

Honeywell

N431X

Decoded Laser Scan Engine

User's Guide

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Product Agency Compliance

Note: It is the OEM manufacturer's responsibility to comply with applicable regulation(s) in regard to standards for specific equipment combinations.

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For CE-related inquiries, contact:

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CB Scheme

IEC 60950-1:2005+Am1:2009

EN 60950-1:2006+A11:2009+A1:2010+A12:2011

c  **US UL/C-UL (Recognized component)**

UL 60950-1 Second Edition

CSA C22.2 No. 60950-1-07, 2nd Edition

LED Safety Statement

LEDs have been tested and classified as "EXEMPT RISK GROUP" to the standard IEC 62471:2006.

International

Laser Safety Statement



This device has been tested in accordance with and complies with IEC 60825-1 ed2.0.

LASER LIGHT, DO NOT STARE INTO BEAM, CLASS 2 LASER PRODUCT, 1.0 mW MAX OUTPUT: 650nm.

Engine Laser Beam

Wavelength 650 nm

Max power output 1mW

The laser diode is considered an embedded laser. Intrabeam viewing of the laser shall be prevented.

Embedded Laser

Wavelength 650 nm

Max power output 10 mW

Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Patents

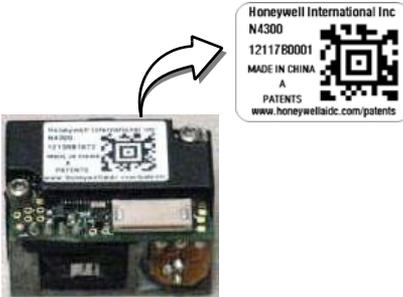
For patent information, please refer to www.honeywellaidc.com/patents.

Required Safety Labels

Shipping Container Labels



Product Label



ESD Precautions

The engine is shipped in ESD safe packaging. Use care when handling the scan engine outside its packaging. Be sure grounding wrist straps and properly grounded work areas are used.

Dust and Dirt

The engine must be sufficiently enclosed to prevent dust particles from gathering on the engine and lens. When stocking the unit, keep it in its protective packaging. Dust and other external contaminants will eventually degrade unit performance.

RoHS

The N43XX engine is in compliance with Directive 2002/95/EC, Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS), dated January, 2003.

ⓓ D-Mark Statement

Certified to EN 60950-1:2006+A11:2009+A1:2010+A12:2011 Information Technology Equipment product safety.



Table of Contents

Chapter 1 - Getting Started

| | |
|---|-----|
| Introduction | 1-1 |
| About This Manual | 1-1 |
| Unpacking Your Device | 1-1 |
| Connecting the Development Engine to the PC | 1-1 |
| Reading Techniques | 1-3 |
| Menu Bar Code Security Settings | 1-4 |
| Setting Custom Defaults | 1-4 |
| Resetting the Custom Defaults | 1-4 |
| Resetting the Factory Defaults | 1-5 |

Chapter 2 - Programming the Interface

| | |
|---|------|
| Introduction | 2-1 |
| Programming the Interface - Plug and Play | 2-1 |
| RS232 Serial Port..... | 2-1 |
| OPOS Mode | 2-1 |
| USB IBM SurePos..... | 2-2 |
| IBM Secondary Interface..... | 2-3 |
| USB PC or Macintosh Keyboard | 2-3 |
| USB HID..... | 2-4 |
| HID Fallback Mode..... | 2-4 |
| USB Serial Commands | 2-4 |
| USB Serial Emulation..... | 2-4 |
| CTS/RTS Emulation | 2-5 |
| ACK/NAK Mode..... | 2-6 |
| Communication Timeout | 2-6 |
| NAK Retries..... | 2-7 |
| Support BEL/CAN in ACK/NAK..... | 2-7 |
| Verifone® Ruby Terminal Default Settings | 2-8 |
| Gilbarco® Terminal Default Settings | 2-8 |
| Wincor Nixdorf Terminal Default Settings | 2-9 |
| Wincor Nixdorf Beetle™ Terminal Default Settings..... | 2-9 |
| Keyboard Country Layout | 2-10 |
| Keyboard Wedge Modifiers | 2-12 |

| | |
|--|------|
| ALT Mode | 2-12 |
| Keyboard Style | 2-12 |
| Keyboard Conversion | 2-13 |
| Keyboard Modifiers | 2-14 |
| RS232 Modifiers | 2-16 |
| RS232 Baud Rate | 2-16 |
| RS232 Word Length: Data Bits, Stop Bits, and Parity | 2-17 |
| RS232 Handshaking | 2-18 |
| RS232 Timeout | 2-19 |
| XON/XOFF | 2-20 |
| ACK/NAK | 2-20 |
| Communication Timeout | 2-20 |
| NAK Retries | 2-21 |
| Support BEL/CAN in ACK/NAK | 2-22 |
| RS232 Defaults | 2-22 |

Chapter 3 - Input/Output Settings

| | |
|---|-----|
| Power Up Beeper | 3-1 |
| Beep on BEL Character | 3-1 |
| Good Read and Error Indicators | 3-2 |
| Beeper – Good Read | 3-2 |
| Beeper Pitch – Good Read | 3-2 |
| Beeper - Transmit Order | 3-3 |
| Beeper Pitch – Error | 3-3 |
| Beeper Duration – Good Read | 3-3 |
| Number of Beeps – Good Read | 3-4 |
| Number of Beeps – Error | 3-4 |
| LED Indicators | 3-4 |
| LED Settings | 3-5 |
| Activation Settings | 3-5 |
| Activation Defaults | 3-5 |
| Presentation Modes | 3-6 |
| Manual Activation Mode | 3-6 |
| End Manual Activation After Good Read | 3-6 |

| | |
|--|------|
| Manual Activation Laser Timeout - | |
| External Trigger Settings | 3-7 |
| CodeGate® | 3-8 |
| Object Detection Mode | 3-8 |
| End Object Detection After Good Read | 3-8 |
| Object Detection Laser Timeout | 3-9 |
| Object Detection Distance | 3-9 |
| Character Activation Mode | 3-10 |
| Activation Character | 3-10 |
| End Character Activation After Good Read | 3-10 |
| Character Activation Laser Timeout | 3-11 |
| Character Deactivation Mode | 3-11 |
| Deactivation Character | 3-11 |
| Reread Delay | 3-12 |
| User-Specified Reread Delay | 3-12 |
| Centering | 3-13 |
| Blinky Mode | 3-13 |
| Laser Scan Angle | 3-14 |
| Decode Security | 3-14 |
| Continuous Scan Mode | 3-14 |
| Power Save Mode Timeout | 3-15 |
| Power Save Mode | 3-15 |
| Aimer Control | 3-15 |
| User-Specified Aimer Delays | 3-16 |
| Output Sequence Overview | 3-17 |
| Require Output Sequence | 3-17 |
| Output Sequence Editor | 3-17 |
| To Add an Output Sequence | 3-17 |
| Other Programming Selections | 3-18 |
| Output Sequence Editor | 3-20 |
| Sequence Timeout | 3-20 |
| Sequence Match Beeper | 3-20 |
| Partial Sequence | 3-20 |
| Require Output Sequence | 3-21 |
| No Read | 3-22 |

