

# QuickScan® i QD2100 Barcode Imager



## Product Reference Guide

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# Chapter 1

## Introduction

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### About this Guide

This Product Reference Guide (PRG) is provided for users seeking advanced technical information, including connection, programming, maintenance and specifications. The Quick Reference Guide (QRG) and other publications associated with this product are downloadable free of charge from the website listed on the back cover of this manual.

Typically, units are factory-programmed for the most common terminal and communications settings. If you need to modify any programmable settings, custom configuration can be accomplished by scanning the programming barcodes within this guide.

Programming can alternatively be performed using the Datalogic Aladdin™ Configuration application which is downloadable from the Datalogic website listed on the back cover of this manual. This multi-platform utility program allows device configuration using a PC. It communicates to the device using a serial or USB cable and can also create configuration barcodes to print.

### Manual Overview

[Chapter 1, Introduction](#) provides a product overview, unpacking instructions, and cable connection information.

[Chapter 2, Getting Started](#) presents information about unpacking and setting up the imager.

[Chapter 3, Interfaces](#) consists of interface configuration barcodes and details.

[Chapter 4, General Features](#) includes programming barcodes for selecting common features for the imager and general use barcodes to customize how the data is transmitted to the host device.

[Chapter 5, RS-232 ONLY Interface](#) supplies information about setting up the imager for RS-232 operation.

[Chapter 6, RS-232/USB-Com Interfaces](#) features information about options involving both the RS-232 and USB-Com interfaces.

[Chapter 7, Keyboard Interface](#) discusses how to set up the imager for Keyboard Wedge operation.

[Chapter 8, USB-OEM Interface](#) explains how to set the imager up for USB operation.

[Chapter 9, IBM 46XX Interface](#) is a resource for setting up an IBM interface.

[Chapter 10, Data Editing](#) offers advanced configuration options for customization of scanned data output.

[Chapter 11, Symbologies](#) defines options for all symbologies and provides the programming barcodes necessary for configuring these features.

[Appendix A, Technical Specifications](#) lists physical and performance characteristics, as well as environmental and regulatory specifications. It also provides standard cable pin-outs.

[Appendix B, Standard Defaults](#) references common factory default settings for imager features and options.

[Appendix C, LED and Beeper Indications](#) supplies tables containing descriptions of the functions and behaviors of the imager's LED and Beeper indicators.

[Appendix D, Sample Barcodes](#) offers sample barcodes of several common symbologies.

[Appendix E, Keypad](#) includes numeric barcodes to be scanned for certain parameter settings.

[Appendix F, Scancode Tables](#) lists control character emulation information for Wedge and USB Keyboard interfaces.

## Manual Conventions

The following conventions are used in this document:

The symbols listed below are used in this manual to notify the imager of key issues or procedures that must be observed when using the imager:



**NOTE**

**Notes contain information necessary for properly diagnosing, repairing and operating the imager.**



**CAUTION**

**The CAUTION symbol advises you of actions that could damage equipment or property.**

## References

Current versions of the Product Reference Guide (PRG), Quick Reference Guide (QRG), the Datalogic Aladdin™ Configuration application, and any other manuals, instruction sheets and utilities for this product can be downloaded from the website listed on the back cover of this manual. Alternatively, printed copies or product support CDs can be purchased through your Datalogic reseller.

## Technical Support

### Datalogic Website Support

The Datalogic website ([www.scanning.datalogic.com](http://www.scanning.datalogic.com)) is the complete source for technical support and information for Datalogic products. The site offers product support, product registration, warranty information, product manuals, product tech notes, software updates, demos, and instructions for returning products for repair.

### Reseller Technical Support

An excellent source for technical assistance and information is an authorized Datalogic reseller. A reseller is acquainted with specific types of businesses, application software, and computer systems and can provide individualized assistance.

### Telephone Technical Support

If you do not have internet or email access, you may contact Datalogic technical support at (541) 349-8283 or check the back cover of your manual for more contact information.

# NOTES

# Chapter 2

## Getting Started

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### About the Imager

Advancements in the LED technology used in this imager significantly improve the illumination of the target field of view, resulting in higher scan efficiency. Whether used in Single Trigger or Continuous Mode, the ergonomic design of the imager will help to promote comfortable handling during extended periods of use.

The imager can communicate using the following interfaces:

**RS-232** — The imager can communicate with a standard or Wincor-Nixdorf (W-N) RS-232 host.

**RS-232 OPOS** — This interface is used for OPOS/UPOS/JavaPOS systems.

**Keyboard Wedge (KBW)** — When connected using this interface, the host interprets scanned data as keystrokes and supports several international keyboards (for the Windows® environment). See [Country Mode on page 68](#) for a full listing.

**USB** — Select to communicate either by USB OEM, USB COM, USB Keyboard interface or USB POS types by scanning the appropriate interface type barcodes available in this manual. The default interface is USB-KBD for Wedge models (7230) and USB-OEM for IBM models (7210).

**IBM** — IBM Port 5B or Port 9B are selectable interface options.

### Unpacking

Check carefully to ensure the imager and any accessories ordered are present and undamaged. If any damage occurred during shipment, contact [Technical Support on page 3](#). KEEP THE PACKAGING. Should the unit ever require service, it should be returned in its original shipping container.

## Setting Up the Imager

Follow the steps provided in this section to connect and get your imager up and communicating with its host:

1. [Install the Interface Cable](#)
2. [Select the Interface Type](#)
3. [Configure Interface Settings](#) (only if not using factory settings for that interface)
4. [Configure Other Features](#) (if modifications are needed from factory settings)

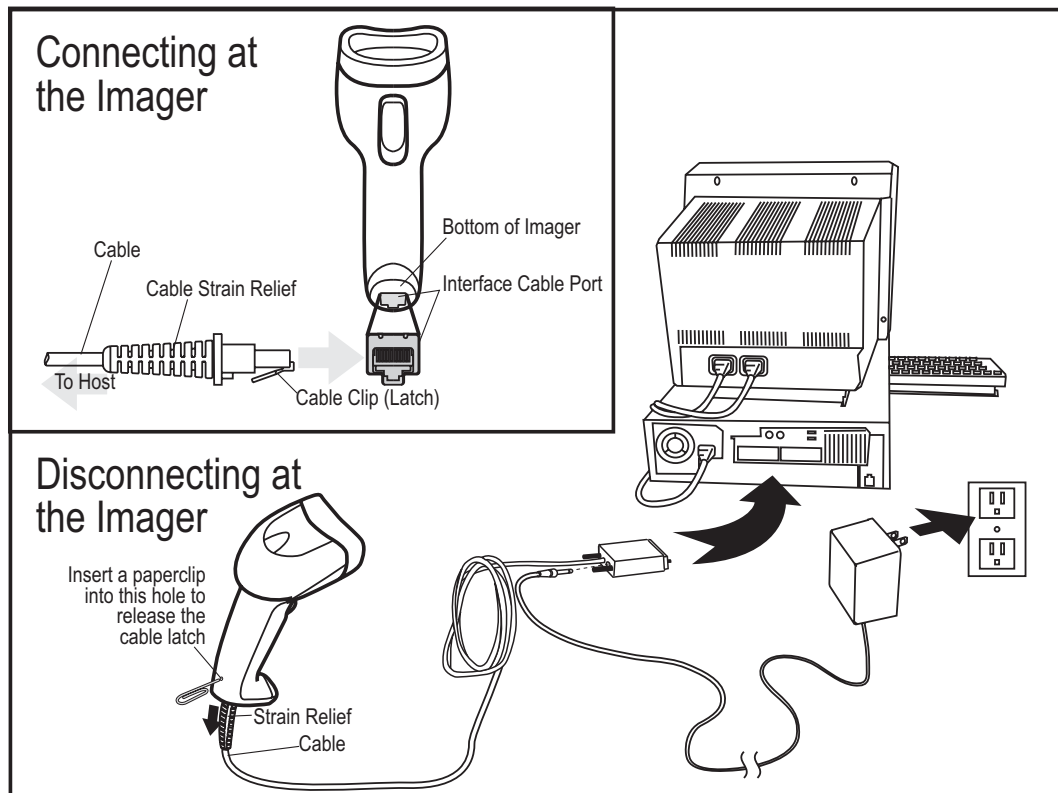
### Install the Interface Cable

The imager kit you ordered to match your interface should provide a compatible cable for your installation. If not, contact [Technical Support](#).

Seat the cable assembly into the imager, aligning both the connector, aligning the cable clip with its opening as shown in the insert portion of [Figure 1](#).

**RS-232 Serial Connection** — Turn off power to the terminal/PC and connect the imager to the terminal/PC serial port via the RS-232 cable as shown in [Figure 1](#). If the terminal will not support POT (Power Off the Terminal) to supply imager power, use the approved power supply (AC Adapter). Plug the AC Adapter barrel connector into the socket on the RS-232 cable connector and the AC Adapter plug into a standard power outlet.

**Figure 1. Connecting the Interface Cable/RS-232 Connection**



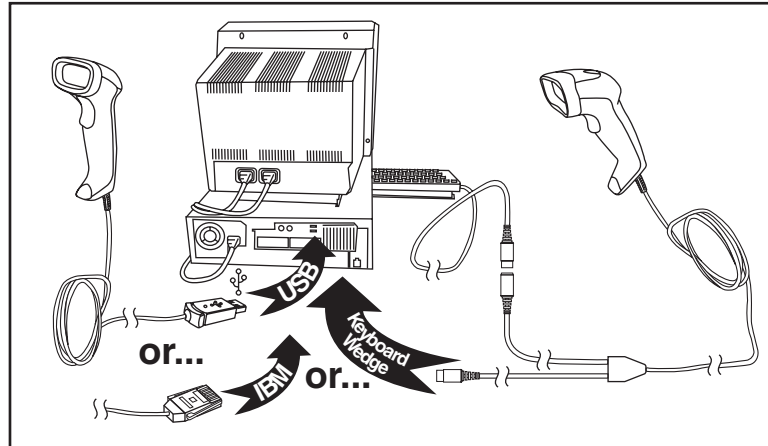
Other connection types are described below and illustrated in [Figure 2](#).

**USB Connection** — Connect the imager to a USB port on the terminal/PC using the correct USB cable for the interface type you ordered. Reference [Figure 2](#).

**IBM Connection** — Connect the imager to the IBM port on the terminal/PC using the correct IBM cable. Reference [Figure 2](#).

**Keyboard Wedge Connection** — The Keyboard Wedge cable has a 'Y' connection from the imager. Connect the female to the male end from the keyboard and the remaining end at the keyboard port at the terminal/PC. Reference [Figure 2](#).

**Figure 2. Other Interface Connections**



**NOTE**

Specific cables are required for connection to different hosts. The connectors illustrated above are examples only. Actual connectors may vary from those illustrated, but the steps to connect the imager remain the same.

## Programming

The imager is typically factory-configured with a set of default features standard to the interface type you ordered. After scanning the interface barcode from the [Interfaces](#) section, you can select other options and customize your imager through use of the instructions and programming barcodes available in the corresponding features section for your interface and also the [Data Editing](#) and [Symbologies](#) chapters of this manual.

## Using the Programming Barcodes

This manual contains feature descriptions and barcodes which allow you to reconfigure your imager. Some programming barcode labels, like the [Standard Product Default Settings on page 9](#), require only the scan of that single label to enact the change. Most of the programming labels in this manual, however, require the imager to be placed in Programming Mode prior to scanning them. Scan an ENTER/EXIT barcode once to enter Programming Mode. Once the imager is in Programming Mode, you can scan a number of parameter settings before scanning the ENTER/EXIT barcode a second time, which will then accept your changes, exit Programming Mode and return the imager to normal operation.



### NOTE

There are some exceptions to the typical programming sequence described above. Please read the description and setting instructions carefully when configuring each given programmable feature.

## Select the Interface Type

Upon completing the physical connection between the imager and its host, proceed directly to [Interfaces on page 11](#) for information and programming for the interface type the imager is connected to (for example: RS-232, Keyboard Wedge, USB, etc.) and scan the appropriate barcode in that section to select your system's correct interface type.

## Configure Interface Settings

The imager is typically factory-configured with a set of default features standard to the interface type you ordered. If after scanning the interface barcode from the [Interfaces](#) section, your installation requires you to select options to further customize your imager, turn to the appropriate section for your interface type as listed below:

- [RS-232 ONLY Interface, starting on page 41](#)
- [Keyboard Interface, starting on page 67](#)
- [USB-OEM Interface, starting on page 81](#)
- [IBM 46XX Interface, starting on page 83](#)

## Configure Other Features

If your installation requires different programming than the standard factory default settings, the following sections of this manual allow configuration of non-interface-specific settings you might require:

**General Features** — General Features includes programming for scanning, beeper and LED indicators and other such universal settings.

**Symbologies** — Includes options concerning the barcode label types (symbologies). These settings allow you to enable/disable symbologies, set label lengths, require check digit, etc.



## Resetting the Standard Product Defaults

If you aren't sure what programming options are in your imager, or you've changed some options and want the factory settings restored, scan the [Standard Product Default Settings](#) barcode below. This will copy the factory configuration for the currently active interface to the current configuration.



### NOTE

**Factory defaults are based on the interface type. Configure the imager for the correct interface before scanning this label.**



Standard Product Default Settings

The programming section lists the factory default settings for each of the menu commands (indicated by shaded blocks and bold text) on the following pages.

# NOTES

# Chapter 3

## Interfaces

---

### Interface Selection

Each reader model will support one of the following sets of host interfaces:

#### **General Purpose Models (5 volt supply)**

RS-232  
RS-232 OPOS  
USB  
Keyboard Wedge

#### **Retail Point of Sale Models (4 to 14 volt supply)**

RS-232  
RS-232 OPOS  
USB  
IBM 46XX

### Configuring the Interface

Scan the programming barcode from this section which selects the appropriate interface type matching the system the reader will be connected to. Next, proceed to the corresponding chapter in this manual (also listed in [Table 1](#)) to configure any desired settings and features associated with that interface.



#### **NOTE**

Unlike some other programming features and options, interface selections require that you scan only one programming barcode label. **DO NOT** scan an ENTER/EXIT barcode prior to scanning an interface selection barcode.

Some interfaces require the scanner to start in the disabled state when powered up. If additional scanner configuration is desired while in this state, pull the trigger and hold it for five seconds. The scanner will change to a state that allows programming with barcodes.

**Table 1. Available Interfaces**

RS-232		FEATURES
RS-232 standard interface	 Select RS232-STD	Set RS-232 Interface Features starting on page 41
 Select RS232-WN	RS-232 Wincor-Nixdorf	
RS-232 for use with OPOS/UPOS/JavaPOS	 Select RS-232 OPOS	
 Select USB-COM-STD <sup>a</sup>	USB Com to simulate RS-232 standard interface	
IBM		FEATURES
 Select IBM-P5B	IBM-46xx Port 5B reader interface	Set IBM Interface Features starting on page 83
IBM-46xx Port 9B reader interface	 Select IBM-P9B	
USB-OEM		FEATURES
 Select USB-OEM	USB-OEM (can be used for OPOS/UPOS/JavaPOS)	Set USB-OEM Interface Features starting on page 81

<sup>a</sup>. Download the correct USB Com driver from [www.datalogic.com](http://www.datalogic.com)

KEYBOARD	FEATURES
<p>AT, PS/2 25-286, 30-286, 50, 50Z, 60, 70, 80, 90 &amp; 95 w/Standard Key Encoding</p>  <p>Select KBD-AT</p>	<p>Set KEYBOARD WEDGE Interface Features starting on page 67</p>
 <p>Select KBD-AT-NK</p> <p>Keyboard Wedge for IBM AT PS2 with standard key encoding but without external keyboard</p>	
<p>AT, PS/2 25-286, 30-286, 50, 50Z, 60, 70, 80, 90 &amp; 95 w/Alternate Key</p>  <p>Select KBD-AT-ALT</p>	
 <p>Select KBD-AT-ALT-NK</p> <p>Keyboard Wedge for IBM AT PS2 with alternate key encoding but without external keyboard</p>	
<p>PC/XT w/Standard Key Encoding</p>  <p>Select KBD-XT</p>	
 <p>Select KBD-IBM-3153</p> <p>Keyboard Wedge for IBM Terminal 3153</p>	

KEYBOARD — cont.	FEATURES
<p>Keyboard Wedge for IBM Terminals 31xx, 32xx, 34xx, 37xx make only keyboard</p>  <p>Select KBD-IBM-M</p>	<p>Set KEYBOARD WEDGE Interface Features starting on page 67</p>
 <p>Select KBD-IBM-MB</p> <p>Keyboard Wedge for IBM Terminals 31xx, 32xx, 34xx, 37xx make break keyboard</p>	
<p>Keyboard Wedge for DIGITAL Terminals VT2xx, VT3xx, VT4xx</p>  <p>Select KBD-DIG-VT</p>	
 <p>Select USB Keyboard</p> <p>USB Keyboard with standard key encoding</p>	
<p>USB Keyboard with alternate key encoding</p>  <p>Select USB Alternate Keyboard</p>	
 <p>Select USB-KBD-APPLE</p> <p>USB Keyboard for Apple computers</p>	

## Global Interface Features

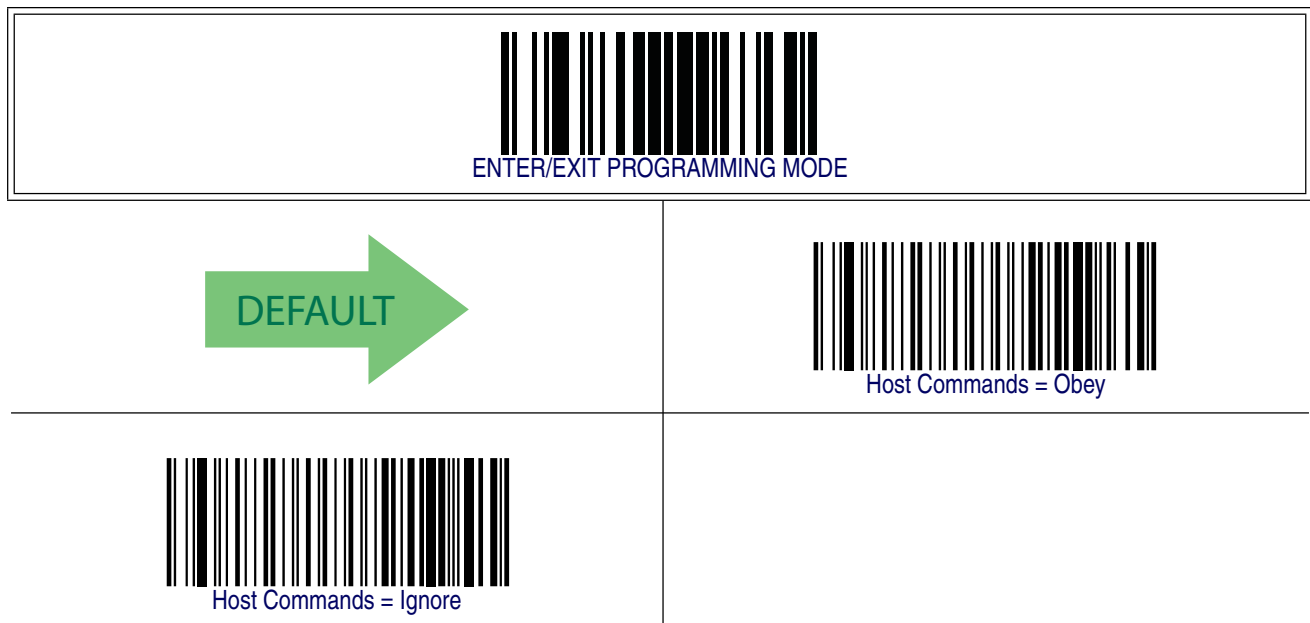
The following interface features are configurable by all interface types. To set features specific to your interface, turn to that section of this manual:

- [RS-232 ONLY Interface on page 41](#)
- [Keyboard Interface on page 67](#)
- [USB-OEM Interface on page 81](#)
- [IBM 46XX Interface on page 83](#)

### Host Commands — Obey/Ignore

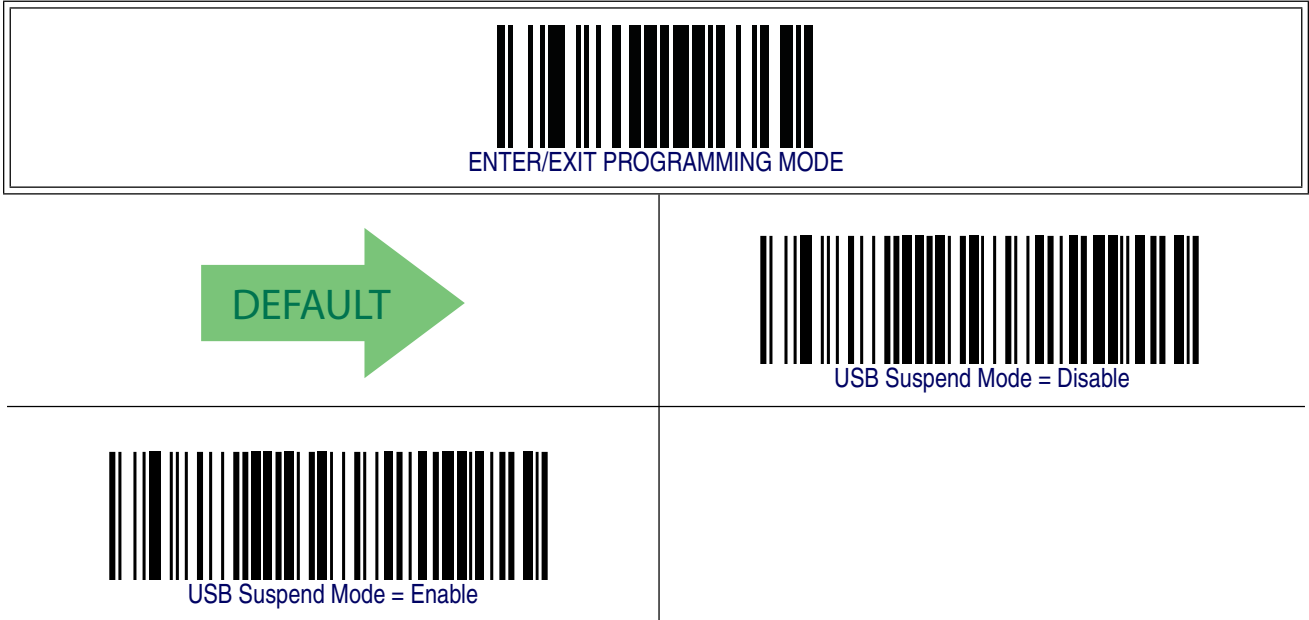
This option specifies whether the reader will obey or ignore host commands. When set to ignore, the reader will ignore all host commands except for those necessary for:

- service mode
- flash programming mode
- keeping the interface active
- transmission of labels.



## USB Suspend Mode

This setting enables/disables the ability of USB interfaces to enter suspend mode.





# Chapter 4

## General Features

### Double Read Timeout

To prevent a double read of the same label, the Double Read Timeout sets the minimum time allowed between reads of labels of the same symbology and data. If the unit reads a label and sees the same label again within the Double Read Timeout, the second read of the label will be ignored. Double Read Timeout does not apply to scan modes that require a trigger pull for each label that is read.

 ENTER/EXIT PROGRAMMING MODE	
	 Double Read Timeout = 0.1 Second
 Double Read Timeout = 0.2 Second	
	 Double Read Timeout = 0.3 Second
 Double Read Timeout = 0.4 Second	

## Double Read Timeout – continued

 ENTER/EXIT PROGRAMMING MODE	
	 Double Read Timeout = 0.5 Second
 Double Read Timeout = 0.6 Second	
	 Double Read Timeout = 0.7 Second
 Double Read Timeout = 0.8 Second	
	 Double Read Timeout = 0.9 Second
 Double Read Timeout = 1 Second	

## Label Gone Timeout

This feature sets the time after the last label segment is seen before the reader prepares for a new label. The timeout can be set within a range of 10 milliseconds to 2,550 milliseconds (2.55 seconds) in 10ms increments. Label Gone Timeout does not apply to scan modes that require a trigger pull for each label that is read

Follow these instructions to set this feature:

1. Determine the desired setting in milliseconds.
2. Divide the desired setting by 10 (setting is in 10ms increments). Pad the result with leading zeroes to yield three digits. For example: 0 = 000, 5 = 005, 20 = 020, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT LABEL GONE TIMEOUT SETTING.
5. Scan the appropriate three alpha-numeric characters from the keypad in [Appendix E, Keypad](#) representing the duration which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

### NOTE

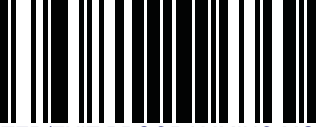
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.


This completes the procedure. See [Table 2](#) for some examples of how to set this feature.


**Table 2. Timeout Setting Examples**

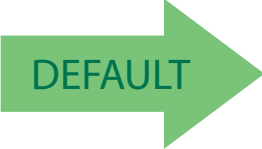
STEP	ACTION	EXAMPLES			
		1	Desired Setting	50ms	150ms
2	Divide by 10 (and pad with leading zeroes)	005	015	180	255
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT LABEL GONE TIMEOUT SETTING				
5	Scan Three Characters From <a href="#">Appendix E, Keypad</a>	'0', '0' and '5'	'0', '1' and '5'	'1', '8' and '0'	"2", '5' and '5'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## Label Gone Timeout – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Label Gone Timeout Setting	
--	--

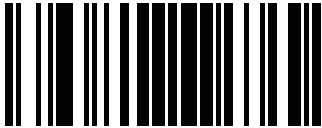

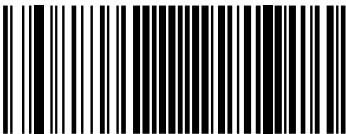

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL
--	---

 016 = Timeout of 160 ms

# LED and Beeper Indicators

## Power On Alert

Disables or enables the indication (from the Beeper) that the reader is receiving power.

 ENTER/EXIT PROGRAMMING MODE	
	 Power On Alert = Disable (No Audible Indication)
 Power On Alert = Four Beeps	

## Good Read: When to Indicate

This feature specifies when the reader will provide indication (beep and/or flash its green LED) upon successfully reading a barcode. Choices are:

- Good Read = Indicate after decode
- Good Read = Indicate after transmit
- Good Read = Indicate after CTS goes inactive, then active



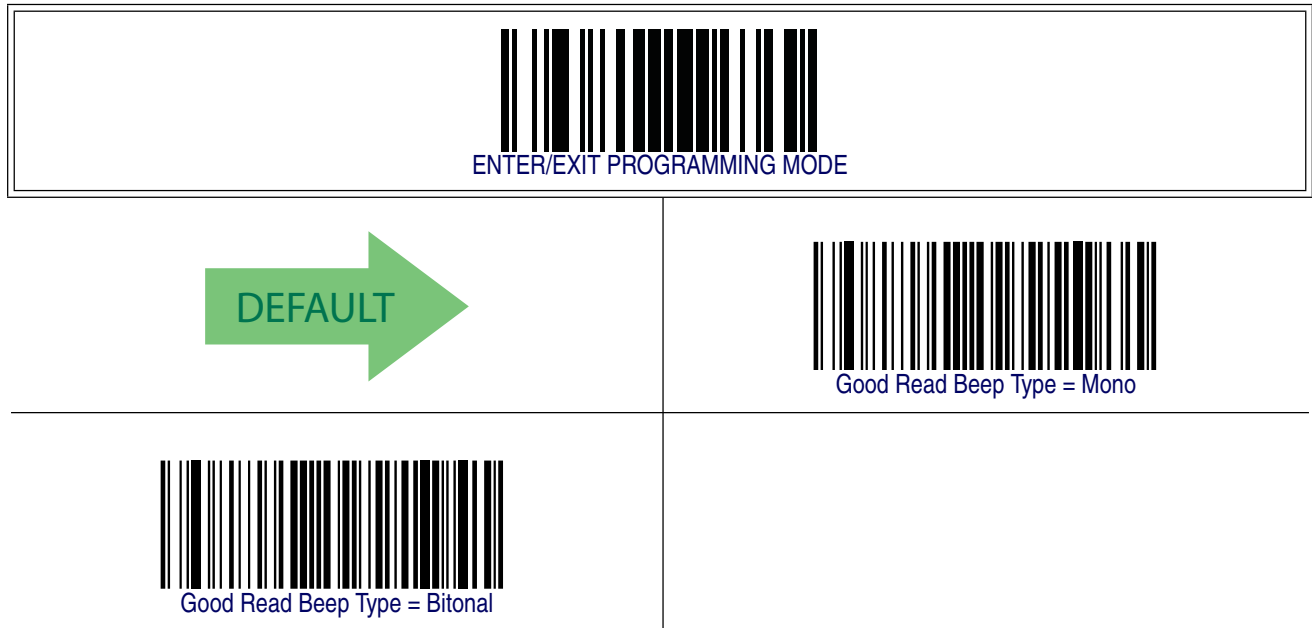
This option, which uses CTS, is only valid for RS-232 interfaces.

### NOTE



## Good Read Beep Type

Specifies whether the good read beep has a mono or bitonal beep sound.



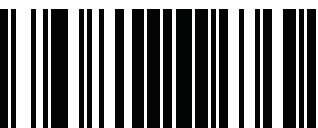

### Good Read Beep Frequency

Adjusts the good read beep to sound at a selectable low, medium or high frequency, selectable from the list below. (Controls the beeper's pitch/tone.)

 ENTER/EXIT PROGRAMMING MODE	
	 Good Read Beep Frequency = Low
 Good Read Beep Frequency = Medium	
 DEFAULT	 Good Read Beep Frequency = High

### Good Read Beep Length

Specifies the duration of a good read beep.

 ENTER/EXIT PROGRAMMING MODE	
	 Good Read Beep Length = 60 msec

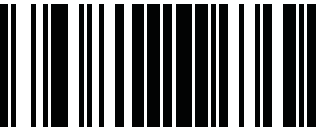

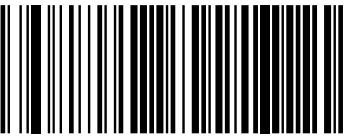
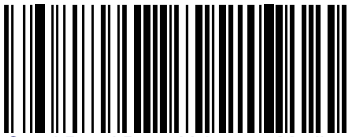
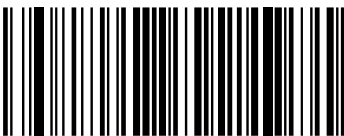



## Good Read Beep Length — continued

 ENTER/EXIT PROGRAMMING MODE	
 Good Read Beep Length = 80 msec	
	 Good Read Beep Length = 100 msec
 Good Read Beep Length = 120 msec	
	 Good Read Beep Length = 140 msec
 Good Read Beep Length = 160 msec	
	 Good Read Beep Length = 180 msec
 Good Read Beep Length = 200 msec	

### Good Read Beep Volume

Selects the beeper volume (loudness) upon a good read beep. There are three selectable volume levels.

 ENTER/EXIT PROGRAMMING MODE	
	 Good Read Beep Volume = Beeper Off
 Good Read Beep Volume = Low	
	 Good Read Beep Volume = Medium
 Good Read Beep Volume = High	 DEFAULT

## Good Read LED Duration

This feature specifies the amount of time that the Good Read LED remains on following a good read. The good read LED on time can be set within a range of 10 milliseconds to 2,550 milliseconds (0.001 to 2.55 seconds) in 10ms increments.

Follow these instructions to set this feature:

1. Determine the desired setting in milliseconds. A setting of 0 means that the good read LED stays on until the next time the trigger is pulled.
2. Divide the desired setting by 10 (setting is in 10ms increments). Pad the result with leading zeroes to yield three digits. For example: 0 = 000, 5 = 000, 20 = 020, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT GOOD READ LED DURATION SETTING.
5. Scan the appropriate three digits from the keypad in [Appendix E, Keypad](#) representing the duration which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

### NOTE

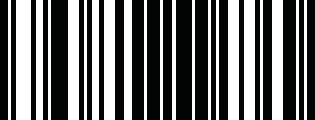
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

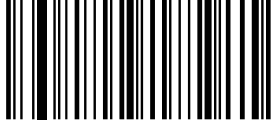
This completes the procedure. See [Table 3](#) for some examples of how to set this feature.


**Table 3. Good Read LED Duration Setting Examples**

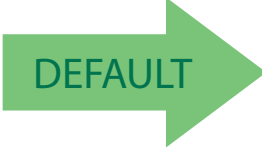
STEP	ACTION	EXAMPLES			
1	Desired Setting	Good Read LED stays on until next trigger pull (00)	20ms	150ms	2550ms (2.55 sec.)
2	Divide by 10 (and pad with leading zeroes)	000	002	015	255
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT LABEL GONE TIMEOUT SETTING				
5	Scan Three Characters From <a href="#">Appendix E, Keypad</a>	'0', '0' and '0'	'0', '0' and '2'	'0', '1' and '5'	'2', '5' and '5'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## Good Read LED Duration – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Good Read LED Duration Setting	
--	--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL
--	---

 020 = Good Read LED stays on for 2 seconds.



Indicators are dimmed during sleep.

**NOTE**

## Scanning Features

### Scan Mode

Selects the scan operating mode for the reader. Selections are:

**Trigger Single** — When the trigger is pulled, scanning is activated until one of the following occurs:

- [Scanning Active Time](#) has elapsed
- a label has been read
- the trigger is released

This mode is associated with typical handheld reader operation: when the trigger is pulled, scanning starts and the product scans until the trigger is released, or a label is read, or the maximum [Scanning Active Time](#) has elapsed.

**Trigger Hold Multiple** — When the trigger is pulled, scanning starts and the product scans until the trigger is released or [Scanning Active Time](#) has elapsed. Reading a label does not disable scanning. [Double Read Timeout](#) prevents undesired multiple reads of the same label while in this mode.

**Trigger Pulse Multiple** — When the trigger is pulled, continuous scanning is activated until [Scanning Active Time](#) has elapsed or the trigger has been released and pulled again. [Double Read Timeout](#)<sup>1</sup> prevents undesired multiple reads of the same label while in this mode.

**Flashing** — The reader flashes<sup>1</sup> on and off regardless of the trigger status. Flash rate is controlled by [Flash On Time](#) and [Flash Off Time](#). When Flash is ON the imager reads continuously. When Flash is OFF scanning is deactivated.

**Always On** — No trigger pull is required to read a barcode. Scanning is continually on. If the trigger is pulled, the reader acts as if it is in [Trigger Single Mode](#). [Double Read Timeout](#)<sup>1</sup> prevents undesired multiple reads of the same label while in this mode.

**Stand Mode** — No trigger pull is required to read a barcode. Scanning is turned on automatically when an item is placed in reader's field of view. If the trigger is pulled, the reader acts as if it is in single read mode. [Double Read Timeout](#)<sup>1</sup> prevents undesired multiple reads of the same label while in this mode.

**Trigger Object Sense** — This mode is similar to Stand Mode, except that a trigger pull is required to activate the decoder.

<sup>1</sup>. Controlled by [Flash On Time](#).

## Scan Mode – continued

 <b>ENTER/EXIT PROGRAMMING MODE</b>	
 Scan Mode = Trigger Single	
	 Scan Mode = Trigger Hold Multiple
 Scan Mode = Trigger Pulse Multiple	
	 Scan Mode = Flashing
 Scan Mode = Always On	
	 Scan Mode = Stand Mode
 Scan Mode = Trigger Object Sense	

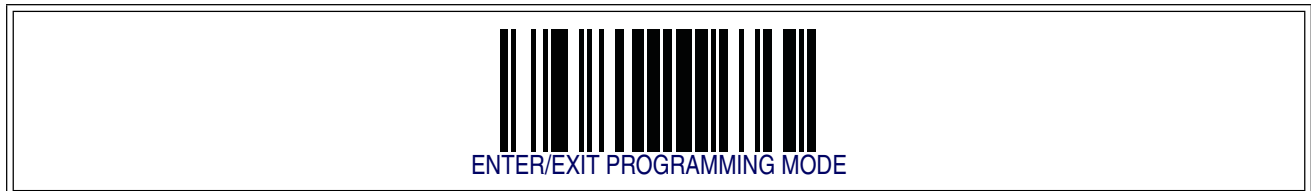
## Stand Mode Triggered Timeout

This feature specifies the time to remain in **Trigger Single** mode after the trigger is pulled while in **Stand Mode**.



This timeout is only used when the Scan Mode is configured as **Stand Mode**.

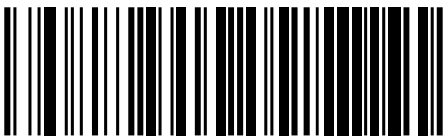
**NOTE**



Stand Mode Triggered Timeout = 0.5 Seconds



Stand Mode Triggered Timeout = 1.5 Seconds



Stand Mode Triggered Timeout = 2 Seconds



Stand Mode Triggered Timeout = 3 Seconds



Stand Mode Triggered Timeout = 4 Seconds

## Stand Mode Triggered Timeout – continued

 ENTER/EXIT PROGRAMMING MODE	
	 Stand Mode Triggered Timeout = 6 Seconds
 Stand Mode Triggered Timeout = 8 Seconds	
	 Stand Mode Triggered Timeout = Switch back to Trigger Single on trigger pull



## Scanning Active Time

This setting specifies the amount of time that the reader stays in scan ON state once the state is entered. The range for this setting is from 1 to 255 seconds in 1-second increments.

Follow these instructions to set this feature:

1. Determine the desired setting.
2. Pad the result with leading zeroes to yield three digits. For example: 0 = 000, 5 = 005, 20 = 020, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT SCANNING ACTIVE TIME SETTING.
5. Scan the appropriate three digits from the keypad in [Appendix E, Keypad](#), that represent the duration which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

### NOTE

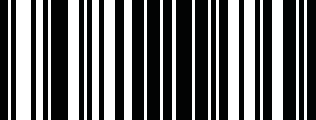
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.


This completes the procedure. See [Table 4](#) for some examples of how to set this feature.


**Table 4. Scanning Active Time Setting Examples**

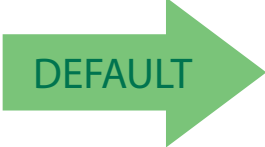
STEP	ACTION	EXAMPLES			
1	Desired Setting	1 Second	90 Sec. (1.5 min.)	180 Sec. (3 min.)	255 Seconds (4.25 min.)
2	Pad leading zero(es)	001	090	180	255
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT SCANNING ACTIVE TIME SETTING				
5	Scan Three Characters From <a href="#">Appendix E, Keypad</a>	'0', '0' and '1'	'0', '9' and '0'	'1', '8' and '0'	'2', '5' and '5'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## Scanning Active Time – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Scanning Active Time Setting	
--	--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL
--	---

 005 = Scanning is active for 5 Seconds

## Flash On Time

This feature specifies the ON time for the indicator LED while in Flash Mode. The selectable range is 100 to 9,900 milliseconds (0.1 to 9.9 seconds), in 100 millisecond increments.

Follow these instructions to set this feature.

1. Determine the desired setting in milliseconds.
2. Divide the desired setting by 100 (setting is in 100ms increments). Pad the result with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT FLASH ON TIME SETTING.
5. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#) representing the duration which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

### NOTE

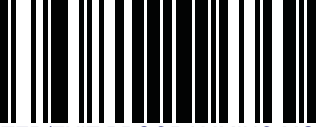
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure. See [Table 5](#) for some examples of how to set this feature.

**Table 5. Flash On Time Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Setting	500ms	1,000ms (1 sec.)	5200ms (5.2 sec.)	9,900ms (9.9 sec.)
2	Divide by 100 (and pad with leading zeroes to yield two digits)	05	10	52	99
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT FLASH OFF TIME SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '5'	'1' and '0'	'5' and '2'	'9' and '9'
6	Scan ENTER/EXIT PROGRAMMING MODE				

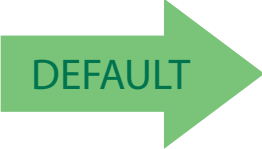
## Flash On Time – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Flash ON Time Setting
---

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

 CANCEL
---

 10 = Flash is ON for 1 Second

## Flash Off Time

This feature specifies the OFF time for the indicator LED while in Flash Mode. The selectable range is 100 to 9,900 milliseconds (0.1 to 9.9 seconds), in 100 millisecond increments.

Follow these instructions to set this feature.

1. Determine the desired setting in milliseconds.
2. Divide the desired setting by 100 (setting is in 100ms increments). Pad the result with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT FLASH OFF TIME SETTING.
5. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the duration which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

### NOTE

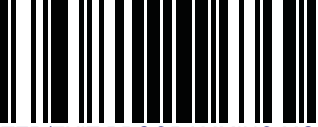
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure. See [Table 6](#) for some examples of how to set this feature.

**Table 6. Flash Off Time Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Setting	500ms	1,000ms (1 sec.)	5200ms (5.2 sec.)	9,900ms (9.9 sec.)
2	Divide by 100 (and pad with leading zeroes to yield two digits)	05	10	52	99
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT FLASH OFF TIME SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '5'	'1' and '0'	'5' and '2'	'9' and '9'
6	Scan ENTER/EXIT PROGRAMMING MODE				

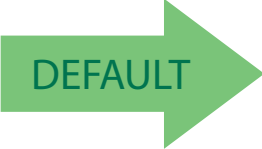
## Flash Off Time – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Flash OFF Time Setting
--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

 CANCEL
---

 06 = Flash is OFF for 600ms

## Stand Mode Sensitivity

Sets the sensitivity level for stand mode wakeup. Choices are low, medium and high.

 ENTER/EXIT PROGRAMMING MODE	
	 Stand Mode Sensitivity = Low
 Stand Mode Sensitivity = Medium	 DEFAULT
	 Stand Mode Sensitivity = High

## Green Spot Duration

Specifies the duration of the good read pointer beam after a good read.

 ENTER/EXIT PROGRAMMING MODE	
	 Green Spot Duration = Disable (Green Spot is Off)
 Green Spot Duration = Short (300 msec)	
	 Green Spot Duration = Medium (500 msec)
 Green Spot Duration = Long (800 msec)	



# Chapter 5

## RS-232 ONLY Interface

### Introduction

Use the programming barcodes in this chapter if modifications to the standard RS-232 interface settings are necessary to meet your system's requirements. Additional settings which apply to both the RS-232 and USB interfaces are available in [Chapter 6, RS-232/USB-Com Interfaces](#).

### RS-232 Standard Factory Settings

Reference [Appendix B, Standard Defaults](#) for a listing of standard factory settings.

### Baud Rate

Baud rate is the number of bits of data transmitted per second. Set the reader's baud rate to match the baud rate setting of the host device. With an improper baud rate setting, data may not reach the host correctly.

