Gryphon™ I GFS4100

Fixed Mount Linear Imager Bar Code Reader

Product Reference Guide

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Patents

This product is covered by one or more of the following patents.

US Pat.: 5,144,118; 5,311,000; 5,481,098; 5,493,108; 5,929,421; 5,992,740; 6,098,883; 6,260,764; 6,443,360 B1; 6,631,846 B2; 6,808,114 B1; 6,817,525 B2; 6,997,385 B2; 7,075,663 B2; 7,387,246 B2.

European Pat.: 789,315 B1; 926,620 B1; 962,880 B1; 997,760 B1; 1,128,315 B1; 1,164,536 B1; 1,217,571 B1; 1,396,811 B1; 1,413,971 B1.

Additional patents pending.

Table of Contents

Chapter 1
Introduction

About this Manual

This Product Reference Guide (PRG) is provided for users seeking advanced technical information, including connection, programming, maintenance and specifications.

Overview

Chapter 1, (this chapter) presents information about manual conventions, and an overview of the reader, its features and operation.

Chapter 2, Setup presents information about unpacking and setting up the reader.

Chapter 3, Configuration Using Barcodes provides instructions and barcode labels for customizing your reader. There are different sections for interface types, general features, data formatting, symbology-specific and model-specific features.

Chapter 4, Software Configuration Strings describes how to configure certain models using serial strings.

Chapter 5, References provides background information and detailed instructions for more complex programming items.

Appendix A, Technical Specifications lists physical and performance characteristics, as well as environmental and regulatory specifications. It also provides standard cable pin-outs and LED/Beeper functions.

Appendix B, Standard Defaults references common factory default settings for reader features and options.

Appendix C, Sample Barcodes offers sample barcodes of several common symbologies.

Appendix D, Keypad includes numeric barcodes to be scanned for certain parameter settings.

Appendix E, Scancode Tables lists control character emulation information for the USB Keyboard interface.

Manual Conventions

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

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

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

References

Current versions of this Product Reference Guide (PRG), Quick Reference Guide (QRG), the Datalogic Aladdin™ Configuration application, and any other manuals, instructions and utilities for this product can be downloaded from the website listed below. Alternatively, printed copies of most documentation can be purchased through your Datalogic reseller.

Technical Support

Datalogic Website Support

The Datalogic website (www.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.

About the Reader

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.

Two models are available, and are covered in this manual:

- Gryphon I GFS4170 - USB Fixed Mount Linear Imager Bar Code Reader
- Gryphon I GFS4150-9 - RS-232 Fixed Mount Linear Imager Bar Code Reader

Programming can also 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 with the device using a serial or USB cable and can also create configuration barcodes to print.

Advances in the LED technology used in the imager-based readers significantly improve the illumination of the target field of view, resulting in higher scan efficiency.

See "Interface Selection" on page 13 for a listing and descriptions of available interface sets by model type.

Programming the Reader

Configuration Methods

Programming Barcodes

The reader is factory-configured with a standard set of default features. After scanning the interface barcode, you can select other options and customize your reader through use of the instructions and programming barcode labels available in the corresponding features section for your interface. Customizable settings for many features are found in "Configuration Using Barcodes" starting on page 17.

Some programming labels, like "Restore Custom Defaults" on page 16, require only the scan of the single label to enact the change. Most, however, require the reader to be placed in Programming Mode prior to scanning them. Scan an ENTER/EXIT barcode once to enter Programming Mode. Once the reader is in Programming Mode, 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 reader to normal operation.

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

Datalogic Aladdin™

Datalogic Aladdin™ is a multi-platform utility program providing a quick and user-friendly configuration method via the RS-232/USB-COM interface. Aladdin is available for download from the Datalogic website. Aladdin allows you to program the reader by selecting configuration commands through a user-friendly graphical interface running on a PC. These commands are sent to the reader over the selected communication interface, or they can be printed as barcodes to be scanned.

Aladdin also provides the ability to perform a software upgrade for the connected device (see the Datalogic Aladdin™ Help On-Line for more details).

Software Configuration Strings

The reader can also be configured by using command strings. These strings can be sent via the RS232/USB-COM interface using a terminal emulator such as HyperTerminal.

Refer to Chapter 4 in this manual, "Software Configuration Strings," for configuration procedures using Serial Strings sent by the Host."

NOTES

Chapter 2
Setup

Unpacking

Check carefully to ensure the reader and any accessories ordered are present and undamaged. If any damage occurred during shipment, contact Datalogic Technical Support. Information is shown on page 8.

KEEP THE PACKAGING. Should the unit ever require service, it should be returned in its original shipping container.

Setting Up the Reader

Follow the steps provided in this section to connect and get your reader up, and communicating with its host.

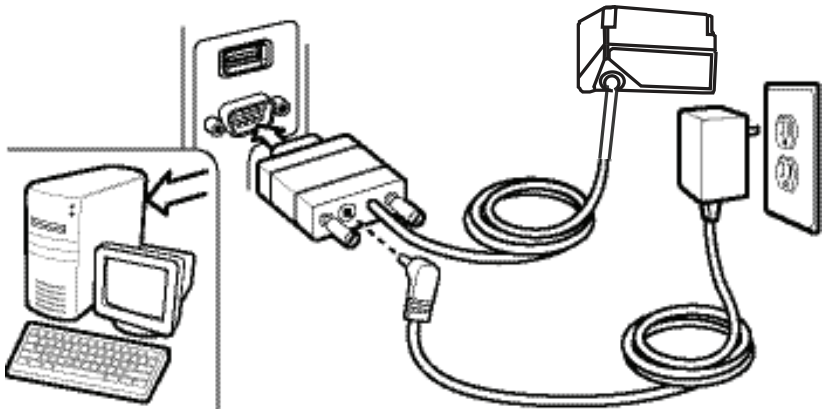
1. Connect the cable to the Host.
2. Go to Interface Selection and set the desired interface.
3. Configure Interface Settings (only if not using factory settings for that interface).
4. Go to Software Version Transmission (if modifications are needed from factory settings).

Installing the Interface Cable

RS-232 Serial Connection

Turn off power to the terminal/PC and connect the reader 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 reader 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.

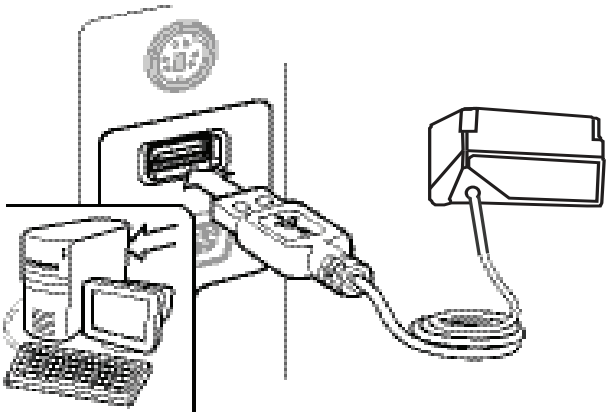
Figure 1. RS-232 Connection



USB Connection

Connect the reader to a USB port on the terminal/PC using the USB cable for the interface type you ordered. Reference Figure 2.

Figure 2. USB connection



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 reader remain the same.

Interface Selection

Upon completing the physical connection between the reader and its host, proceed to Table 1 starting on page 14 to select the interface type the reader is connected to (for example, RS-232 or USB). Scan the appropriate barcode in that section to configure your system's correct interface type.

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

GFS4150-9 Model

- RS-232-STD
- RS-232 Wincor-Nixdorf

GFS4170 Model

- USB-COM, USB-KBD, USB_KBD-ALT, USB-KBD-Apple

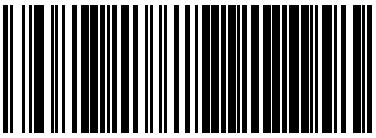
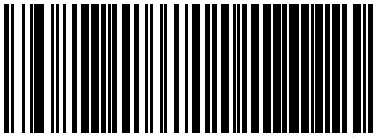
Setting the Interface

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 section in this manual (also listed in Table 1 starting on page 14) to configure any desired settings and features associated with that interface.

Unlike some 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 RS-232 STD	Set RS-232 Interface Features starting on page 21
 Select USB-COM-STD[a]	USB Com to simulate RS-232 standard interface	
RS-232 Wincor-Nixdorf	 Select RS-232 Wincor-Nixdorf	

a. Download the correct USB COM driver from the Datalogic Scanning website.

KEYBOARD		FEATURES
 Select USB Keyboard	USB Keyboard with standard key encoding	Set KEYBOARD Interface Features starting on page 33
USB Keyboard with alternate key encoding	 Select USB Alternate Keyboard	
 Select USB-KBD-APPLE	USB Keyboard for Apple computers	

Customizing Configuration Settings

Configure Interface Settings

If after scanning the interface barcode from the previous table, your installation requires you to select options to further customize your reader, turn to the appropriate section for your interface type in "Configuration Using Barcodes" starting on page 17.

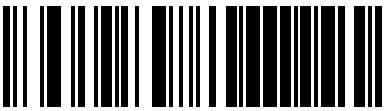
- "RS-232 ONLY Interface" on page 21
- "RS-232/USB-Com Interfaces" on page 26
- "USB Keyboard Interfaces" on page 33

Global Interface Features

See "Global Interface Features" on page 19 for settings configurable by all interface types.

Software Version Transmission

The software version of the device can be transmitted over the RS-232 and Keyboard interfaces by scanning the following label.



Transmit Software Version

Resetting Product Configuration to Defaults

Restore Custom Defaults

If you aren't sure what programming options are in your imager, or you've changed some options and want to restore the Custom Default Configuration that may have been saved in the scanner, scan the Restore Custom Default Configuration barcode below. This will restore the custom configuration for the currently active interface.

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

Restore Custom Default Configuration

Restore Factory Configuration

If you want to restore the Factory Configuration for your imager, scan the Restore Factory Configuration barcode below. The label restores the scanner configuration to the factory settings, including the interface type. The Label ID set is shown in the "Label ID" section on page 44 of this manual.

Restore Factory Configuration

The programming items listed in the following sections show the factory default settings for each of the menu commands.

Chapter 3
Configuration Using Barcodes

This and following sections provide programming barcodes to configure your reader by changing the default settings. For details about additional methods of programming, see Configuration Methods on page 9.

You must first enable your reader to read barcodes in order to use this section. If you have not done this, go to Setup, starting on page 11 and complete the appropriate procedure.

Configuration Parameters

Once the reader is set up, you can change the default parameters to meet your application needs. Refer to "Standard Defaults" starting on page 263 for initial configuration in order to set the default values and select the interface for your application.

The following configuration parameters are applicable to all Gryphon models covered in this manual, unless otherwise indicated. The items are divided into logical groups, making it easy to find the desired function based on its reference group.

Interface Configuration:

- "RS-232 ONLY Interface" on page 21
- "RS-232/USB-Com Interfaces" on page 26
- "USB Keyboard Interfaces" on page 33

Parameters common to all interface applications:

- "Data Format" on page 41 gives options to control the messages sent to the Host system.
- "Reading Parameters" on page 65 control various operating modes and indicators status functioning.

Symbology-specific parameters:

- "Code Selection" on page 77 provides configuration of a personalized mix of codes, code families and their options.

Reading Configuration Barcodes

You must first enable your reader to read barcodes in order to use this section. If you have not done this, go to Setup, starting on page 11 **and complete the appropriate procedure.**

To program features:

1. Scan the ENTER/EXIT PROGRAMMING barcode, available at the top of each programming page, when applicable.
2. Scan the barcode to set the desired programming feature. You may need to cover unused barcodes on the page, and possibly the facing page, to ensure that the reader reads only the barcode you intend to scan.
3. If additional input parameters are needed, go to Appendix D, Keypad, and scan the appropriate characters from the keypad.

   Additional information about many features can be found in the "References" chapter.

   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.
4. Complete the programming sequence by scanning the ENTER/EXIT PROGRAMMING barcode to exit Programming Mode.

For detailed descriptions, programming information and examples for setting selected configuration items, see References, starting on page 233.

GLOBAL INTERFACE FEATURES

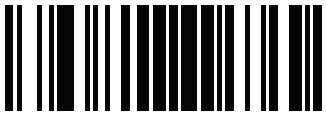
The following interface features are configurable by all interface types.

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

DEFAULT	Host Commands = Obey
Host Commands = Ignore	



NOTES

RS-232 ONLY INTERFACE

Use the programming barcodes in this section 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 the next section, "RS-232/USB-Com Interfaces" starting on page 4-26.

Reference Appendix B, Standard Defaults for a listing of standard factory settings.

Baud Rate

See page 233 for information on this feature.

	Baud Rate = 1200
Baud Rate = 2400	
	Baud Rate = 4800
Baud Rate = 9600	DEFAULT
	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.

	7 Data Bits
8 Data Bits	DEFAULT

Stop Bits

Set the number of stop bits to match host device requirements. See page 233 for more information on this feature.

DEFAULT	1 Stop Bit
2 Stop Bits	

Parity

This feature specifies parity required for sending and receiving data. Select the parity type according to host device requirements. See page 233 for more information.

DEFAULT	Parity = None
Parity = Even	
	Parity = Odd

Handshaking Control

See page 233 for more information about this feature.