Chapter 4 - Data Editing

| | |
|--|-----|
| Prefix/Suffix Overview..... | 4-1 |
| To Add a Prefix or Suffix:..... | 4-1 |
| To Clear One or All Prefixes or Suffixes | 4-2 |
| To Add a Carriage Return Suffix to All Symbologies..... | 4-3 |
| Prefix Selections | 4-3 |
| Suffix Selections | 4-4 |
| Transmit Alternate Extended ASCII Characters | 4-4 |
| Function Code Transmit | 4-6 |
| Communication Check Character..... | 4-6 |
| Intercharacter, Interfunction, and Intermessage Delays..... | 4-7 |
| Intercharacter Delay | 4-7 |
| User Specified Intercharacter Delay | 4-7 |
| Interfunction Delay | 4-8 |
| Intermessage Delay | 4-9 |

Chapter 5 - Data Formatting

| | |
|--|------|
| Data Format Editor Introduction..... | 5-1 |
| Add a Data Format | 5-1 |
| Other Programming Selections..... | 5-3 |
| Terminal ID Table | 5-4 |
| Data Format Editor Commands..... | 5-4 |
| Move Commands..... | 5-8 |
| Search Commands | 5-10 |
| Miscellaneous Commands..... | 5-12 |
| Data Formatter..... | 5-15 |
| Data Format Non-Match Error Tone | 5-16 |
| Primary/Alternate Data Formats | 5-17 |
| Single Scan Data Format Change | 5-17 |

Chapter 6 - Symbologies

| | |
|----------------------------------|-----|
| All Symbologies | 6-1 |
| Message Length Description | 6-2 |

| | |
|---|------|
| Codabar | 6-3 |
| Codabar Concatenation | 6-4 |
| Code 39..... | 6-6 |
| Code 32 Pharmaceutical (PARAF)..... | 6-8 |
| Full ASCII | 6-9 |
| Interleaved 2 of 5 | 6-10 |
| NEC 2 of 5..... | 6-12 |
| Code 93..... | 6-14 |
| Straight 2 of 5 Industrial (three-bar start/stop) | 6-15 |
| Straight 2 of 5 IATA (two-bar start/stop)..... | 6-17 |
| Matrix 2 of 5 | 6-18 |
| Code 11..... | 6-20 |
| Code 128..... | 6-23 |
| ISBT 128 | 6-24 |
| GS1-128..... | 6-30 |
| Telepen | 6-32 |
| UPC-A | 6-34 |
| UPC-A/EAN-13 with Extended Coupon Code..... | 6-37 |
| UPC-A/Code 128 Coupon Code Output..... | 6-37 |
| UPC-A Number System 4 Addenda Required | 6-38 |
| UPC-A Number System 5 Addenda Required | 6-38 |
| UPC-E0 | 6-40 |
| EAN/JAN-13..... | 6-44 |
| EAN-13 Beginning with 2 Addenda Required | 6-45 |
| EAN-13 Beginning with 290 Addenda Required . | 6-46 |
| EAN-13 Beginning with 378/379 Addenda Required | 6-46 |
| EAN-13 Beginning with 414/419 Addenda Required | 6-47 |
| EAN-13 Beginning with 434/439 Addenda Required | 6-48 |
| EAN-13 Beginning with 977 Addenda Required . | 6-49 |
| EAN-13 Beginning with 978 Addenda Required . | 6-49 |
| EAN-13 Beginning with 979 Addenda Required . | 6-50 |
| ISBN Translate | 6-52 |
| ISSN Translate | 6-53 |
| EAN/JAN-8..... | 6-54 |

| | |
|------------------------------------|------|
| MSI | 6-57 |
| Plessey Code..... | 6-59 |
| GS1 DataBar Omnidirectional | 6-61 |
| GS1 DataBar Limited..... | 6-62 |
| GS1 DataBar Expanded | 6-63 |
| Trioptic Code | 6-64 |
| GS1 Emulation..... | 6-65 |
| Postal Codes | 6-65 |
| China Post (Hong Kong 2 of 5)..... | 6-66 |

Chapter 7 - Interface Keys

| | |
|---------------------------------------|-----|
| Keyboard Function Relationships | 7-1 |
| Supported Interface Keys | 7-2 |

Chapter 8 - Utilities

| | |
|---|-----|
| To Add a Test Code I.D. Prefix to All Symbologies | 8-1 |
| Show Software Revision..... | 8-1 |
| Show Data Format..... | 8-1 |
| Test Menu..... | 8-2 |
| EZConfig-Scanning Introduction..... | 8-2 |
| Installing EZConfig-Scanning from the Web | 8-3 |

Chapter 9 - Serial Programming Commands

| | |
|---|-----|
| Conventions..... | 9-1 |
| Menu Command Syntax | 9-1 |
| Query Commands..... | 9-1 |
| Responses..... | 9-2 |
| Serial Trigger Commands..... | 9-3 |
| Read Time-Out | 9-4 |
| Resetting the Standard Product Defaults | 9-4 |
| Menu Commands | 9-5 |

Chapter 10 - Maintenance

| | |
|-------------------|------|
| Repairs | 10-1 |
| Maintenance | 10-1 |

| | |
|---------------------------------------|------|
| Inspecting Cords and Connectors | 10-1 |
| Troubleshooting | 10-1 |

Chapter 11 - Customer Support

| | |
|----------------------------|------|
| Technical Assistance | 11-1 |
|----------------------------|------|

Appendix A - Reference Charts

| | |
|-----------------------------------|-----|
| Symbology Charts | A-1 |
| Linear Symbologies | A-1 |
| Postal Symbologies | A-3 |
| ASCII Conversion Chart | A-3 |
| Lower ASCII Reference Table | A-5 |
| Unicode Key Maps | A-9 |



Getting Started

Introduction

The N431X engine is designed for integration into a wide range of OEM devices. The engine's compact mechanical design can drop into many existing applications, allowing OEMs and third-party manufacturers to integrate the benefits of laser-based scanning into a variety of devices, including hand held computers (PDTs, medical instrumentation, kiosks, diagnostic equipment, and robotics).

About This Manual

This User's Guide provides demonstration, installation, and programming instructions for the N431X engine. Product specifications, dimensions, warranty, and customer support information are also included.