 ENTER/EXIT PROGRAMMING MODE	
	 Baud Rate = 1200
 Baud Rate = 2400	
	 Baud Rate = 4800

# Baud Rate — continued

 ENTER/EXIT PROGRAMMING MODE	
 Baud Rate = 9600	
	 Baud Rate = 19,200
 Baud Rate = 38,400	
	 Baud Rate = 57,600
 Baud Rate = 115,200	

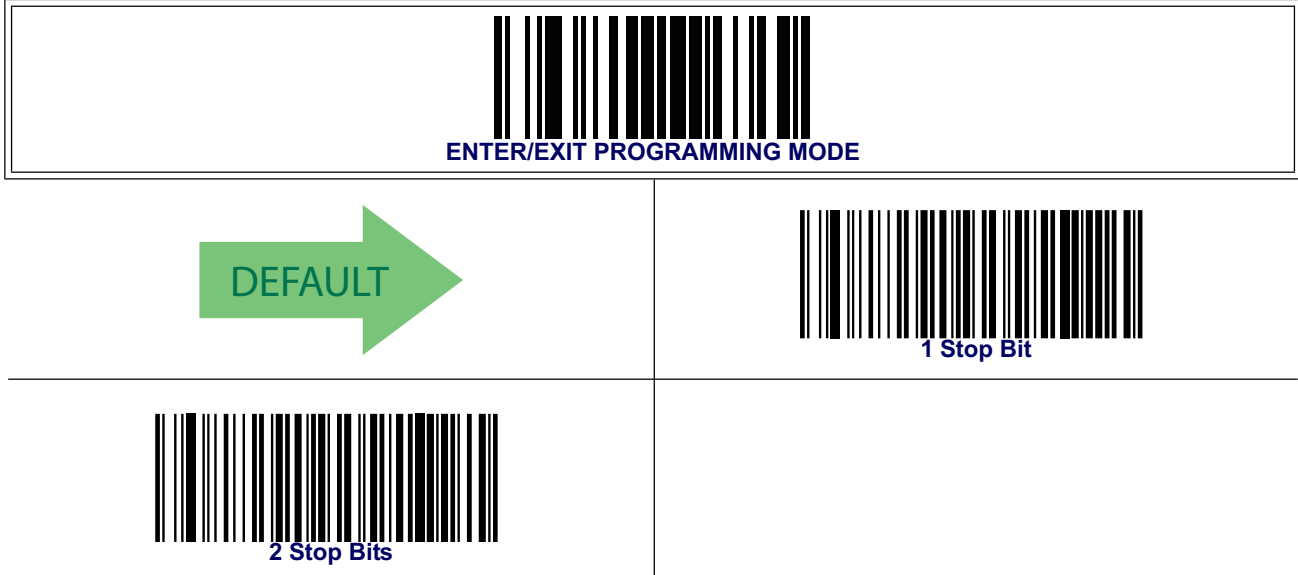
## Data Bits

This parameter allows the reader to interface with devices requiring a 7-bit or 8-bit ASCII protocol for sending and receiving data.



## Stop Bits

The stop bit(s) at the end of each transmitted character marks the end of transmission of one character and prepares the receiving device for the next character in the serial data stream. The number of stop bits selected (one or two) depends on the number the receiving terminal is programmed to accommodate. Set the number of stop bits to match host device requirements.



## Parity

This feature specifies parity required for sending and receiving data. A parity check bit is the most significant bit of each ASCII coded character. Select the parity type according to host device requirements.

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



## Handshaking Control

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

- RTS — RTS is asserted during transmissions. CTS is ignored.
- RTS/CTS — RTS is asserted during transmissions. CTS gates transmissions.
- RTS/XON/XOFF — RTS is asserted during transmissions. CTS is ignored. XON and XOFF gate transmissions.
- RTS On/CTS — RTS is always asserted. CTS gates transmissions.
- RTS/CTS Scan Control — RTS is asserted during transmissions. CTS gates transmissions and controls enable and disable state of scanner.



# Chapter 6

## RS-232/USB-Com Interfaces

---

### Introduction

The programming barcodes in this chapter allow modifications to the standard RS-232 and USB-Com interfaces.

### Standard Factory Settings

Reference [Appendix B, Standard Defaults](#) for a listing of standard factory settings.

## Intercharacter Delay

This parameter specifies the intercharacter delay between the end of one character and the beginning of the next. The delay can be set within a range of zero (0) to 990 milliseconds in 10ms increments. A setting of zero specifies no delay.

To set the delay:

1. Determine the desired setting in milliseconds.
2. Divide the desired setting by 10 (setting is in 10ms increments). Pad the result with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT INTERCHARACTER DELAY SETTING.
5. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the duration which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

**NOTE**

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

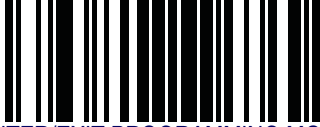


This completes the procedure. See [Table 7](#) for some examples of how to set this feature.


**Table 7. Intercharacter Delay Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Setting	50ms	150ms	600ms	850ms
2	Divide by 10 (and pad with leading zeroes to yield two-digits)	05	15	60	85
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT INTERCHARACTER DELAY SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '5'	'5' and '0'	0' and '0'	'8' and '5'
6	Scan ENTER/EXIT PROGRAMMING MODE				



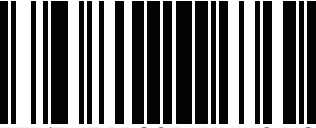



## Intercharacter Delay – cont.

 ENTER/EXIT PROGRAMMING MODE	
	 Intercharacter Delay = No Delay
 Select Intercharacter Delay Setting	
<p>Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.</p>	 CANCEL


**DEFAULT** 00 = No Intercharacter Delay

## Beep On ASCII BEL

When this parameter is enabled, the reader issues a beep when a <BEL> character is detected on the RS-232 serial line. <BEL> is issued to gain a user's attention to an illegal entry or other important event.

 ENTER/EXIT PROGRAMMING MODE	
 Beep On ASCII BEL = Disable	 DEFAULT
 Beep On ASCII BEL = Enable	

## Beep On Not on File

This option enables/disables the action of the reader to sound a three beep sequence upon receiving a Not-On-File (NOF) host command.

 ENTER/EXIT PROGRAMMING MODE	
 Beep On Not On File = Disable	
 DEFAULT	 Beep On Not On File = Enable

## ACK NAK Options

This enables/disables the ability of the reader to support the RS-232 ACK/NAK protocol. When configured, the reader and/or host sends an “ACK” when it receives data properly, and sends “NAK” when the data is in error.

Options are:

- Disable
- Enable for label transmission — The reader expects an ACK/NAK response from the host when a label is sent.
- Enable for host-command acknowledge — The reader will respond with ACK/NAK when the host sends a command.
- Enable for label transmission and host-command acknowledge

 ENTER/EXIT PROGRAMMING MODE	
 DEFAULT	 ACK/NAK Protocol = Disable ACK/NAK
 ACK/NAK Protocol = Enable for label transmission	
	 ACK/NAK Protocol = Enable for host-command acknowledge
 ACK/NAK Protocol = Enable for label transmission and host-com- mand acknowledge	

## ACK Character

This setting specifies an ASCII character or hex value to be used as the ACK character. ASCII characters or any hex value from 0 to 0xFF can be selected.



**NOTE**

Setting to previously defined characters such as XON, XOFF, or host commands conflicts with normal operation of these characters. 8-bit data is not recognized when the option **Data Bits** has been set as 7 Data Bits.

To set this feature:

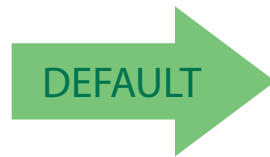
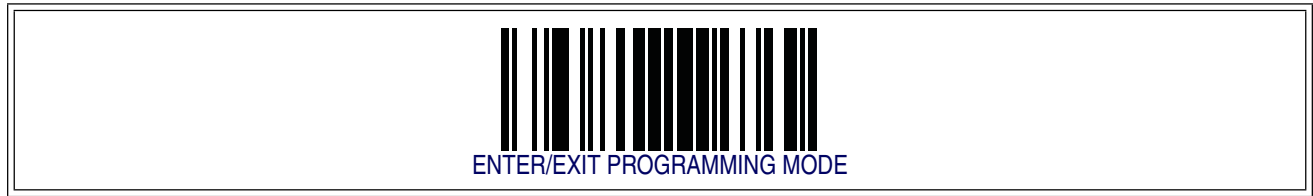
1. Determine the desired character or value.
2. Use the [ASCII Chart](#) on the inside back cover of this manual to find the hex equivalent for the desired character/value.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT ACK CHARACTER SETTING.
5. Scan the appropriate two alpha-numeric characters from the keypad in [Appendix E, Keypad](#), that represent the desired character/value in step 1 above. The second character will cause a two-beep indication.
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure. See [Table 8](#) for some examples of how to set this feature.

**Table 8. ACK Character Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Character/Value	ACK	\$	@	>
2	Hex equivalent	0x06	0x24	0x40	0x3E
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT ACK CHARACTER SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '6'	'2' and '4'	'4' and '0'	'3' AND 'E'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## ACK Character — cont.



0x06 'ACK' Character

## NAK Character

This setting specifies an ASCII character or hex value to be used as the NAK character. ASCII characters or any hex value from 0 to 0xFF can be selected.



### NOTE

Setting to previously defined characters such as XON, XOFF, or host commands conflicts with normal operation of these characters. 8-bit data is not recognized when the option **Data Bits** has been set as 7 Data Bits.

To set this feature:

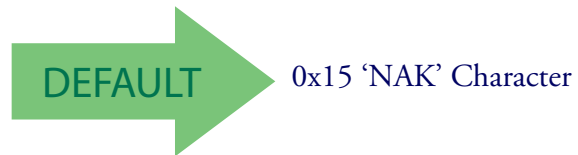
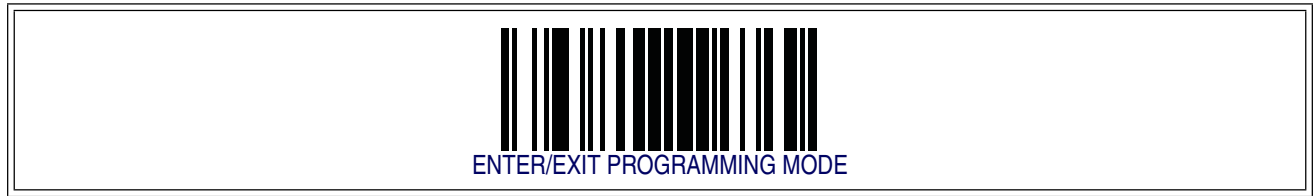
1. Determine the desired character or value.
2. Use the [ASCII Chart](#) on the inside back cover of this manual to find the hex equivalent for the desired character/value.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT NAK CHARACTER SETTING.
5. Scan the appropriate two alpha-numeric characters from the keypad in [Appendix E, Keypad](#), that represent the desired character/value in step 1 above. The second character will cause a two-beep indication.
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure. See [Table 9](#) for some examples of how to set this feature.

**Table 9. NAK Character Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Character/Value	NAK	\$	@	>
2	Hex equivalent	0x15	0x24	0x40	0x3E
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT ACK CHARACTER SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'1' and '5'	'2' and '4'	'4' and '0'	'3' AND 'E'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## NAK Character – cont.



## ACK NAK Timeout Value

This option specifies the amount of time the reader waits for an ACK character from the host following label transmission. The selectable timeout range is 200 milliseconds to 15,000ms (15 seconds) in 200ms increments. A selection of 0 disables the timeout.

To set this value:

1. Determine the desired setting in milliseconds.
2. Divide the desired setting by 200 (setting is in 200ms increments). Pad the result with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT ACK NAK TIMEOUT VALUE SETTING.
5. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the duration which was determined in the steps above. You will hear a two-beep indication after the last character.



If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

**NOTE**

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

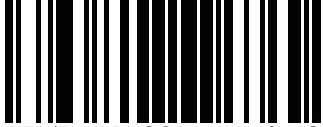

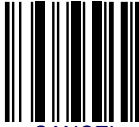
This completes the procedure. See [Table 10](#) for some examples of how to set this feature.

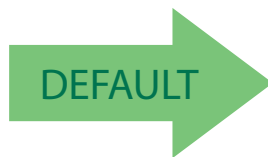
**Table 10. ACK NAK Timeout Value Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Setting	200ms	1,000ms (1 sec.)	5200ms (5.2 sec.)	15,000ms (1 sec.)
2	Divide by 200	01	05	26	75
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT ACK NAK TIMEOUT VALUE SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '1'	'0' and '5'	'2' and '6'	'7' and '5'
7	Scan ENTER/EXIT PROGRAMMING MODE				



## ACK NAK Timeout Value – cont.

 ENTER/EXIT PROGRAMMING MODE	
 Select ACK NAK Timeout Value Setting	
Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL



01 ACK NAK Timeout value is 200ms

## ACK NAK Retry Count

This feature specifies the number of times the reader retries a label transmission due to a retry condition. The selectable range is from 1 to 254 retries. A selection of 0 disables the count, and a selection of 255 specifies unlimited retries.

To set this feature:

1. Determine the desired setting.
2. Pad the number with leading zeroes to yield three digits. For example: 0 = 000, 5 = 005, 20 = 020, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT ACK NAK RETRY COUNT SETTING.
5. Scan the appropriate three digits from the keypad in [Appendix E, Keypad](#), that represent the number which was determined in the steps above. You will hear a two-beep indication after the last character.



If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

**NOTE**

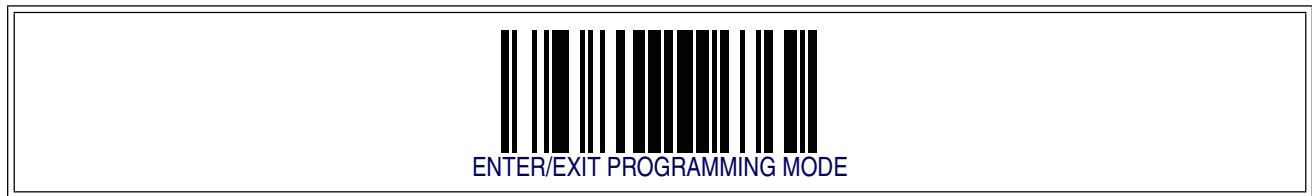
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure. See [Table 11](#) for some examples of how to set this feature.

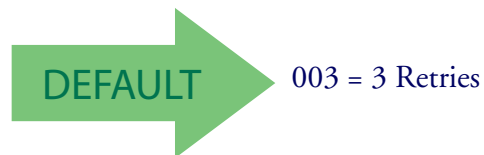
**Table 11. ACK NAK Retry Count Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Setting	Disable Retry Count	3 Retries	54 Retries	Unlimited Retries
2	Pad with leading zero(es)	000	003	054	255
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT ACK NAK RETRY COUNT SETTING				
5	Scan Three Characters From <a href="#">Appendix E, Keypad</a>	'0', '0' and '0'	'0', '0' and '3'	'0', '5' and '4'	'2', '5' and '5'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## ACK NAK Retry Count — cont.



Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

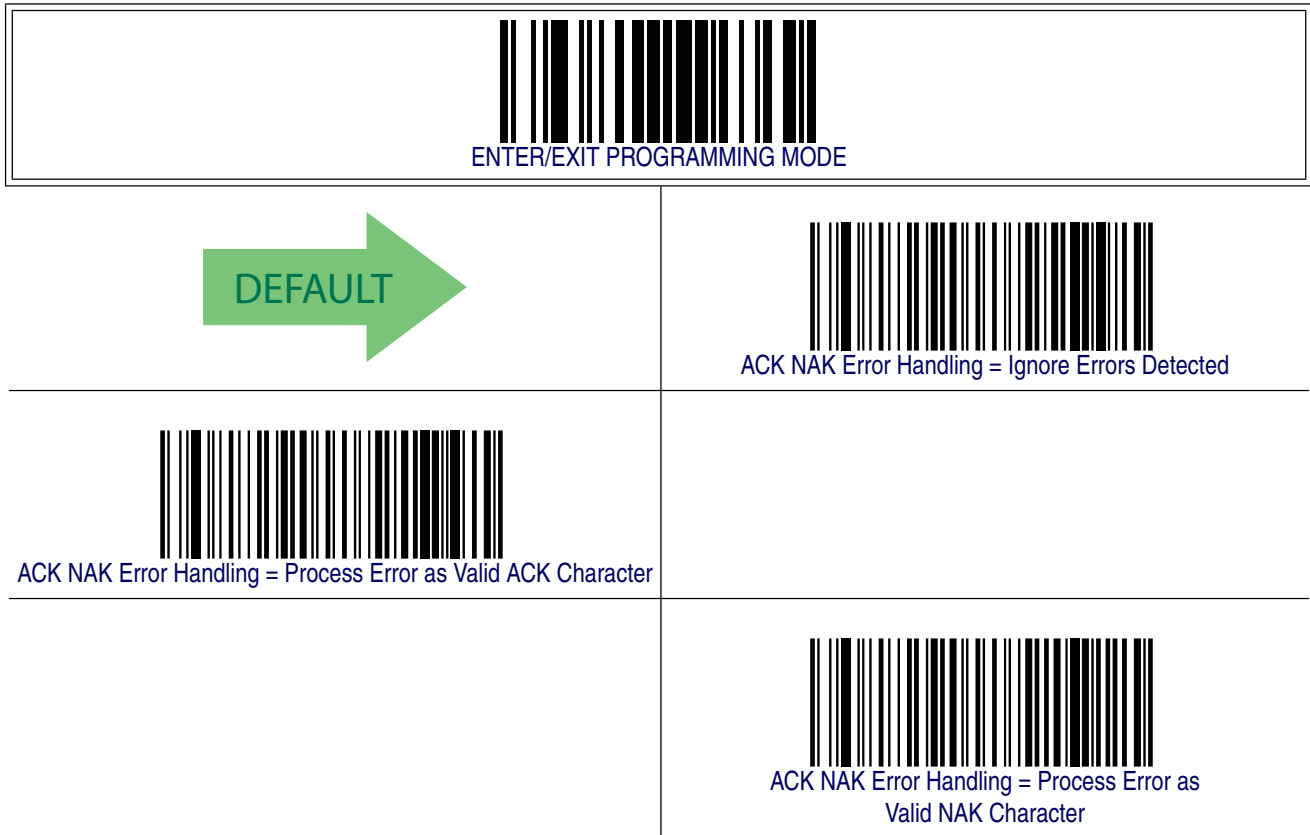


## ACK NAK Error Handling

This feature specifies the method the reader uses to handle receive errors detected while waiting for an ACK character from the host.

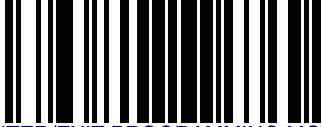



Options are:

- Ignore errors detected
- Process error as valid ACK character
- Process error as valid NAK character



## Indicate Transmission Failure

This option enables/disables the reader's ability to sound an error beep to indicate a transmission failure while in ACK/NAK mode.

 ENTER/EXIT PROGRAMMING MODE	
	 Indicate Transmission Failure = Disable Indication
 Indicate Transmission Failure = Enable Indication	

## Disable Character

Specifies the value of the RS-232 host command used to disable the reader. ASCII characters or any hex value from 0 to 0xFF can be selected.



**NOTE**

Setting to previously defined characters such as XON, XOFF, or host commands conflicts with normal operation of these characters. 8-bit data is not recognized when the option [Data Bits](#) has been set as 7 Data Bits.

To set the value:

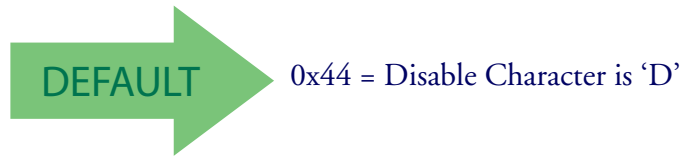
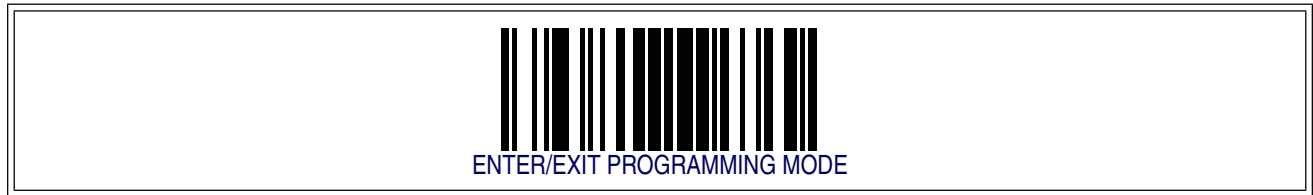
1. Determine the desired character or value. A setting of 0xFF indicates the the Disable Character is not used (not available).
2. Use the [ASCII Chart](#) on the inside back cover of this manual to find the hex equivalent for the desired character/value.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT DISABLE CHARACTER SETTING.
5. Scan the appropriate two alpha-numeric characters from the keypad in [Appendix E, Keypad](#), that represent the desired character/value in step 1 above. The second character will cause a two-beep indication.
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure. See [Table 12](#) for some examples of how to set this feature.

**Table 12. Disable Character Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired character/value	'd'	'}'	'D'	Disable Command Not Used
2	Hex equivalent	0x64	0x7D	0x44	0xFF
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT DISABLE CHARACTER VALUE SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'6' and '4'	'7' and 'D'	'4' and '4'	'F' AND 'F'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## Disable Character – cont.



## Enable Character

Specifies the value of the RS-232 host command used to enable the reader. ASCII characters or any hex value from 0 to 0xFF can be selected.



**NOTE**

Setting to previously defined characters such as XON, XOFF, or host commands conflicts with normal operation of these characters. 8-bit data is not recognized when the option **Data Bits** has been set as 7 Data Bits.

To set this feature:

Determine the desired character or value. A setting of 0xFF indicates the the Enable Character is not used (not available).

1. Determine the desired character or value.
2. Use the [ASCII Chart](#) on the inside back cover of this manual to find the hex equivalent for the desired character/value.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT ENABLE CHARACTER SETTING.
5. Scan the appropriate two alpha-numeric characters from the keypad in [Appendix E, Keypad](#), that represent the desired character/value in step 2 above. The second character will cause a two-beep indication.
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

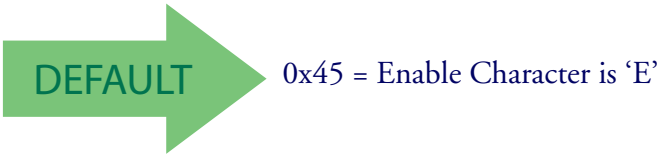
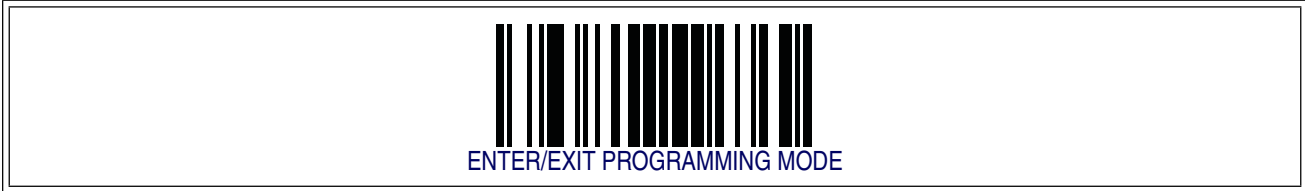
This completes the procedure. See [Table 13](#) for some examples of how to set this feature.

**Table 13. Enable Character Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired character/value	'e'	'}'	'E'	Enable Command Not Used
2	Hex equivalent	0x65	0x7D	0x45	0xFF
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT DISABLE CHARACTER VALUE SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'6' and '5'	'7' and 'D'	'4' and '5'	'F' AND 'F'
6	Scan ENTER/EXIT PROGRAMMING MODE				



# Enable Character – cont.



# NOTES

# Chapter 7

## Keyboard Interface

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### Introduction

Use the programming barcodes in this chapter to select options for USB Keyboard and Wedge Interfaces.

### Standard Factory Settings

Reference [Appendix B, Standard Defaults](#) for a listing of standard factory settings.

### Scancode Tables

Information about control character emulation which applies to keyboard interfaces is listed in [Appendix F, Scancode Tables](#).

## Country Mode

This feature specifies the country/language supported by the keyboard. Only the following interfaces support ALL Country Modes.

- USB Keyboard (without alternate key encoding)
- AT, PS/2 25-286, 30-286, 50, 50Z, 60, 70, 80, 90 & 95 w/Std Key Encoding
- Keyboard Wedge for IBM AT PS2 with standard key encoding but without external keyboard
- AT, PS/2 25-286, 30-286, 50, 50Z, 60, 70, 80, 90 & 95 without Alternate Key
- Keyboard Wedge for IBM AT PS2 without alternate key encoding but without external keyboard

All other interfaces support ONLY the following Country Modes: U.S., Belgium, Britain, France, Germany, Italy, Sweden.

 ENTER/EXIT PROGRAMMING MODE	
	 Country Mode = U.S.
 Country Mode = Belgium	
	 Country Mode = Britain
 Country Mode = Croatia	Supports only the interfaces listed in theCountry Mode feature description.
Supports only the interfaces listed in theCountry Mode feature description.	 Country Mode = Czechoslovakia

## Country Mode — continued

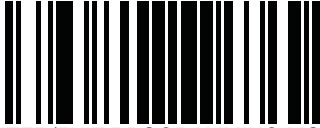
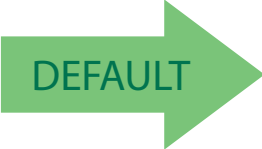

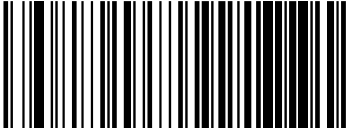
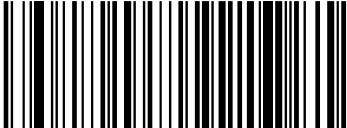
 ENTER/EXIT PROGRAMMING MODE	
 Country Mode = Denmark	Supports only the interfaces listed in theCountry Mode feature description.
	 Country Mode = France
 Country Mode = Germany	
Supports only the interfaces listed in theCountry Mode feature description.	 Country Mode = Hungary
 Country Mode = Italy	
Supports only the interfaces listed in theCountry Mode feature description.	 Country Mode = Japanese 106-key
 Country Mode = Norway	Supports only the interfaces listed in theCountry Mode feature description.

## Country Mode – continued

 ENTER/EXIT PROGRAMMING MODE	
 Country Mode = Poland	Supports only the interfaces listed in theCountry Mode feature description.
Supports only the interfaces listed in theCountry Mode feature description.	 Country Mode = Portugal
 Country Mode = Romania	Supports only the interfaces listed in theCountry Mode feature description.
Supports only the interfaces listed in theCountry Mode feature description.	 Country Mode = Slovakia
 Country Mode = Spain	
	 Country Mode = Sweden
 Country Mode = Switzerland	Supports only the interfaces listed in theCountry Mode feature description.

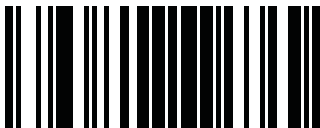
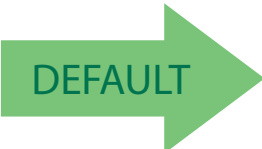


## Caps Lock State

This option specifies the format in which the reader sends character data. This applies to keyboard wedge interfaces. This does not apply when an alternate key encoding keyboard is selected.

 ENTER/EXIT PROGRAMMING MODE	
 DEFAULT	 Caps Lock State = Caps Lock OFF
 Caps Lock State = Caps Lock ON	
	 Caps Lock State = AUTO Caps Lock Enable

## Numlock

This option specifies the setting of the Numbers Lock (Numlock) key while in keyboard wedge interface. This only applies to alternate key encoding interfaces. It does not apply to USB keyboard.

 ENTER/EXIT PROGRAMMING MODE	
 DEFAULT	 Numlock = Numlock key unchanged
 Numlock = Numlock key toggled	

## Send Control Characters

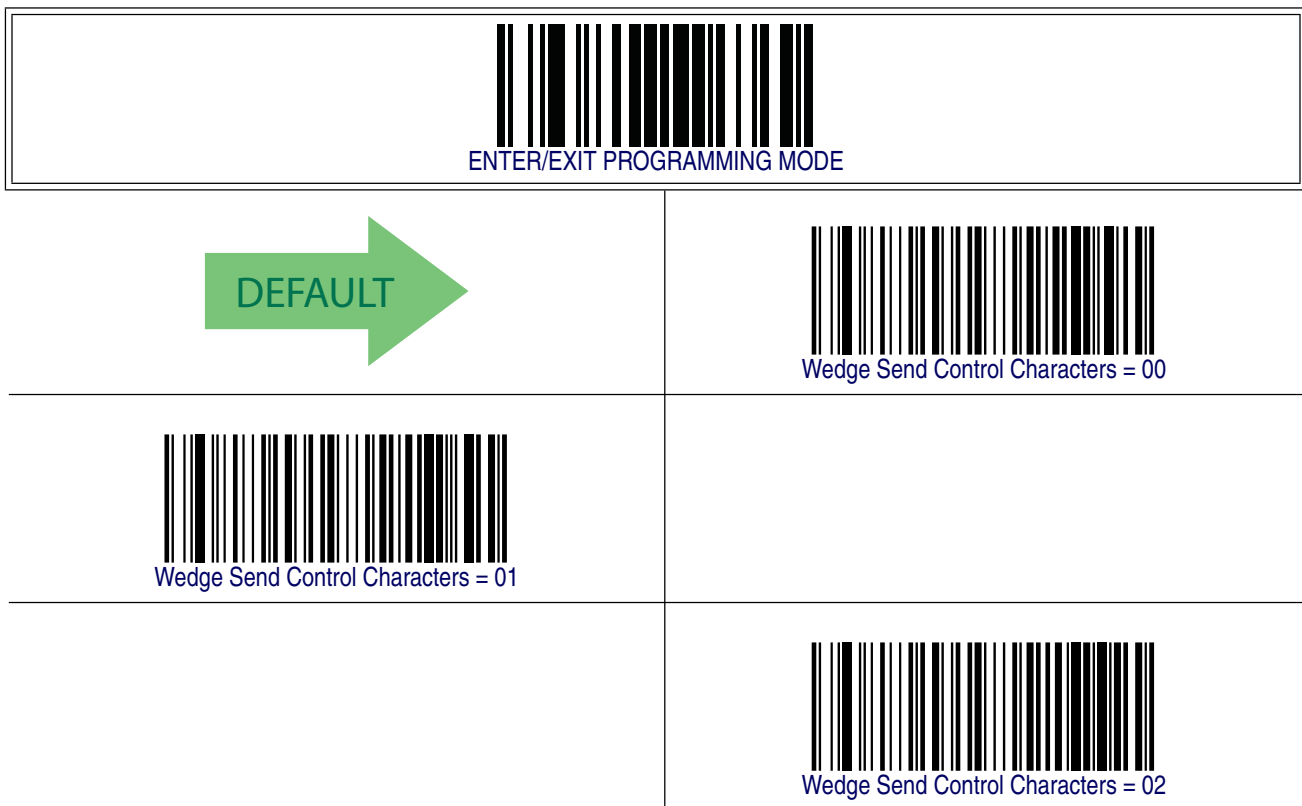
This feature Specifies how the reader transmits ASCII control characters to the host. Reference [Appendix F, Scancode Tables](#) for more information about control characters.

Options are as follows:

**Control Character 00** – Characters from 00 to 0x1F are sent as control character Ctrl+Keys, special keys are located from 0x80 to 0xA1.

**Control Character 01** – Characters from 00 to 0x1F are sent as control character Ctrl+Capital Key, special keys are located from 0x80 to 0xA1.

**Control Character 02** – Special keys are located from 00 to 0x1F and characters from 0x80 to 0xFE are intended as an extended ASCII table (Microsoft Windows Codepage 1252 — see [Microsoft Windows Codepage 1252 on page 306](#)).





## Wedge Quiet Interval

This option specifies the amount of time to look for keyboard activity before the reader breaks the keyboard connection in order to transmit data to host. The selectable range for this feature is from 0 to 990ms in 10ms increments.



This feature applies **ONLY** to the Keyboard Wedge interface.

### NOTE

Follow these instructions to set this feature:

1. Determine the desired setting in milliseconds.
2. Divide the desired setting by 10 (setting is in 10ms increments). Pad the result with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT WEDGE QUIET INTERVAL SETTING.
5. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the duration which was determined in the steps above. You will hear a two-beep indication after the last character.



If you make a mistake before the last character, scan the **CANCEL** barcode to abort and not save the entry string. You can then start again at the beginning.

### NOTE

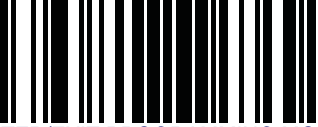
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure to set the Wedge Quiet Interval. See [Table 14](#) for some examples of how to set this feature.

**Table 14. Timeout Setting Examples**


STEP	ACTION	EXAMPLES			
1	Desired Setting	10ms	150ms	600ms	850ms
2	Divide by 10 (and pad with leading zeroes)	01	15	60	85
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT WEDGE QUIET INTERVAL SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '1'	'1' and '5'	'6' and '0'	'8' and '5'
6	Scan ENTER/EXIT PROGRAMMING MODE				

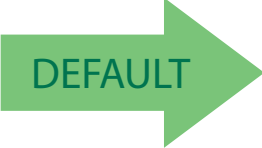
## Wedge Quiet Interval – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Wedge Quiet Interval Setting
--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

 CANCEL
---

 10 = Quiet Interval of 100 ms

## Intercharacter Delay

This parameter specifies the intercharacter delay between the end of one character and the beginning of the next. The delay can be set within a range of zero (0) to 990 milliseconds in 10ms increments. A setting of zero specifies no delay.



This feature applies **ONLY** to the Keyboard Wedge interface.

### NOTE

To set the delay:

1. Determine the desired setting in milliseconds.
2. Divide the desired setting by 10 (setting is in 10ms increments). Pad the result with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT INTERCHARACTER DELAY SETTING.
5. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the duration which was determined in the steps above. You will hear a two-beep indication after the last character.



If you make a mistake before the last character, scan the **CANCEL** barcode to abort and not save the entry string. You can then start again at the beginning.

### NOTE

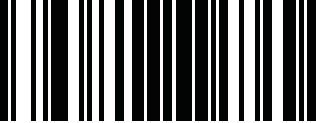



6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

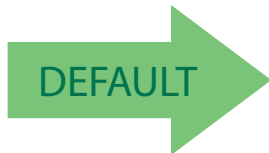
This completes the procedure. See [Table 14](#) for some examples of how to set this feature.

**Table 15. Intercharacter Delay Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Setting	50ms	150ms	600ms	850ms
2	Divide by 10 (and pad with leading zeroes to yield two-digits)	05	15	60	85
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT INTERCHARACTER DELAY SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '5'	'1' and '5'	'6' and '0'	'8' and '5'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## Intercharacter Delay – cont.

 ENTER/EXIT PROGRAMMING MODE	
	 Intercharacter Delay = No Delay
 Select Intercharacter Delay Setting	
Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL



00 = No Intercharacter Delay

## Intercode Delay

Specifies the delay between labels transmitted to the host for this interface. The selectable range for this feature is from 0 to 99 seconds.

Follow these instructions to set this feature:

1. Determine the desired setting.
2. Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT INTERCODE DELAY SETTING.
5. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the duration which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

### NOTE

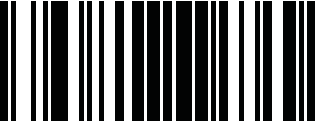
6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

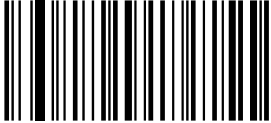
This completes the procedure. See [Table 16](#) for some examples of how to set this feature.

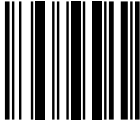
**Table 16. Wedge Intercode Delay Examples**

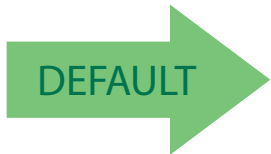
STEP	ACTION	EXAMPLES			
1	Desired Setting	No Delay	5 Seconds	60 Seconds	99 Seconds
2	Pad with leading zero(es)	00	05	60	99
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT INTERCODE DELAY SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '0'	'0' and '5'	'6' and '0'	'9' AND '9'
7	Scan ENTER/EXIT PROGRAMMING MODE				

## Intercode Delay – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Set Intercode Delay	
--	--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL
--	---

 00 = No Wedge Intercode Delay

## USB Keyboard Speed

This option specifies the USB poll rate for a USB keyboard.



This feature applies **ONLY** to the USB Keyboard interface.

**NOTE**

 ENTER/EXIT PROGRAMMING MODE	
 DEFAULT	 USB Keyboard Speed = 1ms
 USB Keyboard Speed = 2ms	
	 USB Keyboard Speed = 3ms
 USB Keyboard Speed = 4ms	
	 USB Keyboard Speed = 5ms

# USB Keyboard Speed – continued

 ENTER/EXIT PROGRAMMING MODE	
 USB Keyboard Speed = 6ms	
	 USB Keyboard Speed = 7ms
 USB Keyboard Speed = 8ms	
	 USB Keyboard Speed = 9ms
 USB Keyboard Speed = 10ms	



# Chapter 8

## USB-OEM Interface

---

### Introduction

Feature settings for USB interfaces differ depending upon which host type the reader will be connected with. Use the feature settings in this chapter and [Chapter 9, IBM 46XX Interface](#) to specifically configure for the USB-OEM interface. Other USB interfaces are included in the appropriate chapter for their host type.

### Standard Factory Settings

Reference [Appendix B, Standard Defaults](#) for a listing of standard factory settings.

## USB-OEM Device Usage

The USB-OEM protocol allows for the reader to be identified as one of two different types of barcode scanners. Depending on what other scanners you may already have connected to a USB-OEM POS, you may need to change this setting to enable all devices to communicate.

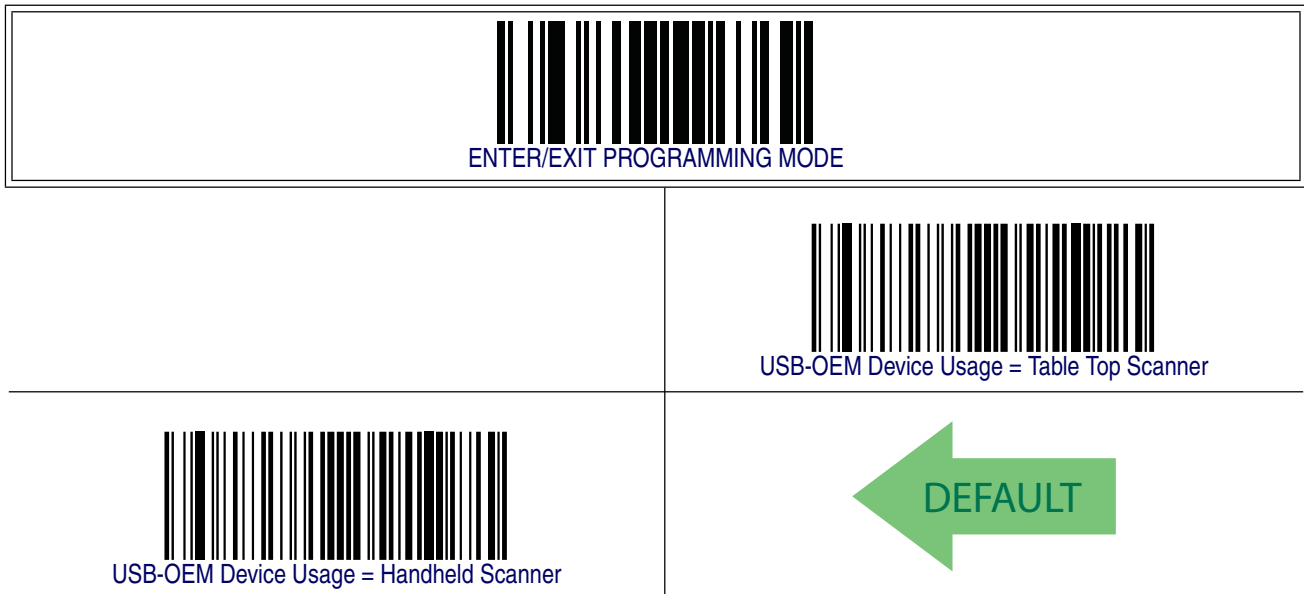
Options are:

- Table Top Scanner
- Handheld Scanner



**It may be necessary to switch device usage when connecting two readers/scanners of the same type to a POS system.**

**NOTE**



# Chapter 9

## IBM 46XX Interface

---

### Introduction

Use the barcodes in this section to configure programmable features for available IBM 46XX interfaces.

### IBM Standard Factory Settings

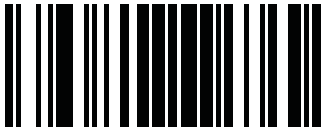
Reference [Appendix B, Standard Defaults](#) for a listing of standard factory settings.

## 46xx Number of Host Resets

Specifies how many consecutive resets are processed before the reader starts a five-second period to allow the user to enter Programming Mode and configure the reader. The configurable range for this feature is 1 to 15 resets.

 ENTER/EXIT PROGRAMMING MODE	
	 46xx Number of Host Resets = 1
 46xx Number of Host Resets = 2	
	 46xx Number of Host Resets = 3
 46xx Number of Host Resets = 4	
	 46xx Number of Host Resets = 5
 46xx Number of Host Resets = 6	

## 46xx Number of Host Resets – cont.

 ENTER/EXIT PROGRAMMING MODE	
	 46xx Number of Host Resets = 7
 46xx Number of Host Resets = 8	
	 46xx Number of Host Resets = 9
 46xx Number of Host Resets = 10	
	 46xx Number of Host Resets = 11
 46xx Number of Host Resets = 12	

## 46xx Number of Host Resets – cont.

 ENTER/EXIT PROGRAMMING MODE	
	 46xx Number of Host Resets = 13
 46xx Number of Host Resets = 14	
	 46xx Number of Host Resets = 15

## Transmit Labels in Code 39 Format

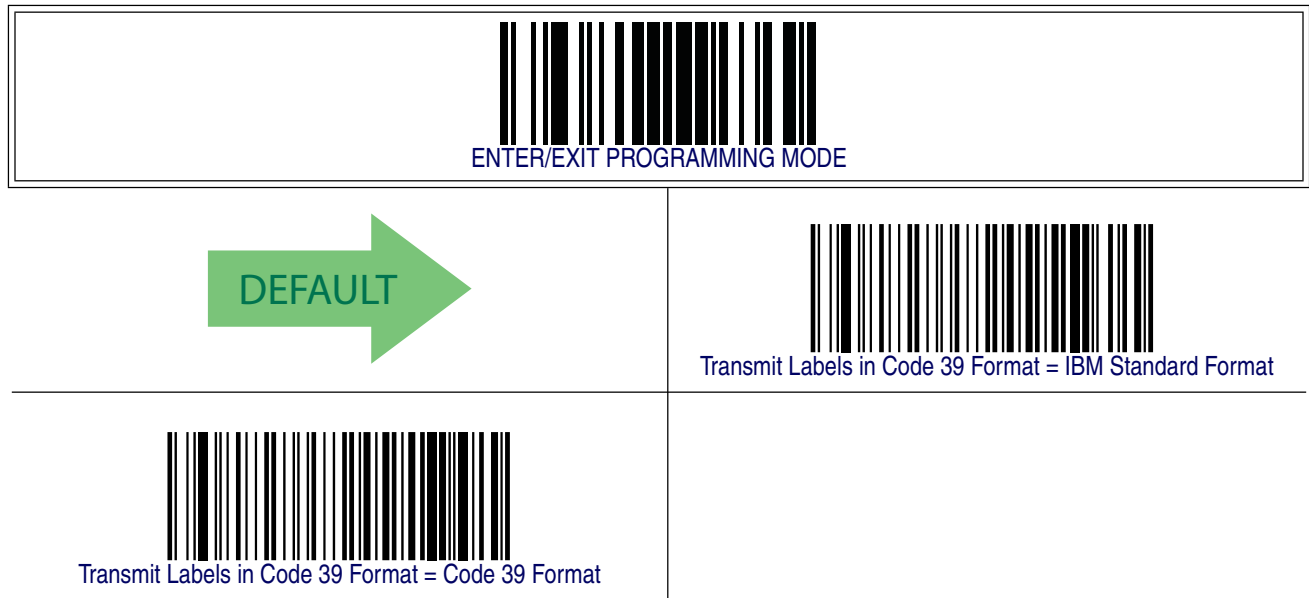
This feature enable/disables translation to Code 39 before transmitting label data to an IBM-46XX or a USB-OEM host. Only the symbology identifier is modified for the translation. The data is not converted to Code 39 or verified to be valid for Code 39.