DEFAULT	Handshaking Control = RTS
Handshaking Control = RTS/CTS	
	Handshaking Control = RTS/XON/XOFF
Handshaking Control = RTS On/CTS	
	Handshaking Control = RTS/CTS Scan Control

RS-232/USB-COM INTERFACES

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

See page 234 for more information.

Intercharacter Delay = No Delay

Select Intercharacter Delay Setting

To configure this feature, scan the ENTER/EXIT PROGRAMMING MODE barcode above, then the barcode at left followed by the digits (in hex) from the Alphanumeric characters in Appendix D, Keypad representing your desired character(s). End by scanning the ENTER/EXIT barcode again.

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

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.

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.

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. See page 235 for more information.

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-command 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. See page 235 for more information.

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.

Select ACK Character Setting

DEFAULT

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. See page 236 for more information.

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.

Select NAK Character Setting

DEFAULT

0x15 'NAK' Character

The ACK/NACK Characters must be different and must not contain reserved characters (see Appendix E, Reserved Characters).

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.

See page 237 for more information on setting this feature.

Select ACK NAK Timeout Value Setting

To configure this feature, scan the ENTER/EXIT PROGRAMMING MODE barcode above, then the barcode at left followed by the digits (in hex) from the Alphanumeric characters in Appendix D, Keypad representing your desired character(s). End by scanning the ENTER/EXIT barcode again.

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

CANCEL

DEFAULT

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. See page 238 for more information.

Select ACK NAK Retry Count Setting

To configure this feature, scan the ENTER/EXIT PROGRAMMING MODE barcode above, then the barcode at left followed by the digits (in hex) from the Alphanumeric characters in Appendix D, Keypad representing your desired character(s). End by scanning the ENTER/EXIT barcode again.

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

CANCEL

DEFAULT

003 = 3 Retries

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.

DEFAULT	ACK NAK Error Handling = Ignore Errors Detected
ACK NAK Error Handling = Process Error as Valid ACK Character	
	ACK NAK Error Handling = 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.

	Indicate Transmission Failure = Disable Indication
Indicate Transmission Failure = Enable Indication	DEFAULT

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.

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 Data Bits are set as 7 Data Bits.

See page 239 for more information on setting this feature.

Select Disable Character Setting

DEFAULT

0x44 = Disable Character is 'D'

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.

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 Data Bits are set as 7 Data Bits.

See page 240 in "References" for more information on setting this feature.

Select Enable Character Setting

DEFAULT

0x45 = Enable Character is 'E'

The Enable/Disable Characters must be different and must not contain reserved characters (see Appendix E, Reserved Characters)

USB KEYBOARD INTERFACES

Use the programming barcodes in this chapter to select options for USB Keyboard Interfaces. Reference Appendix B, Standard Defaults for a listing of standard factory settings.

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 USB Keyboard (without alternate key encoding) interface supports ALL Country Modes.

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

DEFAULT	Country Mode = U.S.
Country Mode = Belgium	
	Country Mode = Britain
Country Mode = Croatia	Supports only the interfaces listed in the Country Mode feature description.
Supports only the interfaces listed in the Country Mode feature description.	Country Mode = Czechoslovakia

Country Mode — continued

Country Mode = Denmark	Supports only the interfaces listed in the Country Mode feature description.
	Country Mode = France
Country Mode = Germany	
Supports only the interfaces listed in the Country Mode feature description.	Country Mode = Hungary
Country Mode = Italy	
Supports only the interfaces listed in the Country Mode feature description.	Country Mode = Japanese 106-key
Country Mode = Norway	Supports only the interfaces listed in the Country Mode feature description.

Country Mode — continued

Country Mode = Poland	Supports only the interfaces listed in the Country Mode feature description.
Supports only the interfaces listed in the Country Mode feature description.	Country Mode = Portugal
Country Mode = Romania	Supports only the interfaces listed in the Country Mode feature description.
Supports only the interfaces listed in the Country Mode feature description.	Country Mode = Slovakia
Country Mode = Spain	
	Country Mode = Sweden
Country Mode = Switzerland	Supports only the interfaces listed in the Country Mode feature description.

Send Control Characters

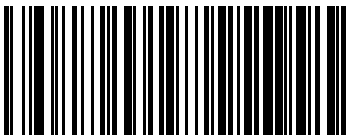
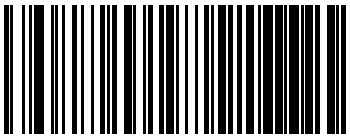
This feature Specifies how the reader transmits ASCII control characters to the host. Reference Appendix F, Scancode Tables for more information about control characters.

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 288).

DEFAULT	 Send Control Characters = 00
 Send Control Characters = 01	
	 Send Control Characters = 02

USB Keyboard Speed

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

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

USB Keyboard Speed = 6ms	
	USB Keyboard Speed = 7ms
USB Keyboard Speed = 8ms	
	USB Keyboard Speed = 9ms
USB Keyboard Speed = 10ms	

NOTES

DATA FORMAT

The features in this chapter can be used to build specific user-defined data into a message string. See “References” starting on page 241 for more detailed instructions on setting these features.

Global Prefix/Suffix

This option sets up to 20 characters each from the set of ASCII characters or any hex value from 00 to FF. The characters may be added as a prefix (in a position before the barcode data, also called a header) and/or as a suffix (in a position following the barcode data, also called a footer). See page 242 for more detailed instructions on setting this feature.

To configure this feature, scan the ENTER/EXIT PROGRAMMING MODE barcode above 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 D, 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. Exit programming mode by scanning the ENTER/EXIT barcode again.


Set Global Prefix


Set Global Suffix

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


CANCEL

DEFAULT

No Global Prefix
Global Suffix = 0x0D (CR)

Global AIM ID

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

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).

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

a. UPC-A and UPC-E labels are converted to EAN 13 when adding AIM IDs.
b. ISBN (X with a 0 modifier character)

DEFAULT

Global AIM ID = Disable

Global AIM ID = Enable

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

	GS1-128 AIM ID = Disable
GS1-128 AIM ID = Enable	DEFAULT

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" below) or individually per symbology (see "Label ID: Set Individually Per Symbology"on page 45). 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 43.

See Label ID, starting on page 244 of “References” for more information on setting this feature.

Label ID: Pre-loaded Sets

The reader supports two pre-loaded sets of Label IDs. See Label ID: Pre-loaded Sets, starting on page 244 for details on the USA set and the EU 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 custom configuration or custom defaults will be lost.

DEFAULT	Label ID Pre-loaded Set = USA Set
Label ID Pre-loaded Set = EU Set	

Label ID: Set Individually Per Symbology

This feature configures a Label ID individually for a single symbology. See Label ID: Set Individually Per Symbology, starting on page 246 for detailed instructions on setting this feature.

Label ID Control

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

DEFAULT	Label ID Transmission = Disable
Label ID Transmission = Enable as Prefix	
	Label ID Transmission = Enable as Suffix

Label ID Symbology Selection

This option selects the symbology for which a Label ID is to be configured. See "Label ID"on page 44 or page 246 in “References” for more detailed instructions.

	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-E Label ID Character(s)	
	Set UPC-E/P2 Label ID Character(s)
Set UPC-E/P5 Label ID Character(s)	
	Set EAN 13 Label ID Character(s)

Code 93 Character Correlation

Enables/disables Character Correlation for Code 93.

	Code 93 Character Correlation = Disable
Code 93 Character Correlation = Enable	DEFAULT

Code 93 Stitching

Disable/enable fixed or variable length stitching for Code 93.

	Code 93 Stitching = Disable
Code 93 Stitching = Enable	DEFAULT

MSI

The following options apply to the MSI symbology.

MSI Enable/Disable

Enables/Disables ability of reader to decode MSI labels.

DEFAULT	MSI = Disable
MSI = Enable	

MSI Check Character Calculation

Enables/Disables calculation and verification of an optional MSI check character.

	MSI Check Character Calculation = Disable
MSI Check Character Calculation = Enable Mod10	DEFAULT
	MSI Check Character Calculation = Enable Mod11/10
MSI Check Character Calculation = Enable Mod10/10	

MSI Check Character Transmission

Enables/disables transmission of an MSI check character.

MSI Check Character Transmission = Disable

MSI Check Character Transmission = Enable

DEFAULT

MSI Length Control

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

DEFAULT

MSI Length Control = Variable Length

MSI = Fixed Length

MSI Set Length 1

This feature specifies one of the barcode lengths for MSI 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 01 to 50 characters.

Table 20 provides some examples for setting Length 1. See page 256 for detailed instructions on setting this feature.

Table 20. MSI Length 1 Setting Examples

STEP	ACTION	EXAMPLES			
1	**Desired Setting**	01 Characters	07 Characters	15 Characters	50 Characters
2	**Scan ENTER/EXIT PROGRAMMING MODE**				
3	**Scan SELECT MSI LENGTH 1 SETTING**				
4	**Scan Two Characters From** Appendix D, Keypad	'0' and '1'	'0' and '7'	'1' and '5'	'5' AND '0'
5	**Scan ENTER/EXIT PROGRAMMING MODE**				

Select MSI 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

DEFAULT

01 = Length 1 is 1 Character

MSI Set Length 2

This feature specifies one of the barcode lengths for MSI 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).

Table 21 provides examples for setting Length 2. See page 256 for detailed instructions on setting this feature.

Table 21. MSI Length 2 Setting Examples

STEP	ACTION	EXAMPLES			
1	**Desired Setting**	00 (Ignore This Length)	07 Characters	15 Characters	50 Characters
2	**Scan ENTER/EXIT PROGRAMMING MODE**				
3	**Scan SELECT MSI LENGTH 2 SETTING**				
4	**Scan Two Characters From** Appendix D, Keypad	'0' and '0'	'0' and '7'	'1' and '5'	'5' AND '0'
5	**Scan ENTER/EXIT PROGRAMMING MODE**				

Select MSI 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.

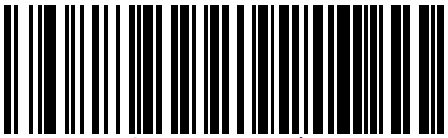
CANCEL

DEFAULT

50 = Length 2 is 50 Characters

MSI Minimum Reads

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

	 MSI Minimum Reads = 1
 MSI Minimum Reads = 2	
	 MSI Minimum Reads = 3
 MSI Minimum Reads = 4	

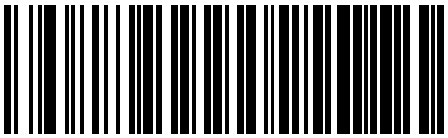
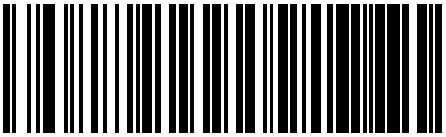
MSI Decoding Level

Specifies the decoding level for MSI. Decoding Levels are used to configure a barcode symbology decoder to be very aggressive to very conservative depending on a particular customer's needs. See page 255 for more information on this feature.

	MSI Decoding Level = Disable
MSI Decoding Level = 1 (conservative)	
	MSI Decoding Level = 2
MSI Decoding Level = 3	DEFAULT
	MSI Decoding Level = 4
MSI Decoding Level = 5 (aggressive)	

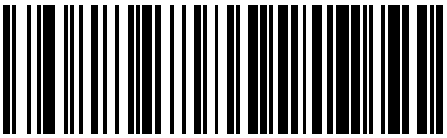
MSI Stitching

Enables/disables fixed length stitching for MSI.

DEFAULT	 MSI Stitching = Disable
 MSI Stitching = Enable	

MSI Character Correlation

Enables/disables Character Correlation for MSI.

DEFAULT	 MSI Character Correlation = Disable
 MSI Character Correlation = Enable	

PLESSEY

The following options apply to the Plessey symbology.

Plessey Enable/Disable

Enables/Disables ability of reader to decode Plessey labels.

DEFAULT	Plessey = Disable
Plessey = Enable	

Plessey Check Character Calculation

Enables/Disables calculation and verification of an optional Plessey check character.

	Plessey Check Character Calculation = Disable
Plessey Check Character Calculation = Enable Plessey std. check char. verification	DEFAULT
	Plessey Check Character Calculation = Enable Anker check char. verification
Plessey Check Character Calculation = Enable Plessey std. and Anker check char verification	

Plessey Check Character Transmission

Enables/disables transmission of an MSI check character.

	Plessey Check Character Transmission = Disable
Plessey Check Character Transmission = Enable	DEFAULT

Plessey Length Control

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

DEFAULT	Plessey Length Control = Variable Length
Plessey = Fixed Length	

Plessey Set Length 1

This feature specifies one of the barcode lengths for Plessey 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 01 to 50 characters.

Table 22 provides some examples for setting Length 1. See page 256 for detailed instructions on setting this feature.

Table 22. Plessey Length 1 Setting Examples

STEP	ACTION	EXAMPLES			
1	**Desired Setting**	01 Characters	07 Characters	15 Characters	50 Characters
2	**Scan ENTER/EXIT PROGRAMMING MODE**				
3	**Scan SELECT Plessey LENGTH 1 SETTING**				
4	**Scan Two Characters From** Appendix D, Keypad	'0' and '1'	'0' and '7'	'1' and '5'	'5' AND '0'
5	**Scan ENTER/EXIT PROGRAMMING MODE**				

Select Plessey 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

DEFAULT

01 = Length 1 is 1 Character

Plessey Set Length 2

This feature specifies one of the barcode lengths for Plessey 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).

Table 23 provides examples for setting Length 2. See page 256 for detailed instructions on setting this feature.