Honeywell's bar code engines are factory programmed for the most common terminal and communications settings. If you need to change these settings, programming is accomplished by scanning the bar codes in this guide.

An asterisk (*) next to an option indicates the default setting.

Unpacking Your Device

After you open the shipping carton containing the OEM engine(s), take the following steps:

- Check for damage during shipment. Report damage immediately to the carrier who delivered the carton.
- Make sure the items in the carton match your order.
- Save the shipping container for later storage or shipping.

Connecting the Development Engine to the PC

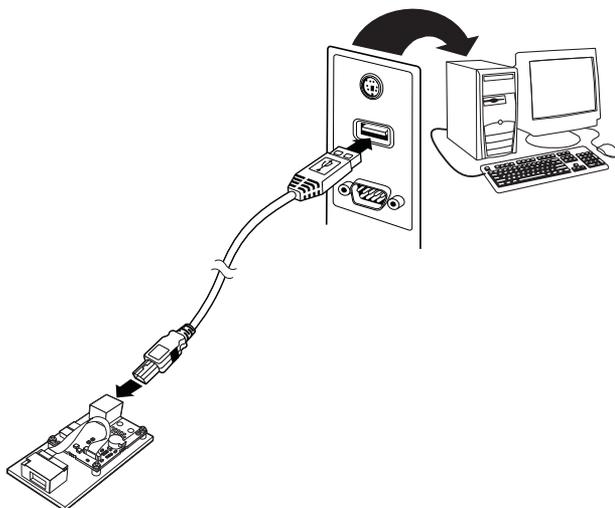
The development OEM engine can connect to a PC for evaluation.

Note: The development board and the kit components are not intended for integration and should ONLY be used for evaluation of the engine.

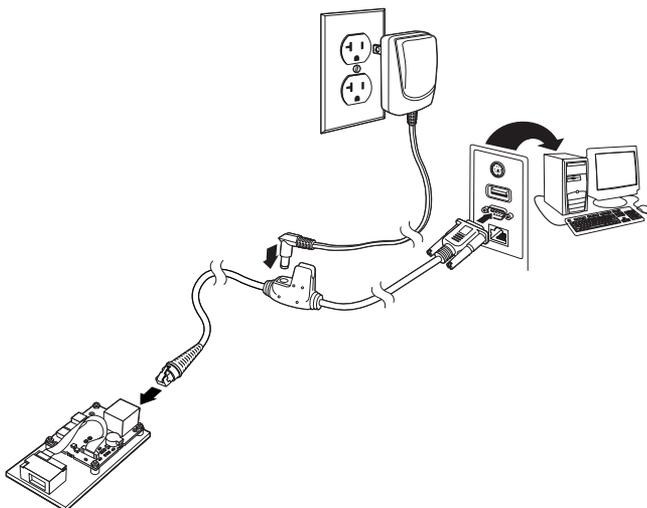
1. Turn off power to the terminal/computer.
2. If using a USB connection, connect the included interface cable to the engine and to the matching USB port on the back of the computer. Skip to step 5.

Note: For additional USB programming and technical information, refer to Honeywell's "USB Application Note," available at www.honeywellaidc.com.

Note: For USB connection only: Connecting power to both the micro-B connector and the 10 pin RJ45 connector simultaneously could damage the PC and/or the engine.



3. If using an RS-232 connection, connect the serial interface cable to the engine and to the matching port on the back of the computer.



4. Connect the power supply connector to the serial interface cable. Plug in the power supply.
5. Turn the terminal/computer power back on. The engine beeps.
6. If connecting the Development engine using an RS-232 interface, all communication parameters between the engine and the terminal must

match for correct data transfer through the serial port using RS-232 protocol. Scan the RS-232 interface bar code below. This programs the Development engine for an RS-232 interface at 115,200 baud, parity-none, 8 data bits, 1 stop bit, and adds a suffix of a CR LF.



PAP232.

RS-232 Interface

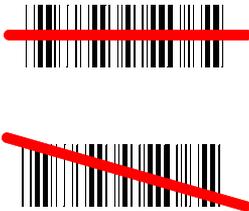
7. Verify the engine operation by scanning a bar code from the [Sample Symbols](#) in the back of this manual. The engine beeps once when a bar code is successfully decoded.

To connect a N4313/N4315 engine to your host system, please refer to the Integration Manual.

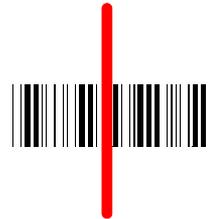
Reading Techniques

The engine projects a bright red scan beam that corresponds to the engine's scanning field of view. The scan beam should be centered horizontally over the bar code and must highlight all the vertical bars of the bar code. It will not read if the scan beam is in any other direction.

Good Read



No Read



The scan beam is smaller when the engine is closer to the code and larger when it is farther from the code. Symbologies with smaller bars or elements (mil size) should be read closer to the unit. Symbologies with larger bars or elements (mil size) should be read farther from the unit. To read a symbol (on a page or on an object), hold the engine at an appropriate distance from the target and center the scan beam on the symbol. If the code being scanned is highly reflective (e.g., laminated), it may be necessary to tilt the code up 15° to 18° to prevent unwanted reflection.

Note: At 254mm a double beam of up to 3mm is to be expected. A double beam will not affect scanning performance and is not a product defect.

Menu Bar Code Security Settings

Honeywell engines are programmed by scanning menu bar codes or by sending serial commands to the engine. If you want to restrict the ability to scan menu codes, you can use the Menu Bar Code Security settings. Please contact the nearest technical support office (see [Limited Warranty](#) on page 11-1) for further information.

Setting Custom Defaults

You have the ability to create a set of menu commands as your own, custom defaults. To do so, scan the **Set Custom Defaults** bar code below before each menu command or sequence you want saved. If your command requires scanning numeric codes from the back cover, then a **Save** code, that entire sequence will be saved to your custom defaults. Scan the **Set Custom Defaults** code again before the next command you want saved to your custom defaults.

When you have entered all the commands you want to save for your custom defaults, scan the **Save Custom Defaults** bar code.



MNUCDF.

Set Custom Defaults



DEFAULT.

Save Custom Defaults

You may have a series of custom settings and want to correct a single setting. To do so, just scan the new setting to overwrite the old one. For example, if you had previously saved the setting for Beeper Volume at Low to your custom defaults, and decide you want the beeper volume set to High, just scan the **Set Custom Defaults** bar code, then scan the Beeper Volume High menu code, and then **Save Custom Defaults**. The rest of the custom defaults will remain, but the beeper volume setting will be updated.

Resetting the Custom Defaults

If you want the custom default settings restored to your engine, scan the **Activate Custom Defaults** bar code below. This resets the engine to the custom default settings. If there are no custom defaults, it will reset the engine to the factory default settings. Any settings that have not been specified through the custom defaults will be defaulted to the factory default settings.