Options are:

**IBM Standard Format** – Send labels in standard IBM format.

**Code 39 Format** – Translate the following symbologies to Code 39:

- USB-OEM: Code128, Code 93, and Codabar
- IBM-Port 5B: Code 128, Code 93, and Codabar
- IBM-Port 9B: Code 93 and Codabar



# NOTES



# Chapter 10

## Data Editing

### Data Editing Overview



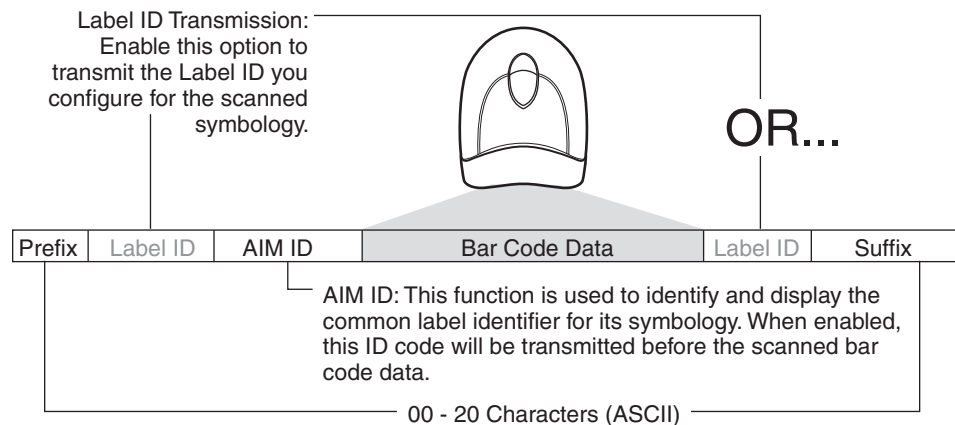
It is not recommended to use these features with IBM interfaces.

#### CAUTION

When a barcode is scanned, additional information can be sent to the host computer along with the barcode data. This combination of barcode data and supplementary user-defined data is called a “message string.” The features in this chapter can be used to build specific user-defined data into a message string.

There are several types of selectable data characters that can be sent before and after scanned data. You can specify if they should be sent with all symbologies, or only with specific symbologies. **Figure 3** shows the available elements you can add to a message string:

**Figure 3. Breakdown of a Message String**



Additional advanced editing is available. Contact [Technical Support](#) on page 3 for more information.

#### NOTE

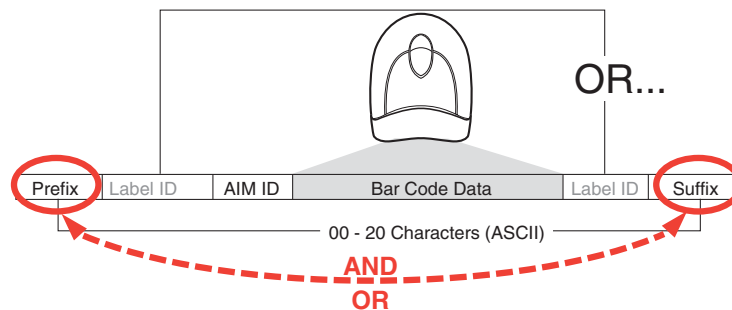
## Please Keep In Mind...

- Modifying a message string is not a mandatory requirement. Data editing is sophisticated feature allowing highly customizable output for advanced users. Factory default settings for data editing is typically set to NONE.
- A prefix or suffix may be applied (reference the [Symbologies](#) chapter for these settings) across all symbologies (set via the Global features in this chapter).
- You can add any character from the [ASCII Chart](#) (from 00-FF) on the inside back cover of this manual as a prefix, suffix or Label ID.
- Enter prefixes and suffixes in the order in which you want them to appear on the output.

## Global Prefix/Suffix

Up to 20 ASCII characters may be added as a prefix (in a position before the barcode data) and/or as a suffix (in a position following the barcode data) as indicated in [Figure 4](#).

**Figure 4. Prefix and Suffix Positions**



## Example: Setting a Prefix

In this example, we'll set a prefix for all symbologies.

1. Determine which ASCII character(s) are to be added to scanned barcode data. In this example, we'll add a dollar sign ('\$') as a prefix.
2. Scan the ENTER/EXIT barcode.
3. Scan the SET GLOBAL PREFIX barcode.
4. Reference the ASCII Chart on the inside back cover of this manual, to find the hex value assigned to the desired character. The corresponding hex number for the '\$' character is 24. To enter this selection code, scan the '2' and '4' barcodes from [Appendix E, Keypad](#).



### NOTE

**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

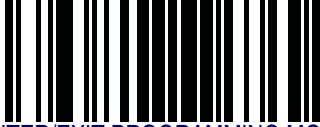


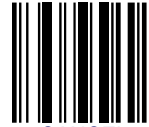
5. If less than the expected string of 20 characters are selected, scan the ENTER/EXIT barcode to terminate the string.

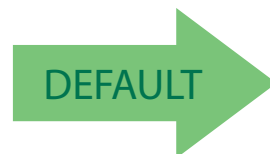
6. Scan the ENTER/EXIT barcode once again to exit Programming Mode.
7. The resulting message string would appear as follows:

Scanned barcode data:12345

Resulting message string output: \$12345

This option sets up to 20 characters each from the set of ASCII characters or any hex value from 00 to FF. To configure this feature, scan the ENTER/EXIT barcode to place the unit in Programming Mode, then the “Set Global Prefix” or “Set Global Suffix,” barcode followed by the digits (in hex) from the Alphanumeric characters in [Appendix E, Keypad](#) representing your desired character(s). If less than the expected string of 20 characters are selected, scan the ENTER/EXIT barcode to terminate the string. Reference the section, [Example: Setting a Prefix on page 90](#), for more information. Exit programming mode by scanning the ENTER/EXIT barcode once again.

 ENTER/EXIT PROGRAMMING MODE	
	 Set Global Prefix
 Set Global Suffix	
<p>Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.</p>	
 CANCEL	



**No Global Prefix**  
**Global Suffix = 0x0D (CR)**

## Global AIM ID



This feature enables/disables addition of AIM IDs for all symbology types.

### NOTE

AIM label identifiers (as opposed to custom characters you select yourself as with label identifiers) can be included with scanned barcode data. AIM label identifiers consist of three characters as follows:

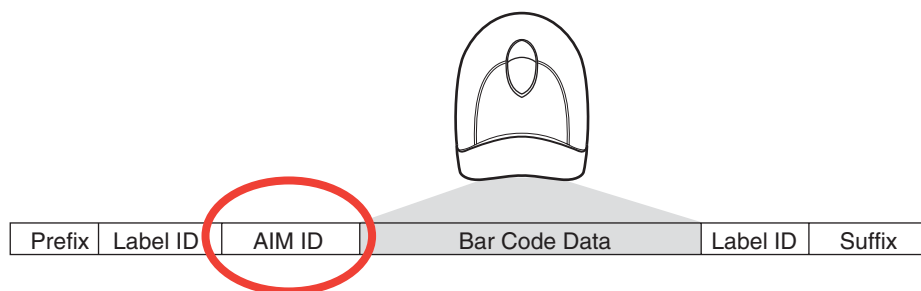
- A close brace character (ASCII '['), followed by...
- A code character (see the table below), followed by...
- A modifier character (the modifier character is symbol dependent).

SYMBOLGY	CHAR	SYMBOLGY	CHAR
UPC/EAN	E <sup>a</sup>	Code 128/GS1-128	C
Code 39 and Code 32	A	GS1 DataBar Omnidirectional, GS1 DataBar Expanded	e
Codabar	F	Standard 2 of 5	S
Interleaved 2 of 5	I	ISBN	X <sup>b</sup>
Code 93	G	Code 11	H

<sup>a.</sup> UPC-A and UPC-E labels are converted to EAN 13 when adding AIM IDs.

<sup>b.</sup> ISBN (X with a 0 modifier character)

**Figure 5. AIM ID**



## Global AIM ID – continued



## GS1-128 AIM ID

If Global AIM ID is disabled, the AIM ID for GS1-128 can be enabled/disabled independently. The AIM ID for GS1-128 is a ]C1, ]C2 or ]C3. AIM IDs for other symbologies can be enabled/disabled independently as well. Contact Customer Support for assistance.



## Label ID

A Label ID is a customizable code of up to three ASCII characters (each can be one of hex 0x01-0xFF), used to identify a barcode (symbology) type. It can be appended previous to or following the transmitted barcode data depending upon how this option is enabled. This feature provides options for configuring custom Label IDs as a pre-loaded set (see [Label ID: Pre-loaded Sets on page 95](#)) or individually per symbology (see [Label ID: Set Individually Per Symbology on page 98](#)). If you wish to program the reader to always include an industry standard label identifier for ALL symbology types, see the previous feature [Global AIM ID on page 92](#).

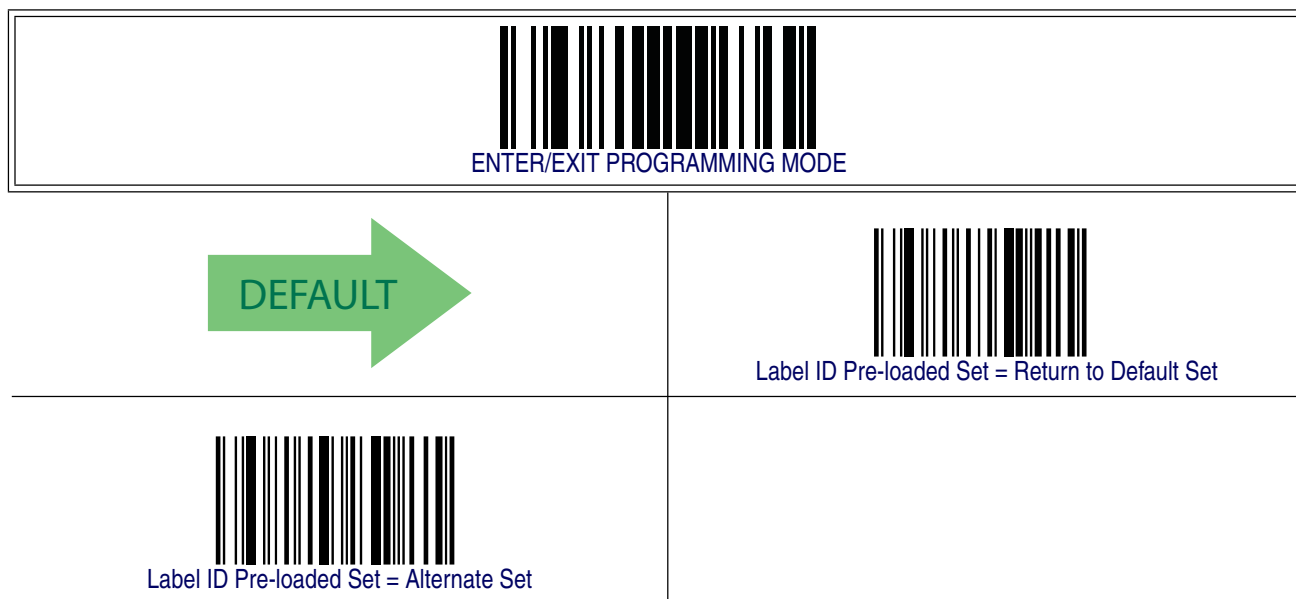
### Label ID: Pre-loaded Sets

The reader supports two pre-loaded sets of Label IDs. [Table 17](#) shows the default set and alternate set.



**CAUTION**

When changing from one Label ID set to another, all other reader configuration settings, including the host interface type, will be erased and set to the standard factory defaults. Any customized configuration will be lost.



**Table 17. Label ID Pre-loaded Sets**

Symbology	Default Label ID set		Alternate Label ID set	
	ASCII character	Hexidecimal value	ASCII character	Hexidecimal value
CODABAR	%	250000	R	520000
CODE11	CE	434500	b	620000
CODE128	#	230000	T	540000
CODE39	*	2A0000	V	560000
CODE4	4	340000	4	340000
CODE5	j	6A0000	j	6A0000
CODE93	&	260000	U	550000
GS1 DATABAR OMNIDIRECTIONAL	R4	523400	u	750000
GS1 DATABAR EXPANDED	RX	525800	t	740000
GS1 DATABAR LIMITED	RL	524C00	v	760000
DATALOGIC 2OF5	s	730000	s	730000
GS1-128		000000	k	6B0000
EAN13	F	460000	B	420000
EAN13 P2	F	460000	L	4C0000
EAN13 P5	F	460000	M	4D0000
EAN13 P8	F	460000	#	230000
EAN8	FF	464600	A	410000
EAN8 P2	FF	464600	J	4A0000
EAN8 P5	FF	464600	K	4B0000
EAN8 P8	FF	464600	*	2A0000
FOLLETT 2OF5	O	4F0000	O	4F0000
GTIN	G	470000	\$A	244100
GTIN2	G2	473200	\$B	244200
GTIN5	G5	473500	\$C	244300
GTIN8	G8	473800	\$D	244400
I2OF5	i	690000	N	4E0000
ISBN	l	490000	@	400000
ISBT128	f	660000	f	660000
CODE32	A	410000	X	580000



Symbology	Default Label ID set		Alternate Label ID set	
S25	s	730000	P	500000
UPCA	A	410000	C	430000
UPCA P2	A	410000	F	460000
UPCA P5	A	410000	G	470000
UPCA P8	A	410000	Q	510000
UPCE	E	450000	D	440000
UPCE P2	E	450000	H	480000
UPCE P5	E	450000	I	490000
UPCE P8	E	450000	E	450000

## Label ID: Set Individually Per Symbology

To configure a Label ID individually for a single symbology:

1. Scan the ENTER/EXIT barcode.
2. Select Label ID position as either BEFORE (Enable as Prefix) or AFTER (Enable as suffix) by scanning the appropriate barcode in the section [Label ID Control on page 100](#). Reference [Figure 6](#) for Label ID positioning options if multiple identification features are enabled.
3. Scan a barcode to select the symbology for which you wish to configure a custom Label ID from the section [Label ID Symbology Selection, starting on page 101](#).
4. Determine the desired character(s) (you may choose up to three) which will represent the Label ID for the selected symbology.
5. Turn to the [ASCII Chart](#) on the inside back cover of this manual and find the equivalent hex digits associated with your choice of Label ID. For example, if you wish to select an equal sign (=) as a Label ID, the chart indicates its associated hex characters as 3D. Turn to [Keypad, starting on page 291](#) and scan the barcodes representing the hex characters determined. For the example given, the characters '3' and 'D' would be scanned. More examples of Label ID settings are provided in [Table 18](#).



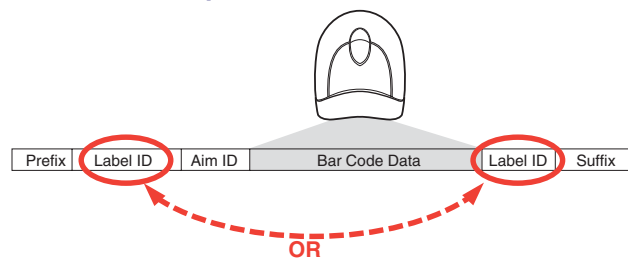
**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

### NOTE

6. Scan the ENTER/EXIT barcode to exit Label ID entry.
7. Scan the ENTER/EXIT barcode once again to exit Programming Mode.

This completes the steps to configure a Label ID for a given symbology.

**Figure 6. Label ID Position Options**



## Label ID – continued

**Table 18. Label ID Examples**

STEP	ACTION	EXAMPLES			
1.	Scan the ENTER/EXIT barcode	(Scanner enters Programming Mode)			
2.	Determine placement of the Label ID characters BEFORE or AFTER with regard to scanned data using <a href="#">Label ID Control on page 100</a>	Enable as Prefix	Enable as Suffix	Enable as Prefix	Enable as Suffix
3.	Scan the barcode selecting the symbology type you wish to designate label ID characters for using <a href="#">Label ID Symbology Selection, starting on page 101</a> .	GS1 DataBar Omnidirectional	Code 39	Interleaved 2 of 5	Code 32
4.	Custom Label ID example (desired characters):	D B *	= C 3	+	P H
5.	Find hex equivalents from the ASCII table (inside back cover), then scan in these digits/characters using the barcodes in the section: <a href="#">Keypad, starting on page 291</a> . If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	44 42 2A	3D 43 33	2B	50 48
6.	Scan the ENTER/EXIT barcode	(Scanner exits Label ID entry)			
7.	Scan the ENTER/EXIT barcode once again	(Scanner exits Programming Mode)			
<b>Result:</b>		DB*[barcode data]	[barcode data]=C3	+[barcode data]	[barcode data]PH

# Label ID – continued

## Label ID Control

This option controls whether a Label ID is disabled, or sent as a prefix or suffix for a given symbology type.

 ENTER/EXIT PROGRAMMING MODE	
	 Label ID Transmission = Disable
 Label ID Transmission = Enable as Prefix	
	 Label ID Transmission = Enable as Suffix
 CANCEL	<p>Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.</p>

## Label ID – continued

### Label ID Symbology Selection

This option selects the symbology for which a Label ID is to be configured. See [Label ID on page 95](#) for full instructions.

 ENTER/EXIT PROGRAMMING MODE	
	 Set UPC-A Label ID Character(s)
 Set UPC-A/P2 Label ID Character(s)	
	 Set UPC-A/P5 Label ID Character(s)
 Set UPC-A/GS1-128 Label ID Character(s)	
	 Set UPC-E Label ID Character(s)
 Set UPC-E/P2 Label ID Character(s)	

## Label ID – continued

### Label ID Symbology Selection – continued

This option selects the symbology for which a Label ID is to be configured. See [Label ID on page 95](#) for full instructions.

 ENTER/EXIT PROGRAMMING MODE	
	 Set UPC-E/P5 Label ID Character(s)
 Set UPC-E/GS1-128 Label ID Character(s)	
	 Set EAN 13 Label ID Character(s)
 Set EAN 13/P2 Label ID Character(s)	
	 Set EAN 13/P5 Label ID Character(s)
 Set EAN 13/GS1-128 Label ID Character(s)	

## Label ID – continued

### Label ID Symbology Selection – continued

This option selects the symbology for which a Label ID is to be configured. See [Label ID on page 95](#) for full instructions.

 ENTER/EXIT PROGRAMMING MODE	
	 Set EAN 8 Label ID Character(s)
 Set EAN 8/P2 Label ID Character(s)	
	 Set EAN 8/P5 Label ID Character(s)
 Set EAN 8/GS1-128 Label ID Character(s)	
	 Set GTIN Label ID Character(s)
 Set GTIN/P2 Label ID Character(s)	

## Label ID – continued

### Label ID Symbology Selection – continued

This option selects the symbology for which a Label ID is to be configured. See [Label ID on page 95](#) for full instructions.

 ENTER/EXIT PROGRAMMING MODE	
	 Set GTIN/P5 Label ID Character(s)
 Set GTIN/GS1-128 Label ID Character(s)	
	 Set GS1 DataBar Omnidirectional Label ID Character(s)
 Set GS1 DataBar Expanded Label ID Character(s)	
	 Set GS1 DataBar Limited Label ID Character(s)
 Set Code 39 Label ID Character(s)	



## Label ID – continued

### Label ID Symbology Selection – continued

This option selects the symbology for which a Label ID is to be configured. See [Label ID on page 95](#) for full instructions.

 ENTER/EXIT PROGRAMMING MODE	
 Set Code 32 Label ID Character(s)	
	 Set Code 128 Label ID Character(s)
 Set Concatinated ISBT 128 Label ID Character(s)	
	 Set GS1-128 Label ID Character(s)
 Set Interleaved 2 of 5 Label ID Character(s)	
	 Set Codabar Label ID Character(s)
 Set Code 11 Label ID Character(s)	

## Label ID — continued

### Label ID Symbology Selection — continued

This option selects the symbology for which a Label ID is to be configured. See [Label ID on page 95](#) for full instructions.

 ENTER/EXIT PROGRAMMING MODE	
 Set Standard 2 of 5 Label ID Character(s)	
	 Set Code 4 Label ID Character(s)
 Set Code 5 Label ID Character(s)	
	 Set Follett 2 of 5 Label ID Character(s)

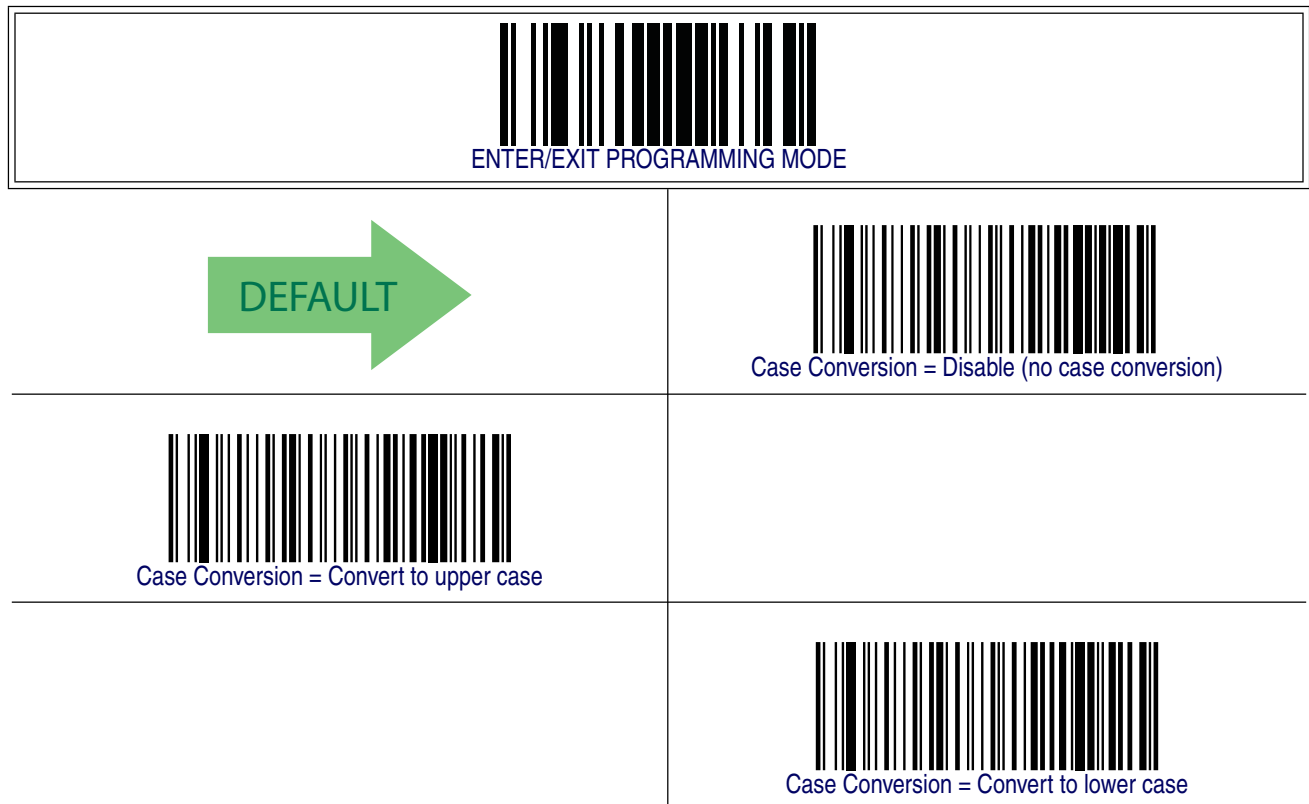
## Case Conversion

This feature allows conversion of the case of all alphabetic characters to upper or lower case.



Case conversion affects **ONLY** scanned barcode data, and does not affect Label ID, Prefix, Suffix, or other appended data.

### NOTE



## Character Conversion

Character conversion is an eight byte configuration item. The eight bytes are 4 character pairs represented in hexadecimal ASCII values. The first character in the pair is the character that will be converted. The second character in the pair is the character to convert to. If the character to convert in a pair is FF, then no conversion is done.

For example, if you have the character conversion configuration item set to the following: 41423132FFFFFFF

The first pair is 4142 or AB (41 hex is an ASCII capital A, 42 hex is an ASCII capital B) and the second pair is 3132 or 12 (31 hex is an ASCII 1, 32 is an ASCII 2). The other two pairs are FFFF and FFFF.

With the label, AB12BA21, it would look as follows after the character conversion: BB22BB22.

The A characters were converted to B characters and the 1 characters were converted to 2 characters. Nothing is done with the last two character pairs, since they are all FF.

To set Character Conversion:

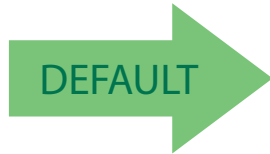
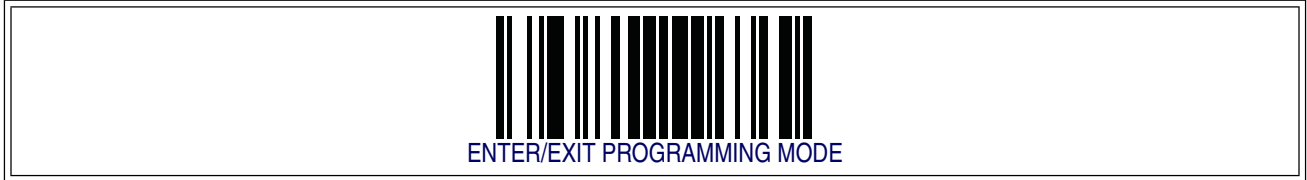
1. Scan the ENTER/EXIT barcode.
2. Scan the “Configure Character Conversion” barcode.
3. Determine the desired string. Sixteen positions must be determined as in the above example. Next, turn to the ASCII Chart on the inside back cover of this manual and find the equivalent hex digits needed to fulfill the string.
4. Turn to [Appendix E, Keypad](#) and scan the barcodes representing the hex characters determined in the previous step.
5. Scan the ENTER/EXIT barcode to exit Programming Mode.



### NOTE

**If less than the expected string of 16 characters are selected, scan the ENTER/EXIT barcode twice to accept the selections and exit Programming Mode.**

## Character Conversion – continued



**0xFFFFFFFFFFFFFFFF**  
**(No character conversion)**

# NOTES

# Chapter 11

## Symbologies

---

### Introduction

The reader supports the following symbologies (barcode types). Options for each symbology are included in this chapter.

### Symbologies

- UPC-A
- UPC-E
- EAN 13 (JAN 13)
- EAN 8 (JAN 8)
- GS1 DataBar Omnidirectional
- GS1 DataBar Expanded
- GS1 DataBar Limited
- Code 39
- Code 32
- Code 128
- GS1-128
- Interleaved 2 of 5 (I 2 of 5)
- Datalogic 2 of 5
- Codabar
- Code 11
- Standard 2 of 5
- ISBT 128
- Code 4
- Code 5
- Follett 2 of 5

### Standard Factory Settings for Symbologies

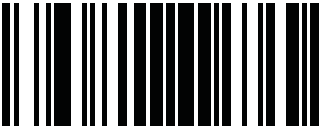



Default settings are indicated at each feature/option with a green arrow. Also reference [Appendix B, Standard Defaults](#) for a listing of the most widely used set of standard factory settings. That section also provides space to record any custom settings needed or implemented for your system.

## UPC-A

The following options apply to the UPC-A symbology.

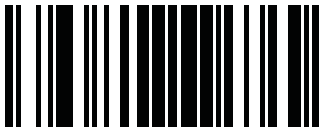
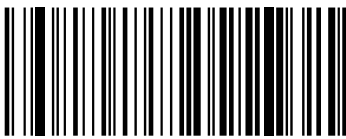


### UPC-A Enable/Disable

When disabled, the reader will not read UPC-A barcodes.

 ENTER/EXIT PROGRAMMING MODE	
	 UPC-A = Disable
 UPC-A = Enable	 DEFAULT

### UPC-A Check Character Transmission

Enable this option to transmit the check character along with UPC-A barcode data.

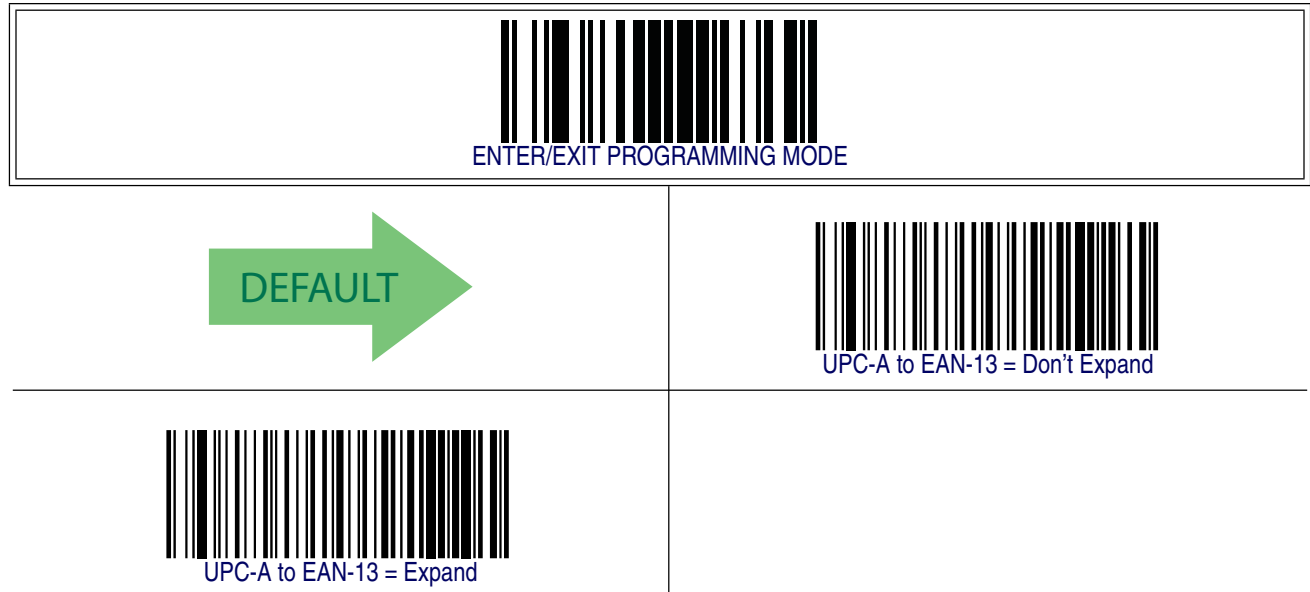
 ENTER/EXIT PROGRAMMING MODE	
	 UPC-A Check Character Transmission = Don't Send
 UPC-A Check Character Transmission = Send	 DEFAULT



## UPC-A – cont.

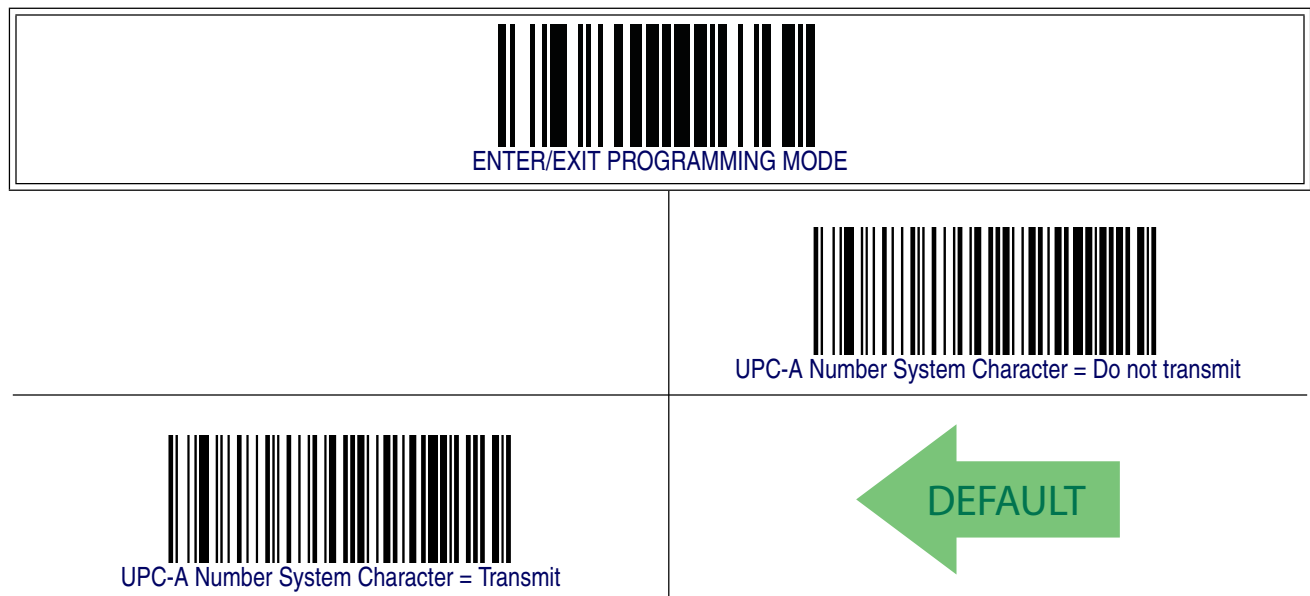
### Expand UPC-A to EAN-13

Expands UPC-A data to the EAN-13 data format. Selecting this feature also changes the symbology ID to match those required for EAN-13.



### UPC-A Number System Character Transmission

This feature enables/disables transmission of the UPC-A number system character.






# UPC-A – cont.

## In-Store Minimum Reads

This feature specifies the minimum number of consecutive times an in-store label must be decoded before it is accepted as good read.

In-store labels are defined as UPC-A labels with a number-system character of 2 or 4 as well as EAN 8 and EAN 13 labels with a Flag1 character of 2 or an EAN 13 label starting with the three characters '980'.

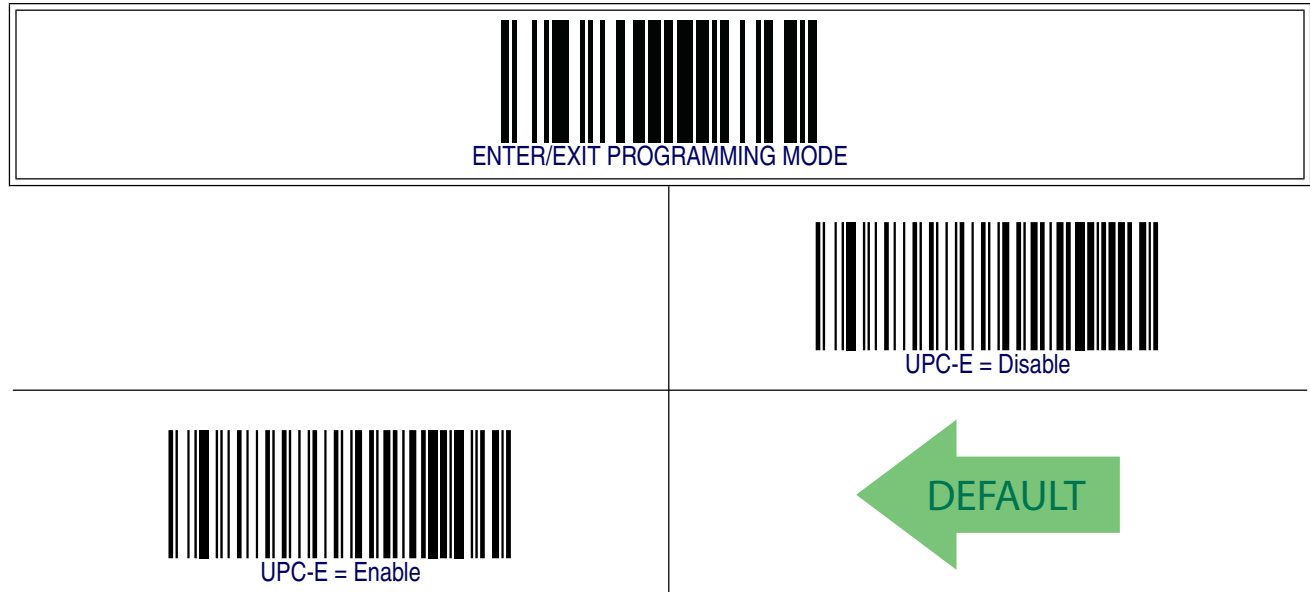
 ENTER/EXIT PROGRAMMING MODE	
	 In-Store Minimum Reads = 1
 In-Store Minimum Reads = 2	
	 In-Store Minimum Reads = 3
 In-Store Minimum Reads = 4	

## UPC-E

The following options apply to the UPC-E symbology.

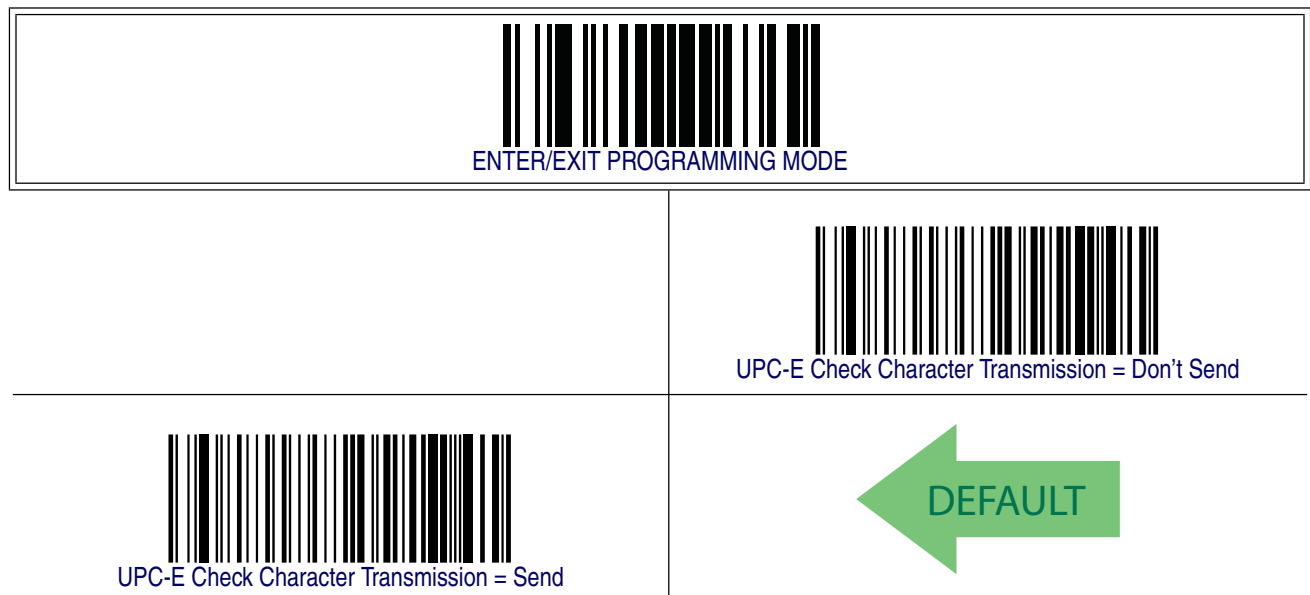
### UPC-E Enable/Disable

When disabled, the reader will not read UPC-E barcodes.



### UPC-E Check Character Transmission

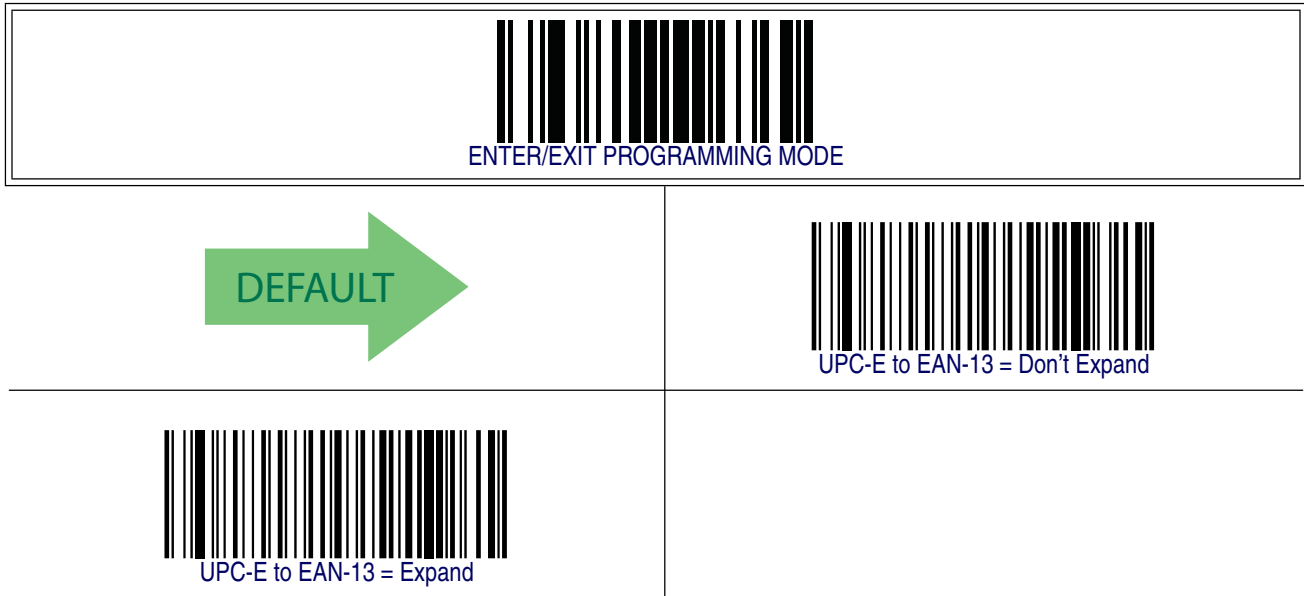
Enable this option to transmit the check character along with UPC-E barcode data.



## UPC-E — cont.

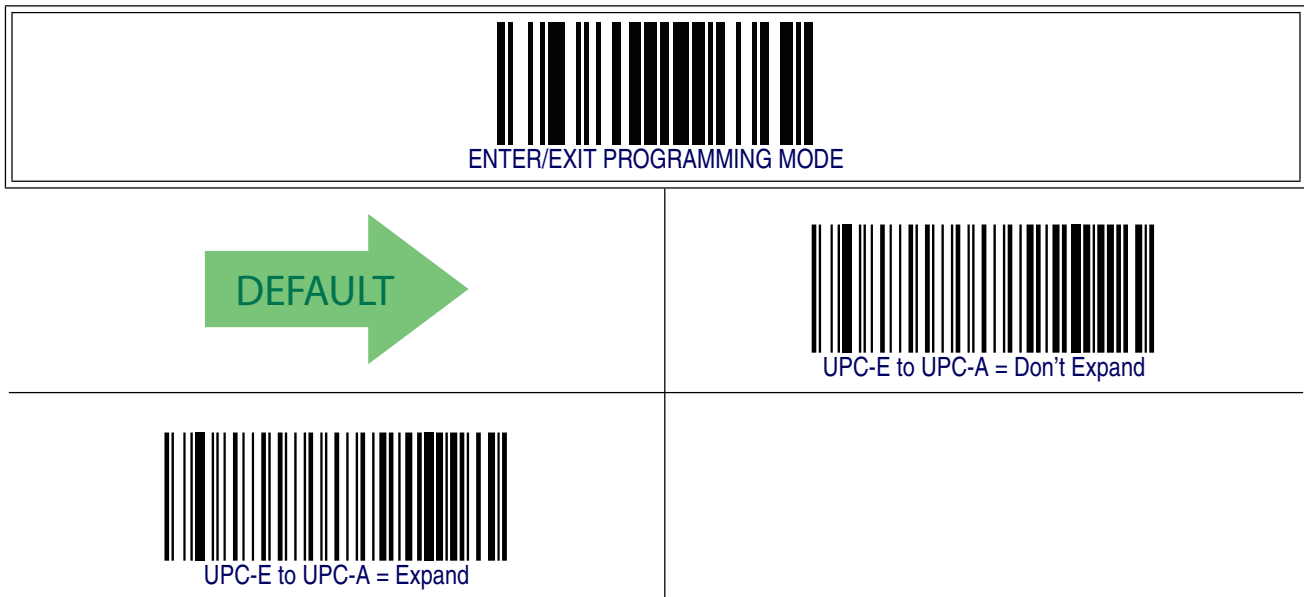
### Expand UPC-E to EAN-13

Expands UPC-E data to the EAN-13 data format. Selecting this feature also changes the symbology ID to match those required for EAN-13.