Table 23. Plessey Length 2 Setting Examples

STEP	ACTION	EXAMPLES			
1	**Desired Setting**	00 (Ignore This Length)	07 Characters	15 Characters	50 Characters
2	**Scan ENTER/EXIT PROGRAMMING MODE**				
3	**Scan SELECT PLESSEY LENGTH 2 SETTING**				
4	**Scan Two Characters From** Appendix D, Keypad	'0' and '0'	'0' and '7'	'1' and '5'	'5' AND '0'
5	**Scan ENTER/EXIT PROGRAMMING MODE**				

Select Plessey 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

DEFAULT

50 = Length 2 is 50 Characters

Plessey Minimum Reads

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

	Plessey Minimum Reads = 1
Plessey Minimum Reads = 2	
	Plessey Minimum Reads = 3
Plessey Minimum Reads = 4	DEFAULT

Plessey Decoding Level

Specifies the decoding level for Plessey. Decoding Levels are used to configure a barcode symbology decoder to be very aggressive to very conservative depending on a particular customer's needs. See page 255 for more information on this feature.

	Plessey Decoding Level = Disable
Plessey Decoding Level = 1 (conservative)	
	Plessey Decoding Level = 2
Plessey Decoding Level = 3	DEFAULT
	Plessey Decoding Level = 4
Plessey Decoding Level = 5 (aggressive)	

Plessey Stitching

Enables/disables fixed length stitching for Plessey.

DEFAULT

Plessey Stitching = Disable

Plessey Stitching = Enable

Plessey Character Correlation

Enables/disables Character Correlation for Plessey.

DEFAULT

Plessey Character Correlation = Disable

Plessey Character Correlation = Enable

NOTES

Chapter 4
Software Configuration Strings

RS-232 models (as well as USB models with the USB-COM Interface selected) can be configured using the serial strings contained in this chapter.

To configure RS-232 models by using the configuration strings:

1. Connect your reader to a PC RS-232 port according to the information in Installing the Interface Cable, starting on page 12. Set the PC serial port to the default RS-232 communication parameters (see Standard Defaults, starting on page 263).

To configure the reader using configuration strings you must enter Service Mode, which automatically sets the reader communication to 115200 baud rate. You must therefore set the host accordingly for RS-232 communications. Upon exiting Service Mode, the programmed baud rate will be restored.

2. Using a Terminal Emulation Program, send the Restore Current Interface (Custom) Default string to the reader using the syntax described on the next page.

3. Send all the necessary command strings according to your application's requirements.

To configure USB models (only for USB-COM Interface) by using the configuration strings:

USB models by default have the USB-KBD Interface selected and are easily configured by reading the barcodes in Setting the Interface, starting on page 13**.**

1. Download and install the USB-COM driver from www.scanning.datalogic.com .

2. Connect your reader to a PC USB port according to the information in Installing the Interface Cable, starting on page 12.

3. Change the interface to USB-COM by reading the barcode below.

USB-COM

4. Using a Terminal Emulation Program, send the Restore Current Interface (Custom) Default string to the reader using the syntax described on the next page.

5. Send all the necessary command strings according to your application's requirements.

Command Syntax

1. Enter Service (Serial String Programming) Mode

$S<CR>

This command automatically sets the reader communication to 115200 baud rate. Before continuing, please set the baud rate of the Terminal Emulation Program to 115200.

2. Send Command

$	*Command*	*Parameter*	*Value*	<CR>

Where:

Command:	**Description**
HA*XX*	Interface Selection
AA	Enable All Symbologies
AD	Disable All Symbologies
R	Reset Reader
C*XXXXXX*	Write Single Configuration Item to RAM
Parameter:	
XXXX	A 4-character ASCII string See Serial Configuration Strings Table
Value:	
XX	A 2-character Hex string See Serial Configuration Strings Table

3. Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode

$Ar<CR>

This command automatically returns to the programmed baud rate. Before continuing, please set the baud rate of the Terminal Emulation Program to the programmed baud rate.

Example 1:

1. **$S<CR>**

   Enter Service Mode.

2. **$CLFCA02<CR>**

   Write command "Convert to Lower Case" to current configuration.

3. **$Ar<CR>**

   Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode.

Each configuration parameter setting removes the condition previously active for that parameter.

Example 2:

1. **$S<CR>**

   Enter Service Mode.

2. **$HA05<CR>**

   Select RS232 Interface.

3. **$Ar<CR>**

   Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode.

Example 3:

1. **$+$!<CR>**

   Read Application Software Release.

Example 4:

Some parameters (ex. Strings) need to insert all the characters (typically 20 Chrs). For example, to apply the Chr "T" (0x54) as Serial Stop String:

1. **$S<CR>**

   Enter Service Mode

2. **$CSTON540000000000000000000000000000000000000<CR>**

   Select the string:"T" (54 = T) as Serial Stop Character. You must insert all the 20 Chrs (00 = one empty Chr)

3. **$Ar<CR>**

   Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode.

SERIAL CONFIGURATION STRINGS

ENTER/EXIT CONFIGURATION COMMANDS	
Description	**Command**
Enter Service Mode (configuration) fixed 115200 Baud rate	**S**
Exit Service Mode (configuration) return to programmed Baud rate	**s**
Apply Configuration to RAM (temporary memory) and Exit Service Mode	**r01**
Apply and Save Configuration to FLASH (permanent memory) and Exit Service Mode	**Ar**

To configure the reader using configuration strings, it must be placed into Service Mode, which automatically sets the reader communication to 115200 baud rate. You must therefore set the host accordingly for RS-232 communications. Upon exiting Service Mode, the programmed baud rate will be restored.

CONFIGURATION COMMANDS	
Description	**Command**
Write Single Configuration Item to RAM (temporary memory)	**Cxxxxxx**
Read Single Configuration Item from RAM (temporary memory)	**cxxxx**
Reset Reader	**R**
Read Application Software Release (does not require Enter/Exit Service Mode)	**$+$!**
Host Commands Obey	**CIFIH00**
Host Commands Ignore	**CIFIH01**
Enable All Symbologies	**AA**
Disable All Symbologies	**AD**

The Interface Selection commands store and load the new interface type with its factory defaults into the current configuration.

INTERFACE SELECTION COMMANDS	
Description	**Command**
Restore Current Interface (Custom) Default Configuration	**HA00**
RS232-STD	**HA05**
USB-COM	**HA47**
RS232-Wincor-Nixdorf	**HA12**
USB-KBD	**HA35**
USB-KBD-ALT	**HA2B**
USB KBD-APPLE	**HA2C**

To read a particular parameter setting from the reader, send the read parameter command without any value. The reader will respond with its currently configured value.

The Read Application Software Release command is a direct command that does not require entering Service Mode.

RS-232 ONLY PARAMETERS			
Description		**Parameter**	**Value**
Baud Rate	1200	**R2BA**	**00**
	2400		**01**
	4800		**02**
	9600		**03**
	19200		**04**
	38400		**05**
	57600		**06**
	115200		**07**
Parity	none	**R2PA**	**00**
	even		**01**
	odd		**02**
Data Bits	7	**R2DA**	**00**
	8		**01**
Stop Bits	1	**R2ST**	**00**
	2		**01**
Handshaking Control	RTS	**R2HC**	**00**
	RTS/CTS	**R2HC**	**01**
	RTS/Xon/Xoff	**R2HC**	**02**
	RTS On/CTS	**R2HC**	**03**
	RTS/CTS Scan Control	**R2HC**	**04**

RS-232/USB-COM PARAMETERS			
Description		**Parameter**	**Value**
Intercharacter Delay	No delay or from 10 to 990 ms	**R2IC**	***a***
Disable Character	Host command character which disables the reader	**R2DC**	***b***
Enable Character	Host command character which enables the reader	**R2EC**	***b***
ACK/NAK Options	Disable	**R2AE**	**00**
	Enable for label transmission		**01**
	Enable for host command acknowledge		**02**
	Enable for label transmission and host command acknowledge		**03**
ACK Character	Selects character to be used as ACK	**R2AC**	***c***
NAK Character	Selects character to be used as NAK	**R2NA**	***c***
ACK/NAK Timeout Value	No timeout or from 200 to 15000 ms	**R2AT**	***d***
ACK/NAK Retry Count	From 0 to unlimited retries	**R2AR**	***e***
ACK/NAK Error Handling	Ignore errors detected	**R2EH**	**00**
	Process errors as valid ACK character		**01**
	Process errors as valid NAK character		**02**
Beep On ASCII BEL	Disable	**R2BB**	**00**
	Enable		**01**
Beep On Not-On-File	Disable	**BPNF**	**00**
	Enable		**01**
Indicate Transmission Failure	Disable	**R2TF**	**00**
	Enable		**01**

a = Hex value from **00** to **63** representing the decimal number *(00 = no delay; all others x10 ms)*

b = Hex value from **00** to **FE** representing the ASCII character

c = Hex value from **00** to **FF** representing the ASCII character

d =Hex value from **00** to **4B** representing the decimal number *(00 = timeout disabled; all others x200 ms)*

e = Hex value from **00** to **FF** representing the number of retries *(00 = no retries; 01-FE = 1-254 retries; FF = unlimited retries)*

USB ONLY PARAMETERS			
Description		**Parameter**	**Value**
USB suspend mode	Disable	**USSE**	**00**
	Enable		**01**

USB-KBD / USB-KBD-ALT / USB-KBD-APPLE PARAMETERS			
Description		**Parameter**	**Value**
Keyboard Country Mode	*US	**KBCO**	**00**
	*Belgium		**01**
	*Britain		**02**
	Croatia		**11**
	Czechoslovakia		**0E**
	Denmark		**03**
	*France		**04**
	*Germany		**05**
	Hungary		**0D**
	*Italy		**06**
	Japanese (106 key)		**0C**
	Norway		**07**
	Poland		**12**
	Portugal		**08**
	Romania		**10**
	Slovakia		**0F**
	*Spain		**09**
	*Sweden		**0A**
	Switzerland		**0B**
Send Control Characters	CTRL + KEY	**KBSC**	**00**
	CTRL + SHIFT + KEY		**01**
	Special Function KEY		**02**
USB Keyboard Speed	1 ms	**KBSP**	**01**
	2 ms		**02**
	3 ms		**03**
	4 ms		**04**
	5 ms		**05**
	6 ms		**06**
	7 ms		**07**
	8 ms		**08**
	9 ms		**09**
	10 ms		**0A**

* = Valid for USB-KBD-APPLE

READING PARAMETERS PARAMETERS			
Description		**Parameter**	**Value**
Illumination Mode	Disabled	**SPIL**	**00**
	Triggered		**01**
	Enabled		**02**
Operating Modes	On Line	**SNRM**	**00**
	Serial On Line		**01**
	Automatic		**02**
	Automatic (Object Sense)		**03**
	Test Mode		**04**
Test Mode Multiple	Disabled	**SNTM**	**00**
	Enabled		**01**
Automatic Threshold	From 2 to 255 scans without a code	**SNAT**	***g***
Phase Off Event	Trigger Stop	**SNTO**	**00**
	Timeout		**01**
	Trigger Stop-Timeout		**02**
Timeout	From 40 to 5100 ms	**SNET**	***h***
Serial Start	Any string of characters (max 20) between 00-FE	**STON**	***i***
Serial Stop	Any string of characters (max 20) between 00-FE	**STOF**	***i***
Label Programming Mode	Disabled	**FAPM**	**00**
	Enabled		**01**
Exposure Mode	Continuous	**SPST**	**00**
	Strobed	**SPST**	**01**

g = Hex value from **02** to **FF** representing the number of scans without a code

h = Hex value from **02** to **FF** representing the decimal number *(x20 ms)*

i = Hex value from **00** to **FE** representing the ASCII character

DATA FORMAT			
Description		**Parameter**	**Value**
Data Transmission	On Decode	**LFTX**	**01**
	After Phase Off		**00**
Code Verifier Mode	Disabled	**LFCV**	**00**
	Transmit Wrong String		**01**
	Transmit Wrong Code		**02**
Match String	Any string of characters (max 20) between 00-FE	**COVS**	***k***
Wrong Code String	Any string of characters (max 20) between 00-FE	**WCVS**	***k***
Case Conversion	Disable	**LFCA**	**00**
	Upper Case		**01**
	Lower Case		**02**
Global Prefix (Header)	Any string of characters (max 20) between 00-FE	**LFPR**	***k***
Global Suffix (Terminator)	Any string of characters (max 20) between 00-FE	**LFSU**	***k***
No Read String	Any string of characters (max 20) between 00-FE	**NORS**	***k***
Character Conversion	An 8-character string between 00-FF	**LFCH**	***m***
Transmit AIM IDs	Disable	**AIEN**	**00**
	Enable		**01**
Transmit Custom Label IDs	Disable	**IDCO**	**00**
	Prefix		**01**
	Suffix		**02**
GS1-128 AIM ID	Disable	**U8AI**	**00**
	Enable		**01**

k = Hex value from **00** to **FE** representing the ASCII character

m = 8 Hex values from **00** to **FF** representing the 8 ASCII characters *(FF = no replacement or ignore)*