DEFAULT.

Activate Custom Defaults

Resetting the Factory Defaults



This selection erases all your settings and resets the engine to the original factory defaults. It also disables all plugins.

If you aren't sure what programming options are in your engine, or you've changed some options and want to restore the engine to factory default settings, first scan the **Remove Custom Defaults** bar code, then scan **Activate Defaults**. This resets the engine to the factory default settings.



DEFOVR.

Remove Custom Defaults



DEFAULT.

Activate Defaults

The [Serial Programming Commands](#), beginning on page 9-1 list the factory default settings for each of the commands (indicated by an asterisk (*) on the programming pages).



Programming the Interface

Introduction

This chapter describes how to program your system for the desired interface.

Programming the Interface - Plug and Play

Plug and Play bar codes provide instant set up for commonly used interfaces.

Note: After you scan one of the codes, power cycle the host terminal to have the interface in effect.

RS232 Serial Port

The **RS232 Interface** bar code is used when connecting to the serial port of a PC or terminal. The following **RS232 Interface** bar code also programs a carriage return (CR) and a line feed (LF) suffix, baud rate, and data format as indicated below.

| Option | Setting |
|-------------|--|
| Baud Rate | 115,200 bps |
| Data Format | 8 data bits, no parity bit, 1 stop bit |



PAP232.

RS232 Interface

OPOS Mode

The following bar code configures your engine for OPOS (OLE for Retail Point of Sale) by modifying the following OPOS-related settings:

| Option | Setting |
|----------------------------------|-----------------------------|
| Interface | RS232 |
| Baud Rate | 38400 |
| RS232 Handshaking | Flow Control, No Timeout |
| | XON/XOFF Off |
| | ACK/NAK Off |
| Data Bits, Stop Bits, and Parity | 8 Data, 1 Stop, Parity None |

| Option | Setting |
|----------------------|---|
| Prefix/Suffix | Clear All Prefixes and Suffixes |
| | Add Code ID and AIM ID Prefix |
| | Add CR Suffix |
| Intercharacter Delay | Off |
| Symbolologies | Enable UPC-A with check digit and number system |
| | Enable UPC-E0 with check digit |
| | Enable EAN/JAN-8 with check digit |
| | Enable EAN/JAN-13 with check digit |
| | Enable Code 128 |
| | Enable Code 39 |
| | Enable OPOS with automatic disable off |



PAPOPS.
OPOS Mode

USB IBM SurePos

Scan one of the following “Plug and Play” codes to program the engine for an IBM SurePos (USB handheld scanner) or IBM SurePos (USB tabletop scanner) interface.

Note: After scanning one of these codes, you must power cycle the cash register.



PAPSPPH.
USB IBM SurePos
(USB Handheld Scanner)
Interface



PAPSPT.
USB IBM SurePos
(USB Tabletop Scanner)
Interface

Each bar code above also programs the following suffixes for each symbology:

| Symbology | Suffix | Symbology | Suffix |
|-----------|--------|--------------------|----------|
| EAN 8 | 0C | Code 39 | 00 0A 0B |
| EAN 13 | 16 | Interleaved 2 of 5 | 00 0D 0B |
| UPC A | 0D | Code 128 | 00 18 0B |
| UPC E | 0A | Code 39 | 00 0A 0B |

IBM Secondary Interface

On some older IBM cash registers, it may be necessary to disable the secondary or management interface. In particular, it has been found necessary on IBM registers using the 4690 V2R4 operating system. The following bar codes are used for this purpose. *Default = Enable Secondary Interface.*



REMIFC1.

***Enable Secondary Interface**



REMIFC0.

Disable Secondary Interface

USB PC or Macintosh Keyboard

Scan one of the following codes to program the engine for USB PC Keyboard or USB Macintosh Keyboard. Scanning these codes also adds a CR and LF.



PAP124.

USB Keyboard (PC)



PAP125.

USB Keyboard (Mac)



PAP134.

USB Japanese Keyboard (PC)

USB HID

Scan the following code to program the engine for USB HID bar code scanners.



PAP131.

USB HID Bar Code Scanner

HID Fallback Mode

If you attempt to set a USB interface for your engine, but the setup fails on the host system, you can program the engine to fall back to a HID keyboard interface after a set length of time. For example, if the engine is configured for Serial Emulation Mode, but the host system does not have the correct driver, the engine would fail. If you set the **HID Fallback Mode** for a set length of time, for example, 5 minutes, the engine would change to a HID keyboard interface after 5 minutes of trying to configure as serial emulation.

A unique beep sequence indicates that this mode has been entered. While in HID Fallback Mode, the engine will not scan normal bar codes and sounds a unique beep sequence that indicates the engine is in Fallback Mode. Menu codes can still be scanned while in HID Fallback Mode, allowing you to change the engine's programming.

Scan the bar code below, then set the length for the HID Fallback (from 0-60 minutes) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 5 minutes.*



USBFTO.

HID Fallback Mode

USB Serial Commands

USB Serial Emulation

Scan one of the following codes to program the engine to emulate a regular RS232-based COM Port. If you are using a Microsoft® Windows® PC, you will need to download a driver from the Honeywell website (www.honeywellaidc.com). The driver will use the next available COM Port number. Apple® Macintosh computers recognize the engine as a USB CDC class device and automatically uses a class driver.

Scanning either of these codes also adds a CR and LF.



PAP130.

**USB Serial Emulation for
Windows XP, Windows Server
2003, and later**



REMIFC0;PAP130.

USB Serial Emulation for Windows 2000

Note: No extra configuration (e.g., baud rate) is necessary.

CTS/RTS Emulation



USBCTS1.

CTS/RTS Emulation On



USBCTS0.

*** CTS/RTS Emulation Off**

ACK/NAK Mode



USBACK1.
ACK/NAK Mode On



USBACK0.
* ACK/NAK Mode Off

Communication Timeout

This allows you to set the length (in milliseconds) for a timeout for the host ACK/NAK response. Scan the bar code below, then set the timeout (from 0-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 2000 ms.*



232DLK.
Communication Timeout

Timeout Retries

This setting limits the number of Communication Timeout retries. If the Timeout Retries is set to 0, the transmission is terminated after the initial Communication Timeout. Scan the bar code below, then set the number of retries (from 0-255) by scanning digits from the [Programming Chart](#), then scanning **Save**. (5 is the recommended setting.) *Default = 0.*



HSTRTY.
Timeout Retries

Communication Timeout Beeper

This selection programs the engine to issue an error beep when a communication timeout has occurred. The error beep sound is programmed using [Number of Beeps – Error](#) (page 3-4). *Default = On.*



HSTTOA0.