### Expand UPC-E to UPC-A

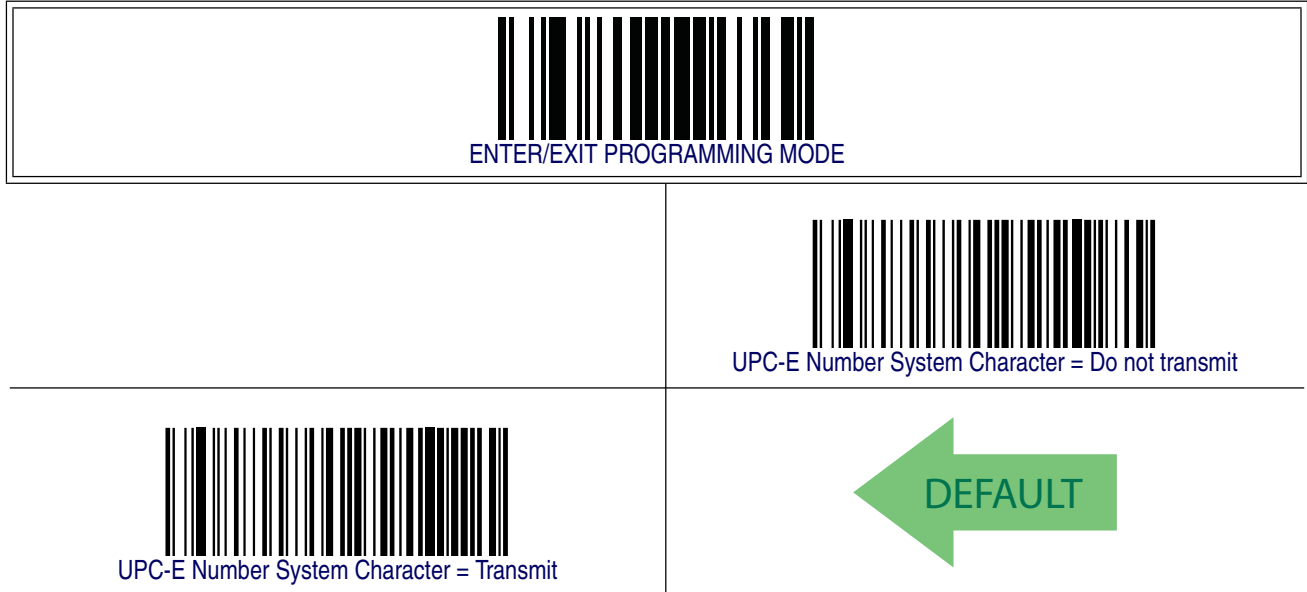
Expands UPC-E data to the UPC-A data format.



## UPC-E – cont.

### UPC-E Number System Character Transmission

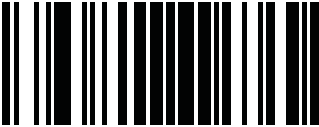



This feature enables/disables transmission of the UPC-E system number character.



## UPC-E — cont.

### UPC-E Minimum Reads

This feature specifies the minimum number of consecutive times a UPC-E label must be decoded before it is accepted as good read..

 ENTER/EXIT PROGRAMMING MODE	
	 UPC-E Minimum Reads = 1
 UPC-E Minimum Reads = 2	 DEFAULT
	 UPC-E Minimum Reads = 3
 UPC-E Minimum Reads = 4	

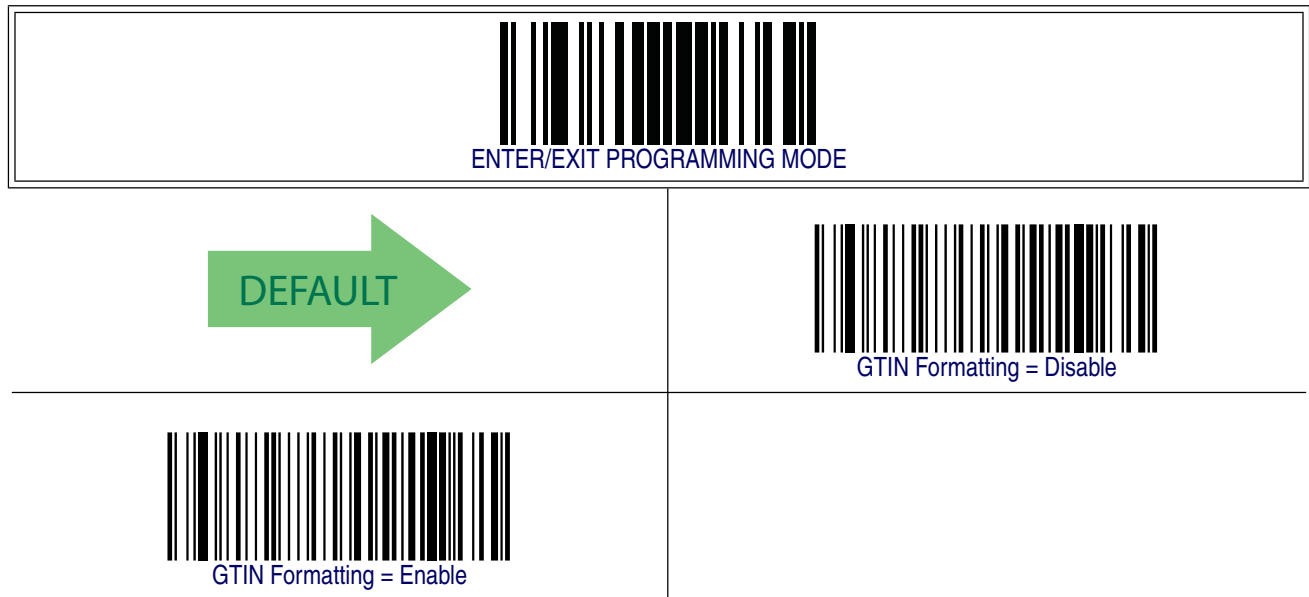
## GTIN Formatting

This feature enables/disables the ability to convert UPC-E, UPC-A, EAN 8, and EAN 13 labels into the GTIN 14-character format.



**NOTE**

If add-on information is present on the base label prior to the conversion taking place, the add-on information will be appended to the converted GTIN label.



## EAN 13

The following options apply to the EAN 13 (Jan 13) symbology.

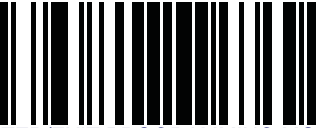



### EAN 13 Enable/Disable

When disabled, the reader will not read EAN 13/JAN 13 barcodes.

 ENTER/EXIT PROGRAMMING MODE	
	 EAN 13 = Disable
 EAN 13 = Enable	 DEFAULT

### EAN 13 Check Character Transmission

Enable this option to transmit the check character along with EAN 13 barcode data.

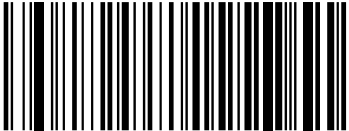

 ENTER/EXIT PROGRAMMING MODE	
	 EAN 13 Check Character Transmission = Don't Send
 EAN 13 Check Character Transmission = Send	 DEFAULT



## EAN 13 – cont.

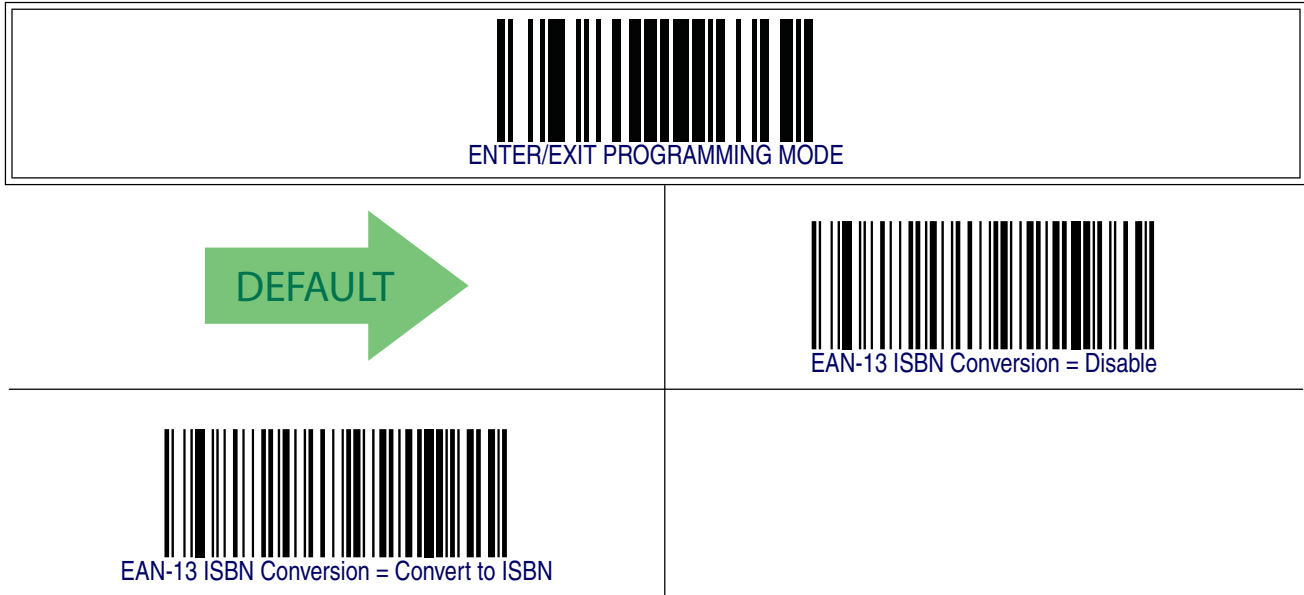
### EAN-13 Flag 1 Character

Enables/disables transmission of an EAN/JAN13 Flag1 character. The Flag 1 character is the first character of the label.

 ENTER/EXIT PROGRAMMING MODE	
	 EAN-13 Flag 1 Char= Don't transmit
 EAN-13 Flag 1 Char= Transmit	 DEFAULT

### EAN-13 ISBN Conversion

This option enables/disables conversion of EAN 13/JAN 13 Bookland labels starting with 978 to ISBN labels.



## EAN 13 – cont.

### EAN 13 Minimum Reads

This feature specifies the minimum number of consecutive times an EAN 13 label must be decoded before it is accepted as good read.

 ENTER/EXIT PROGRAMMING MODE	
	 EAN 13 Minimum Reads = 1
 EAN 13 Minimum Reads = 2	
	 EAN 13 Minimum Reads = 3
 EAN 13 Minimum Reads = 4	

## EAN 8

The following options apply to the EAN 8 (Jan 8) symbology.

### EAN 8 Enable/Disable

When disabled, the reader will not read EAN 8/JAN 8 barcodes.

 ENTER/EXIT PROGRAMMING MODE	
 EAN 8 = Enable	 EAN 8 = Disable
 DEFAULT	

### EAN 8 Check Character Transmission

Enable this option to transmit the check character along with EAN 8 barcode data.

 ENTER/EXIT PROGRAMMING MODE	
 EAN 8 Check Character Transmission = Send	 EAN 8 Check Character Transmission = Don't Send
 DEFAULT	

# EAN 8 – cont.

## Expand EAN 8 to EAN 13

Enable this option to expand EAN 8/JAN 8 labels to EAN 13/JAN 13.



## EAN 8 – cont.

### EAN 8 Minimum Reads

This feature specifies the minimum number of consecutive times an EAN 8 (Jan 8) label must be decoded before it is accepted as good read..



## UPC/EAN Global Settings

This section provides configuration settings for UPC-A, UPC-E, EAN 13 and EAN 8 symbologies, and affects all of these unless otherwise marked for each feature description.

### UPC/EAN Decoding Level

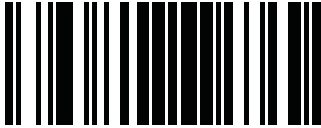

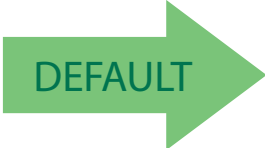




Decoding Levels are used to configure a barcode symbology decoder to be very aggressive to very conservative depending on a particular customer's needs.

- Choosing Level 1 results in a very conservative decoder at the expense of not being able to read poorly printed or damaged labels.
- Choosing Level 5 results in a very aggressive decoder. This aggressive behavior allows decoding of poorly printed and damaged labels at the expense of increasing the likelihood of decoding errors.
- Choosing Level 3, which is the default setting, allows the majority of product labels to be decoded.

There are many factors that determine when to change the decoding level for a particular symbology. These factors include spots, voids, non-uniform bar/space widths, damaged labels, etc. that may be experienced in some barcode labels. If there are many hard to read or damaged labels that cannot be decoded using a conservative setting, increase the decoding level to be more aggressive. If the majority of labels are very good quality labels, or there is a need to decrease the possibility of a decoder error, lower the decoding level to a more conservative level.

# UPC/EAN Global Settings – cont.

## UPC/EAN Decoding Level – cont.

 ENTER/EXIT PROGRAMMING MODE	
 UPC/EAN Decoding Level = 1	
 DEFAULT	 UPC/EAN Decoding Level = 2
 UPC/EAN Decoding Level = 3	
	 UPC/EAN Decoding Level = 4
 UPC/EAN Decoding Level = 5	



# UPC/EAN Global Settings – cont.

## UPC/EAN Correlation

When correlation is enabled, the barcode reader will combine label data from multiple scans when decoding. Enabling correlation will help the scanner read labels that have some spots and/or voids. It may also help read labels that have damaged areas. Enabling correlation will also increase the chances that a label will be read incorrectly.



# UPC/EAN Global Settings – cont.

## UPC/EAN Price Weight Check

This feature enables/disables calculation and verification of price/weight check digits. Options are

- Disabled
- Enable 4-digit price-weight check-digit calculation
- Enable 5-digit price-weight check-digit calculation
- Enable European 4-digit price-weight check-digit calculation
- Enable European 5-digit price-weight check-digit calculation

 ENTER/EXIT PROGRAMMING MODE	
	 Price Weight Check = Disabled
 Price Weight Check = 4-digit price-weight check	
	 Price Weight Check = 5-digit price-weight check
 Price Weight Check = European 4-digit price-weight check	
	 Price Weight Check = European 5-digit price-weight check

# UPC/EAN Global Settings – cont.

## UPC-A Minimum Reads

This feature specifies the minimum number of consecutive times a UPC-A label must be decoded before it is accepted as good read..



## Add-Ons

The following features apply to optional add-ons.



**NOTE**

Contact Customer Support for advanced programming of optional and conditional add-ons.

## Optional Add-ons

The reader can be enabled to optionally read the following add-ons (supplementals):

- P2
- P5
- GS1-128



**NOTE**

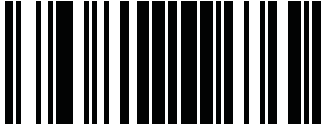
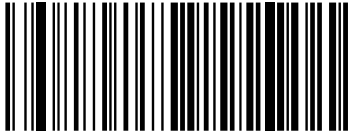
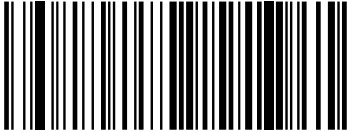
If a UPC/EAN base label and a an add-on are both decoded, the reader will transmit the base label and add-on. If a UPC/EAN base label is decoded without an add-on, the base label will be transmitted without an add-on.

Conditional add-on settings (if enabled) are considered by the reader before optional add-on settings.



## Add-Ons – cont.

### Optional Add-ons – cont.

 ENTER/EXIT PROGRAMMING MODE	
 Optional Add-Ons = Enable P5	
 DEFAULT	 Optional Add-Ons = Disable GS1-128
 Optional Add-Ons = Enable GS1-128	

## Add-Ons — cont.


### Optional Add-On Timer

This option sets the time the reader will look for an add-on when an add-on fragment has been seen and optional add-ons are enabled. (Also see [Optional GS1-128 Add-On Timer on page 137.](#))

 ENTER/EXIT PROGRAMMING MODE	
 Optional Add-on Timer = 10ms	
	 Optional Add-on Timer = 20ms
 Optional Add-on Timer = 30ms	
	 Optional Add-on Timer = 40ms
 Optional Add-on Timer = 50ms	

## Add-Ons – cont.

### Optional Add-On Timer – cont.

 ENTER/EXIT PROGRAMMING MODE	
	 Optional Add-on Timer = 60ms
 Optional Add-on Timer = 70ms	
	 Optional Add-on Timer = 100ms
 Optional Add-on Timer = 120ms	
	 Optional Add-on Timer = 140ms
 Optional Add-on Timer = 160ms	

## Add-Ons — cont.

### Optional Add-On Timer — cont.

 ENTER/EXIT PROGRAMMING MODE	
	 Optional Add-on Timer = 180ms
 Optional Add-on Timer = 200ms	
	 Optional Add-on Timer = 220ms
 Optional Add-on Timer = 240ms	
	 Optional Add-on Timer = 260ms
 Optional Add-on Timer = 280ms	
	 Optional Add-on Timer = 300ms



## Add-Ons — cont.

### Optional GS1-128 Add-On Timer

This option sets the timer expiration value to read the additional part after reading the linear EAN/UPC part. For UPC/EAN add-ons other than those of this type, see [Optional Add-On Timer on page 134](#).

 ENTER/EXIT PROGRAMMING MODE	
	 Optional GS1-128 Add-On Timer = Disable
 Optional GS1-128 Add-On Timer = 10ms	
	 Optional GS1-128 Add-On Timer = 20ms
 Optional GS1-128 Add-On Timer = 30ms	
	 Optional GS1-128 Add-On Timer = 40ms
 Optional GS1-128 Add-On Timer = 50ms	

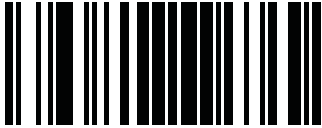

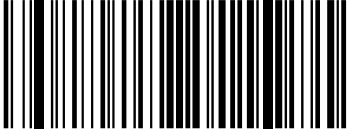
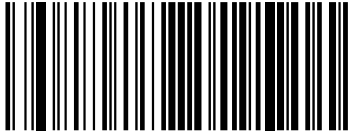
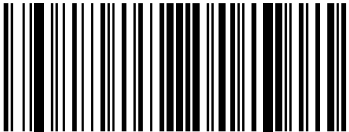
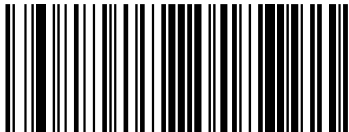

## Add-Ons — cont.

### Optional GS1-128 Add-On Timer — cont.

 ENTER/EXIT PROGRAMMING MODE	
	 Optional GS1-128 Add-On Timer = 60ms
 Optional GS1-128 Add-On Timer = 70ms	
	 Optional GS1-128 Add-On Timer = 100ms
 Optional GS1-128 Add-On Timer = 120ms	
	 Optional GS1-128 Add-On Timer = 140ms
 Optional GS1-128 Add-On Timer = 160ms	

## Add-Ons – cont.

### Optional GS1-128 Add-On Timer – cont.

 ENTER/EXIT PROGRAMMING MODE	
	 Optional GS1-128 Add-On Timer = 180ms
 Optional GS1-128 Add-On Timer = 200ms	
	 Optional GS1-128 Add-On Timer = 220ms
 Optional GS1-128 Add-On Timer = 240ms	
	 Optional GS1-128 Add-On Timer = 260ms
 Optional GS1-128 Add-On Timer = 280ms	
	 Optional GS1-128 Add-On Timer = 300ms

## Add-Ons — cont.

### P2 Add-Ons Minimum Reads

This feature specifies the minimum number of times a P2 add-on must be read before it is marked as valid and then combined with a base label.

 ENTER/EXIT PROGRAMMING MODE	
	 P2 Add-Ons Minimum Reads = 1
 P2 Add-Ons Minimum Reads = 2	 DEFAULT
	 P2 Add-Ons Minimum Reads = 3
 P2 Add-Ons Minimum Reads = 4	

## Add-Ons — cont.

### P5 Add-Ons Minimum Reads

This feature specifies the minimum number of times a P5 add-on must be read before it is marked as valid and then combined with a base label.

 ENTER/EXIT PROGRAMMING MODE	
 DEFAULT	 P5 Add-Ons Minimum Reads = 1
 P5 Add-Ons Minimum Reads = 2	
	 P5 Add-Ons Minimum Reads = 3
 P5 Add-Ons Minimum Reads = 4	

## Add-Ons — cont.

### GS1-128 Add-Ons Minimum Reads

This feature specifies the minimum number of times an GS1-128 add-on must be read before it is marked as valid and then combined with a base label.

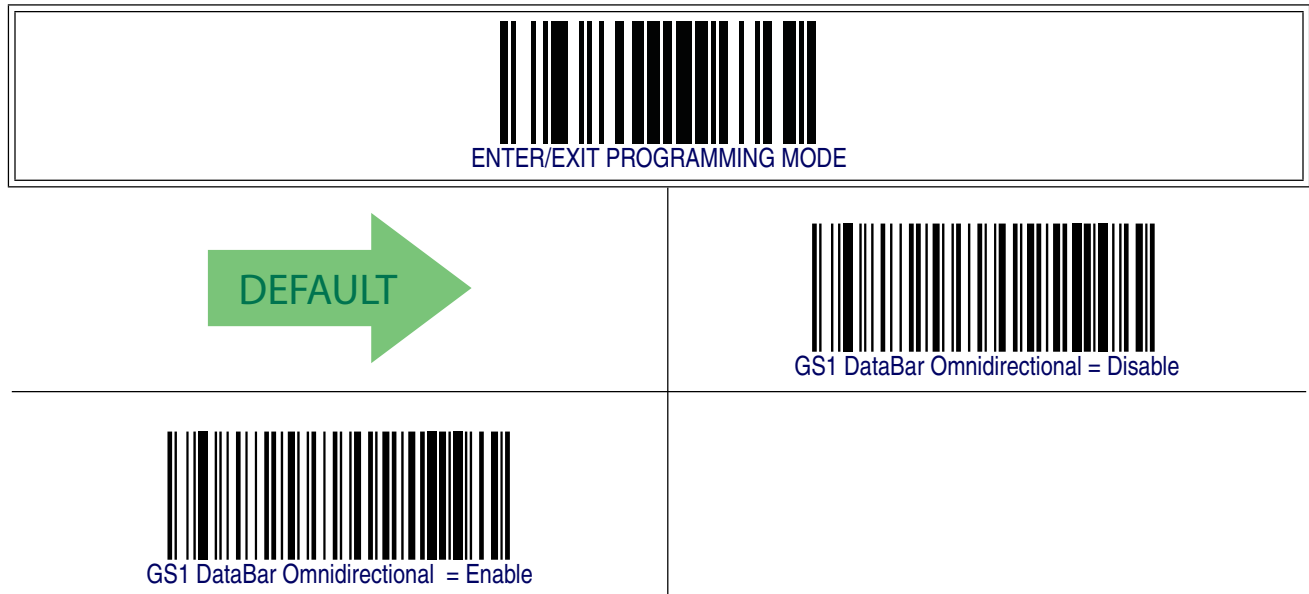


## GS1 DataBar Omnidirectional

The following options apply to the GS1 DataBar Omnidirectional (formerly RSS-14) symbology.

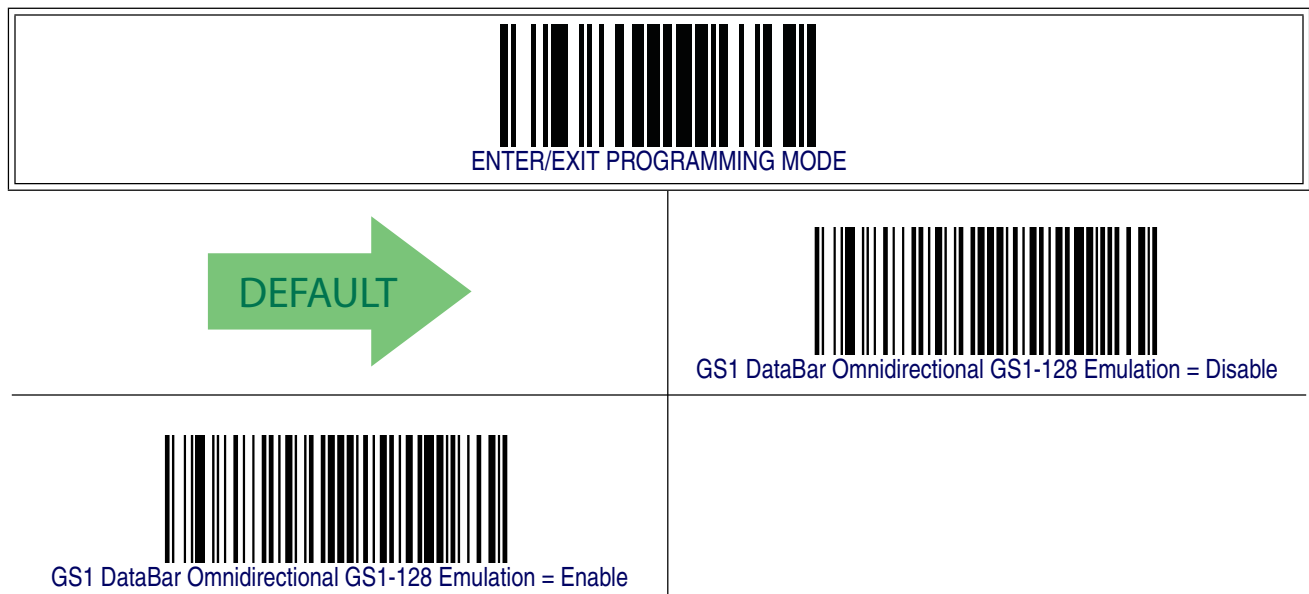
### GS1 DataBar Omnidirectional Enable/Disable

When disabled, the reader will not read GS1 DataBar Omnidirectional barcodes.



### GS1 DataBar Omnidirectional GS1-128 Emulation

When enabled, GS1 DataBar Omnidirectional barcodes will be translated to the GS1-128 label data format.



# GS1 DataBar Omnidirectional – cont.

## GS1 DataBar Omnidirectional Minimum Reads

This feature specifies the minimum number of consecutive times a GS1 DataBar Omnidirectional label must be decoded before it is accepted as good read.





## GS1 DataBar Expanded

The following options apply to the GS1 DataBar Expanded (formerly RSS Expanded) symbology.

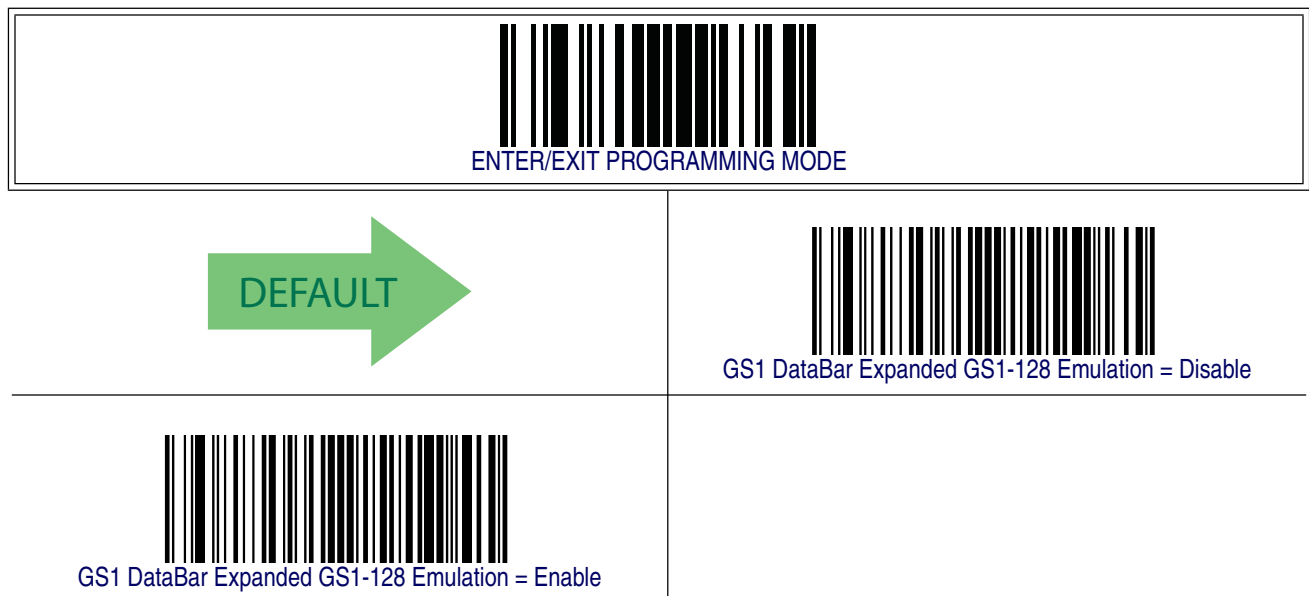
### GS1 DataBar Expanded Enable/Disable

When disabled, the reader will not read GS1 DataBar Expanded barcodes.



### GS1 DataBar Expanded GS1-128 Emulation

When enabled, GS1 DataBar Expanded barcodes will be translated to the GS1-128 label data format.



# GS1 DataBar Expanded – cont.

## GS1 DataBar Expanded Minimum Reads

This feature specifies the minimum number of consecutive times a GS1 DataBar Expanded label must be decoded before it is accepted as good read.



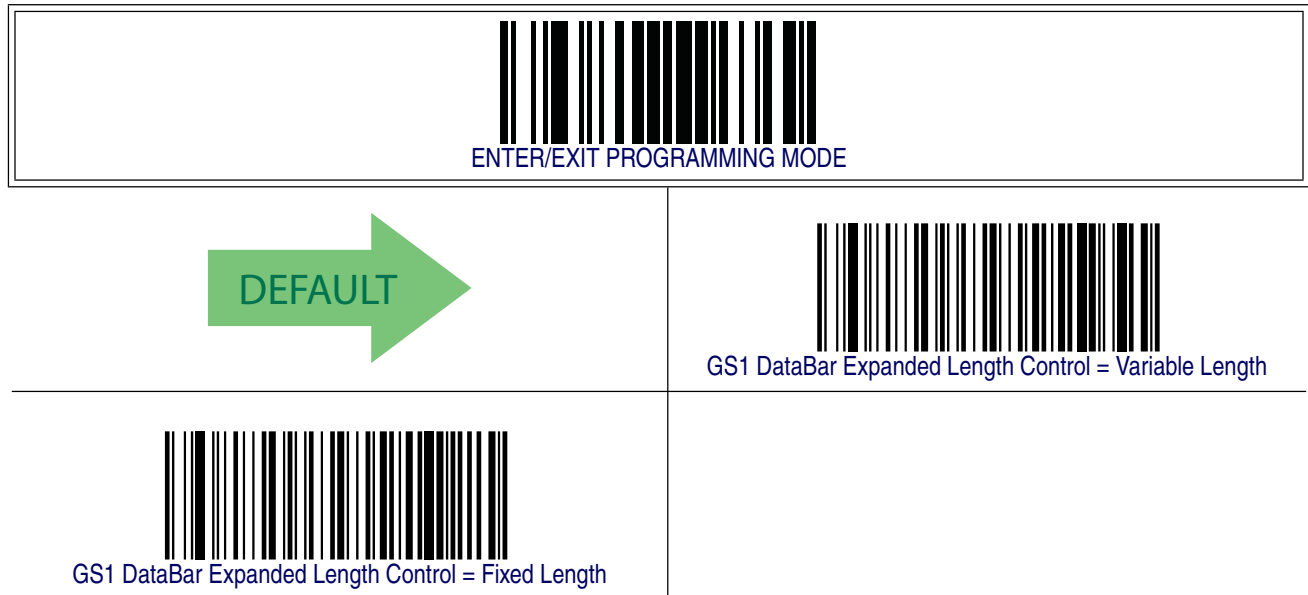
## GS1 DataBar Expanded – cont.

### GS1 DataBar Expanded Length Control

This feature specifies either variable length decoding or fixed length decoding for the GS1 DataBar Expanded symbology.

**Variable Length** – For variable-length decoding, a minimum length may be set.

**Fixed Length** – For fixed-length decoding, two different lengths may be set.



# GS1 DataBar Expanded – cont.

## GS1 DataBar Expanded Set Length 1

This feature specifies one of the barcode lengths for [GS1 DataBar Expanded Length Control](#). Length 1 is the minimum label length if in [Variable Length Mode](#), or the first fixed length if in [Fixed Length Mode](#). Length includes the barcode’s data characters only.

The length can be set from 1 to 74 characters.

Follow these instructions to set this feature:

1. Determine the desired character length (from 1 to 74). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT GS1 DataBar EXPANDED LENGTH 1 SETTING.
4. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

**NOTE**

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.




This completes the procedure. See [Table 19](#) for some examples of how to set this feature.


**Table 19. GS1 DataBar Expanded Length 1 Setting Examples**

STEP	ACTION	EXAMPLES			
		01 Character	07 Characters	52 Characters	74 Characters
1	Desired Setting	01 Character	07 Characters	52 Characters	74 Characters
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT GS1 DataBar EXPANDED LENGTH 1 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '1'	'0' and '7'	'5' and '2'	'7' AND '4'
5	Scan ENTER/EXIT PROGRAMMING MODE				

## GS1 DataBar Expanded – cont.

### GS1 DataBar Expanded Set Length 1 – cont.

 ENTER/EXIT PROGRAMMING MODE	
 Select GS1 DataBar Expanded Set Length 1 Setting	
Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL


 01 = Length 1 is 1 Character

# GS1 DataBar Expanded – cont.

## GS1 DataBar Expanded Set Length 2

This feature specifies one of the barcode lengths for [GS1 DataBar Expanded Length Control](#). Length 2 is the maximum label length if in [Variable Length Mode](#), or the second fixed length if in [Fixed Length Mode](#). Length includes the barcode’s data characters only.

The length can be set from 1 to 74 characters. A setting of 0 specifies to ignore this length (only one fixed length).

Follow these instructions to set this feature:

1. Determine the desired character length (from 1 to 74). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT GS1 DataBar EXPANDED LENGTH 2 SETTING.
4. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

**NOTE**

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

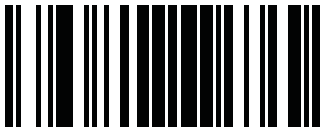
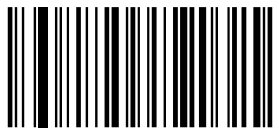

This completes the procedure. See [Table 20](#) for some examples of how to set this feature.

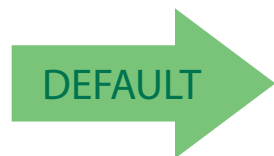
**Table 20. GS1 DataBar Expanded Length 2 Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Setting	00 (ignore second length)	07 Characters	52 Characters	74 Characters
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT GS1 DataBar EXPANDED LENGTH 2 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '0'	'0' and '7'	'5' and '2'	'7' and '4'
5	Scan ENTER/EXIT PROGRAMMING MODE				

## GS1 DataBar Expanded – cont.

### GS1 DataBar Expanded Set Length 2 – cont.

 ENTER/EXIT PROGRAMMING MODE	
 Select GS1 DataBar Expanded Set Length 2 Setting	
Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL



74 = Length 2 is 74 Characters

## GS1 DataBar Limited

The following options apply to the GS1 DataBar Limited (formerly RSS Limited) symbology.

### GS1 DataBar Limited Enable/Disable

When disabled, the reader will not read GS1 DataBar Limited barcodes.



### GS1 DataBar Limited GS1-128 Emulation

When enabled, GS1 DataBar Limited barcodes will be translated to the GS1-128 label data format.





# GS1 DataBar Limited – cont.

## GS1 DataBar Limited Minimum Reads

This feature specifies the minimum number of consecutive times a GS1 DataBar Limited label must be decoded before it is accepted as good read.



## Code 39

The following options apply to the Code 39 symbology.

### Code 39 Enable/Disable

When disabled, the reader will not read Code 39 barcodes.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 39 = Disable
 Code 39 = Enable	 DEFAULT

## Code 39 — cont.

### Code 39 Check Character Calculation

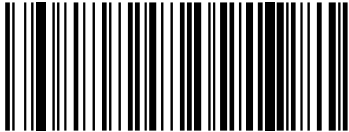

Enable this option to enables/disables calculation and verification of an optional Code 39 check character. When disabled, any check character in the label is treated as a data character.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 39 Check Character Calculation = Don't Calculate
 Code 39 Check Character Calculation = Calculate Std Check	
	 Code 39 Check Character Calculation = Calculate Mod 7 Check
 Code 39 Check Character Calculation = Enable Italian Post Check	
	 Code 39 Check Character Calculation = Enable Daimler Chrysler Check

## Code 39 – cont.

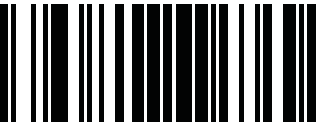
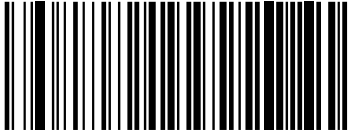
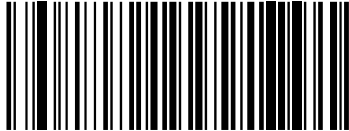
### Code 39 Check Character Transmission

Enable this option to transmit the check character along with Code 39 barcode data.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 39 Check Character Transmission = Don't Send
 Code 39 Check Character Transmission = Send	 DEFAULT

### Code 39 Start/Stop Character Transmission

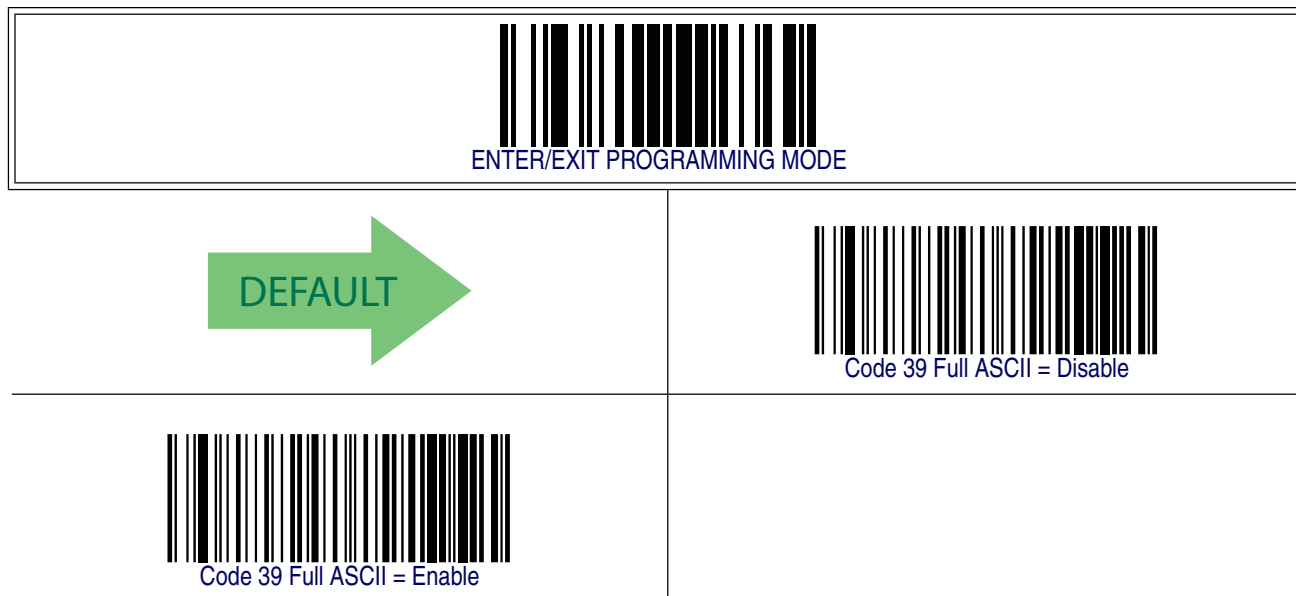
Enable this option to enable/disable transmission of Code 39 start and stop characters.

 ENTER/EXIT PROGRAMMING MODE	
 DEFAULT	 Code 39 Start/Stop Character Transmission = Don't Transmit
 Code 39 Start/Stop Character Transmission = Transmit	

## Code 39 — cont.

### Code 39 Full ASCII

In Code 39 decoding, this enables/disables the translation of Code 39 characters to Code 39 full-ASCII characters.



## Code 39 – cont.

### Code 39 Quiet Zones

This feature specifies the number of quiet zones for Code 39 labels. Quiet zones are blank areas at the ends of a barcode and are typically 10 times the width of the narrowest bar or space in the label.

 ENTER/EXIT PROGRAMMING MODE	
 Code 39 Quiet Zones = Quiet Zone on one side	
	 Code 39 Quiet Zones = Quiet Zones on two sides
 Code 39 Quiet Zones = Auto	 DEFAULT
	 Code 39 Quiet Zones = Virtual Quiet Zones on two sides

## Code 39 — cont.

### Code 39 Minimum Reads

This feature specifies the minimum number of consecutive times a Code 39 label must be decoded before it is accepted as good read..

 ENTER/EXIT PROGRAMMING MODE	
	 Code 39 Minimum Reads = 1
 Code 39 Minimum Reads = 2	
	 Code 39 Minimum Reads = 3
 Code 39 Minimum Reads = 4	

## Code 39 – cont.

### Code 39 Decoding Level

Decoding Levels are used to configure a barcode symbology decoder to be very aggressive to very conservative depending on a particular customer's needs.

- Choosing Level 1 results in a very conservative decoder at the expense of not being able to read poorly printed or damaged labels.
- Choosing Level 5 results in a very aggressive decoder. This aggressive behavior allows decoding of poorly printed and damaged labels at the expense of increasing the likelihood of decoding errors.
- Choosing Level 3, which is the default setting, allows the majority of product labels to be decoded.

There are many factors that determine when to change the decoding level for a particular symbology. These factors include spots, voids, non-uniform bar/space widths, damaged labels, etc. that may be experienced in some barcode labels. If there are many hard to read or damaged labels that cannot be decoded using a conservative setting, increase the decoding level to be more aggressive. If the majority of labels are very good quality labels, or there is a need to decrease the possibility of a decoder error, lower the decoding level to a more conservative level.




This configuration item applies to Code 39 and Code 32.

#### NOTE



## Code 39 — cont.

### Code 39 Decoding Level — cont.

 ENTER/EXIT PROGRAMMING MODE	
 Code 39 Decoding Level = 1	
	 Code 39 Decoding Level = 2
 Code 39 Decoding Level = 3	 DEFAULT
	 Code 39 Decoding Level = 4
 Code 39 Decoding Level = 5	

## Code 39 – cont.

### Code 39 Length Control

This feature specifies either variable length decoding or fixed length decoding for the Code 39 symbology.

**Variable Length** – For variable length decoding, a minimum and maximum length may be set.

**Fixed Length** – For fixed length decoding, two different lengths may be set.



## Code 39 – cont.

### Code 39 Set Length 1

This feature specifies one of the barcode lengths for [Code 39 Length Control](#). Length 1 is the minimum label length if in [Variable Length Mode](#), or the first fixed length if in [Fixed Length Mode](#). Length includes the barcode's data characters only.

The length can be set from 0 to 50 characters.

Follow these instructions to set this feature:

1. Determine the desired character length (from 0 to 50). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT CODE 39 LENGTH 1 SETTING.
4. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

#### NOTE

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

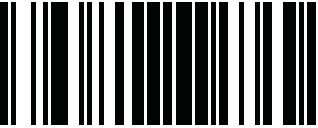
This completes the procedure. See [Table 21](#) for some examples of how to set this feature.