Custom Code Identifiers	Any string of characters (max 3) between 00-FE		
UPC-A		**ABID**	***k***
UPC-E		**EBID**	***k***
EAN-8		**8BID**	***k***
EAN-13		**3BID**	***k***
UPC-A/P2		**A2ID**	***k***
UPC-A/P5		**A5ID**	***k***
UPC-E/P2		**E2ID**	***k***
UPC-E/P5		**E5ID**	***k***
EAN-8/P2		**82ID**	***k***
EAN-8/P5		**85ID**	***k***
EAN-13/P2		**32ID**	***k***
EAN-13/P5		**35ID**	***k***
ISBN		**ISID**	***k***
ISSN		**INID**	***k***
GTIN for EAN/UPC w/o Add-On		**GBID**	***k***
GTIN for EAN/UPC w P2		**G2ID**	***k***
GTIN for EAN/UPC w P5		**G5ID**	***k***
Code 39		**C3ID**	***k***
Code 32		**P3ID**	***k***
Code 128		**C8ID**	***k***
GS1-128		**U8ID**	***k***
ISBT 128		**I8ID**	***k***
Interleaved 2 of 5		**I2ID**	***k***
Standard 2 of 5		**S2ID**	***k***
Industrial 2 of 5		**U2ID**	***k***
Datalogic 2 of 5		**D2ID**	***k***
IATA		**IAID**	***k***
Codabar		**CBID**	***k***
ABC Codabar		**ACID**	***k***
GS1 Databar 14 (Omnidirectional)		**4BID**	***k***
GS1 Databar Expanded		**XBID**	***k***
GS1 Databar Limited		**LBID**	***k***

Custom Code Identifiers	Any string of characters (max 3) between 00-FE		
Code 93		**C9ID**	***k***
MSI		**MSID**	***k***
Plessey		**PLID**	***k***

k = Hex value from **00** to **FE** representing the ASCII character

DIGITAL OUTPUT			
Description		**Parameter**	**Value**
OUTPUT			
Activation Event	Disable	**OUA1**	**00**
	Good Read		**01**
	No Read		**02**
	Wrong Code		**03**
Deactivation Event	Disable	**OUD1**	**00**
	Timeout		**01**
	Reading Phase Active		**02**
Deactivation Timeout	100 to 25500 ms	**OUT1**	***n***
Active Level	Closed	**OUL1**	**00**
	Open		**01**

n = Hex value from **01** to **FF** representing the decimal number *(x100 ms)*

POWER SAVE			
Description		**Parameter**	**Value**
Sleep Mode Timeout	Disable	**SLTO**	**00**
	10 seconds		**01**
	30 seconds		**02**
	1 minute		**03**
	5 minutes		**04**
	10 minutes		**05**

LED AND BEEPER INDICATORS			
Description		**Parameter**	**Value**
Power On Alert	Disable	**BPPU**	**00**
	Enable		**01**
Indicate Good Read	On Decode	**BPIN**	**00**
	After Transmit		**01**
Good Read Beep	Disable	**BPVO**	**00**
	Enable		**01**
Good Read Beep Length	Time length from 10 to 2550 ms	**BPLE**	***o***
Good Read Led Duration	Time length from 0 to 25,500 ms	**LAGL**	***f***
Green Spot Duration	Disable	**LSSP**	**00**
	Short 300ms		**01**
	Medium 500ms		**02**
	Long 800ms		**03**
Led Indication	On Decode	**BPIN**	**00**
	After Transmit		**01**

o = Hex value from **01** to **FF** representing the decimal number *(x10 ms)*

f = Hex value from **00** to **FF** representing the decimal number *(00 = Disable; others x100ms)*

CODE SELECTION			
Description		**Parameter**	**Value**
UPC-A			
UPC-A	Disable	**ABEN**	**00**
	Enable		**01**
Check Character Tx	Disable	**ABCT**	**00**
	Enable		**01**
Expand to EAN-13	Disable	**AB3B**	**00**
	Enable		**01**
Number System Tx	Disable	**ABNS**	**00**
	Enable		**01**
Minimum Reads	One Read	**ABMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Coupon Control	Allow all coupon barcodes to be decoded	**CPCL**	**00**
	Enable only UPC-A coupon decoding		**01**
	Enable only GS1 Databar coupon decoding		**02**
UPC-E			
UPC-E	Disable	**EBEN**	**00**
	Enable		**01**
Check Character Tx	Disable	**EBCT**	**00**
	Enable		**01**
Expand to UPC-A	Disable	**EBAB**	**00**
	Enable		**01**
Expand to EAN-13	Disable	**EB3B**	**00**
	Enable		**01**
Number System Tx	Disable	**EBNS**	**00**
	Enable		**01**
Minimum Reads	One Read	**EBMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
EAN-13			
EAN-13	Disable	**3BEN**	**00**
	Enable		**01**
Check Character Tx	Disable	**3BCT**	**00**
	Enable		**01**
ISBN Conversion	Disable	**3BIS**	**00**

CODE SELECTION			
Description		**Parameter**	**Value**
	Enable		01
ISSN Conversion	Disable	3BIN	00
	Enable		01
Flag 1 Character	Disable	3BF1	00
	Enable		01
Minimum Reads	One Read	3BMR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Coupon Control	Allow all coupon barcodes to be decoded	CPCL	00
	Enable only UPC-A coupon decoding		01
	Enable only GS1 Databar coupon decoding		02
EAN-8			
EAN-8	Disable	8BEN	00
	Enable		01
Check Character Tx	Disable	8BCT	00
	Enable		01
Expand to EAN-13	Disable	8B3B	00
	Enable		01
Minimum Reads	One Read	8BMR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Add-Ons			
P2 Add-On	Disable	ADO2	00
	Enable		01
P5 Add-On	Disable	ADO5	00
	Enable		01
P2 Minimum Reads	One Read	ADM2	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
P5 Minimum Reads	One Read	ADM5	01
	Two Reads		02
	Three Reads		03
	Four Reads		04
Optional Add-On Timer	Timer disabled or from 10 to 300 ms	ADOT	*p*

p = Hex value from **00** to **1E** representing the decimal number *(00 = Timer disabled; all others x10 ms)*

CODE SELECTION			
Description		**Parameter**	**Value**
EAN/UPC Global Settings			
GTIN Format	Disable	**GBEN**	**00**
	Enable		**01**
Decoding Level	Disable	**UNDL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Character Correlation	Disable	**UNCO**	**00**
	Enable		**01**
In-Store Minimum Reads	One Read	**INMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Code 39			
Code 39	Disable	**C3EN**	**00**
	Enable		**01**
Code 39 Full ASCII	Disable	**C3FA**	**00**
	Enable		**01**
Code Length Control	Variable	**C3LC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 50 characters	**C3L1**	***q***
	Length 2 (or Max Length) 0 or from 1 to 50 characters	**C3L2**	***q***
Code 32 (Italian Pharma)	Disable	**P3EN**	**00**
	Enable		**01**
Code 32 Check Tx	Disable	**P3CT**	**00**
	Enable		**01**
Code 32 Start/Stop Tx	Disable	**P3SS**	**00**
	Enable		**01**
Check Options			
Check Calculation	Disable	**C3CC**	**00**
	Enable Standard Check		**01**
	Enable Mod-7 Check		**02**
	Enable Italian Post Check		**04**
	Enable Daimler Chrysler Check		**08**

q = Hex value from **00** to **32** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
Code 39 Check Tx	Disable	**C3CT**	**00**
	Enable		**01**
Code 39 Start/Stop Tx	Disable	**C3SS**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**C3MR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Decoding Level	Disable	**C3DL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Interdigit Ratio	Any ratio or 1 to 10	**C3IR**	***r***
Character Correlation	Disable	**C3CO**	**00**
	Enable		**01**
Quiet Zones	Quiet Zone on One Side	**C3LO**	**01**
	Quiet Zones on Two Sides		**02**
	Auto		**03**
	Virtual Quiet Zones on Two Sides		**04**
	Small Quiet Zones on Two Sides		**05**
Stitching	Disable	**C3ST**	**00**
	Enable		**01**
Code 128 (GS1-128)			
Code 128	Disable	**C8EN**	**00**
	Enable		**01**
GS1-128 Enable	Enable (transmit labels in Code 128 data format)	**U8EN**	**00**
	Enable (transmit labels in GS1-128 data format)		**01**
	Disable		**02**
Code Length Control	Variable	**C8LC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 80 characters	**C8L1**	***s***
	Length 2 (or Max Length) 0 or from 1 to 80 characters	**C8L2**	***s***

r = Hex value from **00** to **0A** representing the decimal number of the interdigit space/module ratio *(00 = any ratio)*
s = Hex value from **00** to **50** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
Expand to Code 39	Disable	**C8C3**	**00**
	Enable		**01**
Check Options			
Check Tx	Disable	**C8CT**	**00**
	Enable		**01**
Function Character Tx	Disable	**C8TF**	**00**
	Enable		**01**
Sub-Code Change Tx	Disable	**C8SC**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**C8MR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Decoding Level	Disable	**C8DL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Character Correlation	Disable	**C8CO**	**00**
	Enable		**01**
Quiet Zones	No Quiet Zones	**C8LO**	**00**
	Quiet Zone on One Side		**01**
	Quiet Zones on Two Sides		**02**
	Auto		**03**
	Virtual Quiet Zones on Two Sides		**04**
Stitching	Disable	**C8ST**	**00**
	Enable		**01**
ISBT 128			
ISBT 128 Concatenation	Disable	**I8CE**	**00**
	Enable		**01**
Concatenation Mode	Static	**I8CM**	**00**
	Dynamic		**01**
Dynamic Concat. Timeout	From 50 to 2550 ms	**I8DT**	***t***
Chain 0 - Chain 15	Contact Datalogic		

t = Hex value from **05** to **FF** representing the decimal number *(x10 ms)*

CODE SELECTION			
Description		**Parameter**	**Value**
Interleaved 2 of 5 (I 2 of 5)			
I 2 of 5	Disable	**I2EN**	**00**
	Enable		**01**
Code Length Control	Variable	**I2LC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 2 to 50 characters (only even numbers)	**I2L1**	***v***
	Length 2 (or Max Length) from 0 or from 2 to 50 characters (only even numbers)	**I2L2**	***v***
Check Options			
Check Calculation	Disable	**I2CC**	**00**
	Enable Standard(Mod 10)		**01**
	Enable German Parcel		**02**
	Enable DHL		**04**
	Enable Daimler Chrysler		**08**
	Enable Bosch		**10**
	Enable Italian Post		**20**
Check Tx	Disable	**I2CT**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**I2MR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Decoding Level	Disable	**I2DL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Character Correlation	Disable	**I2CO**	**00**
	Enable		**01**
Stitching	Disable	**I2ST**	**00**
	Enable		**01**
Zero Pattern	Disable	**I2ZP**	**00**
	Enable		**01**

v = Hex value from **00** or **02** to **32** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
Standard 2 of 5			
Standard 2 of 5	Disable	**S2EN**	**00**
	Enable		**01**
Code Length Control	Variable	**S2LC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 50 characters	**S2L1**	***v***
	Length 2 (or Max Length) 0 or from 1 to 50 characters	**S2L2**	***v***
Check Options			
Check Calculation	Disable	**S2CC**	**00**
	Enable		**01**
Check Tx	Disable	**S2CT**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**S2MR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Decoding Level	Disable	**S2DL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Character Correlation	Disable	**S2CO**	**00**
	Enable		**01**
Stitching	Disable	**S2ST**	**00**
	Enable		**01**
Industrial 2 of 5			
Industrial 2 of 5	Disable	**U2EN**	**00**
	Enable		**01**
Code Length Control	Variable	**U2LC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 50 characters	**U2L1**	***v***
	Length 2 (or Max Length) 0 or from 1 to 50 characters	**U2L2**	***v***
Check Options			
Check Calculation	Disable	**U2CC**	**00**
	Enable		**01**

v = Hex value from **00** or **02** to **32** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
Check Tx	Disable	**U2CT**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**U2MR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Character Correlation	Disable	**U2CO**	**00**
	Enable		**01**
Stitching	Disable	**U2ST**	**00**
	Enable		**01**
IATA			
IATA	Disable	**IAEN**	**00**
	Enable		**01**
Check Tx	Disable	**IACT**	**00**
	Enable		**01**
Datalogic 2 of 5			
Datalogic 2 of 5	Disable	**D2EN**	**00**
	Enable		**01**
Code Length Control	Variable	**D2LC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 50 characters	**D2L1**	***v***
	Length 2 (or Max Length) 0 or from 1 to 50 characters	**D2L2**	***v***
Check Options			
Check Calculation	Disable	**D2CC**	**00**
	Enable		**01**
Check Tx	Disable	**D2CT**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**D2MR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Decoding Level	Disable	**D2DL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**

v = Hex value from **00** or **02** to **32** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
	Level 4		**04**
	Level 5		**05**
Character Correlation	Disable	**D2CO**	**00**
	Enable		**01**
Stitching	Disable	**D2ST**	**00**
	Enable		**01**
Codabar			
Codabar	Disable	**CBEN**	**00**
	Enable		**01**
Code Length Control	Variable	**CBLC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 3 to 50 characters	**CBL1**	***v***
	Length 2 (or Max Length) 0 or from 3 to 50 characters	**CBL2**	***v***
ABC Codabar			
ABC Codabar	Disable	**CBAB**	**00**
	Enable		**01**
Concatenation Mode	Static	**CBCM**	**00**
	Dynamic		**01**
Dynamic Concat. Timeout	From 50 to 2550 ms	**CBDT**	***t***
Check Options			
Check Calculation	Disable	**CBCC**	**00**
	Enable AIM Standard Check		**01**
	Enable Mod-10 Check		**02**
Check Tx	Disable	**CBCT**	**00**
	Enable		**01**
Start/Stop Set	ABCD/TN*E	**CBSC**	**00**
	ABCD/ABCD		**01**
	abcd/tn*e		**02**
	abcd/abcd		**03**
Start/Stop Tx	Disable	**CBSS**	**00**
	Enable		**01**
Start/Stop Match	Disable	**CBSM**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**CBMR**	**01**
	Two Reads		**02**