Off



HSTTOA1.

* On

NAK Retries

This selection limits the number of NAK retries that can occur in ACK/NAK mode. Scan the bar code below, then set the number of retries (from 0-255) by scanning digits from the [Programming Chart](#), then scanning [Save](#). (5 is the recommended setting.) *Default = 0, or disabled.*



HSTRTN.

NAK Retries

Support BEL/CAN in ACK/NAK

This protocol responds to <BEL> and <CAN> commands when in ACK/NAK mode. The engine sounds an error tone when a <BEL> command is sent from the host. <CAN> terminates the transmission. *Default = BEL/CAN Off.*



BELCAN1.

BEL/CAN On



BELCAN0.

* BEL/CAN Off

Verifone® Ruby Terminal Default Settings

Scan the following Plug and Play code to program the engine for a Verifone Ruby terminal. This bar code sets the baud rate to 1200 bps and the data format to 8 data bits, Mark parity, 1 stop bit and RTS/CTS no timeout. It also adds a line feed (LF) suffix and programs the following prefixes for each symbology:

| Symbology | Prefix |
|-----------|--------|
| UPC-A | A |
| UPC-E | A |
| EAN-8 | FF |
| EAN-13 | F |



PAPRBY.

Verifone Ruby Settings

Note: If you are having unexpected results with this programming code, scan the [Activate Defaults](#) bar code on page 1-5 first, then scan the programming code above.

Gilbarco® Terminal Default Settings

Scan the following Plug and Play code to program the engine for a Gilbarco terminal. This bar code sets the baud rate to 2400 bps and the data format to 7 data bits, even parity, 2 stop bits. It also adds a carriage return (CR) suffix and programs the following prefixes for each symbology:

| Symbology | Prefix |
|-----------|--------|
| UPC-A | A |
| UPC-E | E0 |
| EAN-8 | FF |
| EAN-13 | F |



PAPGLB.

Gilbarco Settings

Note: If you are having unexpected results with this programming code, scan the [Activate Defaults](#) bar code on page 1-5 first, then scan the programming code above.

Wincor Nixdorf Terminal Default Settings

Scan the following Plug and Play code to program the engine for a Wincor Nixdorf terminal. This bar code sets the baud rate to 9600 bps and the data format to 8 data bits, no parity, 1 stop bit.



PAPWNX.

Wincor Nixdorf Terminal Settings

Note: If you are having unexpected results with this programming code, scan the [Activate Defaults](#) bar code on page 1-5 first, then scan the programming code above.

Wincor Nixdorf Beetle™ Terminal Default Settings

Scan the following Plug and Play code to program the engine for a Wincor Nixdorf Beetle terminal. The following prefixes are programmed for each symbology:

| Symbology | Prefix | Symbology | Prefix |
|-----------|--------|----------------------|--------|
| Code 128 | K | EAN-13 | A |
| Code 93 | L | GS1-128 | P |
| Codabar | N | Interleaved 2 of 5 | I |
| UPC-A | A0 | Plessey | O |
| UPC-E | C | Straight 2 of 5 IATA | H |
| EAN-8 | B | All other bar codes | M |



PAPBTL.

Wincor Nixdorf Beetle Settings

Note: If you are having unexpected results with this programming code, scan the [Activate Defaults](#) bar code on page 1-5 first, then scan the programming code above.

Keyboard Country Layout

Scan the appropriate country code below to program the keyboard layout for your country or language. As a general rule, the following characters are supported, but need special care for countries other than the United States:

@ | \$ # { } [] = / ' \ < > ~



KBDCTY0.
* United States



KBDCTY91.
Arabic



KBDCTY1.
Belgium



KBDCTY92.
Chinese



KBDCTY2.
Finland



KBDCTY3.
France



KBDCTY4.
Germany



KBDCTY19.
Hungary



KBDCTY90.
IBM Financial



KBDCTY5.
Italy



KBDCTY28.
Japan ASCII



KBDCTY93.
Korea

Keyboard Country (continued)



KBDCTY26.

Russia



KBDCTY10.

Spain



KBDCTY94.

Thailand



KBDCTY7.

United Kingdom



KBDCTY31.

Slovenia



KBDCTY6.

Switzerland (German)



KBDCTY24.

Turkey Q



KBDCTY95.

Vietnam

Refer to the Honeywell website (www.honeywell.com/aidc) for complete keyboard country support information and applicable interfaces. If you need to program a keyboard for a country other than one listed above, scan the **Program Keyboard Country** bar code below, then scan the numeric bar code(s) for the appropriate country from the inside back cover, then the **Save** bar code.



KBDCTY.

Program Keyboard Country

Keyboard Wedge Modifiers

ALT Mode

If your bar code contains special characters from the extended ASCII chart for example, an e with an accent grave (è), you will use ALT Mode. (See [Extended ASCII Characters](#) on page A-6.)

Note: Scan the ALT mode bar code after scanning the appropriate Keyboard Country code.

If your keystrokes require using the ALT key and 3 characters, scan the **3 Characters** bar code. If your keystrokes require the ALT key and 4 characters, scan the **4 Characters** bar code. The data is then output with the special character(s). *Default = Off.*



KBDALT0.

* Off



KBDALT6.

3 Characters



KBDALT7.

4 Characters

Keyboard Style

This programs keyboard styles, such as Caps Lock and Shift Lock. If you have used [Keyboard Conversion](#) settings, they will override any of the following Keyboard Style settings. *Default = Regular.*

Regular is used when you normally have the Caps Lock key off.



KBDSTY0.

* Regular

Caps Lock is used when you normally have the Caps Lock key on.



KBDSTY1.

Caps Lock

Shift Lock is used when you normally have the Shift Lock key on (not common to U.S. keyboards).



KBDSTY2.

Shift Lock

Autocaps via NumLock bar code should be scanned in countries (e.g., Germany, France) where the Caps Lock key cannot be used to toggle Caps Lock. The NumLock option works similarly to the regular Autocaps, but uses the NumLock key to retrieve the current state of the Caps Lock.



KBDSTY7.

Autocaps via NumLock

Emulate External Keyboard should be scanned if you do not have an external keyboard (IBM AT or equivalent).



KBDSTY5.

Emulate External Keyboard

Note: After scanning the Emulate External Keyboard bar code, you must power cycle your computer.

Keyboard Conversion

Alphabetic keyboard characters can be forced to be all upper case or all lowercase. So if you have the following bar code: "abc569GK," you can make the output "ABC569GK" by scanning **Convert All Characters to Upper Case**, or to "abc569gk" by scanning **Convert All Characters to Lower Case**. These settings override [Keyboard Style](#) selections.

Default = Keyboard Conversion Off.



KBDCNV0.

*** Keyboard Conversion Off**



KBDCNV1.