**Table 21. Code 39 Length 1 Setting Examples**


STEP	ACTION	EXAMPLES			
		00 Characters	07 Characters	15 Characters	50 Characters
1	Desired Setting				
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT CODE 39 LENGTH 1 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '0'	'0' and '7'	'1' and '5'	'5' AND '0'
5	Scan ENTER/EXIT PROGRAMMING MODE				

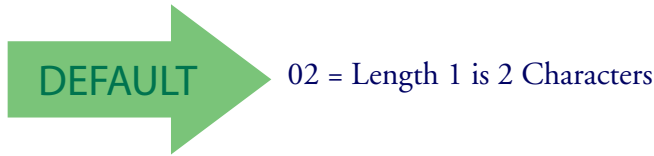
## Code 39 – cont.

### Code 39 Set Length 1 – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Code 39 Set Length 1 Setting	
--	--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL
--	---



## Code 39 — cont.

### Code 39 Set Length 2

This feature specifies one of the barcode lengths for [Code 39 Length Control](#). Length 2 is the maximum label length if in [Variable Length Mode](#), or the second fixed length if in [Fixed Length Mode](#). Length includes the barcode's check, data, and full-ASCII shift characters. The length does not include start/stop characters.

The length can be set from 1 to 50 characters. A setting of 0 specifies to ignore this length (only one fixed length).

Follow these instructions to set this feature:

1. Determine the desired character length (from 1 to 50 — or 0 to ignore this length). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT CODE 39 LENGTH 2 SETTING.
4. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake, before the last character scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

#### NOTE

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

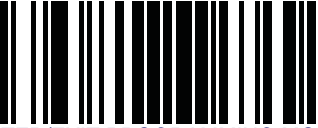
This completes the procedure. See [Table 22](#) for some examples of how to set this feature.

**Table 22. Code 39 Length 2 Setting Examples**


STEP	ACTION	EXAMPLES			
		00 (Ignore This Length)	07 Characters	15 Characters	50 Characters
1	Desired Setting				
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT CODE 39 LENGTH 2 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '0'	'0' and '7'	'1' and '5'	'5' AND '0'
5	Scan ENTER/EXIT PROGRAMMING MODE				

## Code 39 – cont.

### Code 39 Set Length 2 – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Code 39 Length 2 Setting
--

<p>Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.</p>	 CANCEL
---	---



## Code 39 — cont.

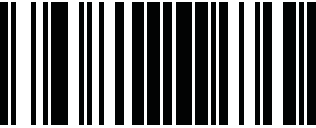

### Code 39 Interdigit Ratio

This feature specifies the ratio between an intercharacter space and module for Code 39 labels.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 39 Interdigit Ratio = Disable
 Code 39 Interdigit Ratio = 1	
	 Code 39 Interdigit Ratio = 2
 Code 39 Interdigit Ratio = 3	
 <b>DEFAULT</b>	 Code 39 Interdigit Ratio = 4
 Code 39 Interdigit Ratio = 5	

# Code 39 – cont.

## Code 39 Interdigit Ratio – cont.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 39 Interdigit Ratio = 6
 Code 39 Interdigit Ratio = 7	
	 Code 39 Interdigit Ratio = 8
 Code 39 Interdigit Ratio = 9	
	 Code 39 Interdigit Ratio = 10



## Code 39 — cont.

### Code 39 Character Correlation

When correlation is enabled, the barcode reader will combine label data from multiple scans when decoding. Enabling correlation will help the scanner read labels that have some spots and/or voids. It may also help read labels that have damaged areas. Enabling correlation will also increase the chances that a label will be read incorrectly.



## Code 39 Stitching

This option enables/disables stitching for Code 39 labels. When parts of a Code 39 barcode are presented to the reader with this feature enabled, the barcode parts will be assembled by the reader's software, and the data will be decoded if all barcode proofing requirements are met.

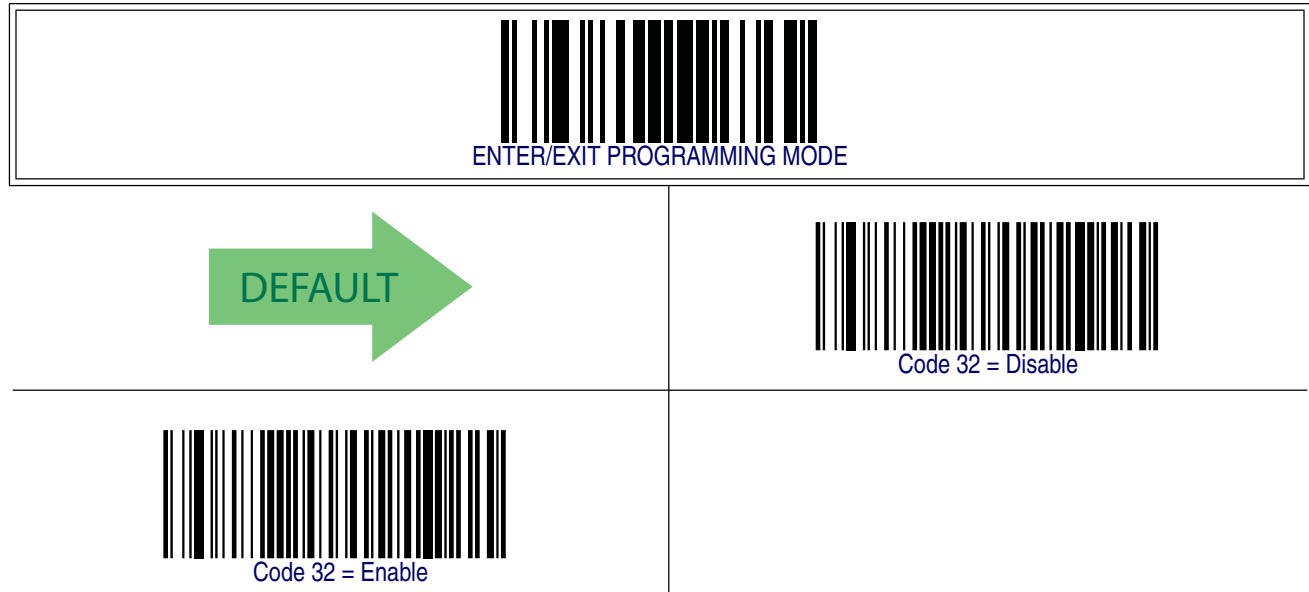


## Code 32

The following options apply to the Code 32 (Italian Pharmaceutical Code) symbology.

### Code 32 Enable/Disable

When disabled, the reader will not read Code 32 barcodes.



### Code 32 Feature Setting Exceptions



**NOTE**

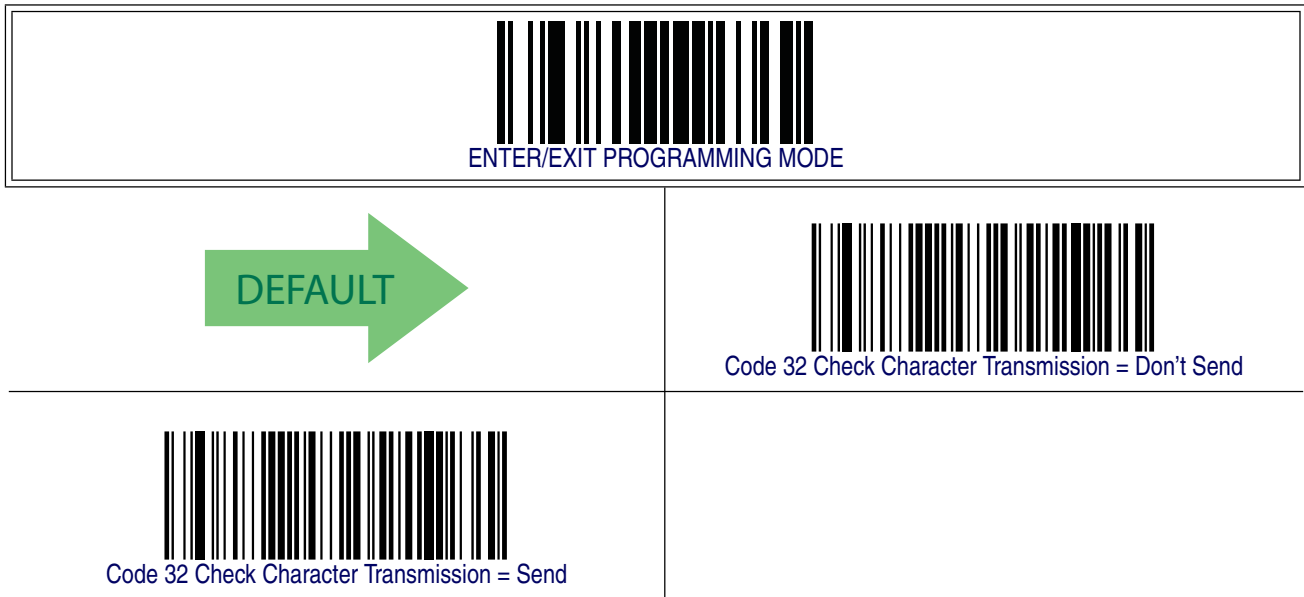
The following features are set for Code 32 by using these Code 39 settings:

- Code 39 Quiet Zones on page 158
- Code 39 Minimum Reads on page 159
- Code 39 Decoding Level on page 160
- Code 39 Interdigit Ratio on page 167
- Code 39 Character Correlation on page 169
- Code 39 Stitching on page 170

## Code 32 – cont.

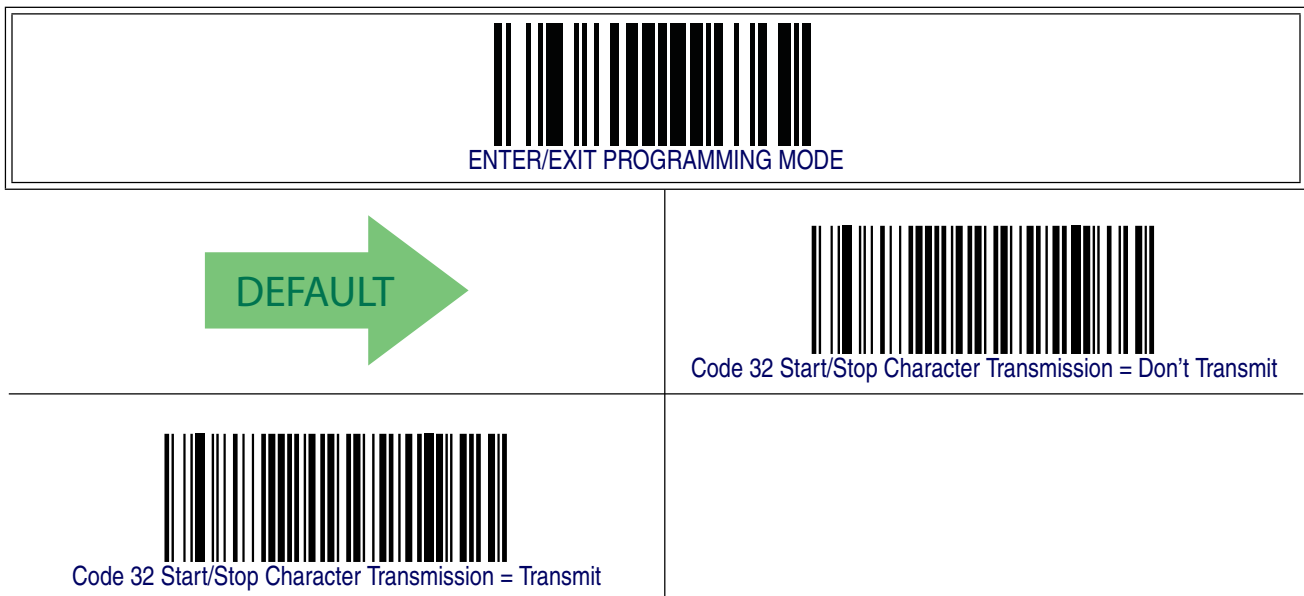
### Code 32 Check Character Transmission

Enable this option to transmit the check character along with Code 32 barcode data.



### Code 32 Start/Stop Character Transmission

This option enables/disables transmission of Code 32 start and stop characters.



## Code 128

The following options apply to the Code 128 symbology.

### Code 128 Enable/Disable

When disabled, the reader will not read Code 128 barcodes.



### Expand Code 128 to Code 39

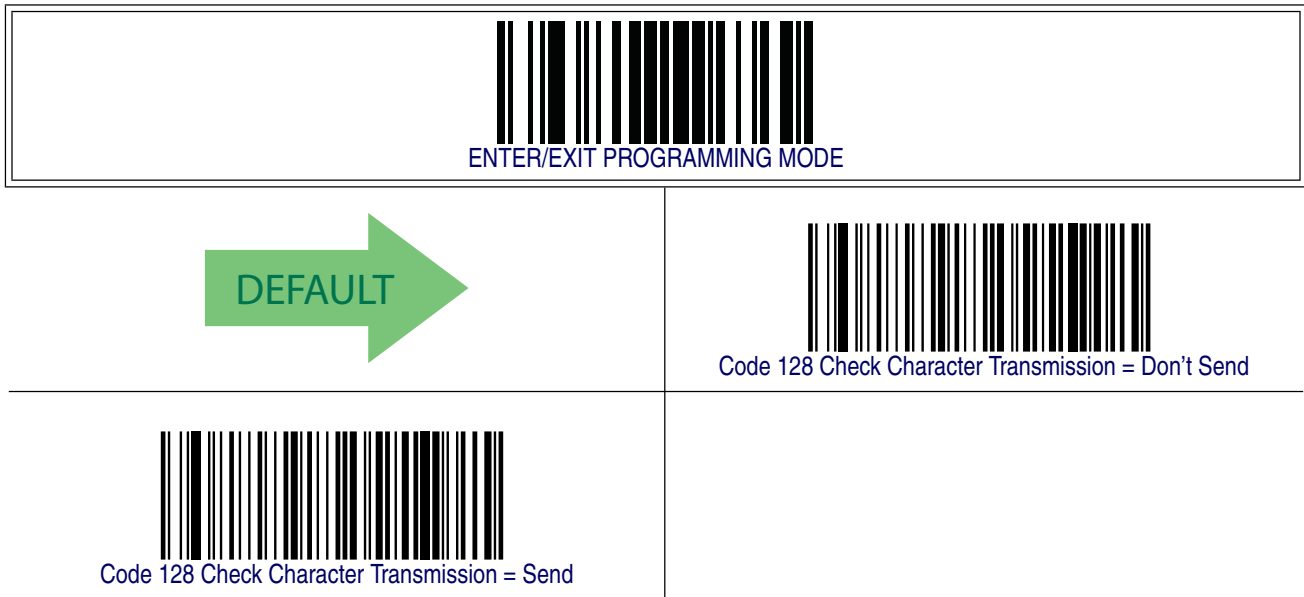
This feature enables/disables expansion of Code 128 labels to Code 39 labels.



## Code 128 – cont.

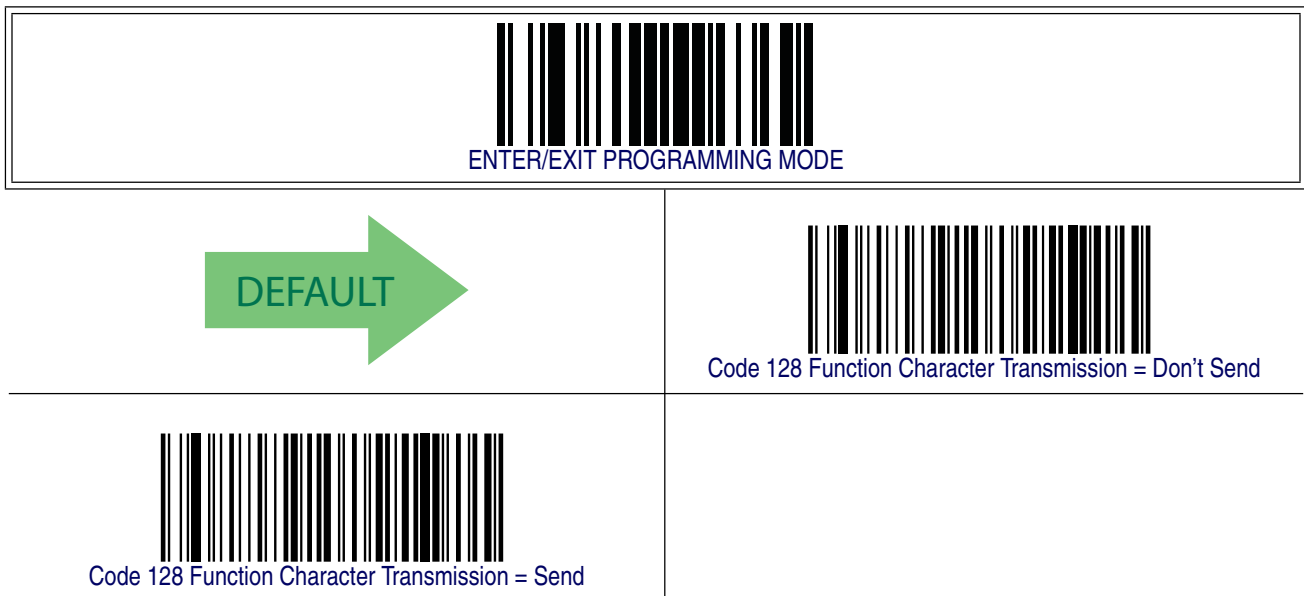
### Code 128 Check Character Transmission

Enable this option to transmit the check character along with Code 128 barcode data.



### Code 128 Function Character Transmission

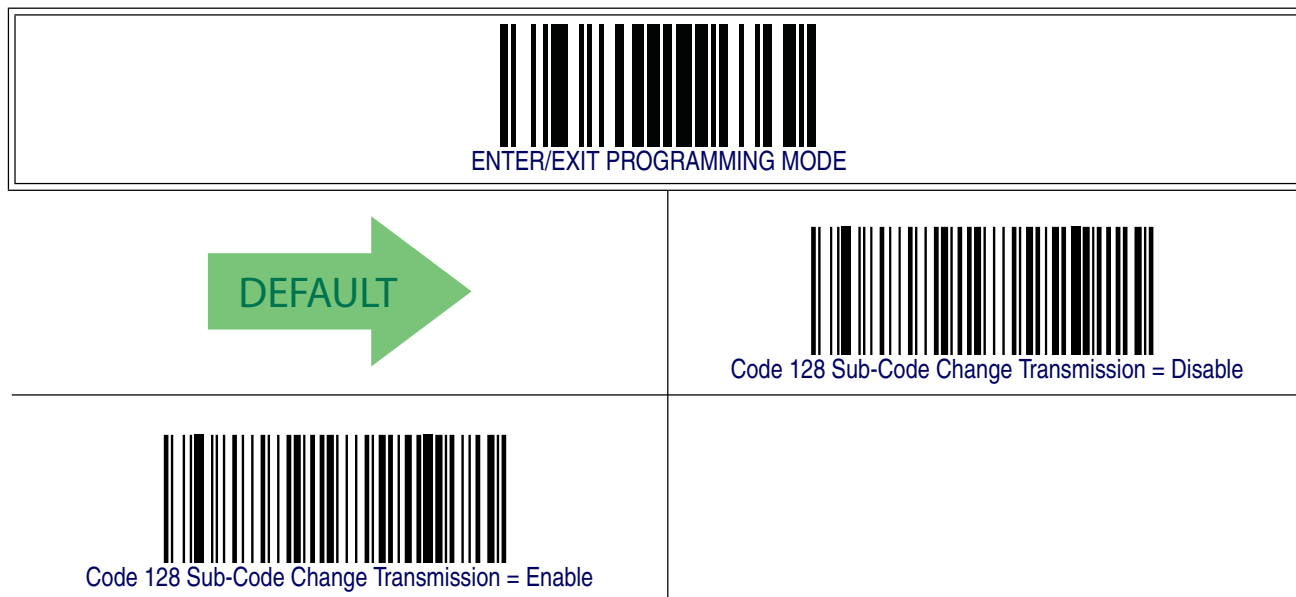
Enables/disables transmission of Code128 function characters 1, 2, 3, and 4.



## Code 128 — cont.

### Code 128 Sub-Code Change Transmission

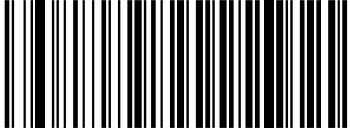

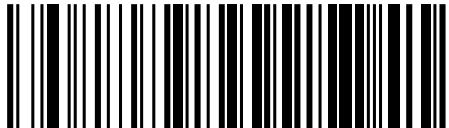
Enables/disables the transmission of “Sub-Code exchange” characters (NOT transmitted by standard decoding).



# Code 128 – cont.

## Code 128 Quiet Zones

This feature specifies the number of quiet zones for Code 128 labels. Quiet zones are blank areas at the ends of a barcode and are typically 10 times the width of the narrowest bar or space in the label.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 128 Quiet Zones = No Quiet Zones
 Code 128 Quiet Zones = Quiet Zone on one side	
	 Code 128 Quiet Zones = Quiet Zones on two sides
 Code 128 Quiet Zones = Auto	 DEFAULT
	 Code 128 Quiet Zones = Virtual Quiet Zones on two sides



## Code 128 – cont.

### Code 128 Minimum Reads

This feature specifies the minimum number of consecutive times a Code 128 label must be decoded before it is accepted as good read..



## Code 128 – cont.

### Code 128 Decoding Level

Decoding Levels are used to configure a barcode symbology decoder to be very aggressive to very conservative depending on a particular customer's needs.

- Choosing Level 1 results in a very conservative decoder at the expense of not being able to read poorly printed or damaged labels.
- Choosing Level 5 results in a very aggressive decoder. This aggressive behavior allows decoding of poorly printed and damaged labels at the expense of increasing the likelihood of decoding errors.
- Choosing Level 3, which is the default setting, allows the majority of product labels to be decoded.

There are many factors that determine when to change the decoding level for a particular symbology. These factors include spots, voids, non-uniform bar/space widths, damaged labels, etc. that may be experienced in some barcode labels. If there are many hard to read or damaged labels that cannot be decoded using a conservative setting, increase the decoding level to be more aggressive. If the majority of labels are very good quality labels, or there is a need to decrease the possibility of a decoder error, lower the decoding level to a more conservative level.

## Code 128 – cont.

### Code 128 Decoding Level – cont.

 ENTER/EXIT PROGRAMMING MODE	
 Code 128 Decoding Level = 1	
	 Code 128 Decoding Level = 2
 Code 128 Decoding Level = 3	
	 Code 128 Decoding Level = 4
 Code 128 Decoding Level = 5	

## Code 128 – cont.

### Code 128 Length Control

This feature specifies either variable length decoding or fixed length decoding for the Code 128 symbology.

**Variable Length** – For variable length decoding, a minimum and maximum length may be set.

**Fixed Length** – For fixed length decoding, two different lengths may be set.



## Code 128 – cont.

### Code 128 Set Length 1

This feature specifies one of the barcode lengths for [Code 128 Length Control](#). Length 1 is the minimum label length if in [Variable Length Mode](#), or the first fixed length if in [Fixed Length Mode](#). Length includes the barcode's data characters only.

The length can be set from 1 to 80 characters.

Follow these instructions to set this feature:

1. Determine the desired character length (from 1 to 80). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT CODE 128 LENGTH 1 SETTING.
4. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

#### NOTE

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

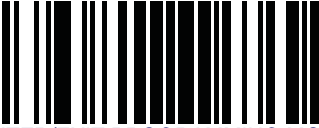
This completes the procedure. See [Table 23](#) for some examples of how to set this feature.

**Table 23. Code 128 Length 1 Setting Examples**

STEP	ACTION	EXAMPLES			
		01 Character	07 Characters	15 Characters	80 Characters
1	Desired Setting				
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT CODE 128 LENGTH 1 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '1'	'0' and '7'	'1' and '5'	'8' AND '0'
5	Scan ENTER/EXIT PROGRAMMING MODE				

# Code 128 – cont.

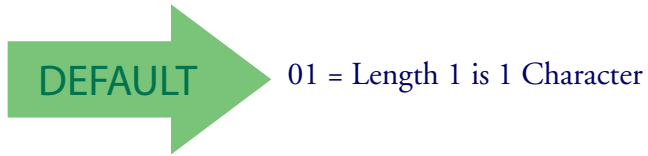
## Code 128 Set Length 1 – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Code 128 Set Length 1 Setting
---

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

 CANCEL
---



## Code 128 — cont.

### Code 128 Set Length 2

This feature specifies one of the barcode lengths for [Code 128 Length Control](#). Length 2 is the maximum label length if in [Variable Length Mode](#), or the second fixed length if in [Fixed Length Mode](#). Length includes the barcode's data characters only.

The length can be set from 1 to 80 characters. A setting of 0 specifies to ignore this length (only one fixed length).

Follow these instructions to set this feature:

1. Determine the desired character length (from 1 to 80 — or 0 to ignore this length). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT CODE 128 LENGTH 2 SETTING.
4. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

#### NOTE

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

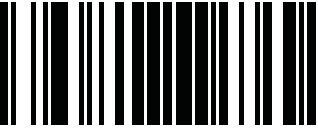
This completes the procedure. See [Table 24](#) for some examples of how to set this feature.

**Table 24. Code 128 Length 2 Setting Examples**


STEP	ACTION	EXAMPLES			
1	Desired Setting	00 (Ignore This Length)	07 Characters	15 Characters	80 Characters
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT CODE 128 LENGTH 2 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '0'	'0' and '7'	'0' and 'F'	'5' AND '0'
5	Scan ENTER/EXIT PROGRAMMING MODE				

## Code 128 – cont.

### Code 128 Set Length 2 – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Code 128 Length 2 Setting
---

<p>Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.</p>	 CANCEL
---	---

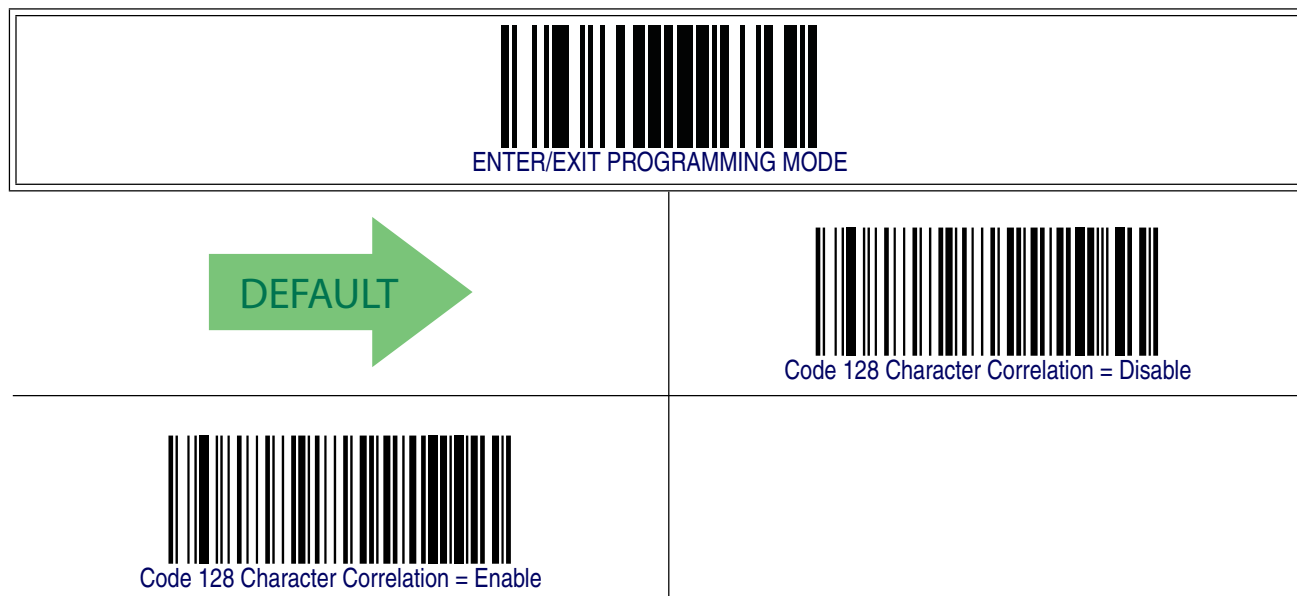




## Code 128 – cont.

### Code 128 Character Correlation

When correlation is enabled, the barcode reader will combine label data from multiple scans when decoding. Enabling correlation will help the scanner read labels that have some spots and/or voids. It may also help read labels that have damaged areas. Enabling correlation will also increase the chances that a label will be read incorrectly.



## Code 128 – cont.

### Code 128 Stitching

This option enables/disables stitching for Code 128 labels. When parts of a Code 128 barcode are presented to the reader with this feature enabled, the barcode parts will be assembled by the reader's software, and the data will be decoded if all barcode proofing requirements are met.



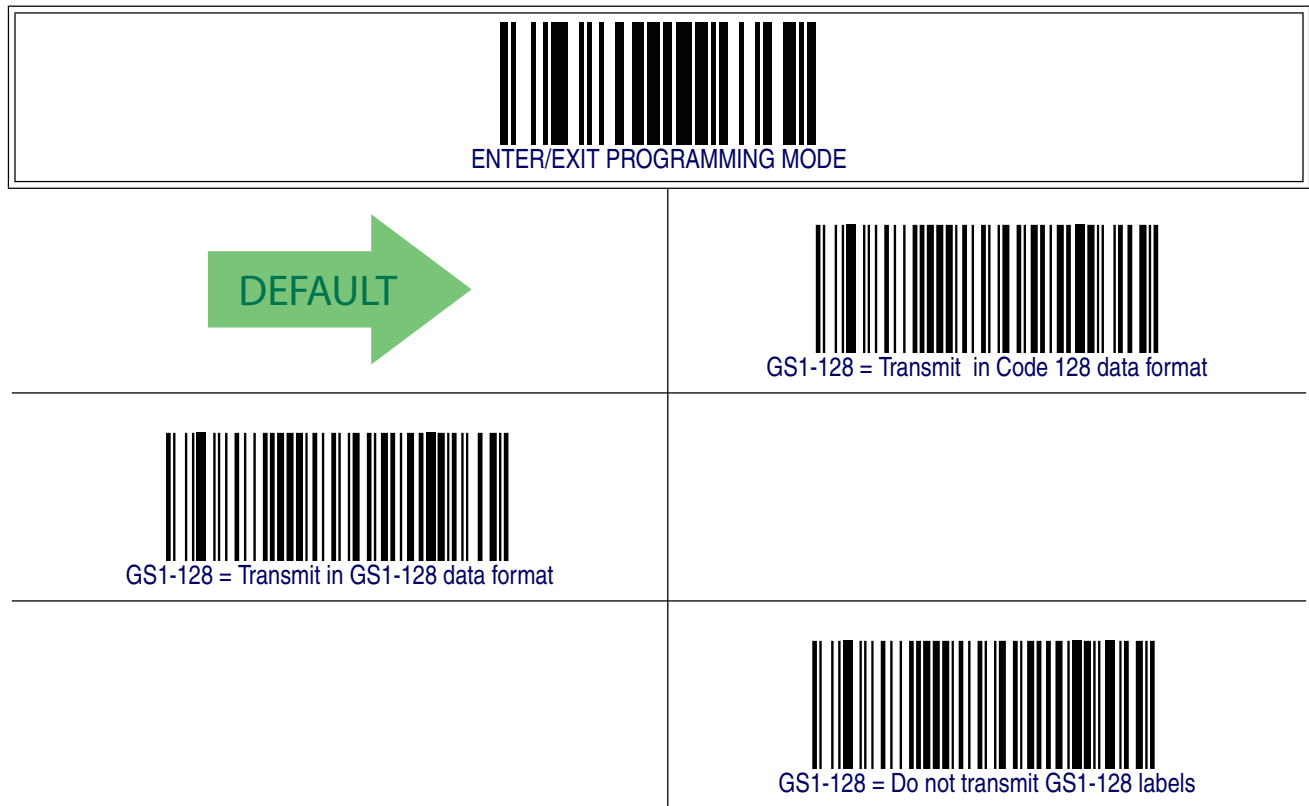
## GS1-128

The following options apply to the GS1-128 symbology. (Also known as USS-128, GTIN-128, UCC-128.)

### GS1-128 Enable

This option enables/disables the ability of the reader to translate GS1-128 labels to the GS1-128 data format. Options are:

- Transmit GS1-128 labels in Code 128 data format.
- Transmit GS1-128 labels in GS1-128 data format.
- Do not transmit GS1-128 labels.



## Interleaved 2 of 5 (I 2 of 5)

The following options apply to the I 2 of 5 symbology.

### I 2 of 5 Enable/Disable

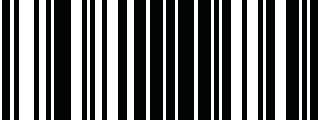
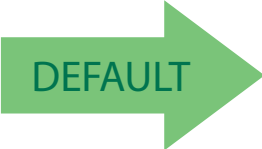
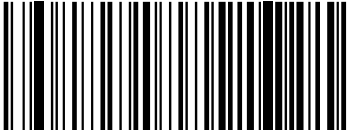


When disabled, the reader will not read I 2 of 5 barcodes.



## Interleaved 2 of 5 (I 2 of 5) – cont.

### I 2 of 5 Check Character Calculation

This option enables/disables calculation and verification of an optional I 2 of 5 check character. When disabled, any check character in label is treated as a data character.

 ENTER/EXIT PROGRAMMING MODE	
 DEFAULT	 I 2 of 5 Check Character Calculation = Disable
 I 2 of 5 Check Character Calculation = Check Standard (Modulo 10)	
	 I 2 of 5 Check Character Calculation = Check German Parcel
 I 2 of 5 Check Character Calculation = Check DHL	
	 I 2 of 5 Check Character Calculation = Check Daimler Chrysler
 I 2 of 5 Check Character Calculation = Check Bosch	

## Interleaved 2 of 5 (I 2 of 5) – cont.

### I 2 of 5 Check Character Transmission

Enable this option to transmit the check character along with I 2 of 5 barcode data.

 ENTER/EXIT PROGRAMMING MODE	
	 I 2 of 5 Check Character Transmission = Don't Send
 I 2 of 5 Check Character Transmission = Send	 DEFAULT

## Interleaved 2 of 5 (I 2 of 5) – cont.

### I 2 of 5 Minimum Reads

This feature specifies the minimum number of consecutive times an I 2 of 5 label must be decoded before it is accepted as good read..

 ENTER/EXIT PROGRAMMING MODE	
	 I 2 of 5 Minimum Reads = 1
 I 2 of 5 Minimum Reads = 2	 <b>DEFAULT</b>
	 I 2 of 5 Minimum Reads = 3
 I 2 of 5 Minimum Reads = 4	

---

## Interleaved 2 of 5 (I 2 of 5) – cont.

### 2 of 5 Decoding Level



This configuration item applies to Interleaved 2 of 5, Datalogic 2 of 5 and Standard 2 of 5.

#### NOTE

Decoding Levels are used to configure a barcode symbology decoder to be very aggressive to very conservative depending on a particular customer's needs.

- Choosing Level 1 results in a very conservative decoder at the expense of not being able to read poorly printed or damaged labels.
- Choosing Level 5 results in a very aggressive decoder. This aggressive behavior allows decoding of poorly printed and damaged labels at the expense of increasing the likelihood of decoding errors.
- Choosing Level 3, which is the default setting, allows the majority of product labels to be decoded.

There are many factors that determine when to change the decoding level for a particular symbology. These factors include spots, voids, non-uniform bar/space widths, damaged labels, etc. that may be experienced in some barcode labels. If there are many hard to read or damaged labels that cannot be decoded using a conservative setting, increase the decoding level to be more aggressive. If the majority of labels are very good quality labels, or there is a need to decrease the possibility of a decoder error, lower the decoding level to a more conservative level.



## Interleaved 2 of 5 (I 2 of 5) – cont.

### 2 of 5 Decoding Level – cont.

 ENTER/EXIT PROGRAMMING MODE	
 2 of 5 Decoding Level = 1	
	 2 of 5 Decoding Level = 2
 2 of 5 Decoding Level = 3	 <b>DEFAULT</b>
	 2 of 5 Decoding Level = 4
 2 of 5 Decoding Level = 5	

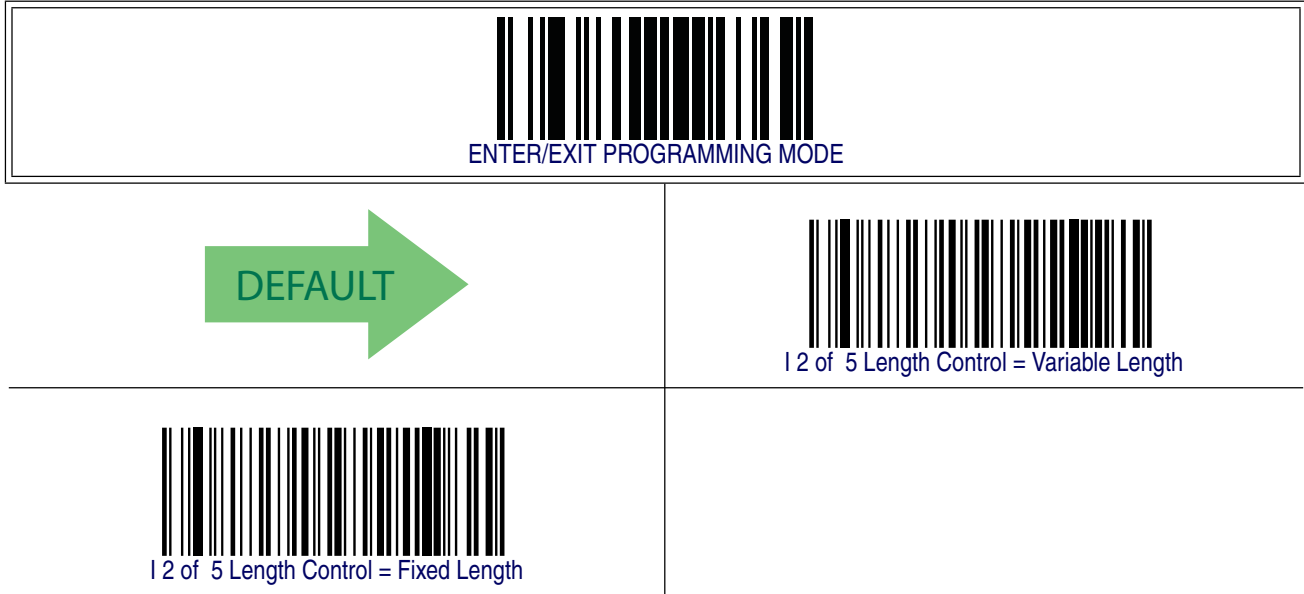
## Interleaved 2 of 5 (I 2 of 5) – cont.

### I 2 of 5 Length Control

This feature specifies either variable length decoding or fixed length decoding for the I 2 of 5 symbology.

**Variable Length** – For variable length decoding, a minimum and maximum length may be set.

**Fixed Length** – For fixed length decoding, two different lengths may be set.



## Interleaved 2 of 5 (I 2 of 5) – cont.

### I 2 of 5 Set Length 1

This feature specifies one of the barcode lengths for **I 2 of 5 Length Control**. Length 1 is the minimum label length if in **Variable Length Mode**, or the first fixed length if in **Fixed Length Mode**. The length includes the barcode's check and data characters. The length can be set from 2 to 50 characters in increments of two.

Follow these instructions to set this feature:

1. Determine the desired character length (from 2 to 50). The length must be an even number.
2. Pad the result with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT I 2 of 5 LENGTH 1 SETTING.
5. Scan the appropriate two digits from the keypad in **Appendix E, Keypad**, that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

#### NOTE

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

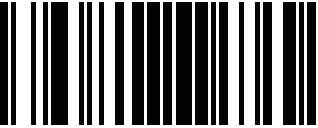
This completes the procedure. See **Table 27** for some examples of how to set this feature.


**Table 25. I 2 of 5 Length 1 Setting Examples**


STEP	ACTION	EXAMPLES			
		2 Characters	6 Characters	14 Characters	50 Characters
1	Desired Setting				
2	Pad with leading zeroes to yield two digits	02	06	14	50
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT I 2 of 5 LENGTH 1 SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '2'	'0' and '6'	'1' and '4'	'5' AND '0'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## Interleaved 2 of 5 (I 2 of 5) – cont.

### Datalogic 2 of 5 Set Length 1 – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select I 2 of 5 Length 1 Setting	
---	--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL
--	---

 06 = Length 1 is 6 Characters

## Interleaved 2 of 5 (I 2 of 5) – cont.

### I 2 of 5 Set Length 2

This feature specifies one of the barcode lengths for [I 2 of 5 Length Control](#). Length 2 is the maximum label length if in [Variable Length Mode](#), or the second fixed length if in [Fixed Length Mode](#). The length includes the barcode's check and data characters. The length can be set from 2 to 50 characters. A setting of 0 specifies to ignore this length (only one fixed length).

Follow these instructions to set this feature:

1. Determine the desired character length (from 2 to 50, or 0 to ignore this length). The length must be an even number.
2. Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT I 2 of 5 LENGTH 2 SETTING.
5. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

#### NOTE

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

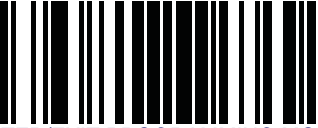
This completes the procedure. See [Table 28](#) for some examples of how to set this feature.


**Table 26. I 2 of 5 Length 2 Setting Examples**


STEP	ACTION	EXAMPLES			
1	Desired Setting	Ignore This Length	4 Characters	14 Characters	50 Characters
2	Pad with leading zeroes to yield two digits	00	04	14	50
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT I 2 OF 5 LENGTH 2 SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '0'	'0' and '4'	'1' and '4'	'5' AND '0'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## Interleaved 2 of 5 (I 2 of 5) – cont.

### I 2 of 5 Set Length 2 – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select I 2 of 5 Length 2 Setting	
---	--

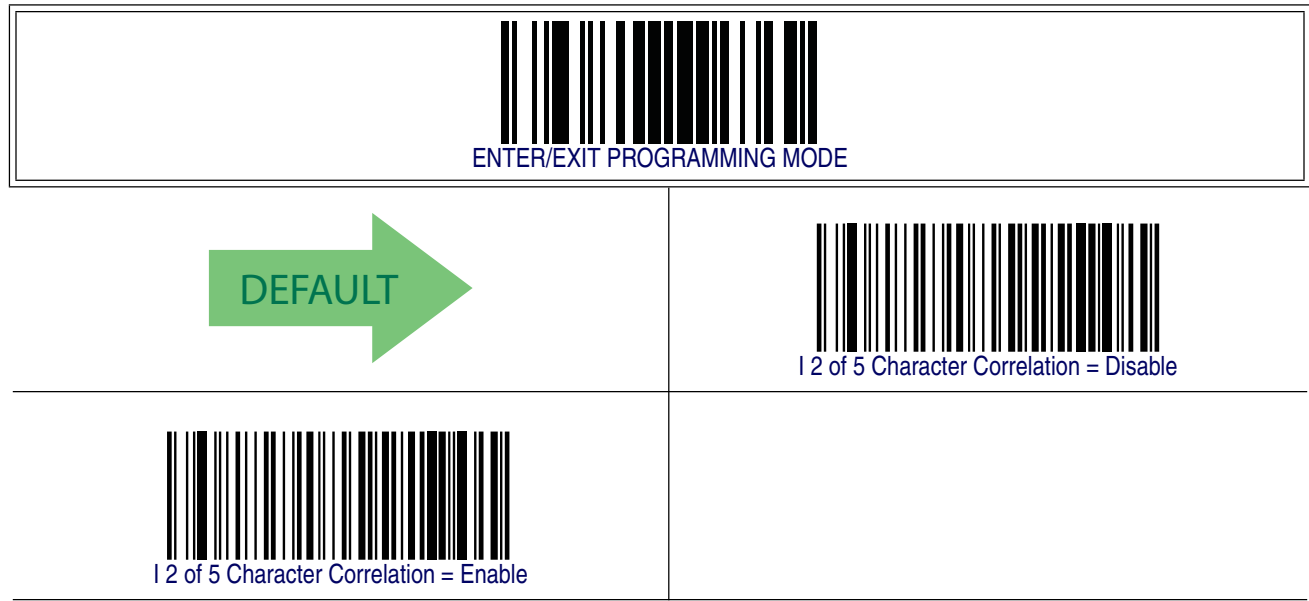
Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL
--	---

 50 = Length 2 is 50 Characters

## Interleaved 2 of 5 (I 2 of 5) – cont.

### I 2 of 5 Character Correlation

When correlation is enabled, the barcode reader will combine label data from multiple scans when decoding. Enabling correlation will help the scanner read labels that have some spots and/or voids. It may also help read labels that have damaged areas. Enabling correlation will also increase the chances that a label will be read incorrectly.