v = Hex value from **00** or **02** to **32** representing the decimal number

t = Hex value from **05** to **FF** representing the decimal number *(x10 ms)*

CODE SELECTION			
Description		**Parameter**	**Value**
	Three Reads		**03**
	Four Reads		**04**
Decoding Level	Disable	**CBDL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Character Correlation	Disable	**CBCO**	**00**
	Enable		**01**
Interdigit Ratio	Any ratio or 1 to 10	**CBIR**	***r***
Quiet Zones	Quiet Zone on One Side	**CBLO**	**01**
	Quiet Zones on Two Sides		**02**
	Auto		**03**
	Virtual Quiet Zones on Two Sides		**04**
	Small Quiet Zones on Two Sides		**05**
Stitching	Disable	**CBST**	**00**
	Enable		**01**
GS1 Databar Omnidirectional			
GS1 Databar Omnidirectional	Disable	**4BEN**	**00**
	Enable		**01**
GS1-128 Emulation	Disable	**4BU8**	**00**
	Enable		**01**
Omnidirectional Decoding Options			
Minimum Reads	One Read	**4BMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
GS1 Databar Expanded			
GS1 Databar Expanded	Disable	**XBEN**	**00**
	Enable		**01**
GS1-128 Emulation	Disable	**XBU8**	**00**
	Enable		**01**
Code Length Control	Variable	**XBLC**	**00**
	Fixed		**01**

r = Hex value from **00** to **0A** representing the decimal number of the interdigit space/module ratio *(00 = any ratio)*

CODE SELECTION			
Description		**Parameter**	**Value**
Set Length	Length 1 (or Min Length) from 1 to 74 characters	**XBL1**	***w***
	Length 2 (or Max Length) 0 or from 1 to 74 characters	**XBL2**	***w***
Expanded Decoding Options			
Minimum Reads	One Read	**XBMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Coupon Control	Allow all coupon barcodes to be decoded	**CPCL**	**00**
	Enable only UPC-A coupon decoding		**01**
	Enable only GS1 Databar coupon decoding		**02**
GS1 Databar Limited			
GS1 Databar Limited	Disable	**LBEN**	**00**
	Enable		**01**
GS1-128 Emulation	Disable	**LBU8**	**00**
	Enable		**01**
Limited Decoding Options			
Minimum Reads	One Read	**LBMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Code 93			
Code 93	Disable	**C9EN**	**00**
	Enable		**01**
Code Length Control	Variable	**C9LC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 50 characters	**C9L1**	***v***
	Length 2 (or Max Length) 0 or from 1 to 50 characters	**C9L2**	***v***
Check Options			
Check Calculation	Disable	**C9CC**	**00**
	Enable Check C		**01**
	Enable Check K		**02**
	Enable Check C and K		**03**
Check Tx	Disable	**C9CT**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**C9MR**	**01**

w = Hex value from **00** to **4A** representing the decimal number
v = Hex value from **00** or **02** to **32** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
	Two Reads		02
	Three Reads		03
	Four Reads		04
Decoding Level	Disable	C9DL	00
	Level 1		01
	Level 2		02
	Level 3		03
	Level 4		04
	Level 5		05
Character Correlation	Disable	C9CO	00
	Enable		01
Quiet Zones	No Quiet Zones	C9LO	00
	Quiet Zone on One Side		01
	Quiet Zones on Two Sides		02
	Auto		03
	Virtual Quiet Zones on Two Sides		04
Stitching	Disable	C9ST	00
	Enable		01
MSI			
MSI	Disable	MSEN	00
	Enable		01
Code Length Control	Variable	MSLC	00
	Fixed		01
Set Length	Length 1 (or Min Length) from 1 to 50 characters	MSL1	*v*
	Length 2 (or Max Length) 0 or from 1 to 50 characters	MSL2	*v*
Check Options			
Check Calculation	Disable	MSCC	00
	Enable Mod 10		01
	Enable Mod 11/10		02
	Enable Mod 10/10		03
Check Tx	Disable	MSCT	00
	Enable		01
Decoding Options			
Minimum Reads	One Read	MSMR	01
	Two Reads		02
	Three Reads		03
	Four Reads		04

v = Hex value from **00** or **02** to **32** representing the decimal number

CODE SELECTION			
Description		**Parameter**	**Value**
Decoding Level	Disable	**MSDL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Stitching	Disable	**MSST**	**00**
	Enable		**01**
Plessey			
Plessey	Disable	**PLEN**	**00**
	Enable		**01**
Code Length Control	Variable	**PLLC**	**00**
	Fixed		**01**
Set Length	Length 1 (or Min Length) from 1 to 50 characters	**PLL1**	***v***
	Length 2 (or Max Length) 0 or from 1 to 50 characters	**PLL2**	***v***
Check Options			
Check Calculation	Disable	**PLCC**	**00**
	Standard		**01**
	Anker Calculation		**02**
	Standard and Anker Calculation		**03**
Check Tx	Disable	**PLCT**	**00**
	Enable		**01**
Decoding Options			
Minimum Reads	One Read	**PLMR**	**01**
	Two Reads		**02**
	Three Reads		**03**
	Four Reads		**04**
Decoding Level	Disable	**PLDL**	**00**
	Level 1		**01**
	Level 2		**02**
	Level 3		**03**
	Level 4		**04**
	Level 5		**05**
Character Correlation	Disable	**PLCO**	**00**
	Enable		**01**
Stitching	Disable	**PLST**	**00**
	Enable		**01**

v = Hex value from **00** or **02** to **32** representing the decimal number

NOTES

Chapter 5
References

This section contains explanations and examples of selected barcode features. See the Configuration section for the actual barcode labels used to configure the reader.

RS-232 Parameters

RS-232 Only

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.

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.

RS-232/USB COM Parameters

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. Go to page 27 and scan the barcode: SELECT INTERCHARACTER DELAY SETTING.
5. Scan the appropriate two digits from the keypad in Appendix D, 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.

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

This completes the procedure. See Table 24 for some examples of how to set this feature.

Table 24. Intercharacter Delay Setting Examples

STEP	ACTION	EXAMPLES			
1	Desired Setting	50ms	150ms	600ms	850ms
2	Divide by 10 (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 Appendix D, Keypad	'0' and '5'	'5' and '0'	'6' and '0'	'8' and '5'
6	Scan ENTER/EXIT PROGRAMMING MODE				

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

The ACK/NAK Characters must be different and must not contain reserved characters (see Appendix E, Reserved Characters**).**

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.

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.**

1. Determine the desired character or value. Use the ASCII Chart on the inside back cover of this manual to find the hex equivalent for the desired character/value.
2. Go to page 29 and scan ENTER/EXIT PROGRAMMING MODE to enter Programming Mode.
3. Scan the barcode: SELECT ACK CHARACTER SETTING.
4. Scan the appropriate two alpha-numeric characters from the keypad in Appendix D, Keypad, that represent the desired character/value in step 1 above. The second character will cause a two-beep indication.
5. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit.

Table 25. ACK Character Setting Examples

STEP	ACTION	EXAMPLES			
1	**Desired Character/Value**	ACK	$	@	>
2	**Hex equivalent from** ASCII Chart	0x06	0x24	0x40	0x3E
3	**Scan ENTER/EXIT PROGRAMMING MODE**				
4	**Scan SELECT ACK CHARACTER SETTING**				
5	**Scan Two Characters from** Appendix D, Keypad	'0' and '6'	'2' and '4'	'4' and '0'	'3' AND 'E'
6	**Scan ENTER/EXIT PROGRAMMING MODE**				

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.

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. Go to page 29 and 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 D, 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 26 for some examples of how to set this feature.

Table 26. NAK Character Setting Examples

STEP	ACTION	EXAMPLES			
1	**Desired Character/Value**	NAK	$	@	>
2	**Hex equivalent from** ASCII Chart	0x15	0x24	0x40	0x3E
3	**Scan ENTER/EXIT PROGRAMMING MODE**				
4	**Scan SELECT ACK CHARACTER SETTING**				
5	**Scan Two Characters From** Appendix D, Keypad	'1' and '5'	'2' and '4'	'4' and '0'	'3' AND 'E'
6	**Scan ENTER/EXIT PROGRAMMING MODE**				

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. Go to page 30 and 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 D, 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.

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. ACK NAK Timeout Value Setting Examples

STEP	ACTION	EXAMPLES			
1	**Desired Setting**	200ms	1,000ms (1 sec.)	5200ms (5.2 sec.)	15,000ms (15 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** Appendix D, Keypad	'0' and '1'	'0' and '5'	'2' and '6'	'7' and '5'
6	**Scan ENTER/EXIT PROGRAMMING MODE**				

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. Go to page 30 and 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 D, 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.

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. 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** Appendix D, Keypad	'0', '0' and '0'	'0', '0' and '3'	'0', '5' and '4'	'2', '5' and '5'
6	**Scan ENTER/EXIT PROGRAMMING MODE**				

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.

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 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. Go to page 32 and 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 D, 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 29 for some examples of how to set this feature.

Table 29. Disable Character Setting Examples

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

The Enable/Disable Characters must be different and must not contain reserved characters (see Appendix E, Reserved Characters**)**

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.

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 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. Go to page 32 and 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 D, 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 30 for some examples of how to set this feature.

Table 30. Enable Character Setting Examples

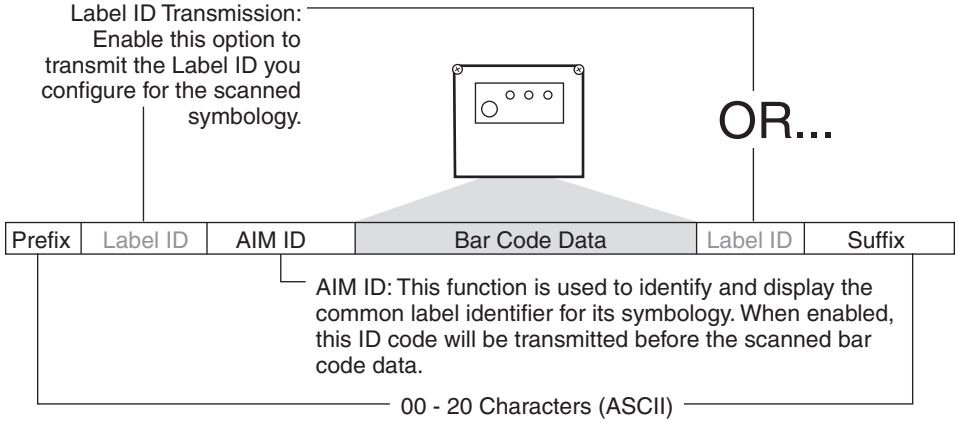
STEP	ACTION	EXAMPLES			
1	**Desired character/value**	'e'	'}'	'E'	Enable Command Not Used
2	**Hex equivalent from** ASCII Chart	0x65	0x7D	0x45	0xFF
3	**Scan ENTER/EXIT PROGRAMMING MODE**				
4	**Scan SELECT DISABLE CHARACTER VALUE SETTING**				
5	**Scan Two Characters From** Appendix D, Keypad	'6' and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

Data Editing

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 Data Editing features 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. See the Advanced formatting features in the Datalogic Aladdin configuration software, or contact Technical Support (described on page 8 for more information.

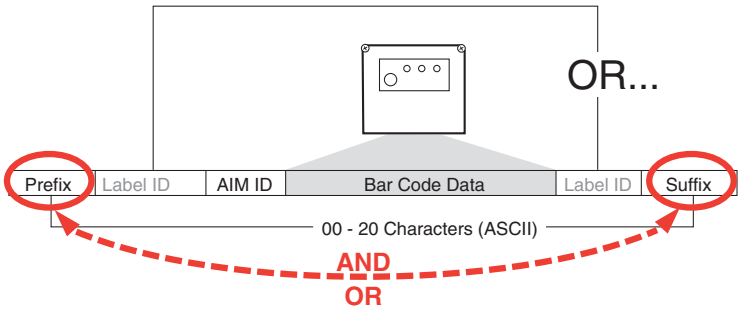
Please Keep In Mind...

- Modifying a message string is not a mandatory requirement. Data editing is a 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 only to a specified symbology (reference Code Selection, starting on page 77) or 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 ('$') as a prefix.
2. Go to page 42 and scan the ENTER/EXIT PROGRAMMING MODE barcode.
3. Scan the SET GLOBAL PREFIX barcode.
4. Reference the ASCII Chart on the inside back cover of this manual to find the hex value assigned to the desired character. The corresponding hex number for the '$' character is 24. To enter this selection code, scan the '2' and '4' barcodes from Appendix D, Keypad.