Convert All Characters to Upper Case



KBDCNV2.

Convert All Characters to Lower Case

Keyboard Modifiers

This modifies special keyboard features, such as CTRL+ ASCII codes and Turbo Mode.

Control + ASCII Mode On: The engine sends key combinations for ASCII control characters for values 00-1F (refer to the ASCII chart for [ASCII Conversion Chart](#), page A-3). Windows is the preferred mode. All keyboard country codes are supported. DOS mode is a legacy mode, and it does not support all keyboard country codes. New users should use the Windows mode.

Windows Mode Prefix/Suffix Off: The engine sends key combinations for ASCII control characters for values 00-1F (refer to the ASCII chart for [ASCII Conversion Chart](#), page A-3), but it does not transmit any prefix or suffix information.

Default = Control + ASCII Mode Off.



KBDCAS2.

**Windows Mode Control + ASCII
Mode On**



KBDCAS1.

**DOS Mode Control + ASCII Mode
On**



KBDCAS0.

*** Control + ASCII Mode Off**



KBDCAS3.

Windows Mode Prefix/Suffix Off

Numeric Keypad Mode: Sends numeric characters as if entered from a numeric keypad. *Default = Off.*



KBDNPS1.

Numeric Keypad Mode On



KBDNPS0.

*** Numeric Keypad Mode Off**

RS232 Modifiers

RS232 Baud Rate

Baud Rate sends the data from the engine to the terminal at the specified rate. The host terminal must be set for the same baud rate as the engine.
Default = 9600.



232BAD0.

300



232BAD2.

1200



232BAD4.

4800



232BAD6.

19200



232BAD8.

57,600



232BAD1.

600



232BAD3.

2400



232BAD5.

* 9600



232BAD7.

38400



232BAD9.

115,200

RS232 Word Length: Data Bits, Stop Bits, and Parity

Data Bits sets the word length at 7 or 8 bits of data per character. If an application requires only ASCII Hex characters 0 through 7F decimal (text, digits, and punctuation), select 7 data bits. For applications that require use of the full ASCII set, select 8 data bits per character. *Default = 8.*

Stop Bits sets the stop bits at 1 or 2. *Default = 1.*

Parity provides a means of checking character bit patterns for validity. *Default = None.*



232WRD3.

7 Data, 1 Stop, Parity Even



232WRD6.

7 Data, 1 Stop, Parity Odd



232WRD1.

7 Data, 2 Stop Parity None



232WRD5.

8 Data, 1 Stop, Parity Even



232WRD8.

8 Data, 1 Stop, Parity Odd



232WRD0.

7 Data, 1 Stop, Parity None



232WRD4.

7 Data, 2 Stop, Parity Even



232WRD7.

7 Data, 2 Stop, Parity Odd



232WRD2.

*** 8 Data, 1 Stop, Parity None**



232WRD9.

7 Data, 1 Stop, Parity Space



232WRD10.

7 Data, 2 Stop, Parity Space



232WRD12.

7 Data, 1 Stop, Parity Mark



232WRD14.

8 Data, 1 Stop Parity Mark



232WRD11.

8 Data, 1 Stop, Parity Space



232WRD13.

7 Data, 2 Stop, Parity Mark

RS232 Handshaking

RS232 Handshaking allows control of data transmission from the engine using software commands from the host device.

RTS/CTS Off: RTS/CTS is turned off so no data flow control is used, but RTS is still active.

RTS/CTS Off, RTS Inactive: RTS/CTS is turned off so no data flow control is used and RTS is inactive.

Flow Control, No Timeout: The engine asserts RTS when it has data to send, and will wait indefinitely for CTS to be asserted by the host.

Character-Based Flow Control, No Timeout: The engine asserts RTS when it has a character to send, and will wait indefinitely for CTS to be asserted by the host

Two-Direction Flow Control: The engine asserts RTS when it is OK for the host to transmit. The host asserts CTS when it is OK for the device to transmit.

Flow Control with Timeout: The engine asserts RTS when it has data to send and waits for a delay (see [RS232 Timeout](#) on page 2-19) for CTS to be asserted by the host. If the delay time expires and CTS is not asserted, the device transmit buffer is cleared and scanning may resume.

Character-Based Flow Control with Timeout: The engine asserts RTS when it has a character to send and waits for a delay (see [RS232 Timeout](#) on page 2-19) for CTS to be asserted by the host. If the delay time expires and CTS is not asserted, the device transmit buffer is cleared and scanning may resume. *Default = RTS/CTS Off, RTS Active.*



232CTS0.

* RTS/CTS Off, RTS Active



232CTS1.

Flow Control, No Timeout



232CTS2.

Two-Direction Flow Control



232CTS9.

Character-Based Flow Control
with Timeout



232CTS10.

RTS/CTS Off, RTS Inactive



232CTS7.

Character-Based Flow Control,
No Timeout



232CTS3.

Flow Control with Timeout

RS232 Timeout

When using Flow Control with Timeout, you must program the length of the delay you want to wait for CTS from the host. Set the length (in milliseconds) for a timeout by scanning the bar code below, then setting the timeout (from 1-5100 milliseconds) by scanning digits from the [Programming Chart](#), then scanning [Save](#). *Default = 1000 ms (1 second).*



232DEL.

RS232 Timeout

XON/XOFF

Standard ASCII control characters can be used to tell the engine to start sending data (**XON/XOFF On**) or to stop sending data (**XON/XOFF Off**). When the host sends the XOFF character (DC3, hex 13) to the engine, data transmission stops. To resume transmission, the host sends the XON character (DC1, hex 11). Data transmission continues where it left off when XOFF was sent. *Default = XON/XOFF Off.*



232XON1.
XON/XOFF On



232XOND.
*** XON/XOFF Off**

ACK/NAK

After transmitting data, the engine waits for an ACK character (hex 06) or a NAK character (hex 15) response from the host. If ACK is received, the communications cycle is completed and the engine looks for more bar codes. If NAK is received, the last set of bar code data is retransmitted and the engine waits for ACK/NAK again. Turn on the ACK/NAK protocol by scanning the **ACK/NAK On** bar code below. To turn off the protocol, scan **ACK/NAK Off**. *Default = ACK/NAK Off.*



232ACK1.
ACK/NAK On



232ACK0.
*** ACK/NAK Off**

Communication Timeout

This allows you to set the length (in milliseconds) for a timeout for the host ACK/NAK response. Scan the bar code below, then set the timeout (from 1-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 2000 ms.*



232DLK.
Communication Timeout

Timeout Retries

This setting limits the number of Communication Timeout retries. If the Timeout Retries is set to 0, the transmission is terminated after the initial Communication Timeout. Scan the bar code below, then set the number of retries (from 0-255) by scanning digits from the [Programming Chart](#), then scanning **Save**. (5 is the recommended setting.) *Default = 0.*



HSTRTY.