## Interleaved 2 of 5 (I 2 of 5) – cont.

### I 2 of 5 Stitching

This option enables/disables stitching for I 2 of 5 labels. When parts of a I 2 of 5 barcode are presented to the reader with this feature enabled, the barcode parts will be assembled by the reader's software, and the data will be decoded if all barcode proofing requirements are met.



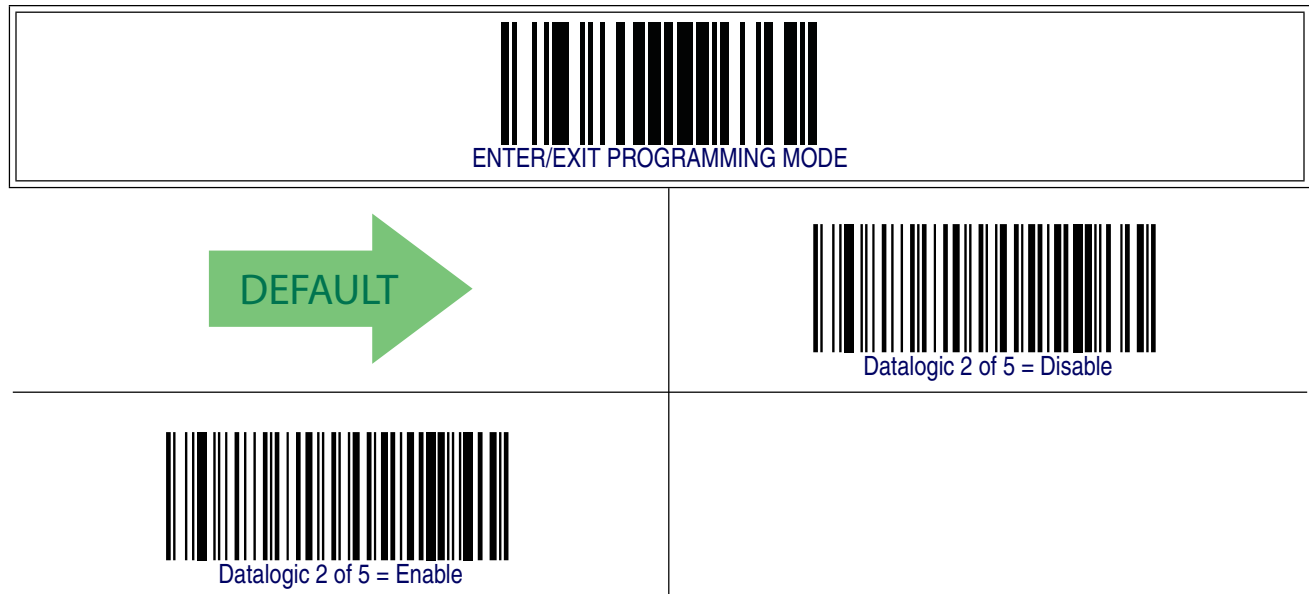


## Datalogic 2 of 5

The following options apply to the Datalogic 2 of 5 symbology.

### Datalogic 2 of 5 Enable/Disable

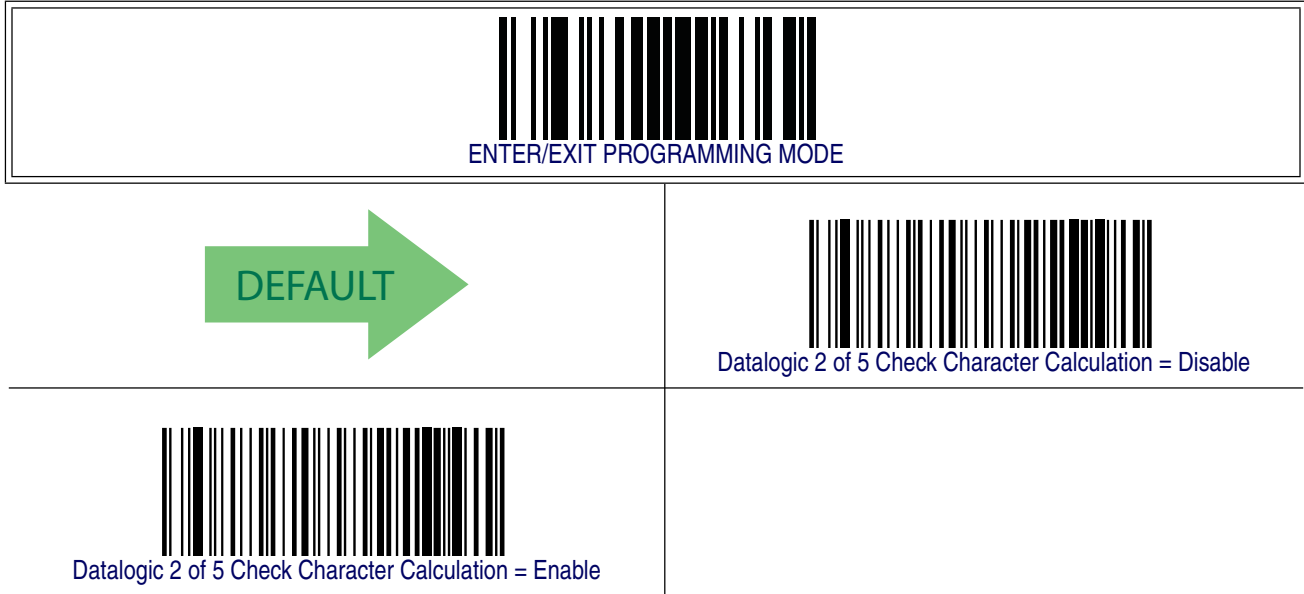
When disabled, the reader will not read Datalogic 2 of 5 barcodes.



## Datalogic 2 of 5 – cont.

### Datalogic 2 of 5 Check Character Calculation

This option enables/disables calculation and verification of an optional Datalogic 2 of 5 check character.



## Datalogic 2 of 5 – cont.

### Datalogic 2 of 5 Minimum Reads

This feature specifies the minimum number of consecutive times an Datalogic 2 of 5 label must be decoded before it is accepted as good read.

 ENTER/EXIT PROGRAMMING MODE	
	 1 of 5 Minimum Reads = 1
 1 of 5 Minimum Reads = 2	 <b>DEFAULT</b>
	 1 of 5 Minimum Reads = 3
 1 of 5 Minimum Reads = 4	

### Datalogic 2 of 5 Decoding Level



The Datalogic 2 of 5 Decoding Level feature is set using [2 of 5 Decoding Level](#) on page 192.

**NOTE**

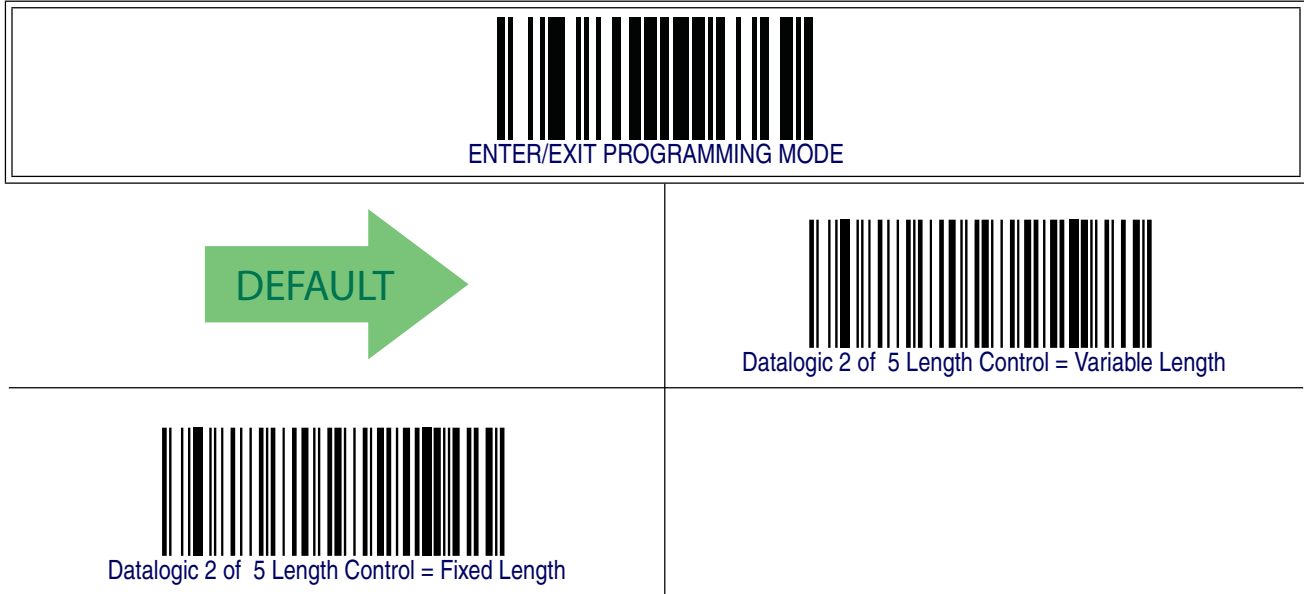
## Datalogic 2 of 5 – cont.

### Datalogic 2 of 5 Length Control

This feature specifies either variable length decoding or fixed length decoding for the Datalogic 2 of 5 symbology.

**Variable Length** – For variable length decoding, a minimum and maximum length may be set.

**Fixed Length** – For fixed length decoding, two different lengths may be set.



## Datalogic 2 of 5 – cont.

### Datalogic 2 of 5 Set Length 1

This feature specifies one of the barcode lengths for [Datalogic 2 of 5 Length Control](#). Length 1 is the minimum label length if in [Variable Length Mode](#), or the first fixed length if in [Fixed Length Mode](#). The length includes the barcode's check and data characters.

The length can be set from 2 to 50 characters in increments of two.

Follow these instructions to set this feature:

1. Determine the desired character length (from 2 to 50). The length must be an even number.
2. Pad the result with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT I 2 of 5 LENGTH 1 SETTING.
5. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



If you make a mistake before the last character scan the **CANCEL** barcode to abort and not save the entry string. You can then start again at the beginning.

#### NOTE

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

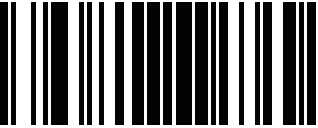
This completes the procedure. See [Table 27](#) for some examples of how to set this feature.


**Table 27. Datalogic 2 of 5 Length 1 Setting Examples**


STEP	ACTION	EXAMPLES			
		2 Characters	6 Characters	14 Characters	50 Characters
1	Desired Setting				
2	Pad with leading zeroes to yield two digits	02	06	14	50
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT Datalogic 2 of 5 LENGTH 1 SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '2'	'0' and '6'	'1' and '4'	'5' AND '0'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## Datalogic 2 of 5 – cont.

### Datalogic 2 of 5 Set Length 1 – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Datalogic 2 of 5 Length 1 Setting	
---	--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL
--	---

 06 = Length 1 is 6 Characters

## Datalogic 2 of 5 – cont.

### Datalogic 2 of 5 Set Length 2

This feature specifies one of the barcode lengths for [Datalogic 2 of 5 Length Control](#). Length 2 is the maximum label length if in [Variable Length Mode](#), or the second fixed length if in [Fixed Length Mode](#). The length includes the barcode's check and data characters.

The length can be set from 2 to 50 characters. A setting of 0 specifies to ignore this length (only one fixed length).

Follow these instructions to set this feature:

1. Determine the desired character length (from 2 to 50, or 0 to ignore this length). The length must be an even number.
2. Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
3. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
4. Scan the barcode: SELECT Datalogic 2 of 5 LENGTH 2 SETTING.
5. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

#### NOTE

6. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

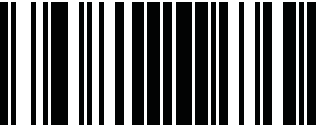
This completes the procedure. See [Table 28](#) for some examples of how to set this feature.


**Table 28. Datalogic 2 of 5 Length 2 Setting Examples**


STEP	ACTION	EXAMPLES			
		Ignore This Length	4 Characters	14 Characters	50 Characters
1	Desired Setting				
2	Pad with leading zeroes to yield two digits	00	04	14	50
3	Scan ENTER/EXIT PROGRAMMING MODE				
4	Scan SELECT DATALOGIC 2 OF 5 LENGTH 2 SETTING				
5	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '0'	'0' and '4'	'1' and '4'	'5' AND '0'
6	Scan ENTER/EXIT PROGRAMMING MODE				

## Datalogic 2 of 5 – cont.

### Datalogic 2 of 5 Set Length 2 – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Datalogic 2 of 5 Length 2 Setting	
---	--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL
--	---

 50 = Length 2 is 50 Characters



## Datalogic 2 of 5 Interdigit Maximum Ratio

This feature specifies the maximum ratio between intercharacter space and module for Datalogic 2 of 5.

 ENTER/EXIT PROGRAMMING MODE	
	 Datalogic 2 of 5 Interdigit Maximum Ratio = Disable
 Datalogic 2 of 5 Interdigit Maximum Ratio = 1	
	 Datalogic 2 of 5 Interdigit Maximum Ratio = 2
 Datalogic 2 of 5 Interdigit Maximum Ratio = 3	
 DEFAULT	 Datalogic 2 of 5 Interdigit Maximum Ratio = 4
 Datalogic 2 of 5 Interdigit Maximum Ratio = 5	

## Datalogic 2 of 5 Interdigit Maximum Ratio – cont.

	 <p>Datalogic 2 of 5 Interdigit Maximum Ratio = 6</p>
 <p>Datalogic 2 of 5 Interdigit Maximum Ratio = 7</p>	
	 <p>Datalogic 2 of 5 Interdigit Maximum Ratio = 8</p>
 <p>Datalogic 2 of 5 Interdigit Maximum Ratio = 9</p>	
	 <p>Datalogic 2 of 5 Interdigit Maximum Ratio = 10</p>

## Datalogic 2 of 5 – cont.

### Datalogic 2 of 5 Character Correlation

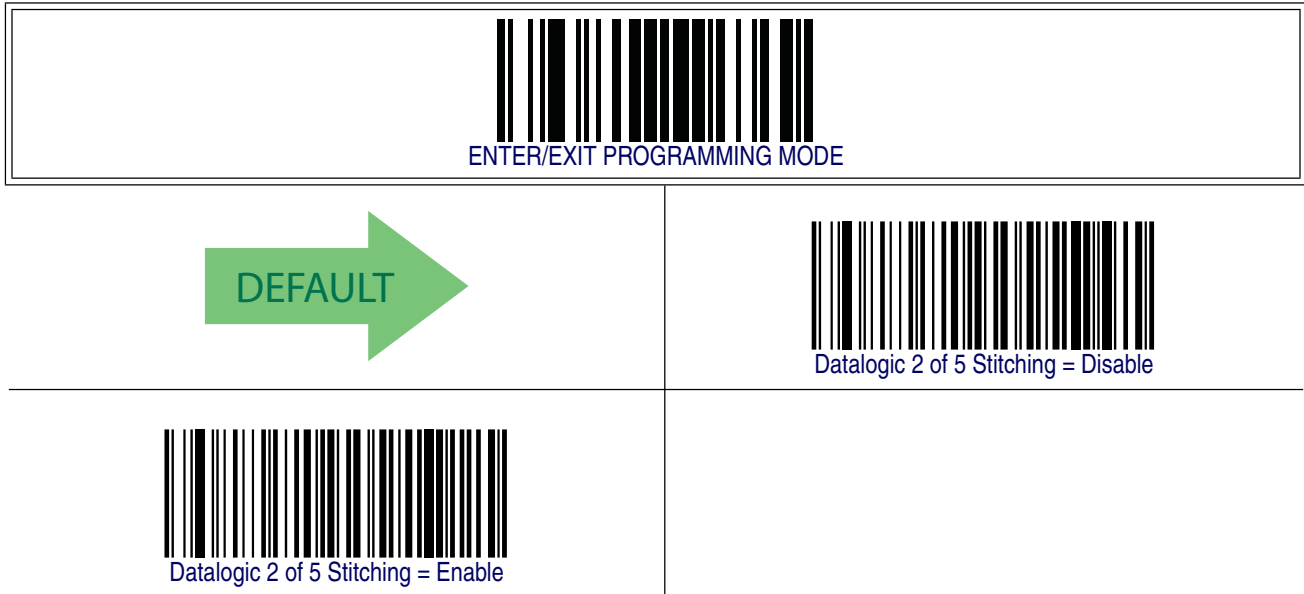
When correlation is enabled, the barcode reader will combine label data from multiple scans when decoding. Enabling correlation will help the scanner read labels that have some spots and/or voids. It may also help read labels that have damaged areas. Enabling correlation will also increase the chances that a label will be read incorrectly.



## Datalogic 2 of 5 – cont.

### Datalogic 2 of 5 Stitching

This option enables/disables stitching for Datalogic 2 of 5 labels. When parts of a Datalogic 2 of 5 barcode are presented to the reader with this feature enabled, the barcode parts will be assembled by the reader's software, and the data will be decoded if all barcode proofing requirements are met.

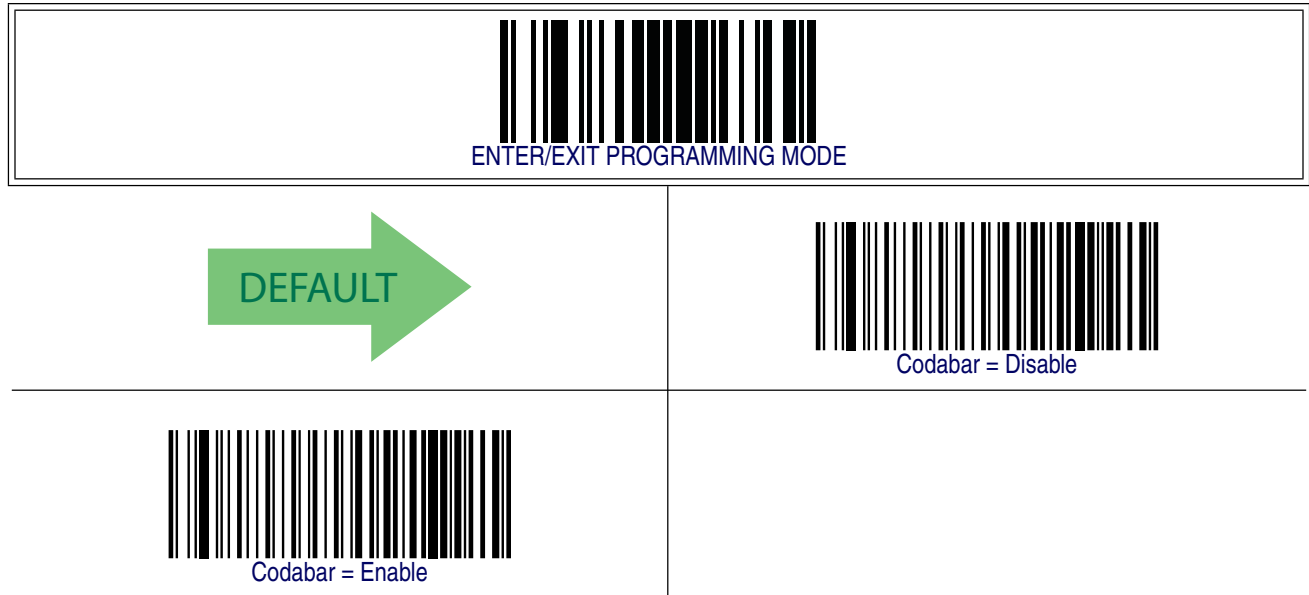


## Codabar

The following options apply to the Codabar symbology.

### Codabar Enable/Disable

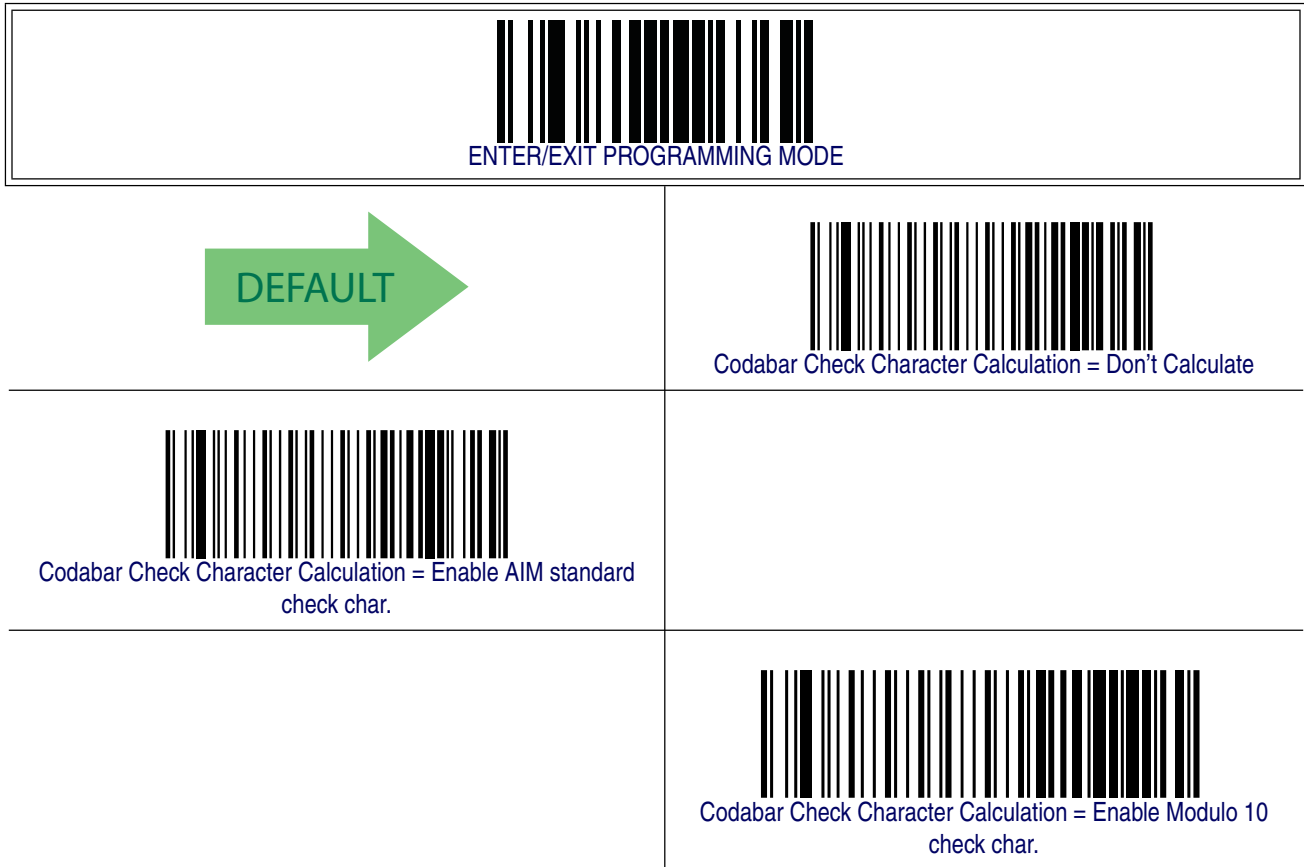
When disabled, the reader will not read Codabar barcodes.



## Codabar – cont.

### Codabar Check Character Calculation

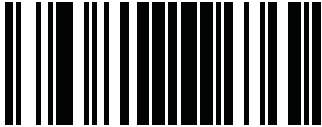
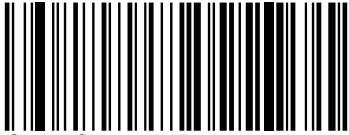
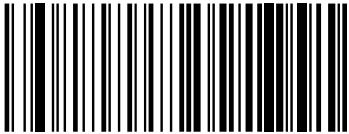

Enable this option to enables/disables calculation and verification of an optional Codabar check character. When disabled, any check characters in the label are treated as data characters.



## Codabar — cont.

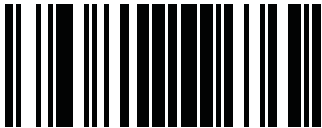

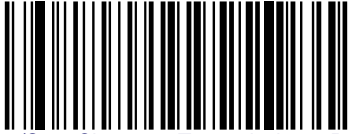
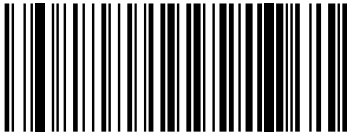
### Codabar Check Character Transmission

Enable this option to transmit the check character along with Codabar barcode data.

 ENTER/EXIT PROGRAMMING MODE	
	 Codabar Check Character Transmission = Don't Send
 Codabar Check Character Transmission = Send	 <b>DEFAULT</b>

### Codabar Start/Stop Character Transmission

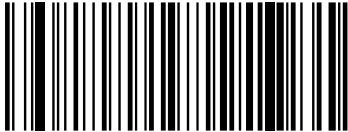
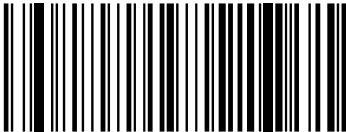

Enable this option to enable/disable transmission of Codabar start and stop characters.

 ENTER/EXIT PROGRAMMING MODE	
 <b>DEFAULT</b>	 Codabar Start/Stop Character Transmission = Don't Transmit
 Codabar Start/Stop Character Transmission = Transmit	

# Codabar — cont.

## Codabar Start/Stop Character Set

This option specifies the format of transmitted Codabar start/stop characters.

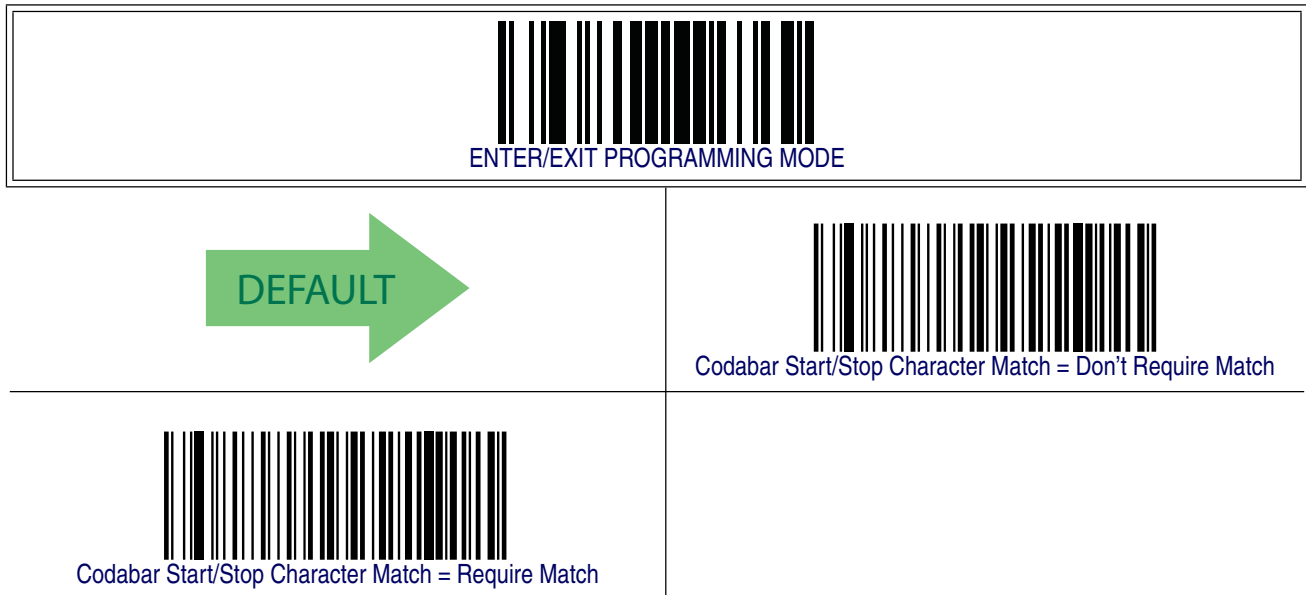
 ENTER/EXIT PROGRAMMING MODE	
	 Codabar Check Character Set = ABCD/TN*E
 Codabar Check Character Set = ABCD/ABCD	
	 Codabar Check Character Set = abcd/tn*e
 Codabar Check Character Set = abcd/abcd	 DEFAULT



## Codabar — cont.

### Codabar Start/Stop Character Match

When enabled, this option requires that start and stop characters match.



## Codabar – cont.

### Codabar Quiet Zones

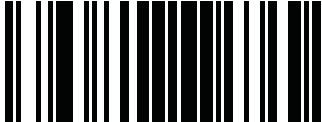
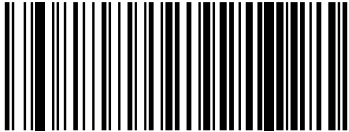
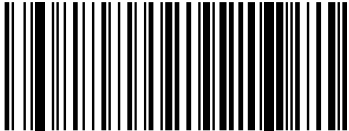


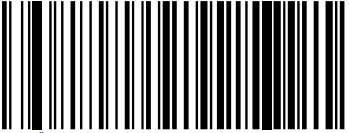
This feature specifies the number of quiet zones for Codabar labels. Quiet zones are blank areas at the ends of a barcode and are typically 10 times the width of the narrowest bar or space in the label.

 ENTER/EXIT PROGRAMMING MODE	
 Codabar Quiet Zones = Quiet Zone on one side	
	 Codabar Quiet Zones = Quiet Zones on two sides
 Codabar Quiet Zones = Auto	 DEFAULT
	 Codabar Quiet Zones = Virtual Quiet Zones on two sides

## Codabar — cont.

### Codabar Minimum Reads

This feature specifies the minimum number of consecutive times a Codabar label must be decoded before it is accepted as good read..

 ENTER/EXIT PROGRAMMING MODE	
	 Codabar Minimum Reads = 1
 Codabar Minimum Reads = 2	 <b>DEFAULT</b>
	 Codabar Minimum Reads = 3
 Codabar Minimum Reads = 4	

## Codabar — cont.

### Codabar Decoding Level

Decoding Levels are used to configure a barcode symbology decoder to be very aggressive to very conservative depending on a particular customer's needs.

- Choosing Level 1 results in a very conservative decoder at the expense of not being able to read poorly printed or damaged labels.
- Choosing Level 5 results in a very aggressive decoder. This aggressive behavior allows decoding of poorly printed and damaged labels at the expense of increasing the likelihood of decoding errors.
- Choosing Level 3, which is the default setting, allows the majority of product labels to be decoded.

There are many factors that determine when to change the decoding level for a particular symbology. These factors include spots, voids, non-uniform bar/space widths, damaged labels, etc. that may be experienced in some barcode labels. If there are many hard to read or damaged labels that cannot be decoded using a conservative setting, increase the decoding level to be more aggressive. If the majority of labels are very good quality labels, or there is a need to decrease the possibility of a decoder error, lower the decoding level to a more conservative level.

## Codabar – cont.

### Codabar Decoding Level – cont.

 ENTER/EXIT PROGRAMMING MODE	
 Codabar Decoding Level = 1	
	 Codabar Decoding Level = 2
 Codabar Decoding Level = 3	
	 Codabar Decoding Level = 4
 Codabar Decoding Level = 5	

## Codabar — cont.

### Codabar Length Control

This feature specifies either variable length decoding or fixed length decoding for the Codabar symbology.

**Variable Length** — For variable length decoding, a minimum and maximum length may be set.

**Fixed Length** — For fixed length decoding, two different lengths may be set.



## Codabar – cont.

### Codabar Set Length 1

This feature specifies one of the barcode lengths for [Codabar Length Control](#). Length 1 is the minimum label length if in [Variable Length Mode](#), or the first fixed length if in [Fixed Length Mode](#). Length includes the barcode's start, stop, check and data characters. The length must include at least one data character. The length can be set from 3 to 50 characters.

Follow these instructions to set this feature:

1. Determine the desired character length (from 3 to 50). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT CODABAR LENGTH 1 SETTING.
4. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

#### NOTE

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

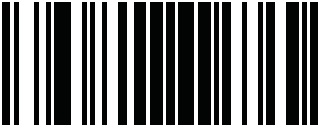
This completes the procedure. See [Table 29](#) for some examples of how to set this feature.

**Table 29. Codabar Length 1 Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Setting (and pad with leading zeroes)	03 Characters	09 Characters	15 Characters	50 Characters
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT CODABAR LENGTH 1 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '3'	'0' and '9'	'1' and '5'	'5' AND '0'
5	Scan ENTER/EXIT PROGRAMMING MODE				

## Codabar – cont.

### Codabar Set Length 1 – cont.

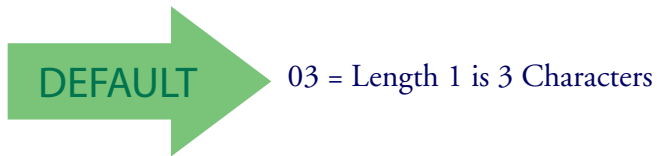
 ENTER/EXIT PROGRAMMING MODE
--

 Select Codabar Length 1 Setting
--

--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

 CANCEL
---





## Codabar — cont.

### Codabar Set Length 2

This feature specifies one of the barcode lengths for [Codabar Length Control](#). Length 2 is the maximum label length if in [Variable Length Mode](#), or the second fixed length if in [Fixed Length Mode](#). The length includes the barcode's start, stop, check and data characters. The length must include at least one data character.

The length can be set from 3 to 50 characters. A setting of 0 specifies to ignore this length (only one fixed length).

Follow these instructions to set this feature:

1. Determine the desired character length (from 3 to 50 — or 0 to ignore this length). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT CODABAR LENGTH 2 SETTING.
4. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

#### NOTE

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

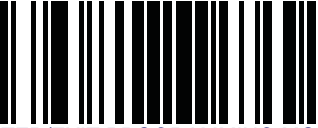
This completes the procedure. See [Table 30](#) for some examples of how to set this feature.

**Table 30. Codabar Length 2 Setting Examples**

STEP	ACTION	EXAMPLES			
		00 Ignore This Length	07 Characters	15 Characters	50 Characters
1	Desired Setting (and pad with leading zeroes)	00 Ignore This Length	07 Characters	15 Characters	50 Characters
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT CODE 39 LENGTH 2 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '0'	'0' and '7'	'1' and '5'	'5' AND '0'
5	Scan ENTER/EXIT PROGRAMMING MODE				

## Codabar – cont.

### Codabar Set Length 2 – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select CodabarLength 2 Setting	
---	--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

 CANCEL
---



## Codabar — cont.

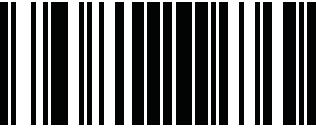

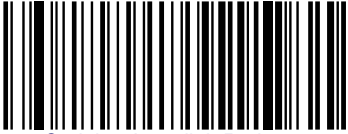
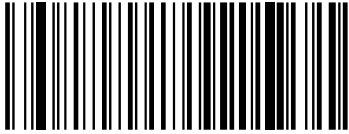
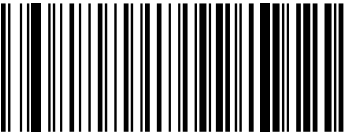
### Codabar Interdigit Ratio

This feature specifies the ratio between an intercharacter space and module for Codabar labels.

 ENTER/EXIT PROGRAMMING MODE	
	 Codabar Interdigit Ratio = Disable
 Codabar Interdigit Ratio = 1	
	 Codabar Interdigit Ratio = 2
 Codabar Interdigit Ratio = 3	
 <b>DEFAULT</b>	 Codabar Interdigit Ratio = 4
 Codabar Interdigit Ratio = 5	

# Codabar — cont.

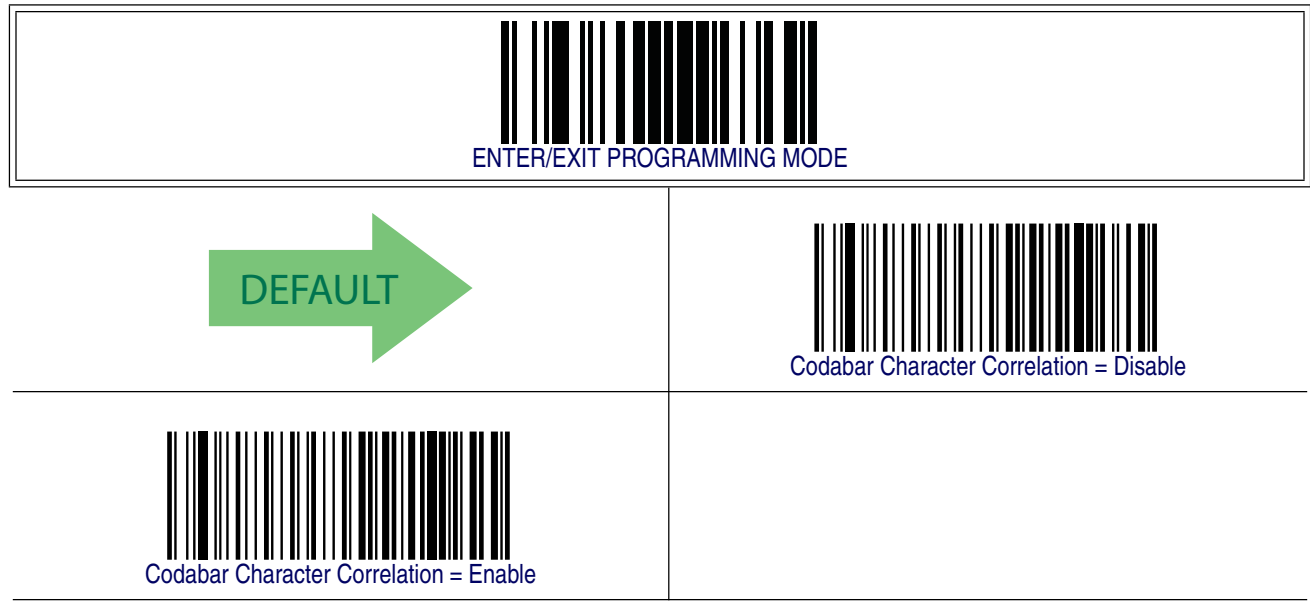
## Codabar Interdigit Ratio — cont.

 ENTER/EXIT PROGRAMMING MODE	
	 Codabar Interdigit Ratio = 6
 Codabar Interdigit Ratio = 7	
	 Codabar Interdigit Ratio = 8
 Codabar Interdigit Ratio = 9	
	 Codabar Interdigit Ratio = 10

## Codabar – cont.

### Codabar Character Correlation

When correlation is enabled, the barcode reader will combine label data from multiple scans when decoding. Enabling correlation will help the scanner read labels that have some spots and/or voids. It may also help read labels that have damaged areas. Enabling correlation will also increase the chances that a label will be read incorrectly.



## Codabar Stitching

This option enables/disables stitching for Codabar labels. When parts of a Codabar barcode are presented to the reader with this feature enabled, the barcode parts will be assembled by the reader's software, and the data will be decoded if all barcode proofing requirements are met.

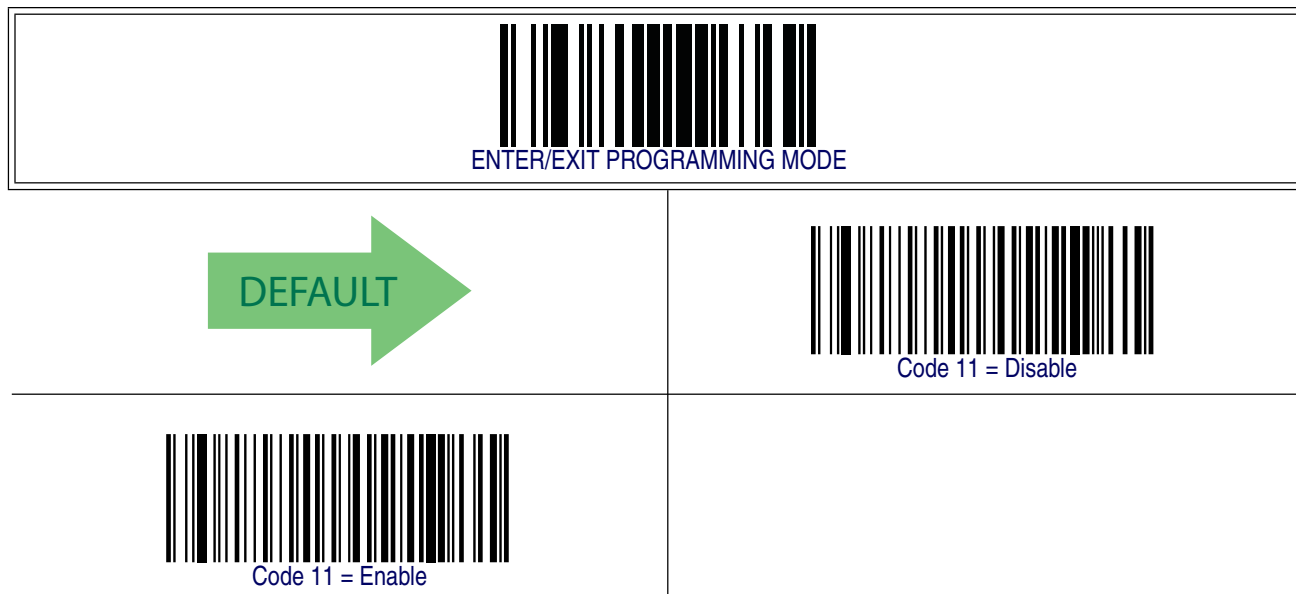


## Code 11

The following options apply to the Code 11 symbology.

### Code 11 Enable/Disable

When disabled, the reader will not read Code 11 barcodes.



## Code 11 – cont.

### Code 11 Check Character Calculation

This option enables/disables calculation and verification of optional Code 11 check character.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 11 Check Character Calculation = Disable
 Code 11 Check Character Calculation = Check C	
	 Code 11 Check Character Calculation = Check K
 Code 11 Check Character Calculation = Check C and K	 DEFAULT



## Code 11 – cont.

### Code 11 Check Character Transmission


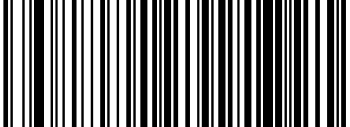

This feature enables/disables transmission of an optional Code 11 check character.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 11 Check Character Transmission = Don't Send
 Code 11 Check Character Transmission = Send	 DEFAULT

## Code 11 – cont.

### Code 11 Minimum Reads

This feature specifies the minimum number of consecutive times a Code 11 label must be decoded before it is accepted as good read..