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**

Global AIM ID

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

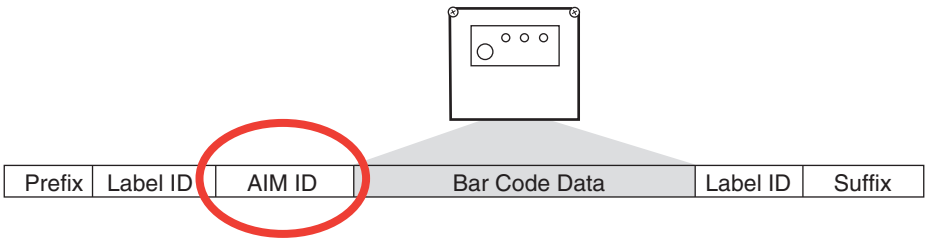
AIM label identifiers (as opposed to custom characters you select yourself as with label identifiers) can be included with scanned barcode data. AIM label identifiers consist of three characters as follows:

- 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).

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

a. UPC-A and UPC-E labels are converted to EAN 13 when adding AIM IDs.
b. ISBN (X with a 0 modifier character)

Figure 5. AIM ID



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" below) or individually per symbology (see "Label ID: Set Individually Per Symbology"on page 246). If you wish to program the reader to always include an industry standard label identifier for ALL symbology types, see "Global AIM ID"on page 43.

Label ID: Pre-loaded Sets

The reader supports two pre-loaded sets of Label IDs. Table 31 shows the USA and the EU sets.

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 custom configuration or custom defaults will be lost.

Table 31. Label ID Pre-loaded Sets

Symbology	USA Label ID set		EU Label ID set	
	ASCII character	Hexadecimal value	ASCII character	Hex i decimal value
ABC Codabar	S	530000	S	530000
Anker Plessey	o	6F0000	o	6F0000
CODABAR	%	250000	R	520000
CODE128	#	230000	T	540000
CODE32	A	410000	X	580000
CODE39	*	2A0000	V	560000
CODE39 CIP	Y	590000	Y	590000
CODE93	&	260000	U	550000
DATALOGIC 2OF5	s	730000	s	730000
EAN13	F	460000	B	420000
EAN13 P2	F	460000	L	4C0000
EAN13 P5	F	460000	M	4D0000
EAN8	FF	464600	A	410000
EAN8 P2	FF	464600	J	4A0000
EAN8 P5	FF	464600	K	4B0000

Label ID Pre-Loaded Sets (continued)

Symbology	USA Label ID set		EU Label ID set	
	ASCII character	Hexadecimal value	ASCII character	Hexadecimal value
GS1 DATABAR EXPANDED	RX	525800	t	740000
GS1 DATABAR LIMITED	RL	524C00	v	760000
GS1 DATABAR OMNIDIRECTIONAL	R4	523400	u	750000
GS1-128		000000	k	6B0000
GTIN	G	470000	$A	244100
GTIN2	G2	473200	$B	244200
GTIN5	G5	473500	$C	244300
IATA	IA	494100	&	260000
Industrial 2 of 5	W	570000	W	570000
Interleaved 2 of 5	i	690000	N	4E0000
ISBN	I	490000	@	400000
ISBT128	f	660000	f	660000
ISSN	n	6E0000	n	6E0000
MSI	@	400000	Z	5A0000
Plessey	a	610000	a	610000
S25	s	730000	P	500000
UPCA	A	410000	C	430000
UPCA P2	A	410000	F	460000
UPCA P5	A	410000	G	470000

Label ID: Set Individually Per Symbology

To configure a Label ID individually for a single symbology:

1. Go to page 45 and 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 45. 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"on page 46.
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 277 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 32.

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.

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

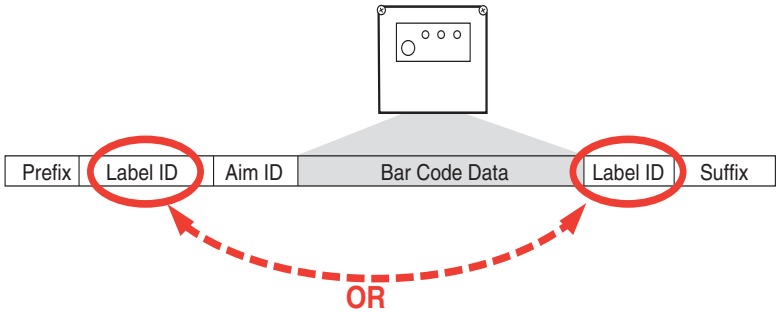


Table 32. Label ID Examples

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** Label ID Control, starting on page 45	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** Label ID Symbology Selection, starting on page 46**.**	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 Chart**(inside back cover), then scan in these digits/characters using the barcodes in the section:** Keypad, starting on page 277**. 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)			
	Result:	DB*[barcode data]	[barcode data]=C3	+[barcode data]	[barcode data]PH

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: 41423132FFFFFFFF

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. Go to page 55 and 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 D, Keypad and scan the barcodes representing the hex characters determined in the previous step.
5. Scan the ENTER/EXIT barcode to exit Programming Mode.

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

Scanner Data Formatting Control

No Read String

This feature allows the transmission of a programmable character or string when no code has been decoded (No read) during a reading phase (On Line Mode only).

To set this feature:

1. Determine the desired character string (maximum 20).
2. Reference the ASCII Chart on the inside back cover of this manual to find the hex value assigned to the desired character.
3. Go to No Read String on page 51 and scan ENTER/EXIT PROGRAMMING MODE to enter Programming Mode

4. Scan the barcode: "Select No Read String."
5. Scan the hex equivalent characters from the keypad in Appendix D that represent the desired character string in step 1 above.
6. If less than the expected string of 20 characters is selected, scan the ENTER/EXIT barcode to terminate the string.
7. Scan the ENTER/EXIT PROGRAMMING MODE barcode once again to exit Programming Mode.

This completes the procedure.

Code Verifier

Code Verifier is available in On Line or Serial On Line and Automatic modes only. A programmable character or string is transmitted after a successful reading phase depending on the result of a comparison between the decoded label and a user specified label.

Code Verifier Mode

Options for this feature are:

- Disable: disable the Code Verifier functionality
- Transmit Wrong String: the reader will transmit the wrong string to the Host.
- Transmit Wrong Code: the reader wll transmit the wrong code to the Host.

If the code read matches the code verifier Match String then it is sent to the host through the configured port. If it does not match the code verifier Match String, either the Wrong Code can be sent or the defined Wrong String message can be sent indicating the error.

Match String

The string used as the match code for code verification. The Match String must be configured to include start/stop characters and check digits, if their transmission is enabled.

It is possible to define the Match string by inserting:

- any printable characters
- non-printable ASCII characters available in the list inside the parameter edit box

No wild card characters are supported.

To set this feature:

1. Determine the desired character string (max 32).
2. Reference the ASCII Chart on the inside back cover of this manual to find the hex value assigned to the desired character.
3. Go to Match String on page 53 and scan ENTER/EXIT PROGRAMMING MODE to enter Programming Mode.
4. Scan the barcode: SELECT MATCH STRING.
5. Turn to Appendix D, Keypad and scan the barcodes representing the hex characters determined in step 1 above.
6. If less than the expected string of 32 characters are selected, scan the ENTER/EXIT barcode to terminate the string.

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

This completes the procedure.

Wrong Code String

The string sent in case of a mismatch (wrong code read).

To set this feature:

1. Determine the desired character string (max 20).
2. Reference the ASCII Chart on the inside back cover of this manual to find the hex value assigned to the desired character.
3. Go to Wrong Code String on page 54 and scan ENTER/EXIT PROGRAMMING MODE to enter Programming Mode.
4. Scan the barcode: SELECT WRONG CODE STRING.
5. Turn to Appendix D, Keypad and scan the barcodes representing the hex characters determined in step 1 above.
6. If less than the expected string of 20 characters are selected, scan the ENTER/EXIT barcode to terminate the string.
7. Scan the ENTER/EXIT PROGRAMMING MODE barcode to exit Programming Mode.

This completes the procedure.

Label Transmit Mode

Specifies whether the decoded label must be transmitted over the host interface as it has been decoded or after the reading phase has been deactivated (phase off). This does not apply to Test Mode.

Reading Parameters

Illumination Mode

This feature allows you to select the illumination mode for the reader. The illumination mode can be used to:

- increase the overall diode life
- reduce power consumption
- turn off the illuminator for safety purposes

Selections:

- Disabled: the illuminator is always off
- Enabled: the illuminator is always on
- Triggered: the illuminator is turned on when the reading phase starts. The illuminator is turned off as soon as the code(s) are read or when the reading phase ends.

The triggered selection is ignored for Automatic and Test Operating Modes.

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 100 milliseconds to 25,500 milliseconds (0.1 to 25.5 seconds) milliseconds in 100ms 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 100 (setting is in 100ms increments). Pad the result with leading zeroes to yield three digits. For example: 0 = 000, 5 = 005, 20 = 020, etc.
3. Go to page 69 and 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 D, 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.

6. 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. 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 LABEL GOOD READ LED DURATION**				
5	**Scan Three Characters From** Appendix D, Keypad	'0', '0' and '0'	'0', '0' and '2'	'0', '1' and '5'	'2', '5' and '5'
6	**Scan ENTER/EXIT PROGRAMMING MODE**				

Scanning Features

Operating Mode

The following Operating Modes (Reading Modes) are supported:

On Line

In On Line mode, the reading phase is defined as the time between the Phase ON and Phase OFF events. The Phase events can be generated by an external input (trigger) or by the Trigger button. While in this mode the scanner activates reading only during a reading phase. The Phase events can be signals coming from the trigger button (or external presence sensor connected to the scanner input for RS232 models).

On Line mode allows the following configurations:

Phase Off Event: Specifies whether the reading phase is closed on a timeout or phase off event. The following selections are available:

- Trigger Stop: the reading phase ends when the trigger event stops. Timeout is disabled.
- Timeout: the reading phase ends when the timeout is expired. Trigger stop is ignored.
- Trigger Stop - Timeout: the reading phase ends when the first event occured.

Timeout: Specifies the maximum duration for the reading phase. Selections: from 40 to 5100 ms in 20 ms increments

Serial On Line

In Serial On Line mode, a reading phase is defined as the time between two events: phase on and phase off, generated by a message sent from the host interface to the scanner. While in this mode the scanner activates reading only during a reading phase. The message (character or string) is user programmable.

Serial On Line mode configurations:

Serial Start Character (or String): Specifies the string message to be sent over the host interface to activate the reading phase

Serial Stop Character (or String): Specifies the string message to be sent over the host interface to stop the reading phase.

The Serial Start/Stop Characters must be different and must not contain reserved characters (see Appendix E, Reserved Characters**).**

Phase Off Event: Specifies whether the reading phase is closed on a timeout or phase off event.

The following selections are available:

- Trigger Stop: the reading phase ends when the serial stop character (or string) is received. Timeout is disabled.
- Timeout: the reading phase ends when the timeout is expired. Serial stop character (or string) is ignored.
- Trigger Stop - Timeout: the reading phase ends when the first event occured.

Timeout: Specifies the maximum duration for the reading phase. Selections: from 40 to 5100 ms in 20 ms increments.

Automatic

In Automatic mode, the scanner is continuously scanning. When a label enters the reading zone and is decoded, no more decodes and reading phases are allowed until the label has left the reading area. In order to guarantee identification of the code in the reading zone, a threshold specifies the number of scans after the successful decode that the scanner will wait before rearming the reading phase. The transmission of the decoded label depends on the configuration of the Transmission Mode parameter.

Automatic mode configurations:

Automatic Threshold: Specifies the number of "empty" scans allowed after decoding a label, before the scanner switches back to a new reading phase.

Automatic/Trigger Object Sense

Automatic/TOS mode is the same as Automatic mode, but with the lighting system OFF. As an object or barcode enters the reading area, the light is turned ON. The light will return OFF as the reading phase is closed (see Automatic Mode above).

While in Trigger Object Sense Mode the green spot stays on while in stand watch state.

Test Mode

Test Mode reports information about the reading performance of the reader, and the code is continuosly read. After 100 scans, the following information is transmitted to the Host:

- The code content
- Percentage of good reads. If the good read percentage is 0, no transmission occurs.

The information can be displayed on the Host PC by running a terminal emulator program such as HyperTerminal. The output data format is fixed.

Test Mode Multiple

This parameter is active only while the scanner is in Test mode:

- Disable: Test mode is possible only for a single barcode
- Enable: Test mode is possible for one or more barcodes at the same time

Camera Control

Exposure Mode

Controls the lighting system mode. Camera lighting system can be set to low power or to high power (Strobed Mode), depending on the user application. When set in Strobed Mode the scanner controls the camera parameters dynamically in order to guarantee best performances with high speed applications and extreme external light conditions.

Parameters:

- Continuous Mode: Lighting LEDs are activated with a 150mA current
- Strobed Mode: Lighting LEDs are activated with a 750mA current.
- Implementation details: Scan rate is fixed to 3,25 msec. An automatic algorithm will be implemented in order to fulfil the dynamic reading performances required.

Special Recipes

Special Recipes allow the user to select the best combination for reading parameters according to the specific application (i.e. Code Color, Code Contrast, Code Resolution).

Power Save

USB Suspend

Enables or disables USB Suspend Mode.

This feature is available only for GFS4170 model (USB interface).

Suspend Mode enables the reader to enter low-power mode if no bus activity is detected, typically when the Host PC goes into Standby mode. All LED indicators are off during Suspend Mode, and the reader power consumption is less than 2.5 mA. The reader wakes up automatically when it detects bus activity.