Timeout Retries

Communication Timeout Beeper

This selection programs the engine to issue an error beep when a communication timeout has occurred. The error beep sound is programmed using [Number of Beeps – Error](#) (page 3-4). *Default = On.*



HSTTOAD.

Off



HSTTOA1.

*** On**

NAK Retries

This selection limits the number of NAK retries that can occur in ACK/NAK mode. Scan the bar code below, then set the number of retries (from 0-255) by scanning digits from the [Programming Chart](#), then scanning **Save**. (5 is the recommended setting.) *Default = 0, or disabled.*



HSTRTN.

NAK Retries

Support BEL/CAN in ACK/NAK

This protocol responds to <BEL> and <CAN> commands when in ACK/NAK mode. The engine sounds an error tone when a <BEL> command is sent from the host. <CAN> terminates the transmission. *Default = BEL/CAN Off.*



BELCAN1.
BEL/CAN On



BELCAN0.
* BEL/CAN Off

RS232 Defaults

If you want the custom RS232 default settings restored to your engine, scan the **RS232 Defaults** bar code below. This resets the engine to the custom default settings (see [Setting Custom Defaults](#) on page 1-4). If there are no custom defaults, it will reset the engine to the factory default settings. Any settings that have not been specified through the custom defaults will be restored to the factory default settings.



232DFT.
RS232 Defaults

Input/Output Settings

Power Up Beeper

The engine can be programmed to beep when it's powered up. If you are using a cordless system, the base can also be programmed to beep when it is powered up. Scan the **Off** bar code(s) if you don't want a power up beep. *Default = Power Up Beeper On - Engine.*



BEPPWRO.

**Power Up Beeper Off -
Engine**



BEPPWR1.

*** Power Up Beeper On -
Engine**

Beep on BEL Character

You may wish to force the engine to beep upon a command sent from the host. If you scan the following **Beep on BEL On** bar code, the engine will beep every time a BEL character is received from the host. *Default = Beep on BEL Off.*



BELBEP0.

***Beep on BEL Off**



BELBEP1.

Beep on BEL On

Good Read and Error Indicators

Beeper – Good Read

The beeper may be programmed **On** or **Off** in response to a good read. Turning this option off, only turns off the beeper response to a good read indication. All error and menu beeps are still audible. *Default = Beeper - Good Read On.*



BEPBEP0.

Beeper - Good Read Off



BEPBEP1.

*** Beeper - Good Read On**

Beeper Pitch – Good Read

The beeper pitch codes modify the pitch (frequency) of the beep the engine emits on a good read. *Default = Medium.*



BEPFQ11600.

Low (1600 Hz)



BEPFQ12350.

*** Medium (2350 Hz)**



BEPFQ14200.

High (4200 Hz)

Beeper - Transmit Order

The beeper transmit order determines when the good read beep occurs. The engine can be set to emit the good read beep either before or after data transmission. *Default = Before Transmission.*



BEPWHN1.

* **Before Transmission**



BEPWHN2.

After Transmission

Beeper Pitch – Error

The beeper pitch codes modify the pitch (frequency) of the sound the engine emits when there is a bad read or error. *Default = Razz.*



BEPFQ2100.

* **Razz (100 Hz)**



BEPFQ2200.

Medium (2000 Hz)



BEPFQ24200.

High (4200 Hz)

Beeper Duration – Good Read

The beeper duration codes modify the length of the beep the engine emits on a good read. *Default = Normal.*



BEPBIP0.

* **Normal Beep**



BEPBIP1.

Short Beep

Number of Beeps – Good Read

The number of beeps of a good read can be programmed from 1 - 9. The same number of beeps will be applied to the beeper and LED in response to a good read. For example, if you program this option to have five beeps, there will be five beeps and five LED flashes in response to a good read. The beeps and LED flashes are in sync with one another.

Note: The LEDs can also be programmed separately. See [LED Settings](#) on page 3-5.

To change the number of beeps, scan the following bar code and then scan a digit (1-9) bar code and the **Save** bar code on the [Programming Chart](#) inside the back cover of this manual. *Default = 1.*



Number of Good Read Beeps/LED Flashes

Number of Beeps – Error

The number of beeps and LED flashes emitted by the engine for a bad read or error can be programmed from 1 - 9. For example, if you program this option to have five error beeps, there will be five error beeps and five LED flashes in response to an error.

Note: The LEDs can also be programmed separately. See [LED Settings](#) on page 3-5.

To change the number of error beeps, scan the following bar code and then scan a digit (1-9) bar code and the **Save** bar code on the [Programming Chart](#) inside the back cover of this manual. *Default = 1.*



Number of Error Beeps/LED Flashes

LED Indicators

The external LED can be programmed to be On or Off. Use the following bar codes to program the external LED indicators. *Default = LED On with Good Scan.*

Note: The external LED refers to the signal Good Read LED and is not a physical LED on the engine.

LED Settings



LEDFN10.
LED Off



LEDFN12.
LED On with Laser



LEDFN1128.
LED On with CTS



LEDFN11.
* LED On with Good Scan



LEDFN14.
LED On when CodeGate
Disabled

Activation Settings

Caution: When working with Activation settings, enable the settings you want before disabling those you do not want to use. If you disable settings first, you may program the engine so it is unable to read bar codes. If this happens, power cycle the engine and scan the defaults bar code on [page 1-4](#).

Activation Defaults

If you want the Activation default settings restored to your engine, scan the **Activation Defaults** bar code below. The engine will reset to the custom default settings (see [Setting Custom Defaults](#) on page 1-4). If there are no custom defaults, it will reset the engine to the factory default settings. Any settings that have not been specified through the custom defaults will be defaulted to the factory default settings.



AOSDFT.
Activation Defaults

Presentation Modes

By default you must press the external trigger to read a bar code. Use the following commands to adjust how the engine behaves.

Presentation Mode: The engine automatically detects bar codes, then scans and transmits the data. The laser turns off afterward.

Presentation Mode with CodeGate®: The engine automatically detects bar codes and decodes them. However, the data is not transmitted until you press the external trigger. The laser remains on briefly after the transmission.



PAPPM1.

Presentation Mode



PAPPM2.

**Presentation Mode with
CodeGate**

Manual Activation Mode

In Manual Activation Mode, you must press the external trigger to scan a bar code. The engine scans until a bar code is read, or until the external trigger is released. *Default = Manual Activation On.*



AOSMEND.

Manual Activation Mode Off



AOSMEN1.

