
(RSS Expanded)



08672345650916
(RSS Limited)

RSS-14



55432198673467
(RSS-14 Truncated)



90876523412674
(RSS-14 Stacked)



78123465709811
(RSS-14 Stacked Omni-Directional)



Numeric Bar Codes

Numeric Bar Codes	D-3
Cancel	D-4

Numeric Bar Codes

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



0



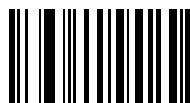
1



2



3



4



5

Numeric Bar Codes

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



6



7



8



9

Cancel

To correct an error or change a selection, scan the bar code below.



Cancel



ASCII Character Sets

Table D-1. ASCII Value Standard Default Parameters Table

ASCII Value	Full ASCII Code 39 Encode Character	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 TAB¹
1010	\$J	CTRL J
1011	\$K	CTRL K

Table D-1. ASCII Value Standard Default Parameters Table (Continued)

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
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
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	‘

Table D-1. ASCII Value Standard Default Parameters Table (Continued)

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
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	:
1059	%F	;
1060	%G	<
1061	%H	=
1062	%I	>
1063	%J	?
1064	%V	@
1065	A	A
1066	B	B
1067	C	C

Table D-1. ASCII Value Standard Default Parameters Table (Continued)

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
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
1090	Z	Z
1091	%K	[
1092	%L	\
1093	%M	]
1094	%N	^
1095	%O	_

Table D-1. ASCII Value Standard Default Parameters Table (Continued)

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
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
1121	+Y	y
1122	+Z	z
1123	%P	{

Table D-1. ASCII Value Standard Default Parameters Table (Continued)

ASCII Value	Full ASCII Code 39 Encode Character	Keystroke
1124	%Q	I
1125	%R	}
1126	%S	~
The keystroke in bold is sent only if the “Function Key Mapping” is enabled. Otherwise, the unbolded keystroke is sent.		

Table D-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

Table D-2. ALT Key Standard Default Tables (Continued)

ALT Keys	Keystroke
2089	ALT Y
2090	ALT Z

Table D-3. Misc. Key Standard Default Table

Misc. Key	Keystroke
3001	PA 1
3002	PA 2
3003	CMD 1
3004	CMD 2
3005	CMD 3
3006	CMD 4
3007	CMD 5
3008	CMD 6
3009	CMD 7
3010	CMD 8
3011	CMD 9
3012	CMD 10
3013	CMD 11
3014	CMD 12
3015	CMD 13
3016	CMD 14

Table D-4. GUI Shift Keys

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.	
Other Value	Keystroke
3048	GUI 0
3049	GUI 1
3050	GUI 2
3051	GUI 3
3052	GUI 4
3053	GUI 5
3054	GUI 6
3055	GUI 7

Table D-4. GUI Shift Keys (Continued)

3056	GUI 8
3057	GUI 9
3065	GUI A
3066	GUI B
3067	GUI C
3068	GUI D
3069	GUI E
3070	GUI F
3071	GUI G
3072	GUI H
3073	GUI I
3074	GUI J
3075	GUI K
3076	GUI L
3077	GUI M
3078	GUI N
3079	GUI O
3080	GUI P
3081	GUI Q
3082	GUI R
3083	GUI S
3084	GUI T
3085	GUI U
3086	GUI V
3087	GUI W
3088	GUI X
3089	GUI Y
3090	GUI Z

Table D-5. PF Key Standard Default Table

PF Keys	Keystroke
4001	PF 1
4002	PF 2
4003	PF 3
4004	PF 4

Table D-5. PF Key Standard Default Table (Continued)

PF Keys	Keystroke
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 D-6. 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

Table D-6. F key Standard Default Table (Continued)

F Keys	Keystroke
5020	F 20
5021	F 21
5022	F 22
5023	F 23
5024	F 24

Table D-7. 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 D-8. Extended Keypad Standard Default Table

Extended Keypad	Keystroke
7001	Break
7002	Delete
7003	Pg Up
7004	End

Table D-8. Extended Keypad Standard Default Table (Continued)

Extended Keypad	Keystroke
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



Programming Reference

Symbol Code Identifiers	B-3
AIM Code Identifiers	B-4

Symbol Code Identifiers

Table E-1. Symbol Code Characters

Code Character	Code Type
A	UPC/EAN
B	Code 39, Code 39 Full ASCII, Code 32
C	Codabar
D	Code 128, ISBT 128
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	UCC/EAN-128
L	Bookland EAN
M	Trioptic Code 39
N	Coupon Code
R	RSS Family

AIM Code Identifiers

Each AIM Code Identifier contains the three-character string **jc_m** where:

j = 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 (all variants), Coupon (Code 128 portion)
E	UPC/EAN, Coupon (UPC portion)
e	RSS Family
F	Codabar
G	Code 93
H	Code 11
I	Interleaved 2 of 5
M	MSI
S	D2 of 5, IATA 2 of 5
X	Bookland EAN, Code 39 Trioptic

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 JA7AIMID 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 JX0412356	

Table E-3. Modifier Characters (Continued)

Code Type	Option Value	Option
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 JC1AIMID	
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 J104123	
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 JF04123	
Code 93	0	No options specified at this time. Always transmit 0.
	Example: A Code 93 bar code 012345678905 is transmitted as JG0012345678905	
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 JM14123	
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 JS04123	
UPC/EAN	0	Standard packet in full EAN country code format, which is 13 digits for UPC-A and UPC-E (not including supplemental data).
	1	Two-digit supplement data only.
	2	Five-digit supplement data only.
	4	EAN-8 data packet.
	Example: A UPC-A bar code 012345678905 is transmitted as JE00012345678905	
Bookland EAN	0	No options specified at this time. Always transmit 0.
	Example: A Bookland EAN bar code 123456789X is transmitted as JX0123456789X	
Code 11	0	Single check digit
	1	Two check digits
	3	Check characters validated but not transmitted.
RSS Family		No option specified at this time. Always transmit 0. RSS-14 and RSS-Limited transmit with an Application Identifier "01". Note: In UCC/EAN-128 emulation mode, RSS is transmitted using Code 128 rules (i.e., J1C1).
	Example: An RSS-14 bar code 100123456788902 is transmitted as Je001100123456788902 .	

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