This feature is disabled by default.

Sleep Mode Timeout

Specifies the timeout value for the reader to enter low-power mode (Sleep).

This feature is available only for GFS4150-9 (RS232 interface) in On Line operating mode.

The reader wakes up when receiving an input signal or trigger button press.

The reader cannot connect to Aladdin when in sleep mode.

Default is 00 (Disable).

Digital Output

Output Activation:

Digital Output can set to be Activated/Deactivated when specified events occur.

Line State: Selects whether the line is Active Low or Active High.

Activation Event: Selects the event the line is activated on. Selectable events: Disabled, Good Read, No Read, Right Code, Wrong Code. Right Code and Wrong Code are available only if Code Verifier functionality is enabled.

Deactivation Event: Selects the event the line is deactivated on. Selectable events: Disabled, Timeout, Reading Phase On.

Deactivation Timeout: Related to the previous parameter, sets the deactivation timeout for the output.

Symbologies

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.

- Level 1 results in a very conservative decoder at the expense of not being able to read poorly printed or damaged labels.
- 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.
- 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.

Set Length

Length Control allows you to select either variable length decoding or fixed length decoding for the specified 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.

Set Length 1

This feature specifies one of the barcode lengths for 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 number of characters that can be set varies, depending on the symbology. Reference the page for your selected symbology to see specific variables.

1. Determine the desired character length (varies depending on symbology). Pad the number with leading zeroes to yield two digits. For example: 0 = 00, 5 = 05, 20 = 20, etc.
2. Go to the Set Length page for your selected symbology and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode to SELECT LENGTH 1 SETTING for your selected symbology.
4. Scan the appropriate two digits from the keypad in Appendix D, 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.

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

Set Length 2

This feature allows you to set one of the barcode lengths for the specified symbology. Length 2 is the maximum label length if in Variable Length Mode, or the second fixed length if in Fixed Length Mode. See the page for the specific symbology for parameters.

The length that can be set varies depending on the symbology. 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. Go to the Set Length page for your selected symbology and scan the ENTER/EXIT PROGRAMMING MODE barcode to enter Programming Mode.
3. Scan the barcode to SELECT LENGTH 2 SETTING for your selected symbology.
4. Scan the appropriate two digits from the keypad in Appendix D, 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.

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

This completes the procedure.

Appendix A
Technical Specifications

Table 34 contains Physical and Performance Characteristics, User Environment and Regulatory information.

Table 34. Technical Specifications

Item	Description
Physical Characteristics	
Color	Grey
Dimensions	Height 1.54" / 39mm Length 2.24" / 57mm Width 2.28" / 58 mm
Weight (without brackets)	USB model - Approx. 5.0 ounces/140 g RS-232 model - approx. 6.0 ounces/170 g
Electrical Characteristics	
Input Voltage	5 VDC ± 5%
External Trigger Input (Only GFS4150-9)	
Voltage Current Consumption Minimum Pulse Duration	5 ÷ 30 VDC (Only GFS4150-9) 10 mA max 5 ms
Output (Only GFS4150-9)	
Vce Collector Current Vce Saturation Power Dissipation	30 Vdc max 40 mA continuous max. 1V max at 10 mA 80 mW max at 50 °C (ambient temperature)
Current & Power Consumption	Input current at 5V = 390 mA (max) < 2.5 mA (GFS4170 model in USB suspend)
Performance Characteristics	
Scan rate	320 scans/s (max)
Light Source	Dual LEDs (Red Light, =620 nm)
Roll Angle Tolerance	± 35°
Pitch Angle Tolerance	± 65° (Avoid zero angle, ± 6°)
Skew Angle Tolerance	± 65°

Item	Description
Depth of Field (Typical)	5 mil - 2" to 6.3" (5cm to 16cm) 8 mil - 1.2" to 10.6" (3cm to 27cm) 13 mil* - 1.2" to 15.7" (3cm to 40 cm) 20 mil - up to 23.6" (up to 60 cm)
Minimum Element Width	3 mil
Print Contrast Minimum	15% minimum reflectance
Decode Capability	UPC/EAN/JAN A, E, 13, 8 (including P2 /P5, ISBN / Bookland & ISSN); Code 39 (including full ASCII); Code 39 CIP (French Pharmaceutical); Code 128; I 2 of 5; Standard 2 of 5; China Post Code (DLS 2 of 5); IATA Industrial 2 of 5 Air Cargo Code; Codabar; ABC Codabar; GS1 - 128; Code ISBT 128; MSI; Plessey; DATABAR-14; DATABAR Limited; DATABAR-14 Stacked; DATABAR Expanded Stacked; Code32 (Italian Pharmacode); China Post (DLS 2 of 5).
Interfaces Supported	GFS4150-9 model: RS-232 Standard GFS4170 model: USB COM Standard, USB Keyboard
User Environment	
Operative Temperature	32° to 122° F (0° to 50° C)
Storage Temperature	-13° to 158° F (-25° to 70° C)
Humidity	Operating: 5% to 90% relative humidity, non condensing
Drop specifications	5 drops from 30 inches (0.76 mt.) to concrete
Ambient Light immunity	Up to 100,000 Lux
Contaminants	IP54
ESD Level	16 KV
Regulatory	See the Quick Reference Guide for each specific product for details.

* (13 mils DOF based on EAN. All others are Code 39. All labels grade A, minimum illumination 100 lux, 20°C, label inclination 10°, static reading).

Standard Cable Pinouts

RS-232 Electrical Connections

9-pin connector		
1	Trigger	Trigger signal input (see Figure 36 and Figure 37 below)
2	TX	Transmit Data
3	RX	Receive Data
4	NC	Not connected
5	GND	Ground
6	VCC	+5Vdc
7	CTS	Clear To Send
8	RTS	Request To Send
9	OUT	Output signal (see Figure 35 below)

Default configuration RS-232: 9600, 8, N, 1, no handshaking, ACK/NAK disabled.

Figure 35. Output Connection

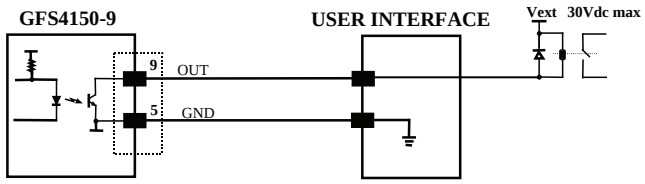


Figure 36. Using GFS4150-9 Power

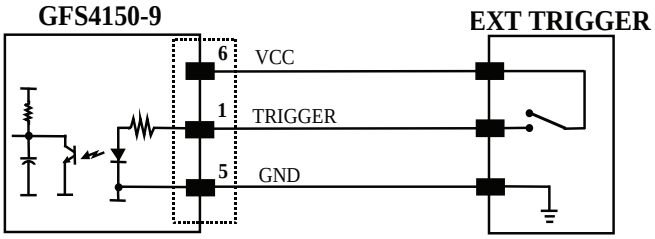
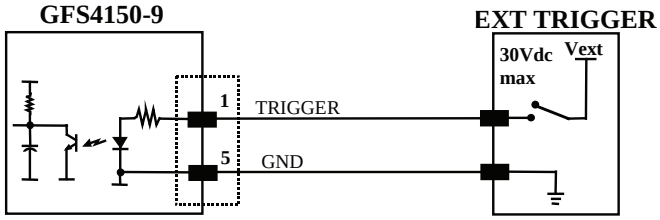


Figure 37. Using External Power Supply



LED and Beeper Indications

Button and LED Status

The top of the product has a button and three indicator LEDs:

	POWER (yellow LED)	ON = Power ON
		OFF = Power OFF or standby (only USB model)
	GOOD (green LED)	ON = Good Read
		Blinks = USB enumeration or interface inactive or waiting for change of configuration
	TRIGGER (blue LED)	ON = external trigger or button pressed or phase active
	Button	Press for manual trigger

The reader's beeper sounds and its LED illuminates to indicate various functions or errors on the reader. 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 reader'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.

Table 38. LED and Beeper Indications

INDICATION	DESCRIPTION	LED	BEEPER
Power-up Beep	The reader is in the process of powering-up.		Reader beeps four times at highest frequency and volume upon power-up.
Good Read Beep	A label has been successfully scanned by the reader.	LED behavior for this indication is configurable via the feature "Good Read: When to Indicate"	The reader will beep once at current frequency, volume, mono/bitonal setting and duration upon a successful label scan.
ROM Failure	There is an error in the reader's software/programming	Flashes	Reader sounds one error beep at highest volume.
Limited Scanning Label Read	Indicates that a host connection is not established when the USB interface is enabled.	N/A	Reader 'chirps' six times at the highest frequency and current volume.
Reader Active Mode	The reader is active and ready to scan.	The Green LED is lit steadily[a]	N/A
Reader Disabled	The reader has been disabled by the host.	The Green LED blinks continuously	N/A
Green Spot is on continuously	While in Object Sense Mode, the green spot stays on while in stand watch state.	N/A	N/A

INDICATION	DESCRIPTION	LED	BEEPER
Green Spot[a] 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

a. Except when in sleep mode or when a Good Read LED Duration other than 00 is selected

Table 39. Programming Mode Indications

Programming Mode - The following indications ONLY occur when the reader is in Programming Mode.			
Label Programming Mode Entry	A valid programming label has been scanned.	Green LED blinks continuously	Reader sounds four low frequency beeps.
Label Programming Mode Rejection of Label	A label has been rejected.	N/A	Reader 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	Reader 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 reader has exited Programming Mode.	N/A	Reader 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	Reader sounds two times at low frequency and current volume.

Error Codes

Upon startup, if the reader sounds a long tone, this means the reader has not passed its automatic Selftest and has entered FRU (Field Replaceable Unit) isolation mode. If the reader 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	Reader Module	
6	Digital PCB	
14	CPLD/Code Mismatch	

NOTES

Appendix B
Standard Defaults

The most common configuration settings are listed in the "Default" column of the table below. 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 40. Standard Defaults

Parameter	Default	Your Setting	Page Number
GLOBAL INTERFACE FEATURES			
Host Commands — Obey/Ignore	Obey		19
RS-232 ONLY			
Baud Rate	9600		22
Data Bits	8 Data Bits		23
Stop Bits	1 Stop Bit		23
Parity	None		24
Handshaking Control	Disable		25
RS-232/USB-COM			
Intercharacter Delay	No Delay		27
Beep On ASCII BEL	Disable		27
Beep On Not on File	Enable		28
ACK Character	'ACK'		29
NAK Character	'NAK'		29
ACK NAK Timeout Value	200 ms		30
ACK NAK Retry Count	3 Retries		30
ACK NAK Error Handling	Ignore Errors Detected		31

Parameter	Default	Your Setting	Page Number
Indicate Transmission Failure	Enable		31
Disable Character	'D'		32
Enable Character	'E'		32
USB KEYBOARD			
Country Mode	U.S. Keyboard		34
Send Control Characters	Disable		37
USB Keyboard Speed	1 ms		38
DATA FORMAT			
Global Prefix/Suffix	No Global Prefix Global Suffix = 0x0D (CR)		42
Global AIM ID	Disable		43
GS1-128 AIM ID	Enable		44
Label ID: Pre-loaded Sets	USA Set		44
Label ID Control	Disable		45
Label ID Symbology Selection			46
Set Global Mid Label ID Characters	No Mid Label ID Character		50
No Read String	0x18 = [CAN]		51
Code Verifier Mode	Disabled		52
Match String			53
Wrong Code String			54
Case Conversion	Disable		54
Character Conversion	No Char Conversion		55
DIGITAL OUTPUT			
Activation Event	Disable		58
Deactivation Event	Disable		59
Deactivation Timeout	005 = 500 msec		59
Activation State	Closed		60
POWER SAVE			
USB Suspend Mode	Disable		62
Sleep Mode Timeout	00		63

Parameter	Default	Your Setting	Page Number
READING PARAMETERS			
Illumination Mode	Triggered		66
Power On Alert	Enable		66
Good Read: When to Indicate	On Decode		67
Good Read Beep	Enable		67
Good Read Beep Length	100 ms		68
Good Read LED Duration	100 ms		69
Green Spot Duration	300 ms		70
LED Indication	On Decode		70
Operating Mode	On Line		71
Phase Off Event	Trigger Stop		72
Phase Off Timeout	100 = Timeout set on for 2 seconds		72
Serial Start Character	0x02 = Serial Start Character is [02 STX]		73
Serial Stop Character	0x03 = Serial Stop Character is [03 ETX]		73
Automatic Threshold	0x0A = 10		74
Test Mode Multiple	Disable		74
Exposure Mode	Continuous		75
CODE SELECTION			
Coupon Control	Enable UPCA coupon decoding		79
UPC-A			
UPC-A Enable/Disable	Enable		80
UPC-A Check Character Transmission	Enable		80
Expand UPC-A to EAN-13	Disable		81
UPC-A Number System Character Transmission	Transmit		81
UPC-A Minimum Reads	1		82
UPC-E			
UPC-E Enable/Disable	Enable		83
UPC-E Check Character Transmission	Send		83
Expand UPC-E to EAN-13	Disable		84