 ENTER/EXIT PROGRAMMING MODE	
	 Code 11 Minimum Reads = 1
 Code 11 Minimum Reads = 2	 DEFAULT
	 Code 11 Minimum Reads = 3
 Code 11 Minimum Reads = 4	

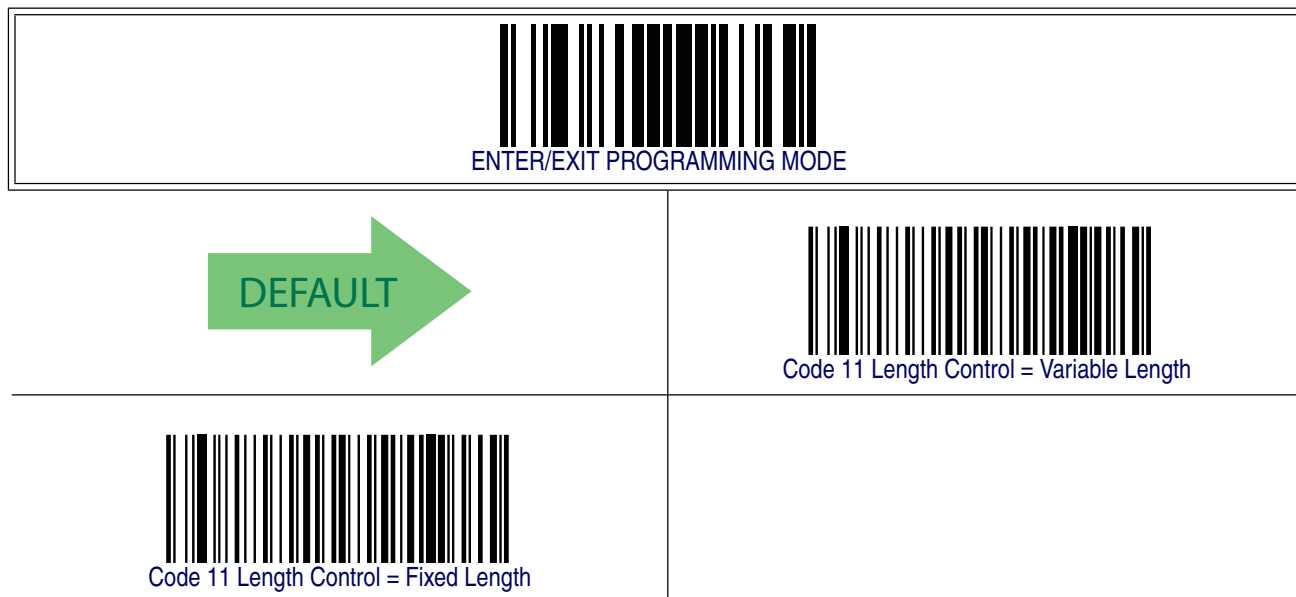
## Code 11 — cont.

### Code 11 Length Control

This feature specifies either variable length decoding or fixed length decoding for the Code 11 symbology.

**Variable Length** — For variable length decoding, a minimum and maximum length may be set.

**Fixed Length** — For fixed length decoding, two different lengths may be set.



# Code 11 – cont.

## Code 11 Set Length 1

This feature specifies one of the barcode lengths for **Code 11 Length Control**. Length 1 is the minimum label length if in **Variable Length Mode**, or the first fixed length if in **Fixed Length Mode**. Length includes the barcode’s check and data characters. The length can be set from 2 to 50 characters.

Follow these instructions to set this feature:

1. Determine the desired character length (from 2 to 50). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT CODE 11 LENGTH 1 SETTING.
4. Scan the appropriate two digits from the keypad in **Appendix E, Keypad**, that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

**NOTE**

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

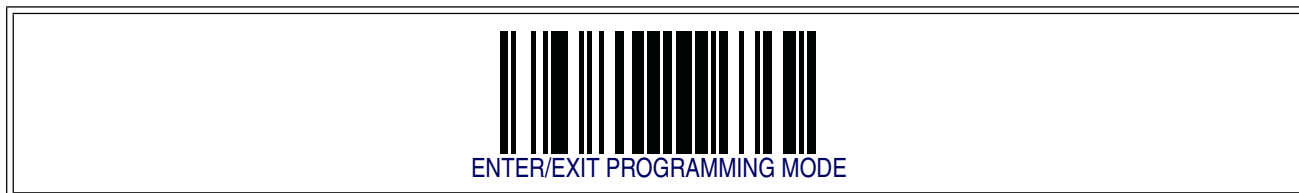
This completes the procedure. See **Table 31** for some examples of how to set this feature.

**Table 31. Code 11 Length 1 Setting Examples**

STEP	ACTION	EXAMPLES			
1	Desired Setting (pad with leading zeroes)	02 Characters	07 Characters	15 Characters	50 Characters
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT CODE 11 LENGTH 1 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '2'	'0' and '7'	'1' and '5'	'5' AND '0'
5	Scan ENTER/EXIT PROGRAMMING MODE				

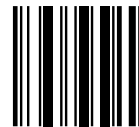
## Code 11 – cont.

### Code 11 Set Length 1 – cont.

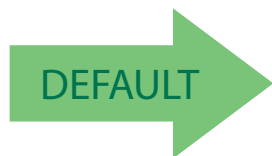


Select Code 11 Set Length 1 Setting

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.



CANCEL



04 = Length 1 is 4 Characters

# Code 11 – cont.

## Code 11 Set Length 2

This feature specifies one of the barcode lengths for **Code 11 Length Control**. Length 2 is the maximum label length if in **Variable Length Mode**, or the second fixed length if in **Fixed Length Mode**. Length includes the barcode’s check and data characters.

The length can be set from 2 to 50 characters. A setting of 0 specifies to ignore this length (only one fixed length).

Follow these instructions to set this feature:

1. Determine the desired character length (from 2 to 50 — or 0 to ignore this length). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT CODE 11 LENGTH 2 SETTING.
4. Scan the appropriate two digits from the keypad in **Appendix E, Keypad**, that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

**NOTE**

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

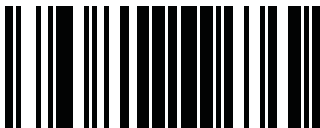
This completes the procedure. See **Table 32** for some examples of how to set this feature.


**Table 32. Code 11 Length 2 Setting Examples**


STEP	ACTION	EXAMPLES			
1	Desired Setting (pad with leading zeroes)	00 (Ignore This Length)	07 Characters	15 Characters	50 Characters
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT CODE 11 LENGTH 2 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '0'	'0' and '7'	'0' and 'F'	'3' AND 2'
5	Scan ENTER/EXIT PROGRAMMING MODE				

## Code 11 – cont.

### Code 11 Set Length 2 – cont.

 ENTER/EXIT PROGRAMMING MODE
--

 Select Code 11 Length 2 Setting	
--	--

Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.	 CANCEL
--	---

 50 = Length 2 is 50 Characters

# Code 11 – cont.

## Code 11 Interdigit Ratio

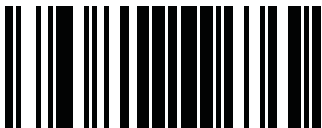
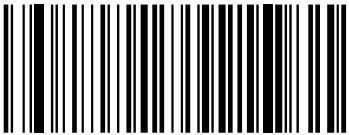
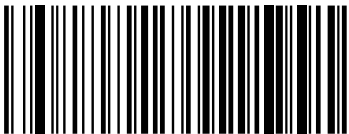

This feature specifies the ratio between an intercharacter space and module for Code 11 labels.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 11 Interdigit Ratio = Disable
 Code 11 Interdigit Ratio = 1	
	 Code 11 Interdigit Ratio = 2
 Code 11 Interdigit Ratio = 3	
 DEFAULT	 Code 11 Interdigit Ratio = 4
 Code 11 Interdigit Ratio = 5	



## Code 11 – cont.

### Code 11 Interdigit Ratio – cont.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 11 Interdigit Ratio = 6
 Code 11 Interdigit Ratio = 7	
	 Code 11 Interdigit Ratio = 8
 Code 11 Interdigit Ratio = 9	
	 Code 11 Interdigit Ratio = 10

## Code 11 Decoding Level

Decoding Levels are used to configure a barcode symbology decoder to be very aggressive to very conservative depending on a particular customer's needs.

- Choosing Level 1 results in a very conservative decoder at the expense of not being able to read poorly printed or damaged labels.
- Choosing Level 5 results in a very aggressive decoder. This aggressive behavior allows decoding of poorly printed and damaged labels at the expense of increasing the likelihood of decoding errors.
- Choosing Level 3, which is the default setting, allows the majority of product labels to be decoded.

There are many factors that determine when to change the decoding level for a particular symbology. These factors include spots, voids, non-uniform bar/space widths, damaged labels, etc. that may be experienced in some barcode labels. If there are many hard to read or damaged labels that cannot be decoded using a conservative setting, increase the decoding level to be more aggressive. If the majority of labels are very good quality labels, or there is a need to decrease the possibility of a decoder error, lower the decoding level to a more conservative level.

## Code 11 – cont.

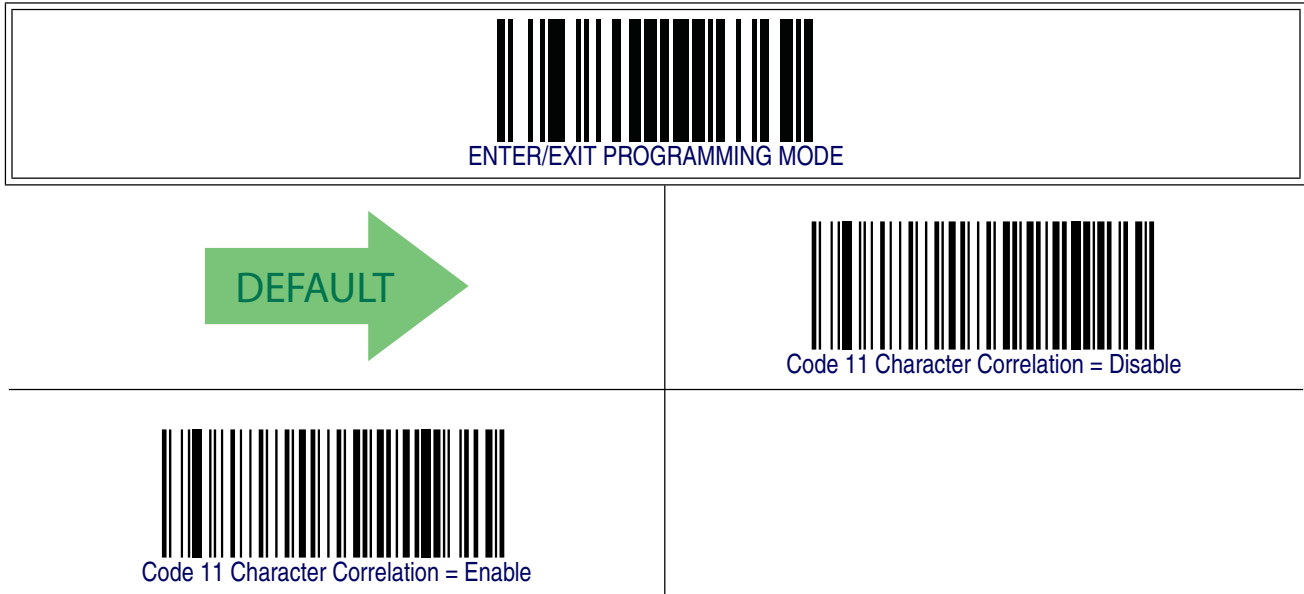
### Code 11 Decoding Level – cont.

 ENTER/EXIT PROGRAMMING MODE	
 Codabar Decoding Level = 1	
	 Codabar Decoding Level = 2
 Codabar Decoding Level = 3	
	 Codabar Decoding Level = 4
 Codabar Decoding Level = 5	

## Code 11 – cont.

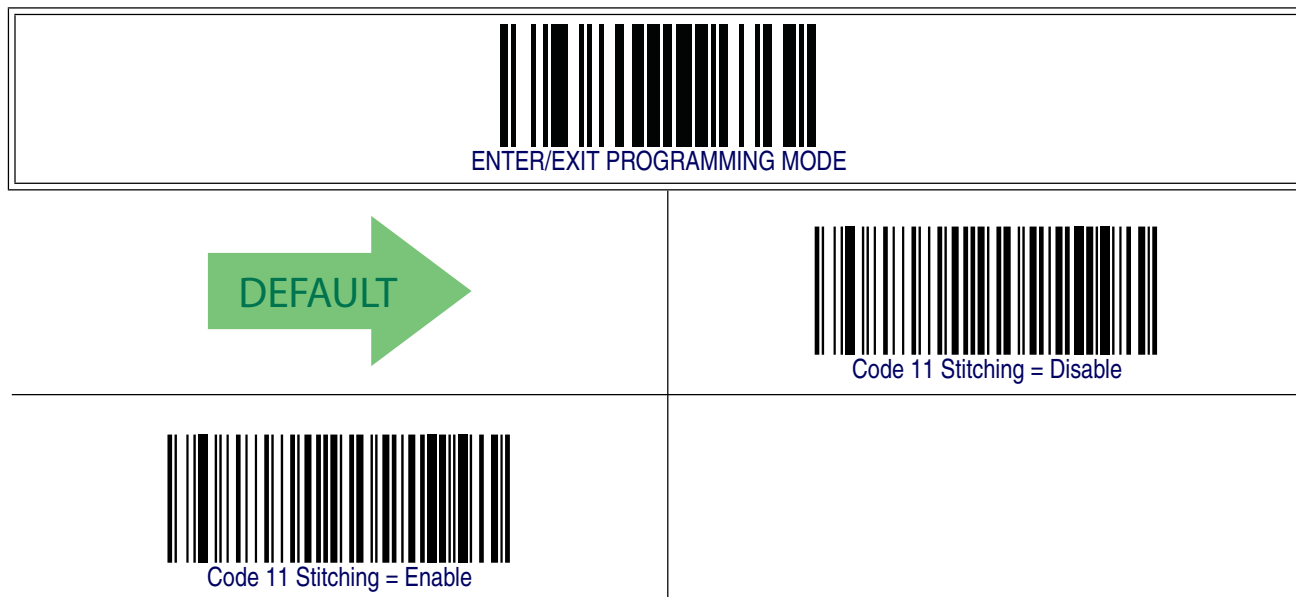
### Code 11 Character Correlation

When correlation is enabled, the barcode reader will combine label data from multiple scans when decoding. Enabling correlation will help the scanner read labels that have some spots and/or voids. It may also help read labels that have damaged areas. Enabling correlation will also increase the chances that a label will be read incorrectly.



## Code 11 Stitching

This option enables/disables stitching for Code 11 labels. When parts of a Code 11 barcode are presented to the reader with this feature enabled, the barcode parts will be assembled by the reader's software, and the data will be decoded if all barcode proofing requirements are met.



## Standard 2 of 5

The following options apply to the Standard 2 of 5 symbology.

### Standard 2 of 5 Enable/Disable

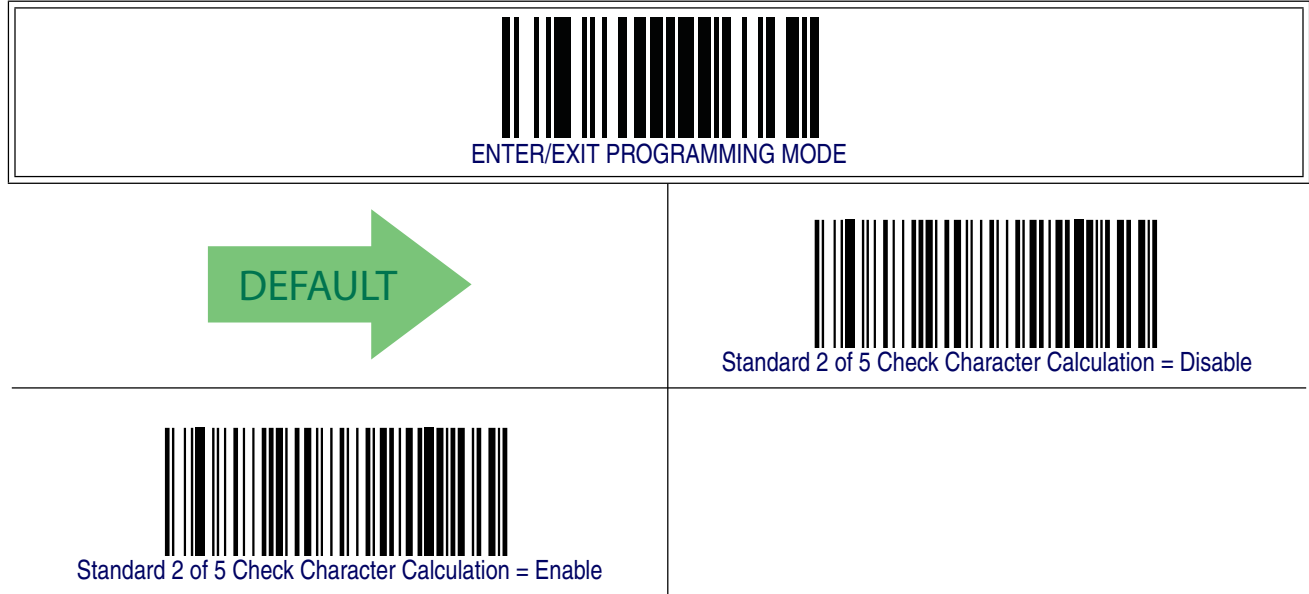
When disabled, the reader will not read Standard 2 of 5 barcodes.



## Standard 2 of 5 — cont.

### Standard 2 of 5 Check Character Calculation

This option enables/disables calculation and verification of an optional Standard 2 of 5 check character.



### Standard 2 of 5 Check Character Transmission


This feature enables/disables transmission of an optional Standard 2 of 5 check character.



## Standard 2 of 5 — cont.

### Standard 2 of 5 Minimum Reads

This feature specifies the minimum number of consecutive times a Standard 2 of 5 label must be decoded before it is accepted as good read.

 ENTER/EXIT PROGRAMMING MODE	
	 Standard 2 of 5 Minimum Reads = 1
 Standard 2 of 5 Minimum Reads = 2	
	 Standard 2 of 5 Minimum Reads = 3
 Standard 2 of 5 Minimum Reads = 4	

### Standard 2 of 5 Decoding Level



**NOTE**

The Standard 2 of 5 Decoding Level feature is set using 2 of 5 Decoding Level on page 192.



## Standard 2 of 5 — cont.

### Standard 2 of 5 Length Control

This feature specifies either variable length decoding or fixed length decoding for the Standard 2 of 5 symbology.

**Variable Length** — For variable length decoding, a minimum and maximum length may be set.

**Fixed Length** — For fixed length decoding, two different lengths may be set.



## Standard 2 of 5 – cont.

### Standard 2 of 5 Set Length 1

This feature specifies one of the barcode lengths for [Standard 2 of 5 Length Control](#). Length 1 is the minimum label length if in [Variable Length Mode](#), or the first fixed length if in [Fixed Length Mode](#). Length includes the barcode’s check and data characters.

The length can be set from 1 to 50 characters.

Follow these instructions to set this feature:

1. Determine the desired character length (from 1 to 50). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT STANDARD 2 OF 5 LENGTH 1 SETTING.
4. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

**NOTE**

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

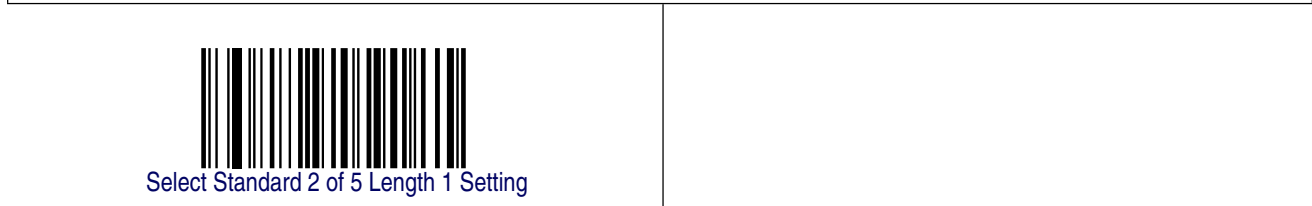
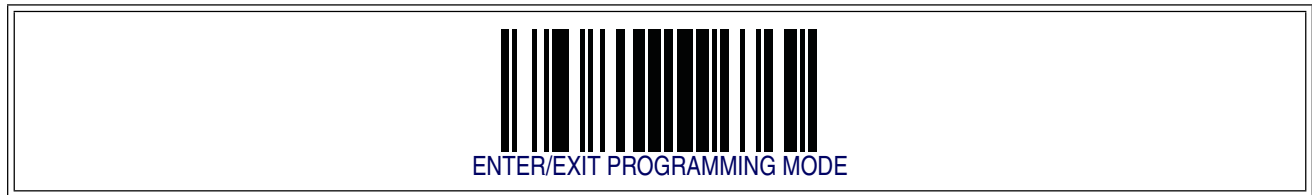
This completes the procedure. See [Table 33](#) for some examples of how to set this feature.

**Table 33. Standard 2 of 5 Length 1 Setting Examples**

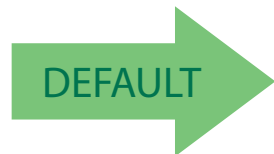
STEP	ACTION	EXAMPLES			
		01 Character	07 Characters	15 Characters	50 Characters
1	Desired Setting	01 Character	07 Characters	15 Characters	50 Characters
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT STANDARD 2 OF 5 LENGTH 1 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '1'	'0' and '7'	'1' and '5'	'5' AND '0'
5	Scan ENTER/EXIT PROGRAMMING MODE				

## Standard 2 of 5 — cont.

### Standard 2 of 5 Set Length 1 — cont.



Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.



08 = Length 1 is 8 Characters

## Standard 2 of 5 — cont.

### Standard 2 of 5 Set Length 2

This feature specifies one of the barcode lengths for [Standard 2 of 5 Length Control](#). Length 2 is the maximum label length if in [Variable Length Mode](#), or the second fixed length if in [Fixed Length Mode](#). Length includes the barcode’s check and data characters.

The length can be set from 1 to 50 characters. A setting of 0 specifies to ignore this length (only one fixed length).

Follow these instructions to set this feature:

1. Determine the desired character length (from 1 to 50 — or 0 to ignore this length). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode: SELECT STANDARD 2 OF 5 LENGTH 2 SETTING.
4. Scan the appropriate two digits from the keypad in [Appendix E, Keypad](#), that represent the length setting which was determined in the steps above. You will hear a two-beep indication after the last character.



**If you make a mistake before the last character, scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.**

**NOTE**

5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

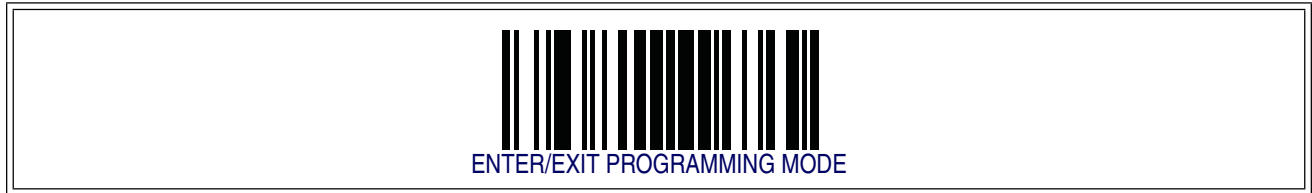
This completes the procedure. See [Table 34](#) for some examples of how to set this feature.

**Table 34. Standard 2 of 5 Length 2 Setting Examples**

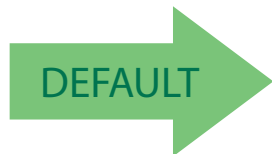
STEP	ACTION	EXAMPLES			
1	Desired Setting (pad with leading zeroes)	00 (Ignore This Length)	07 Characters	15 Characters	50 Characters
2	Scan ENTER/EXIT PROGRAMMING MODE				
3	Scan SELECT STANDARD 2 OF 5 LENGTH 2 SETTING				
4	Scan Two Characters From <a href="#">Appendix E, Keypad</a>	'0' and '0'	'0' and '7'	'1' and '5'	'5' AND '0'
5	Scan ENTER/EXIT PROGRAMMING MODE				

## Standard 2 of 5 – cont.

### Standard 2 of 5 Set Length 2 – cont.



Make a mistake? Scan the CANCEL barcode to abort and not save the entry string. You can then start again at the beginning.

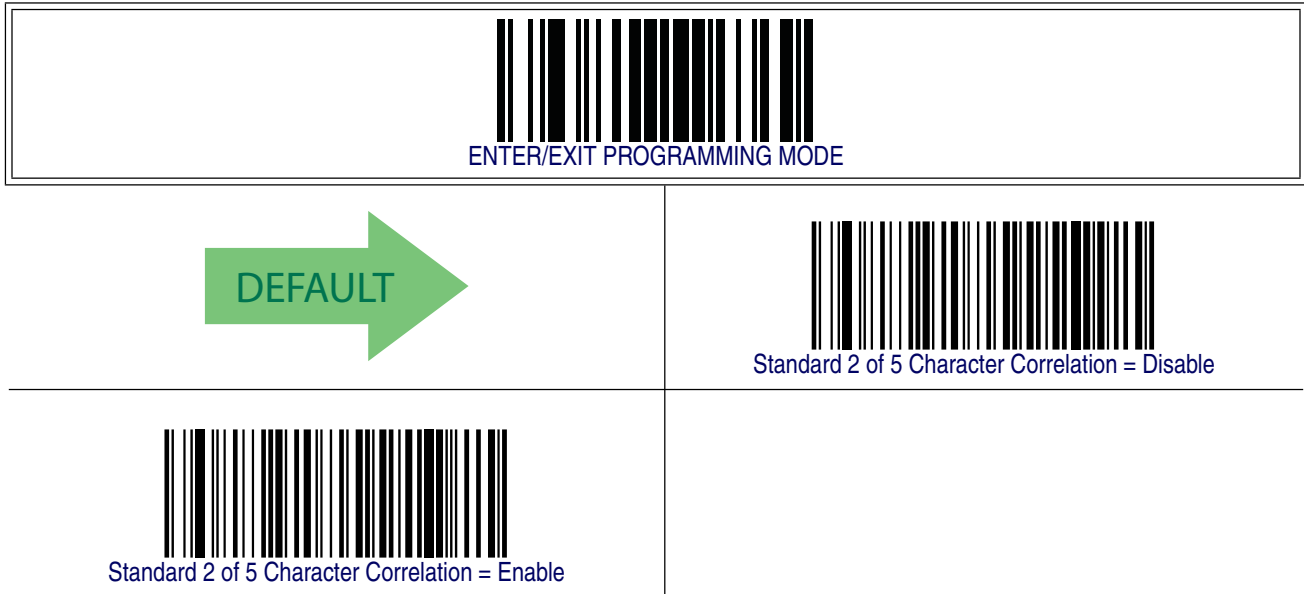


50 = Length 2 is 50 Characters

## Standard 2 of 5 – cont.

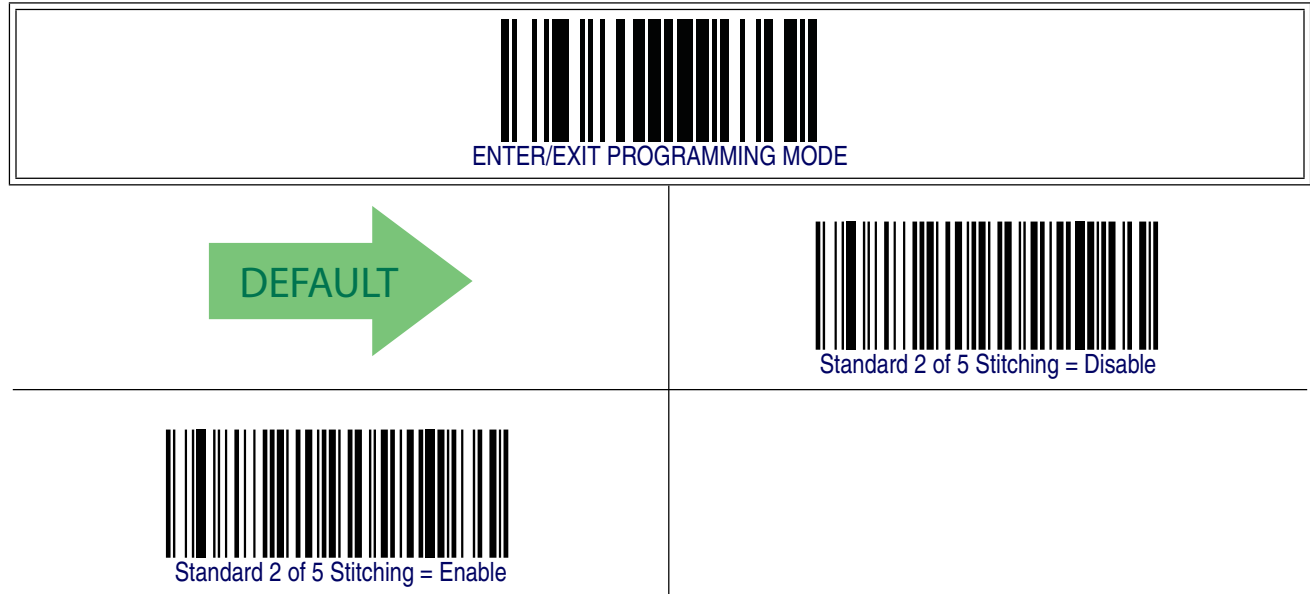
### Standard 2 of 5 Character Correlation

When correlation is enabled, the barcode reader will combine label data from multiple scans when decoding. Enabling correlation will help the scanner read labels that have some spots and/or voids. It may also help read labels that have damaged areas. Enabling correlation will also increase the chances that a label will be read incorrectly.



## Standard 2 of 5 Stitching

This option enables/disables stitching for Standard 2 of 5 labels. When parts of a Standard 2 of 5 barcode are presented to the reader with this feature enabled, the barcode parts will be assembled by the reader's software, and the data will be decoded if all barcode proofing requirements are met.

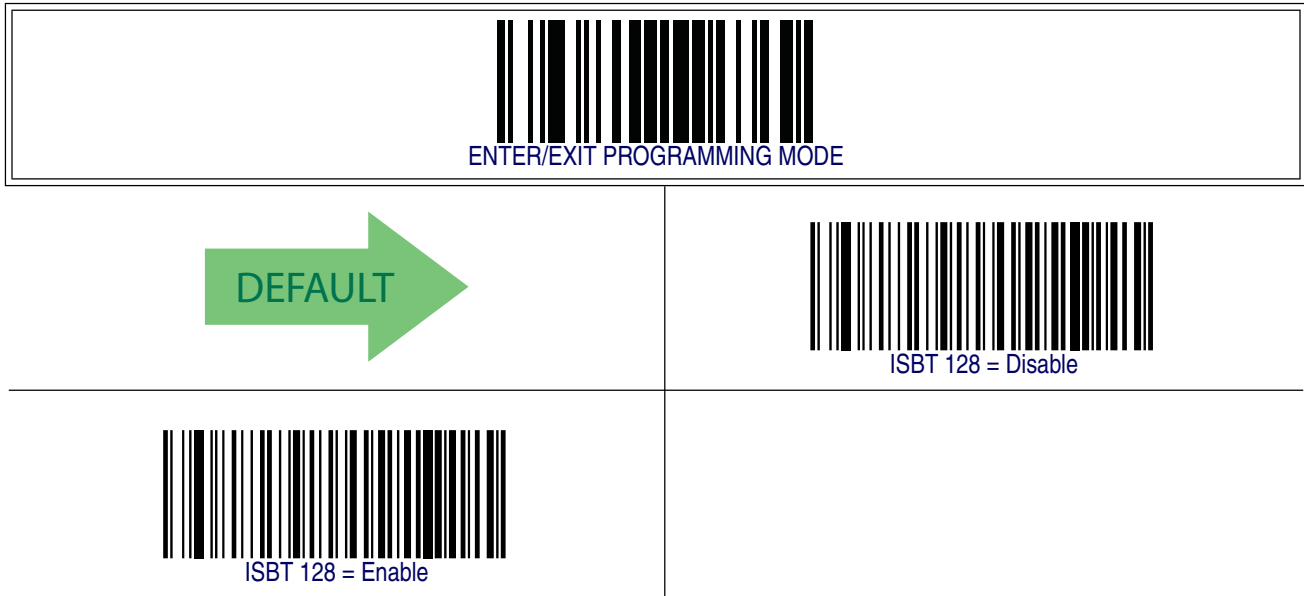


## ISBT 128

The following options apply to the ISBT 128 symbology.

### ISBT 128 Enable/Disable

Enables/Disables ability of imager to decode ISBT 128 labels.



### ISBT 128 Concatenation

Enables/disables ISBT128 concatenation of 2 labels.





## ISBT 128 — cont.

### ISBT 128 Force Concatenation

When enabled, this feature forces all ISBT 128 labels to be concatenated.



This option is only valid when [ISBT 128 Concatenation](#) is enabled. (see page 256).

NOTE



### ISBT 128 Advanced Concatenation Options



Contact Customer Support to set up pairs of label types for concatenation.

NOTE

## Code 4

The following options apply to the Code 4 symbology.

### Code 4 Enable/Disable

Enables/Disables ability of imager to decode Code 4 labels.



## Code 4 – cont.

### Code 4 Check Character Transmission

This feature enables/disables transmission of an optional Code 4 check character.

 ENTER/EXIT PROGRAMMING MODE	
	 Code 4 Check Character Transmission = Don't Send
 Code 4 Check Character Transmission = Send	 DEFAULT

### Code 4 Hex to Decimal Conversion

This feature enables/disables the conversion of hexadecimal label data to decimal label data.

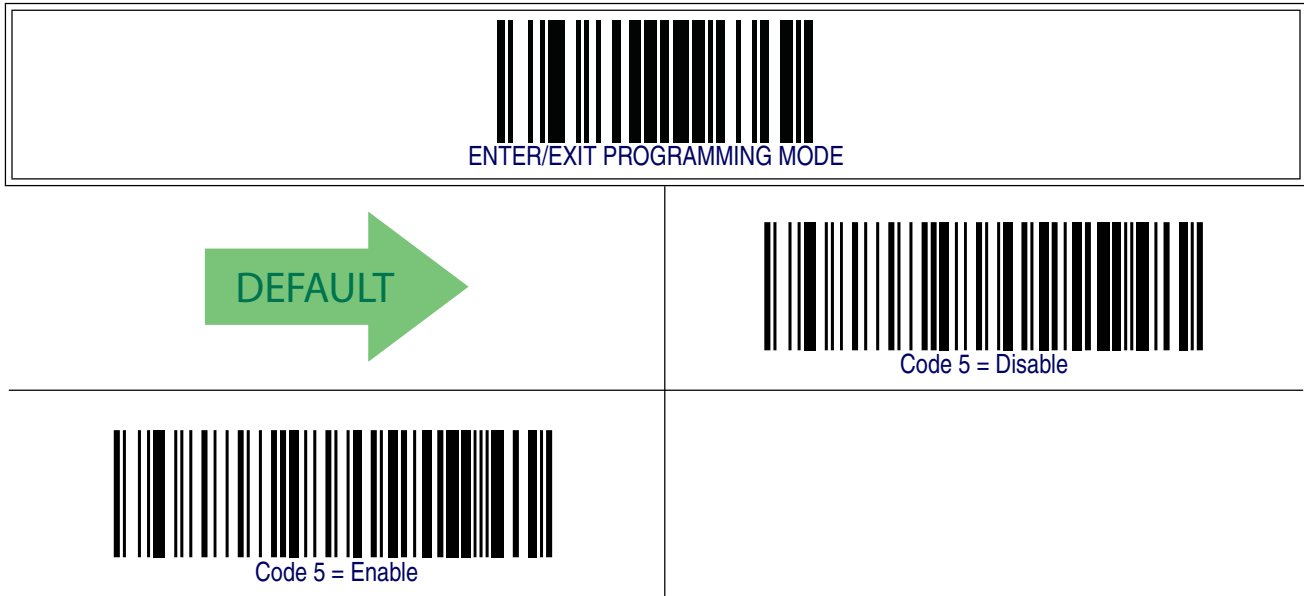
 ENTER/EXIT PROGRAMMING MODE	
	 Code 4 Hex to Decimal Conversion = Disable
 Code 4 Hex to Decimal Conversion = Enable	 DEFAULT

## Code 5

The following options apply to the Code 5 symbology.

### Code 5 Enable/Disable

Enables/Disables ability of imager to decode Code 5 labels.



## Code 5 – cont.

### Code 5 Check Character Transmission

This feature enables/disables transmission of an optional Code 5 check character.



### Code 5 Hex to Decimal Conversion

This feature enables/disables the conversion of hexadecimal label data to decimal label data.



## Code 4 and Code 5 Common Configuration Items

The following options apply to both Code 4 and Code 5 symbolologies.

### Code 4 and 5 Decoding Level

Decoding Levels are used to configure a barcode symbology decoder to be very aggressive to very conservative depending on a particular customer's needs.

- Choosing Level 1 results in a very conservative decoder at the expense of not being able to read poorly printed or damaged labels.
- Choosing Level 5 results in a very aggressive decoder. This aggressive behavior allows decoding of poorly printed and damaged labels at the expense of increasing the likelihood of decoding errors.
- Choosing Level 3, which is the default setting, allows the majority of product labels to be decoded.

There are many factors that determine when to change the decoding level for a particular symbology. These factors include spots, voids, non-uniform bar/space widths, damaged labels, etc. that may be experienced in some barcode labels. If there are many hard to read or damaged labels that cannot be decoded using a conservative setting, increase the decoding level to be more aggressive. If the majority of labels are very good quality labels, or there is a need to decrease the possibility of a decoder error, lower the decoding level to a more conservative level.

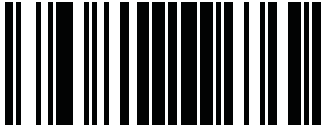


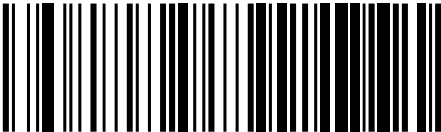





**This configuration item applies to Code 4 and Code 5.**

**NOTE**

## Code 4 and Code 5 Common Configuration Items – cont.

### Code 4 and 5 Decoding Level – cont.

 ENTER/EXIT PROGRAMMING MODE	
 Code 4 and Code 5 Decoding Level = 1	
	 Code 4 and Code 5 Decoding Level = 2
 Code 4 and Code 5 Decoding Level = 3	
	 Code 4 and Code 5 Decoding Level = 4
 Code 4 and Code 5 Decoding Level = 5	

## Code 4 and Code 5 Common Configuration Items – cont.

### Code 4 and Code 5 Minimum Reads

This feature specifies the minimum number of consecutive times a Code 4 or Code 5 label must be decoded before it is accepted as good read.

 ENTER/EXIT PROGRAMMING MODE	
 DEFAULT	 Code 4 or Code 5 Minimum Reads = 1
 Code 4 or Code 5 Minimum Reads = 2	
	 Code 4 or Code 5 Minimum Reads = 3
 Code 4 or Code 5 Minimum Reads = 4	

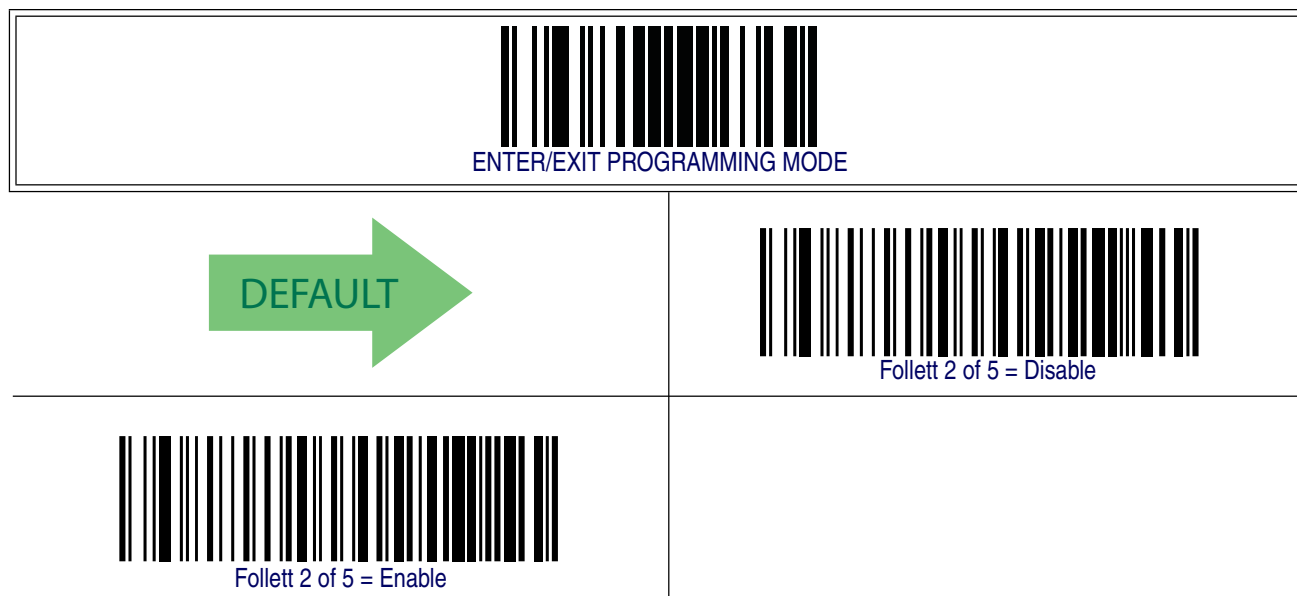


## Follett 2 of 5

The following options apply to the Follett 2 of 5 symbology.

### Follett 2 of 5 Enable/Disable

Enables/Disables ability of imager to decode Follett 2 of 5 labels.



# NOTES

# Appendix A

## Technical Specifications

Table 35 contains Physical and Performance Characteristics, User Environment and Regulatory information. Table 36 provides Standard Cable Pinouts.