Parameter	Default	Your Setting	Page Number
Expand UPC-E to UPC-A	Disable		84
UPC-E Number System Character Transmission	Transmit		85
UPC-E Minimum Reads	2		85
GTIN			
GTIN Formatting	Disable		86
EAN 13 (Jan 13)			
EAN 13 Enable/Disable	Enable		87
EAN 13 Check Character Transmission	Send		87
EAN-13 Flag 1 Character	Transmit		88
EAN-13 ISBN Conversion	Disable		88
EAN 13 Minimum Reads	1		89
ISSN			
ISSN Enable/Disable	Disable		90
EAN 8			
EAN 8 Enable/Disable	Enable		91
EAN 8 Check Character Transmission	Send		91
Expand EAN 8 to EAN 13	Disable		92
EAN 8 Minimum Reads	1		92
UPC/EAN Global Settings			
UPC/EAN Decoding Level	3		93
UPC/EAN Correlation	Disable		94
UPC/EAN Price Weight Check	Disable		94
In-Store Minimum Reads	2		95
Add-Ons			
Optional Add-ons	Disable P2, P5 and P8		96
Optional Add-On Timer	70 ms		97
Optional GS1-128 Add-On Timer	Disable		100
P5 Add-Ons Minimum Reads	1		104
Code 39			
Code 39 Enable/Disable	Enable		106
Code 39 Check Character Calculation	Calculate		106

Parameter	Default	Your Setting	Page Number
Code 39 Check Character Transmission	Send		107
Code 39 Start/Stop Character Transmission	Don't Transmit		108
Code 39 Full ASCII	Disable		108
Code 39 Quiet Zones	Auto		109
Code 39 Minimum Reads	2		110
Code 39 Decoding Level	3		111
Code 39 Length Control	Variable		112
Code 39 Set Length 1	2		113
Code 39 Set Length 2	50		114
Code 39 Interdigit Ratio	4		115
Code 39 Character Correlation	Disable		117
Code 39 Stitching	Enable		117
Code 32 (Italian Pharmaceutical Code)			
Code 32 Enable/Disable	Disable		118
Code 32 Feature Setting Exceptions	N/A		118
Code 32 Check Char Transmission	Don't Send		119
Code 32 Start/Stop Character Transmission	Don't Transmit		119
Code 39 CIP (French Pharmaceutical Code)			
Code 39 CIP Enable/Disable	Disable		118
Code 128			
Code 128 Enable/Disable	Enable		121
Expand Code 128 to Code 39	Disable		121
Code 128 Check Character Transmission	Send		122
Code 128 Function Character Transmission	Disable		122
Code 128 Sub-Code Change Transmission	Disable		123
Code 128 Quiet Zones	Auto		124
Code 128 Minimum Reads	1		125
Code 128 Decoding Level	3		126
Code 128 Length Control	Variable		127
Code 128 Set Length 1	1		128
Code 128 Set Length 2	80		129

Parameter	Default	Your Setting	Page Number
Code 128 Character Correlation	Disable		130
Code 128 Stitching	Enable		130
GS1-128			
GS1-128 Enable	Transmit in Code 128 Data Format		131
ISBT 128			
ISBT 128 Concatenation	Disable		132
ISBT 128 Concatenation Mode	Static		132
ISBT 128 Dynamic Concatenation Timeout	200 msec		133
ISBT 128 Advanced Concatenation Options	Disable		133
Interleaved 2 of 5			
I 2 of 5 Enable/Disable	Disable		134
I 2 of 5 Check Character Calculation	Disable		134
I 2 of 5 Check Character Transmission	Send		135
I 2 of 5 Minimum Reads	2		156
2 of 5 Decoding Level	3		156
I 2 of 5 Length Control	Variable		138
I 2 of 5 Set Length 1	6		139
I 2 of 5 Set Length 2	50		140
I 2 of 5 Character Correlation	Disable		141
I 2 of 5 Stitching	Disable		141
Standard 2 of 5			
Standard 2 of 5 Enable/Disable	Disable		142
Standard 2 of 5 Check Character Calculation	Disable		142
Standard 2 of 5 Check Character Transmission	Send		143
Standard 2 of 5 Minimum Reads	2		143
Standard 2 of 5 Decoding Level	3		144
Standard 2 of 5 Length Control	Variable		144
Standard 2 of 5 Set Length 1	8		145
Standard 2 of 5 Set Length 2	50		146
Standard 2 of 5 Character Correlation	Disable		147
Standard 2 of 5 Stitching	Disable		147

Parameter	Default	Your Setting	Page Number
Industrial 2 of 5			
Industrial 2 of 5 Enable/Disable	Disable		148
Industrial 2 of 5 Check Character Calculation	Disable		148
Industrial 2 of 5 Check Character Transmission	Enable		149
Industrial 2 of 5 Length Control	Variable		149
Industrial 2 of 5 Set Length 1	1		150
Industrial 2 of 5 Set Length 2	50		151
Industrial 2 of 5 Minimum Reads	1		152
Industrial 2 of 5 Stitching	Disable		153
Industrial 2 of 5 Character Correlation	Disable		152
Code IATA			
IATA Enable/Disable	Disable		154
IATA Check Character Transmission	Enable		154
Datalogic 2 of 5			
Datalogic 2 of 5 Enable/Disable	Disable		155
Datalogic 2 of 5 Check Character Calculation	Disable		155
Datalogic 2 of 5 Minimum Reads	2		156
Datalogic 2 of 5 Decoding Level	3		156
Datalogic 2 of 5 Length Control	Variable		157
Datalogic 2 of 5 Set Length 1	6 characters		158
Datalogic 2 of 5 Set Length 2	50		159
Datalogic 2 of 5 Character Correlation	Disable		160
Datalogic 2 of 5 Stitching	Disable		160
Codabar			
Codabar Enable/Disable	Disable		161
Codabar Check Character Calculation	Don't Calculate		161
Codabar Check Character Transmission	Send		162
Codabar Start/Stop Character Transmission	Transmit		162
Codabar Start/Stop Character Set	abcd/abcd		163
Codabar Start/Stop Character Match	Don't Require Match		163
Codabar Quiet Zones	Auto		164

Parameter	Default	Your Setting	Page Number
Codabar Minimum Reads	2		165
Codabar Decoding Level	3		166
Codabar Length Control	Variable		166
Codabar Set Length 1	3		168
Codabar Set Length 2	50		169
Codabar Interdigit Ratio	4		170
Codabar Character Correlation	Disable		172
Codabar Stitching	Disable		172
ABC Codabar			
ABC Codabar Enable/Disable	Disable		173
ABC Codabar Concatenation Mode	Static		173
ABC Codabar Dynamic Concatenation Timeout	200 msec		174
GS1 DataBar™ Omnidirectional			
GS1 DataBar™ Omnidirectional Enable/Disable	Disable		175
GS1 DataBar™ Omnidirectional GS1-128 Emulation	Disable		175
GS1 DataBar™ Omnidirectional Minimum Reads	1		176
GS1 DataBar™ Expanded			
GS1 DataBar™ Expanded Enable/Disable	Disable		177
GS1 DataBar™ Expanded GS1-128 Emulation	Disable		177
GS1 DataBar™ Expanded Minimum Reads	1		178
GS1 DataBar™ Expanded Length Control	Variable		178
GS1 DataBar™ Expanded Set Length 1	1		179
GS1 DataBar™ Expanded Set Length 2	74		180
GS1 DataBar™ Limited			
GS1 DataBar™ Limited Enable/Disable	Disable		181
GS1 DataBar™ Limited GS1-128 Emulation	Disable		181
GS1 DataBar™ Limited Minimum Reads	1		182
Code 93			
Code 93 Enable/Disable	Disable		183
Code 93 Check Character Calculation	Enable Check C and K		183
Code 93 Check Character Transmission	Disable		184

Parameter	Default	Your Setting	Page Number
Code 93 Length Control	Variable		184
Code 93 Set Length 1	1		185
Code 93 Set Length 2	50		186
Code 93 Minimum Reads	1		187
Code 93 Decoding Level	3		188
Code 93 Quiet Zones	Auto		189
Code 93 Stitching	Enable		190
Code 93 Character Correlation	Enable		190
MSI			
MSI Enable/Disable	Disable		191
MSI Check Character Calculation	Enable Mod10		191
MSI Check Character Transmission	Enable		192
MSI Length Control	Variable		193
MSI Set Length 1	1		193
MSI Set Length 2	50		194
MSI Minimum Reads	4		195
MSI Decoding Level	3		196
MSI Stitching	Disable		197
MSI Character Correlation	Disable		197
Plessey			
Plessey Enable/Disable	Disable		198
Plessey Check Character Calculation	Enable Plessey std. check char. verification		199
Plessey Check Character Transmission	Enable		199
Plessey Length Control	Variable		200
Plessey Set Length 1	1		201
Plessey Set Length 2	50		202
Plessey Minimum Reads	4		203
Plessey Decoding Level	3		204
Plessey Stitching	Disable		205
Plessey Character Correlation	Disable		205

NOTES

Appendix C
Sample Barcodes

The sample barcodes in this appendix are typical representations for their symbology types.

UPC-A

EAN-13

Code 39

Code 128

Interleaved 2 of 5

Sample Barcodes — continued

Code 32

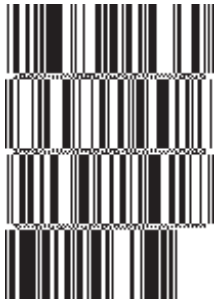
Codabar

Code 93

Code 11

GS1 DataBar™ (RSS)

GS1 DataBar™ variants must be enabled to read the barcodes below (see GS1 DataBar™ Omnidirectional on page 175**).**



10293847560192837465019283746029478450366523
(GS1 DataBar™ Expanded Stacked)

1234890hjio9900mnb
(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)

NOTES

Appendix D
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

6	
	7
8	
	9

A	
	B
C	
	D
E	
	F

NOTES

Appendix E
Reserved Characters

Reserved Characters	Hex Value	Notes
[SOH]	0x01	
[BEL]	0x07	
#	0x23	
$	0x24	
0	0x30	
3	0x33	
B	0X42	
D	0X44	
E	0X45	
F	0X46	
R	0X52	
S	0X53	
h	0x68	
i	0x69	
s	0x73	
t	0x74	
[FF]	0xFF	
Reserved Strings		
C<up to 36 chars>[CR]	0x43 <xxx> 0x0D	C can be used without [CR] or inside a string (not the first character)
01[CR]	0x30 0x31 0x0D	
34[CR]	0x33 0x34 0x0D	

NOTES

Appendix F
Scancode Tables

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 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 288).

Single Press and Release Keys

In the following tables, Ar↓ means Alt right pressed and Ar↑ means Alt right released and so on. Definitions for other keys are Al (Alt left), Cr (Control Right) Cl (Control Left) Sh (shift). This method can be used for combining Alt, Control or Shift with other keys.

Example: Consider a Control character set to 00. If AltRight+A is required before sending a label to the host, it could be done by setting three Prefix keys in this way: 0x99 0x41 0x9A.

Interface Type USB-Keyboard or USB-Keyboard for APPLE

Table 41. 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+@	SOH C(S)+A	STX C(S)+B	ETX C(S)+C	EOT C(S)+D	ENQ C(S)+E	ACK C(S)+F	BEL C(S)+G	BS	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+\	GS C+]	RS C+^	US C(S)+_
2x	SP	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
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↑	Ins	Ent (keyp)	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
9x	F12	Home	End	Pg Up	Pg Dwn	↑	↓	←	→	Ar↓	Ar↑	Al↓	Al ↑	Cl ↓	Cl ↑	Cr ↓
Ax	Cr ↑	□	‘	*ƒ*	„	…	†	‡	ˆ	‰	Š	‹	Ś	‹	Œ	□
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	□	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

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

Interface Type USB-Keyboard or USB-Keyboard for APPLE — cont.

Table 42. 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*	„	…	†	‡	ˆ	‰	Š	‹	Ś	‹	Œ	□
9x	□	‘	’	“	”	•	–	—	˜	™	š	›	œ	□	ž	Ÿ
Ax	NBSP	¡	¢	£	¤	¥	¦	§	¨	©	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	□	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 USB-Keyboard Alt Mode

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	Alt+000	Alt+001	Alt+002	Alt+003	Alt+004	Alt+005	Alt+006	Alt+007	BS	HT TAB	Alt+010	Alt+011	Alt+012	CR Enter	Alt+014	Alt+015
1x	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
2x	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
3x	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
4x	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
5x	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
6x	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
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	A+127
8x	€	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↑	Al↓	Al ↑	Cl ↓	Cl ↑	Cr ↓
Ax	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
Bx	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
Cx	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
Dx	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
Ex	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
Fx	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+052	A+0253	A+0254	A+0255

Interface type USB-Keyboard Alt Mode — cont.

Table 44. 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	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
3x	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
4x	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
5x	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
6x	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
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	A+127
8x	A+0128	A+0129	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+0149	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+0168	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+0184	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+0199	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+0216	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+0232	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+0249	A+0250	A+0251	A+052	A+0253	A+0254	A+0255

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	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80	€ 20AC		‚ 201A	ƒ 0192	„ 201E	… 2026	† 2020	‡ 2021	ˆ 02C6	‰ 2030	Š 0160	‹ 2039	Œ 0152		Ž 017D	
90		' 2018	' 2019	" 201C	" 201D	• 2022	– 2013	— 2014	˜ 02DC	™ 2122	š 0161	› 203A	œ 0153		ž 017E	Ÿ 0178
A0	NBSP 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

Index

U

X

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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820002614 (Rev. C)
November 2012