**Table 35. Technical Specifications**

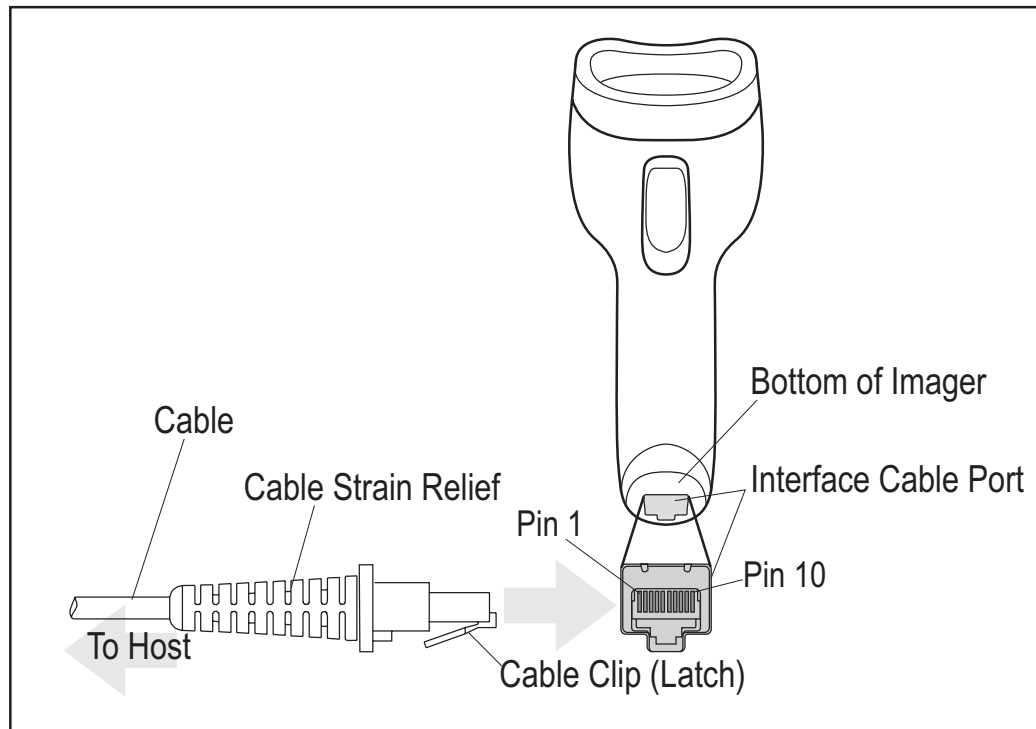
Item	Description
<b>Physical Characteristics</b>	
Dimensions	2.8 in. H x 6.7 in. L x 2.6 in. W (7.1 cm H x 17.1 cm L x 6.6 cm W)
Weight (without cable)	Approximately 4.2 oz. (119 g)
Color	Black or White
<b>Electrical Characteristics</b>	
Voltage & Current	QD2110 4-14 VDC QD2130 5.0 VDC +/-10% 180mA @ 5V Typical Idle 345mA @ 5V Typical Scanning
<b>Performance Characteristics</b>	
Light Source	617nm LEDs
Roll (Tilt) Tolerance	± 45° from normal
Pitch Tolerance	± 65°
Skew (Yaw) Tolerance	± 65°
Scan Angle	43° ± 3°
Depth of Field	4.0 mil 3.0 - 9.5 cm 5.0 mil 2.3 - 14 cm 7.5 mil 1.5 - 26.5 cm 10 mil (80% UPC) 1.3 - 37.5 cm 13 mil (100% UPC) 2.5 - 46.5 cm 15 mil to 48 cm 20 mil to 59 cm
Minimum Element Width	3 mil
Print Contrast Minimum	15% minimum reflectance

Item	Description
Decode Capability	UPC/EAN/JAN, P2 /P5 GS1-128 add-ons; Code 39; Code 39 Full ASCII; Code 32 (Italian Pharmacode); Code 128; ISBT 128; 1 2 of 5; Standard 2 of 5; Code 11; Codabar; GS1-128; Code 93; MSI; GS1 DataBar Omnidirectional, GS1 DataBar Limited, GS1 DataBar Expanded; EAN 13 ISBN; Datalogic 2 of 5; Follet 2/5; Code 4, code 5.
Interfaces Supported	RS-232 Std., RS-232 Wincor-Nixdorf, RS-232 OPOS, IBM 46xx (ports 5B and 9B), USB Com Std., USB Keyboard, USB Alternate Keyboard, USB Keyboard Apple, USB-OEM, Keyboard Wedge (AT with or w/o Alternate Key, IBM AT PS2 with or w/o Alternate Key, PC-XT, IBM 3153, IBM Terminals 31xx, 32xx, 34xx, 37xx make only and make break keyboard, and Digital Terminals VT2x, VT3xx and VT4xx).
<b>User Environment</b>	
Operating Temperature	32° to 122° F (0° to 50° C)
Storage Temperature	-40° to 158° F (-40° to 70° C)
Humidity	5% to 95% relative humidity, non-condensing
Drop Specifications	Withstands multiple 5 ft./1.524 m drops to concrete.
Ambient Light Immunity	Immune to direct exposure of normal office and factory lighting conditions, as well as direct exposure to sunlight.
Contaminants Spray/rain Dust/particulates	IEC 529-IPX2 IEC 529-IP5X
Beeper Volume	User-selectable: three levels
Beeper Tone (frequency)	User-selectable: three tones
Electrostatic Discharge	Conforms to ±20 kV air/direct discharge and ±8 kV of contact discharge.
<b>Regulatory</b>	
Electrical Safety	USA: UL 60950, Canada: CAN/CSA-C22.2 No. 60950, EN60950/IEC60950, NOM-019-SCFI
EMI/RFI	FCC Part 15 Class B, ICES-003 Class B, European Union EMC Directive, Australia Class B, Taiwan EMC, Japan VCCI/MITI, Korea KCC

## Standard Cable Pinouts

Figure 7 and Table 36 provide standard pinout information for the imager's cable.

**Figure 7. Standard Cable Pinouts**



The signal descriptions in Table 36 apply to the connector on the imager and are for reference only.

**Table 36. Standard Cable Pinouts — Imager Side**

Pin	RS-232	OEM	USB	Keyboard Wedge
1	RTS (out)			
2			D+	CLKIN (KBD side)
3			D-	DATAIN (KBD side)
4	GND	GND	GND	GND
5	RX			
6	TX			
7	VCC	VCC	VCC	VCC
8		IBM_B		CLKOUT (PC side)
9		IBM_A		DATAOUT (PC side)
10	CTS (in)			

---

# NOTES

# Appendix B

## Standard Defaults

The most common configuration settings are listed in the “Default” column of [Table 37](#). The settings in this table are as applied to a standard RS-232 interface. See [Table 38](#) for a listing of default exceptions to this list as applied to other interface types. Page references are also provided for feature descriptions and programming barcodes for each parameter. A column has also been provided for recording of your preferred default settings for these same configurable features.

**Table 37. Standard Defaults**

Parameter	Default	Your Setting	Page Number
<b>General Features</b>			
Double Read Timeout	0.4 Second		17
Label Gone Timeout	160 ms		19
Power On Alert	4 Beeps		21
Good Read: When to Indicate	After Decode		22
Good Read Beep Type	Mono		23
Good Read Beep Frequency	Medium		24
Good Read Beep Length	80 ms		24
Good Read Beep Volume	High		26
Good Read LED Duration	LED on until next trigger pull		27
Scan Mode	Trigger Single		29
Stand Mode Triggered Timeout	0.5 Seconds		31
Scanning Active Time	5 Seconds		33
Flash On Time	1 Second		35
Flash Off Time	600 ms		37
Stand Mode Sensitivity	Medium		39
Green Spot Duration	300 ms		40

Parameter	Default	Your Setting	Page Number
<b>RS-232</b>			
Baud Rate	9600		41
Data Bits	8 Data Bits		43
Stop Bits	1 Stop Bit		44
Parity	None		45
Handshaking Control	Disable		46
<b>RS-232/USB-COM</b>			
Intercharacter Delay	No Delay		48
Beep On ASCII BEL	Disable		50
Beep On Not on File	Enable		50
ACK Character	'ACK'		52
NAK Character	'NAK'		54
ACK NAK Timeout Value	600 ms		56
ACK NAK Retry Count	3 Retries		58
ACK NAK Error Handling	Ignore Errors Detected		60
Indicate Transmission Failure	Enable		61
Disable Character	'D'		62
Enable Character	'E'		64
<b>Keyboard Wedge</b>			
Country Mode	U.S. Keyboard		68
Caps Lock State	Caps Lock OFF		71
Numlock	Numlock Key Unchanged		71
Send Control Characters	Disable		72
Intercode Delay	100 ms		77
Intercharacter Delay	No Delay		75
	100 ms		78
USB Keyboard Speed	1 ms		79
<b>USB-OEM</b>			
USB-OEM Device Usage	Handheld Scanner		82



Parameter	Default	Your Setting	Page Number
<b>Data Editing</b>			
Global Prefix/Suffix	No Global Prefix Global Suffix = 0x0D (CR)		90
Global AIM ID	Disable		92
Label ID Control	Disable		100
Case Conversion	Disable		107
Character Conversion	No Char Conversion		108
<b>Symbologies</b>			
UPC-A			
UPC-A Enable/Disable	Enable		112
UPC-A Check Character Transmission	Enable		112
Expand UPC-A to EAN-13	Don't Expand		113
UPC-A Number System Character Transmission	Transmit		113
UPC-A Minimum Reads	1		131
In-Store Minimum Reads	2		114
UPC-E			
UPC-E Enable/Disable	Enable		115
UPC-E Check Character Transmission	Send		115
Expand UPC-E to EAN-13	Don't Expand		116
Expand UPC-E to UPC-A	Don't Expand		116
UPC-E Number System Character Transmission	Transmit		117
UPC-E Minimum Reads	2		118
GTIN			
GTIN Formatting	Disable		119
EAN 13			
EAN 13 Enable/Disable	Enable		120
EAN 13 Check Character Transmission	Send		120
EAN-13 Flag 1 Character	Transmit		121

Parameter	Default	Your Setting	Page Number
EAN-13 ISBN Conversion	Disable		122
EAN 13 Minimum Reads	1		123
EAN 8			
EAN 8 Enable/Disable	Enable		124
EAN 8 Check Character Transmission	Send		124
Expand EAN 8 to EAN 13	Disable		125
EAN 8 Minimum Reads	1		126
UPC/EAN Global Settings			
UPC/EAN Decoding Level	2		127
UPC/EAN Correlation	Disable		129
UPC/EAN Price Weight Check	Disable		130
Add-Ons			
Optional Add-ons	Disable P2, P5 and P8		132
Optional Add-On Timer	70 ms		134
Optional GS1-128 Add-On Timer	Disable		137
P2 Add-Ons Minimum Reads	2		140
P5 Add-Ons Minimum Reads	1		141
GS1-128 Add-Ons Minimum Reads	1		142
GS1 DataBar Omnidirectional			
GS1 DataBar Omnidirectional Enable/Disable	Disable		143
GS1 DataBar Omnidirectional GS1-128 Emulation	Disable		143
GS1 DataBar Omnidirectional Minimum Reads	1		144
GS1 DataBar Expanded			
GS1 DataBar Expanded Enable/Disable	Disable		145
GS1 DataBar Expanded GS1-128 Emulation	Disable		145
GS1 DataBar Expanded Minimum Reads	1		146
GS1 DataBar Expanded Length Control	Variable		147

Parameter	Default	Your Setting	Page Number
GS1 DataBar Expanded Set Length 1	1		148
GS1 DataBar Expanded Set Length 2	74		150
GS1 DataBar Limited			
GS1 DataBar Limited Enable/Disable	Disable		152
GS1 DataBar Limited GS1-128 Emulation	Disable		152
GS1 DataBar Limited Minimum Reads	1		153
Code 39			
Code 39 Enable/Disable	Enable		154
Code 39 Check Character Calculation	Calculate		155
Code 39 Check Character Transmission	Send		156
Code 39 Start/Stop Character Transmission	Don't Transmit		156
Code 39 Full ASCII	Disable		157
Code 39 Quiet Zones	Auto		158
Code 39 Minimum Reads	2		159
Code 39 Decoding Level	3		160
Code 39 Length Control	Variable		162
Code 39 Set Length 1	2		163
Code 39 Set Length 2	50		165
Code 39 Interdigit Ratio	4		167
Code 39 Character Correlation	Disable		169
Code 39 Stitching	Enable		170
Code 32			
Code 32 Enable/Disable	Disable		171
Code 32 Feature Setting Exceptions	3		171
Code 32 Check Character Transmission	Don't Send		172
Code 32 Start/Stop Character Transmission	Don't Transmit		172
Code 128			
Code 128 Enable/Disable	Enable		173

Parameter	Default	Your Setting	Page Number
Expand Code 128 to Code 39	Don't Expand		173
Code 128 Check Character Transmission	Send		174
Code 128 Quiet Zones	Auto		176
Code 128 Minimum Reads	1		177
Code 128 Decoding Level	3		178
Code 128 Length Control	Variable		180
Code 128 Set Length 1	1		181
Code 128 Set Length 2	80		183
Code 128 Character Correlation	Disable		185
Code 128 Stitching	Enable		186
GS1-128			
GS1-128 Enable	Transmit in Code 128 Data Format		187
Interleaved 2 of 5			
I 2 of 5 Enable/Disable	Disable		188
I 2 of 5 Check Character Calculation	Disable		189
I 2 of 5 Check Character Transmission	Send		190
I 2 of 5 Minimum Reads	2		203
2 of 5 Decoding Level	3		192
I 2 of 5 Length Control	Variable		194
I 2 of 5 Set Length 1	12		195
I 2 of 5 Set Length 2	100		197
I 2 of 5 Character Correlation	Disable		199
I 2 of 5 Stitching	Disable		200
Datalogic 2 of 5			
Datalogic 2 of 5 Enable/Disable	Enable		201
Datalogic 2 of 5 Check Character Calculation	Disable		202
Datalogic 2 of 5 Minimum Reads	2		203
Datalogic 2 of 5 Length Control	Variable		204

Parameter	Default	Your Setting	Page Number
Datalogic 2 of 5 Set Length 1	12		205
Datalogic 2 of 5 Set Length 2	100		207
Datalogic 2 of 5 Character Correlation	Disable		211
Datalogic 2 of 5 Stitching	Disable		212
Codabar			
Codabar Enable/Disable	Disable		213
Codabar Check Character Calculation	Don't Calculate		214
Codabar Check Character Transmission	Send		215
Codabar Start/Stop Character Transmission	Don't Transmit		215
Codabar Start/Stop Character Set	abcd/abcd		216
Codabar Start/Stop Character Match	Don't Require Match		217
Codabar Quiet Zones	Auto		218
Codabar Minimum Reads	2		219
Codabar Decoding Level	3		220
Codabar Length Control	Variable		222
Codabar Set Length 1	3		223
Codabar Set Length 2	50		225
Codabar Interdigit Ratio	4		227
Codabar Character Correlation	Disable		229
Codabar Stitching	Disable		230
Code 11			
Code 11 Enable/Disable	Disable		231
	1		231
Code 11 Check Character Calculation	Check C and K		232
Code 11 Check Character Transmission	Send		233
Code 11 Minimum Reads	2		234
Code 11 Length Control	Variable		235
Code 11 Set Length 1	4		236
Code 11 Set Length 2	50		238

Parameter	Default	Your Setting	Page Number
Code 11 Interdigit Ratio	4		240
Code 11 Decoding Level	3		242
Code 11 Character Correlation	Disable		244
Code 11 Stitching	Disable		245
Standard 2 of 5			
Standard 2 of 5 Enable/Disable	Disable		246
Standard 2 of 5 Check Character Calculation	Disable		247
Standard 2 of 5 Check Character Transmission	Send		247
Standard 2 of 5 Minimum Reads	2		248
Standard 2 of 5 Decoding Level	3		248
Standard 2 of 5 Length Control	Variable		249
Standard 2 of 5 Set Length 1	8		250
Standard 2 of 5 Set Length 2	50		252
Standard 2 of 5 Character Correlation	Disable		254
Standard 2 of 5 Stitching	Disable		255
ISBT 128			
ISBT 128 Enable/Disable	Disable		256
ISBT 128 Concatenation	Disable		256
ISBT 128 Force Concatenation	Enable		257
ISBT 128 Advanced Concatenation Options	Disable		257
Code 4			
Code 4 Enable/Disable	Disable		258
Code 4 Check Character Transmission	Enable		259
Code 4 Hex to Decimal Conversion	Enable		259
Code 5			
Code 5 Enable/Disable	Disable		260
Code 5 Check Character Transmission	Enable		261
Code 5 Hex to Decimal Conversion	Enable		261

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Parameter	Default	Your Setting	Page Number
Code 4 and Code 5 Common Configuration Items			
Code 4 and 5 Decoding Level	3		262
Code 4 and Code 5 Minimum Reads	1		264
Follett 2 of 5			
Follett 2 of 5 Enable/Disable	Disable		265

## Default Exceptions

Table 37 lists standard default settings as applied to a standard RS-232 interface.

Table 38 provides a listing of default exceptions to that list as applied to the other interface types.

**Table 38. Default Exceptions by Interface Type**

Parameter	Default Exception
<b>Interfaces: IBM 46XX Port 5B, IBM 46XX Port 9B, USB-OEM</b>	
Global Suffix	No Global Suffix
Double Read Timeout	500 msec
<b>Interfaces: All Keyboard Wedge, USB Keyboard</b>	
No unique settings	
<b>Interface: RS232-WN</b>	
Expand UPC-A to EAN-13	Enable
UPC-E Check Character Transmission	Disable
Parity	Odd Parity
Handshaking Control	RTS/CTS
Transmission Label ID Code	Prefix
GS1-128 AIM ID	Disable
UPCE Label ID Character(s)	C
EAN 8 Label ID Character(s)	B
EAN 13 Label ID Character(s)	A
Code ISBN Label ID Character(s)	A
Code 39 Label ID Character(s)	M
Interlaved 2of5 Label ID Character(s)	I
Code Standard 2/5 Label ID Character(s)	H
Codabar Label ID Character(s)	N
Code 128 Label ID Character(s)	K
GS1-128 Label ID Character(s)	P
Datalogic 2 of 5 Label ID Character(s)	H
ISBT 128 Label ID Character(s)	K
UPCE P2 Label ID Character(s)	C
UPCE/P5 Label ID Character(s)	C
UPCE/GS1-128 Label ID Character(s)	C



Parameter	Default Exception
EAN8/P2 Label ID Character(s)	B
EAN8/P5 Label ID Character(s)	B
EAN8/GS1-128 Label ID Character(s)	B
EAN13/P2 Label ID Character(s)	A
EAN13/P5 Label ID Character(s)	A
EAN13/GS1-128 Label ID Character(s)	A
GS1 DataBar 14 (Omnidirectional) Label ID Character(s)	E
GS1 DataBar Expanded Label ID Character(s)	E
GS1 DataBar Limited Label ID Character(s)	E
Character Conversion	CR to `
<b>Interface: RS232-OPOS</b>	
Baud Rate	115200 Baud
Transmission Label ID Code	Prefix
GS1-128 AIM ID	Disable
UPCA Label ID Character(s)	C
UPCE Label ID Character(s)	D
EAN 8 Label ID Character(s)	A
EAN 13 Label ID Character(s)	B
Code ISBN Label ID Character(s)	@
Code 39 Label ID Character(s)	V
Code 32 Label ID Character(s)	X
Interlaved 2of5 Label ID Character(s)	N
Code Standard 2/5 Label ID Character(s)	P
Codabar Label ID Character(s)	R
Code 11 Label ID Character(s)	b
Code 128 Label ID Character(s)	T
GS1-128 Label ID Character(s)	k
UPCA/P2 Label ID Character(s)	F
UPCA/P5 Label ID Character(s)	G
UPCA/GS1-128 Label ID Character(s)	Q
UPCE P2 Label ID Character(s)	H

Parameter	Default Excpction
UPCE/P5 Label ID Character(s)	I
EAN8/P2 Label ID Character(s)	J
EAN8/P5 Label ID Character(s)	K
EAN8/GS1-128 Label ID Character(s)	*
EAN13/P2 Label ID Character(s)	L
EAN13/P5 Label ID Character(s)	M
EAN13/GS1-128 Label ID Character(s)	#
GS1 DataBar 14 (Omnidirectional) Label ID Character(s)	u
GS1 DataBar Expanded Label ID Character(s)	t
GS1 DataBar Limited Label ID Character(s)	v
GTIN W/o Add on Label ID Character(s)	\$A
GTIN Addon 2 Label ID Character(s)	\$B
GTIN Add on 5 Label ID Character(s)	\$C
GTIN Add on 8 Label ID Character(s)	\$D

# Appendix C

## LED and Beeper Indications

---

The imager's beeper sounds and its LED illuminates to indicate various functions or errors on the imager. An optional "Green Spot" also performs useful functions. The tables below list these indications. One exception to the behaviors listed in the tables is that the imager's functions are programmable, and may or may not be turned on. For example, certain indications, such as the power-up beep can be disabled using programming barcode labels.

## LED and Beeper Indications

INDICATION	DESCRIPTION	LED	BEEPER
Power-up Beep	The imager is in the process of powering-up.		Imager beeps four times at highest frequency and volume upon power-up.
Good Read Beep	A label has been successfully scanned by the imager.	LED behavior for this indication is configurable via the feature "Good Read: When to Indicate"	The imager will beep once at current frequency, volume, mono/bi-tonal setting and duration upon a successful label scan.
ROM Failure	There is an error in the imager's software/programming	Flashes	Imager sounds one error beep at highest volume.
Limited Scanning Label Read	Indicates that a host connection is not established when the IBM or USB interface is enabled.	N/A	Imager 'chirps' six times at the highest frequency and current volume.
Imager Active Mode	The imager is active and ready to scan.	The LED is lit steadily <sup>a</sup>	N/A
Imager Disabled	The imager has been disabled by the host.	The LED blinks continuously	N/A
Green Spot is on continuously	While in Stand Mode or Trigger Object Sense mode the green spot shall be on while in stand watch state.	N/A	N/A
Green Spot <sup>a</sup> flashes momentarily	Upon successful read of a label, the software shall turn the green spot on for the time specified by the configured value.	N/A	N/A

**Programming Mode** - The following indications ONLY occur when the imager is in Programming Mode.

Label Programming Mode Entry	A valid programming label has been scanned.	LED blinks continuously	Imager sounds four low frequency beeps.
Label Programming Mode Rejection of Label	A label has been rejected.	N/A	Imager sounds three times at lowest frequency & current volume.
Label Programming Mode Acceptance of Partial Label	In cases where multiple labels must be scanned to program one feature, this indication acknowledges each portion as it is successfully scanned.	N/A	Imager sounds one short beep at highest frequency & current volume.
Label Programming Mode Acceptance of Programming	Configuration option(s) have been successfully programmed via labels and the imager has exited Programming Mode.	N/A	Imager sounds one high frequency beep and 4 low frequency beeps followed by reset beeps.
Label Programming Mode Cancel Item Entry	Cancel label has been scanned.	N/A	Imager sounds two times at low frequency and current volume.

<sup>a</sup>. Except when in sleep mode or when a [Good Read LED Duration](#) other than 00 is selected

## Error Codes

Upon startup, if the imager sounds a long tone, this means the imager has not passed its automatic Selftest and has entered FRU<sup>1</sup> isolation mode. If the imager is reset, the sequence will be repeated. The following table describes the LED flashes/beep codes associated with an error found.

NUMBER OF LED FLASHES/BEEPS	ERROR	CORRECTIVE ACTION
1	Configuration	Contact Helpdesk for assistance
2	Interface PCB	
4	Imager Module	
5	[Reserved]	
6	Digital PCB	
14	CPLD/Code Mismatch	

1. Field Replaceable Unit (FRU)

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# NOTES



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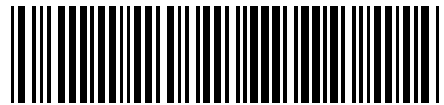
## Sample Barcodes – continued

**Code 32**



**Codabar**

**Code 93**



**Code 11**



## GS1 DataBar (RSS)



GS1 DataBar variants must be enabled to read the barcodes below (see [GS1 DataBar \(RSS\)](#) on page 289).

### NOTE



10293847560192837465019283746029478450366523  
(GS1 DataBar Expanded Stacked)



1234890hjjio9900mnb  
(GS1 DataBar Expanded)



08672345650916  
(GS1 DataBar Limited)

## GS1 DataBar-14



55432198673467  
(GS1 DataBar Omnidirectional Truncated)



90876523412674  
(GS1 DataBar Omnidirectional Stacked)



78123465709811  
(GS1 DataBar Omnidirectional Stacked)







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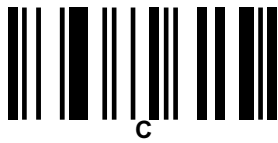
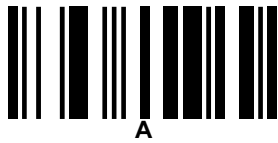
# NOTES

# Appendix E

## Keypad

Use the barcodes in this appendix to enter numbers as you would select digits/characters from a keypad.

 0	
	 1
 2	
	 3
 4	
	 5



	 D
 E	
	 F

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# NOTES

# Appendix F

## Scancode Tables

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### Control Character Emulation

Control character emulation selects from different scancode tables as listed in this appendix. Each of the control character sets below are detailed by interface type in the tables. These apply to Wedge and USB Keyboard platforms.

**Control Character 00** — Characters from 00 to 0x1F are sent as control character Ctrl+Keys, special keys are located from 0x80 to 0xA1.

**Control Character 01** — Characters from 00 to 0x1F are sent as control character Ctrl+Capital Key, special keys are located from 0x80 to 0xA1.

**Control Character 02** — Special keys are located from 00 to 0x1F and characters from 0x80 to 0xFE are intended as an extended ASCII table (Microsoft Windows Codepage 1252 — [see page 304](#)).

# Interface Type PC AT PS/2 or USB-Keyboard

Table 39. Scancode Set When Control Character is 00 or 01

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
<b>0x</b>	NULL C(S)+@	SOH C(S)+A	STX C(S)+B	ETX C(S)+C	EOT C+D	ENQ C(S)+E	ACK C(S)+F	BEL C(S)+G	BS C(S)+H	HT TAB	LF C(S)+J	VT C(S)+K	FF C(S)+L	CR Enter	SO C(S)+N	SI C(S)+O
<b>1x</b>	DLE C(S)+P	DC1 C(S)+Q	DC2 C(S)+R	DC3 C(S)+S	DC4 C(S)+T	NAK C(S)+U	SYN C(S)+V	ETB C(S)+W	CAN C(S)+X	EM C(S)+Y	SUB C(S)+Z	ESC Esc	FS C(S)+^	GS C+]	RS C(S)+^	US C(S)+_
<b>2x</b>	SP	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/
<b>3x</b>	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
<b>4x</b>	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
<b>5x</b>	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
<b>6x</b>	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
<b>7x</b>	p	q	r	s	t	u	v	w	x	y	z	{		}	~	Del
<b>8x</b>	-	Sh↓	Sh↑	Ins	Ent (keyp)	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
<b>9x</b>	F12	Home	End	Pg Up	Pg Dwn	←	↓	←	→	Ar↓	Ar↑	AI↓	AI↑	CI↓	CI↑	Cr↓
<b>Ax</b>	Cr↑	-	'	f	"	...	†	‡	^	%	Š	◀	Š	◀	Œ	-
<b>Bx</b>	°	±	²	³	'	μ	¶	.	,	ı	°	»	¼	½	¾	ı
<b>Cx</b>	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
<b>Dx</b>	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
<b>Ex</b>	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
<b>Fx</b>	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

Extended characters (sky blue) are sent via dedicated keys (when available in the selected country mode) or by an Alt Mode sequence.



# Interface Type PC AT PS/2 or USB-Keybaord — cont.

Table 40. Scancode Set When Control Character is 02

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x	Ar↓	Ar↑	Al↓	Al↑	Cl↓	Cl↑	Cr↓	Cr↑	BS	Tab	→	S+Tab	Enter Keypd	Enter	Ins	Pg Up
1x	Pg Dwn	Home	←	↓	↑	F6	F1	F2	F3	F4	F5	ESC	F7	F8	F9	F10
2x	Space	!	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/
3x	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4x	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5x	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6x	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7x	p	q	r	s	t	u	v	w	x	y	z	{		}	~	Del
8x	–	–	‘	f	”	…	†	‡	^	%00	Š	‹	Š	‹	œ	–
9x	–	‘	,	“	”	•	–	—	~	™	š	›	œ	–	–	–
Ax	NBSP	ı	ç	£	¤	¥	¦	§	¨	©	ª	«	¬	–	®	–
Bx	°	±	²	³	´	µ	¶	·	¸	¹	º	»	¼	½	¾	¿
Cx	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
Dx	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
Ex	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
Fx	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

# Interface type PC AT PS/2 Alt Mode or USB-Keyboard Alt Mode

Table 4-1. Scancode Set When Control Character is 00 or 01

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	Xf
<b>0x</b>	Alt+000	Alt+001	Alt+002	Alt+003	Alt+004	Alt+005	Alt+006	Alt+007	Alt+008	HT TAB	Alt+010	Alt+011	Alt+012	CR Enter	Alt+014	Alt+015
<b>1x</b>	Alt+016	Alt+017	Alt+018	Alt+019	Alt+020	Alt+021	Alt+022	Alt+023	Alt+024	Alt+025	Alt+026	ESC Esc	Alt+028	Alt+029	Alt+030	Alt+031
<b>2x</b>	A+032	A+033	A+034	A+035	A+036	A+037	A+038	A+039	A+040	A+041	A+042	A+043	A+044	A+045	A+046	A+047
<b>3x</b>	A+048	A+049	A+050	A+051	A+052	A+053	A+054	A+055	A+056	A+057	A+058	A+059	A+060	A+061	A+062	A+063
<b>4x</b>	A+064	A+065	A+066	A+067	A+068	A+069	A+070	A+071	A+072	A+073	A+074	A+075	A+076	A+077	A+078	A+079
<b>5x</b>	A+080	A+081	A+082	A+083	A+084	A+085	A+086	A+087	A+088	A+089	A+090	A+091	A+092	A+093	A+094	A+095
<b>6x</b>	A+096	A+097	A+098	A+099	A+100	A+101	A+102	A+103	A+104	A+105	A+106	A+107	A+108	A+109	A+110	A+111
<b>7x</b>	A+112	A+113	A+114	A+115	A+116	A+117	A+118	A+119	A+120	A+121	A+122	A+123	A+124	A+125	A+126	A+127
<b>8x</b>	-	Sh↓	Sh?	Ins	Ent (keyp)	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
<b>9x</b>	F12	Home	End	Pg Up	Pg Dwn	↑	↓	←	→	Ar↓	Ar↑	Al↓	Al↑	Cl↓	Cl↑	Cr↓
<b>Ax</b>	Cr↑	A+0161	A+0162	A+0163	A+0164	A+0165	A+0166	A+0167	A+0168	A+0169	A+0170	A+0171	A+0172	A+0173	A+0174	A+0175
<b>Bx</b>	A+0176	A+0177	A+0178	A+0179	A+0180	A+0181	A+0182	A+0183	A+0184	A+0185	A+0186	A+0187	A+0188	A+0189	A+0190	A+0191
<b>Cx</b>	A+0192	A+0193	A+0194	A+0195	A+0196	A+0197	A+0198	A+0199	A+0200	A+0201	A+0202	A+0203	A+0204	A+0205	A+0206	A+0207
<b>Dx</b>	A+0208	A+0209	A+0210	A+0211	A+0212	A+0213	A+0214	A+0215	A+0216	A+0217	A+0218	A+0219	A+0220	A+0221	A+0222	A+0223
<b>Ex</b>	A+0224	A+0225	A+0226	A+0227	A+0228	A+0229	A+0230	A+0231	A+0232	A+0233	A+0234	A+0235	A+0236	A+0237	A+0238	A+0239
<b>Fx</b>	A+0240	A+0241	A+0242	A+0243	A+0244	A+0245	A+0246	A+0247	A+0248	A+0249	A+0250	A+0251	A+0252	A+0253	A+0254	A+0255

# Interface type PC AT PS/2 Alt Mode or USB-Keyboard Alt Mode – cont.

Table 42. Scancode Set When Control Character is 02

0x	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x	Ar↑	Al↓	Al↑	Cl↓	Cl↑	Cr↓	Cr↑	BS	Tab	→	S+Tab	Enter Keypd	Enter	Ins	Pg Up
1x	Pg Dwn	←	↓	↑	F6	F1	F2	F3	F4	F5	ESC	F7	F8	F9	F10
2x	A+032	A+034	A+035	A+036	A+037	A+038	A+039	A+040	A+041	A+042	A+043	A+044	A+045	A+046	A+047
3x	A+048	A+050	A+051	A+052	A+053	A+054	A+055	A+056	A+057	A+058	A+059	A+060	A+061	A+062	A+063
4x	A+064	A+066	A+067	A+068	A+069	A+070	A+071	A+072	A+073	A+074	A+075	A+076	A+077	A+078	A+079
5x	A+080	A+082	A+083	A+084	A+085	A+086	A+087	A+088	A+089	A+090	A+091	A+092	A+093	A+094	A+095
6x	A+096	A+098	A+099	A+100	A+101	A+102	A+103	A+104	A+105	A+106	A+107	A+108	A+109	A+110	A+111
7x	A+112	A+113	A+114	A+115	A+116	A+117	A+118	A+119	A+120	A+121	A+122	A+123	A+124	A+125	A+126
8x	A+0128	A+0130	A+0131	A+0132	A+0133	A+0134	A+0135	A+0136	A+0137	A+0138	A+0139	A+0140	A+0141	A+0142	A+0143
9x	A+0144	A+0145	A+0146	A+0147	A+0148	A+0150	A+0151	A+0152	A+0153	A+0154	A+0155	A+0156	A+0157	A+0158	A+0159
Ax	A+0160	A+0161	A+0162	A+0163	A+0164	A+0165	A+0166	A+0167	A+0169	A+0170	A+0171	A+0172	A+0173	A+0174	A+0175
Bx	A+0176	A+0177	A+0178	A+0179	A+0180	A+0181	A+0182	A+0183	A+0185	A+0186	A+0187	A+0188	A+0189	A+0190	A+0191
Cx	A+0192	A+0193	A+0194	A+0195	A+0196	A+0197	A+0198	A+0200	A+0201	A+0202	A+0203	A+0204	A+0205	A+0206	A+0207
Dx	A+0208	A+0209	A+0210	A+0211	A+0212	A+0213	A+0214	A+0215	A+0217	A+0218	A+0219	A+0220	A+0221	A+0222	A+0223
Ex	A+0224	A+0225	A+0226	A+0227	A+0228	A+0229	A+0230	A+0231	A+0233	A+0234	A+0235	A+0236	A+0237	A+0238	A+0239
Fx	A+0240	A+0241	A+0242	A+0243	A+0244	A+0245	A+0246	A+0247	A+0248	A+0250	A+0251	A+052	A+0253	A+0254	A+0255

# Digital Interface

Table 43. Scancode Set When Control Character is 00 or 01

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x	NULL C(S)+@	SOH C(S)+A	STX C(S)+B	ETX C(S)+C	EOT C+D	ENQ C(S)+E	ACK C(S)+F	BEL C(S)+G	BS C(S)+H	HT TAB	LF C(S)+J	VT C(S)+K	FF C(S)+L	CR Enter	SO C(S)+N	SI C(S)+O
1x	DLE C(S)+P	DC1 C(S)+Q	DC2 C(S)+R	DC3 C(S)+S	DC4 C(S)+T	NAK C(S)+U	SYN C(S)+V	ETB C(S)+W	CAN C(S)+X	EM C(S)+Y	SUB C(S)+Z	ESC Esc	FS C(S)+^	GS C+]	RS C(S)+^	US C(S)+_
2x	Space	!	“	#	\$	%	&	'	(	)	*	+	,	-	.	/
3x	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4x	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5x	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6x	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7x	p	q	r	s	t	u	v	w	x	y	z	{		}	~	Del
8x	F12	F13	F14	F15	F16	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
9x		Sh↓	Sh↑	Ins	Ent (keyp)	↑	↓	←	→					Ci↓	Ci↑	

# Digital Interface – cont.

Table 44. Scancode Set When Control Character is 02

0x	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
1x		←	↓	↩	↵	F1	F2	F3	F4	F5	ESC	F7	F8	F9	F10
2x	Space	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/
3x	0	1	2	3	4	5	6	7	8	9	;	<	=	>	?
4x	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N
5x	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^
6x	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n
7x	p	q	r	s	t	u	v	w	x	y	z	{		}	~
															Del

# IBM31xx 102-key

Table 45. Scancode Set When Control Character is 00 or 01

	X0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x	NULL C(S)+@	SOH C(S)+A	STX C(S)+B	ETX C(S)+C	EOT C+D	ENQ C(S)+E	ACK C(S)+F	BEL C(S)+G	BS C(S)+H	HT TAB	LF C(S)+J	VT C(S)+K	FF C(S)+L	CR Enter	SO C(S)+N	SI C(S)+O
1x	DLE C(S)+P	DC1 C(S)+Q	DC2 C(S)+R	DC3 C(S)+S	DC4 C(S)+T	NAK C(S)+U	SYN C(S)+V	ETB C(S)+W	CAN C(S)+X	EM C(S)+Y	SUB C(S)+Z	ESC Esc	FS C(S)+^	GS C+]	RS C(S)+^	US C(S)+_
2x	Space	!	“	#	\$	%	&	'	(	)	*	+	,	-	.	/
3x	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4x	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5x	<u>P</u>	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6x	'	<u>a</u>	B	c	d	e	f	g	h	i	j	k	l	m	n	o
7x	p	q	R	s	t	u	v	w	x	y	z	{		}		Del
8x	Sh↓	Sh↑	Reset	Ins	Ent (keyp)	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
9x	F12	Enter	Reset	Insert	Delete	Field -	Field +	Enter paddle	Printl	Ar↓	Ar↑	A1↓	A1↑	C1↓	C1↑	Cr↓
Ax	Cr↑															

# IBM31xx 102-key -- cont.

Table 46. Scancode Set When Control Character is 02

	X0	x1	x2	x3	x4	x5	x6	x9	xA	xB	xC	xD	xE	xF
0x	Ar↵	Ar↑	Al↵	Al↑	Cl↵	Cl↑	Cr↵	Cr↑	→	S+Tab	Enter Keypd	Enter	Ins	Pg Up
1x	Pg Dwn	Home	←	↓	↑	F6	F1	F2	F5	ESC	F7	F8	F9	F10
2x	Space	!	“	#	\$	%	&	‘	*	+	,	-	.	/
3x	0	1	2	3	4	5	6	7	:	;	<	=	>	?
4x	@	A	B	C	D	E	F	G	J	K	L	M	N	O
5x	<u>P</u>	Q	R	S	T	U	V	W	Z	[	\	]	^	_
6x	‘	<u>a</u>	B	c	d	e	f	g	j	k	l	m	n	o
7x	p	q	R	s	t	u	v	w	z	{		}		<i>Del</i>

Table 47. Scancode Set When Control Character is 00 or 01

	X0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x	NULL C(S)+@	SOH C(S)+A	STX C(S)+B	ETX C(S)+C	EOT C+D	ENQ C(S)+E	ACK C(S)+F	BEL C(S)+G	BS C(S)+H	HT TAB	LF C(S)+J	VT C(S)+K	FF C(S)+L	CR Enter	SO C(S)+N	SI C(S)+O
1x	DLE C(S)+P	DC1 C(S)+Q	DC2 C(S)+R	DC3 C(S)+S	DC4 C(S)+T	NAK C(S)+U	SYN C(S)+V	ETB C(S)+W	CAN C(S)+X	EM C(S)+Y	SUB C(S)+Z	ESC Esc	FS C(S)+^	GS C+]	RS C(S)+^	US C(S)+_
2x	Space	!	“	#	\$	%	&	'	(	)	*	+	,	-	.	/
3x	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4x	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5x	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6x	'	a	B	c	d	e	f	g	h	i	j	k	l	m	n	o
7x	p	q	R	s	t	u	v	w	x	y	z	{		}		Del
8x	Sh?	Sh?	Sh?	Ins	Ent (keyp)	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
9x	F12	Home	End	Pg Up	Pg Dwn	↑	↓	←	→	Ar↵	Ar↑	AI↵	AI↑	CI↵	CI↑	Cr↵
Ax	Cr↑															



# IBM XT — cont.

Table 48. Scancode Set When Control Character is 02

	X0	x1	x2	x3	x4	x5	x6	x7	x8	x9	xA	xB	xC	xD	xE	xF
0x	Ar↓	Ar↑	Al↓	Al↑	Cl↓	Cl↑	Cr↓	Cr↑	BS	Tab	→	S+Tab	Enter Keypd	Enter	Ins	Pg Up
1x	Pg Dwn	Home	←	↓	↑	F6	F1	F2	F3	F4	F5	ESC	F7	F8	F9	F10
2x	Space	!	“	#	\$	%	&	‘	(	)	*	+	,	-	.	/
3x	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4x	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5x	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6x	‘	a	B	c	d	e	f	g	h	i	j	k	l	m	n	o
7x	p	q	R	s	t	u	v	w	x	y	z	{		}		Del

# Microsoft Windows Codepage 1252

Windows-1252 is a character encoding of the Latin alphabet, used by default in the legacy components of Microsoft Windows in English and some other Western languages.

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	<u>NUL</u> 0000	<u>STX</u> 0001	<u>SOT</u> 0002	<u>ETX</u> 0003	<u>EOT</u> 0004	<u>ENQ</u> 0005	<u>ACK</u> 0006	<u>BEL</u> 0007	<u>BS</u> 0008	<u>HT</u> 0009	<u>LF</u> 000A	<u>VT</u> 000B	<u>FF</u> 000C	<u>CR</u> 000D	<u>SO</u> 000E	<u>SI</u> 000F
10	<u>DLE</u> 0010	<u>DC1</u> 0011	<u>DC2</u> 0012	<u>DC3</u> 0013	<u>DC4</u> 0014	<u>NAK</u> 0015	<u>SYN</u> 0016	<u>ETB</u> 0017	<u>CAN</u> 0018	<u>EM</u> 0019	<u>SUB</u> 001A	<u>ESC</u> 001B	<u>FS</u> 001C	<u>GS</u> 001D	<u>RS</u> 001E	<u>US</u> 001F
20	<u>SP</u> 0020	!	"	#	\$	%	&	'	(	)	*	+	,	-	.	/
30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	<u>DEL</u> 007F
80	€ 20AC	⋮	ƒ 201A	„ 0192	… 201E	† 2026	‡ 2020	˘ 2021	‰ 02C6	Š 0160	< 2039	€ 0152	⋮	Ž 017D	⋮	⋮
90	⋮	˘ 2018	˙ 2019	“ 201C	” 201D	• 2022	– 2013	— 2014	˜ 02DC	™ 2122	š 0161	> 203A	œ 0153	⋮	ž 017E	ÿ 0178
A0	<u>NBSP</u> 00A0	¡ 00A1	¢ 00A2	£ 00A3	¤ 00A4	¥ 00A5	¦ 00A6	§ 00A7	¨ 00A8	© 00A9	ª 00AA	« 00AB	¬ 00AC	­ 00AD	® 00AE	¯ 00AF
B0	° 00B0	± 00B1	² 00B2	³ 00B3	´ 00B4	µ 00B5	¶ 00B6	· 00B7	¸ 00B8	¹ 00B9	º 00BA	» 00BB	¼ 00BC	½ 00BD	¾ 00BE	¿ 00BF
C0	À 00C0	Á 00C1	Â 00C2	Ã 00C3	Ä 00C4	Å 00C5	Æ 00C6	Ç 00C7	È 00C8	É 00C9	Ê 00CA	Ë 00CB	Ì 00CC	Í 00CD	Î 00CE	Ï 00CF
D0	Ð 00D0	Ñ 00D1	Ò 00D2	Ó 00D3	Ô 00D4	Õ 00D5	Ö 00D6	× 00D7	Ø 00D8	Ù 00D9	Ú 00DA	Û 00DB	Ü 00DC	Ý 00DD	Þ 00DE	ß 00DF
E0	à 00E0	á 00E1	â 00E2	ã 00E3	ä 00E4	å 00E5	æ 00E6	ç 00E7	è 00E8	é 00E9	ê 00EA	ë 00EB	ì 00EC	í 00ED	î 00EE	ï 00EF
F0	ð 00F0	ñ 00F1	ò 00F2	ó 00F3	ô 00F4	õ 00F5	ö 00F6	÷ 00F7	ø 00F8	ù 00F9	ú 00FA	û 00FB	ü 00FC	ý 00FD	þ 00FE	ÿ 00FF

# NOTES

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# NOTES

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## ASCII Chart

ASCII Char.	Hex No.	ASCII Char.	Hex No.	ASCII Char.	Hex No.	ASCII Char.	Hex No.
NUL	00	SP	20	@	40	'	60
SOH	01	!	21	A	41	a	61
STX	02	"	22	B	42	b	62
ETX	03	#	23	C	43	c	63
EOT	04	\$	24	D	44	d	64
ENQ	05	%	25	E	45	e	65
ACK	06	&	26	F	46	f	66
BEL	07	'	27	G	47	g	67
BS	08	(	28	H	48	h	68
HT	09	)	29	I	49	i	69
LF	0A	*	2A	J	4A	j	6A
VT	0B	+	2B	K	4B	k	6B
FF	0C	,	2C	L	4C	l	6C
CR	0D	-	2D	M	4D	m	6D
SO	0E	.	2E	N	4E	n	6E
SI	0F	/	2F	O	4F	o	6F
DLE	10	0	30	P	50	p	70
DC1	11	1	31	Q	51	q	71
DC2	12	2	32	R	52	r	72
DC3	13	3	33	S	53	s	73
DC4	14	4	34	T	54	t	74
NAK	15	5	35	U	55	u	75
SYN	16	6	36	V	56	v	76
ETB	17	7	37	W	57	w	77
CAN	18	8	38	X	58	x	78
EM	19	9	39	Y	59	y	79
SUB	1A	:	3A	Z	5A	z	7A
ESC	1B	;	3B	[	5B	{	7B
FS	1C	<	3C	\	5C		7C
GS	1D	=	3D	]	5D	}	7D
RS	1E	>	3E	^	5E	~	7E
US	1F	?	3F	_	5F	DEL	7F

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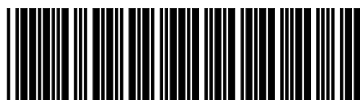
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