*** Manual Activation Mode On**

End Manual Activation After Good Read

After a bar code is successfully read, the laser can be programmed either to remain on and scanning, or to turn off. When **End Manual Activation After Good Read** is enabled, the laser turns off and stops scanning after a good read. If you scan **Do Not End Manual Activation After Good Read**,

the laser remains on after a good read, but the external trigger must be pressed to scan the next bar code. *Default = End Manual Activation After Good Read.*



AOSMGDD.

**Do Not End Manual Activation
After Good**



AOSMGD1.

*** End Manual Activation After
Good Read**

Manual Activation Laser Timeout - External Trigger Settings

You can set a timeout for the length of time the laser remains on and attempting to decode bar codes when the external trigger is held down, and after it is released. Set the length (in milliseconds) for a timeout by scanning one of the following bar codes, then setting the timeout (from 1-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = External Trigger Hold 5000 ms, External Trigger Release 0.*



AOSMPT.

**Laser Timeout - External
Trigger Hold**



AOSMRT.

**Laser Timeout - External
Trigger Release**

CodeGate®

When CodeGate is **On**, the external trigger is used to allow decoded data to be transmitted to the host system. The engine remains on, scanning and decoding bar codes, but the bar code data is not transmitted until the external trigger is pressed. When CodeGate is **Off**, bar code data is transmitted when it is decoded. *Default = CodeGate On.*



AOSCGD0.
CodeGate Off



AOSCGD1.
* CodeGate On

Object Detection Mode

Object Detection Mode uses an LED to detect when an object is in the engine's field of view. When an object is detected, the laser turns on and the engine attempts to scan the bar code. *Default = Object Detection Mode Off.*



AOSOEND.
* Object Detection Mode Off



AOSOEN1.
Object Detection Mode On

End Object Detection After Good Read

After a bar code is successfully detected and read from the engine, the laser can be programmed either to remain on and scanning, or to turn off. When **End Object Detection After Good Read** is enabled, the laser turns

off and stops scanning after a good read. If you scan **Do Not End Object Detection After Good Read**, the laser remains on after a good read.
Default = End Object Detection After Good Read.



AOSOGD0.

**Do Not End Object Detection
After Good Read**



AOSOGD1.

*** End Object Detection After
Good Read**

Object Detection Laser Timeout

You can set a timeout for the length of time the laser remains on and attempting to decode bar codes after an object is detected. Set the length (in milliseconds) for a timeout by scanning the following bar code, then setting the timeout (from 1-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 5000 ms.*

Note: After an object detection timeout has occurred and there is no good read, the laser and flipper will turn off. The laser and flipper can be turned on by moving an object in and out of the object detection range. If the engine is configured for button activation, pushing the button can also turn the laser and flipper back on.



AOSODT.

**Object Detection Laser
Timeout**

Object Detection Distance

When the engine is in the stand and you are using Object Detection Mode, you can set the distance range for detecting objects. **Short** sets the engine to detect objects approximately 5 inches (12.7cm) away from the nose. **Long** sets it to detect objects approximately 10 inches (25.4cm) away.
Default = Long.



AOSRNG2.

Short



AOSRNG1.

*** Long**

Character Activation Mode

You may use a character sent from the host to trigger the engine to begin scanning. When the activation character is received, the engine continues scanning until either the [Character Activation Laser Timeout](#) (page 3-11), the deactivation character is received (see [Deactivation Character](#) on page 3-11), or a bar code is transmitted. Scan the following **On** bar code to use character activation, then use Activation Character (following) to select the character you will send from the host to start scanning. *Default = Off.*



HSTCEND.

* Off



HSTCEN1.

On

Activation Character

This sets the character used to trigger scanning when using Character Activation Mode. On the [ASCII Conversion Chart](#), page A-3, find the hex value that represents the character you want to use to trigger scanning. Scan the following bar code, then use the [Programming Chart](#) to read the alphanumeric combination that represents that ASCII character. Scan [Save](#) to finish.



HSTACH.

Activation Character

End Character Activation After Good Read

After a bar code is successfully detected and read from the engine, the laser can be programmed either to remain on and scanning, or to turn off. When **End Character Activation After Good Read** is enabled, the laser

turns off and stops scanning after a good read. If you scan **Do Not End Character Activation After Good Read**, the laser remains on after a good read. *Default = End Character Activation After Good Read.*



HSTCGD0.

**Do Not End Character Activation
After Good Read**



HSTCGD1.

*** End Character Activation After
Good Read**

Character Activation Laser Timeout

You can set a timeout for the length of time the laser remains on and attempting to decode bar codes when using Character Activation Mode. Set the length (in milliseconds) for a timeout by scanning the following bar code, then setting the timeout (from 1-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 5000 ms.*



HSTCDT.

**Character Activation Laser
Timeout**

Character Deactivation Mode

If you have sent a character from the host to trigger the engine to begin scanning, you can also send a deactivation character to stop scanning. Scan the following **On** bar code to use character deactivation, then use Deactivation Character (following) to select the character you will send from the host to terminate scanning. *Default = Off.*



HSTDEN0.

*** Off**



HSTDEN1.

On

Deactivation Character

This sets the character used to terminate scanning when using Character Deactivation Mode. On the [ASCII Conversion Chart](#), page A-3, find the hex value that represents the character you want to use to terminate scanning.

Scan the following bar code, then use the [Programming Chart](#) to read the alphanumeric combination that represents that ASCII character. Scan **Save** to finish.



Reread Delay

This sets the time period before the engine can read the *same* bar code a second time. Setting a reread delay protects against accidental rereads of the same bar code. Longer delays are effective in minimizing accidental rereads. Use shorter delays in applications where repetitive bar code scanning is required. *Default = Medium.*



User-Specified Reread Delay

If you want to set your own length for the reread delay, scan the following bar code, then set the delay (from 0-30,000 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**.



Centering

Use Centering to narrow the engine's field of view to make sure the engine reads only those bar codes intended by the user. For instance, if multiple codes are placed closely together, centering will insure that only the desired codes are read.

Scan **Centering On**, then scan one of the following bar codes to change the left or right of the centering window. To set the the percent you want to shift the centering window scan the digits from the [Programming Chart](#), then scanning **Save**. *Default = 40% Left and 60% Right.*

Note: Centering is dependent on the orientation of the engine. If the engine is inverted, right becomes left and left becomes right.



DECWIN1.
Centering On



DECWIND.
*** Centering Off**



DECLFT.
Left of Centering Window



DECRGT.
Right of Centering Window

Blinky Mode

Blinky Mode can be activated by Object Detection or the External Trigger. When the **Blinky Mode On** or **Blinky Always On/Continuous** bar codes are scanned, the scan engine blinks on and off at 50% duty cycle (250 milliseconds on, then 250 milliseconds off.) *Default = Blinky Mode Off.*



BLKMOD0.
*** Blinky Mode Off**



BLKMOD1.
Blinky Mode On



BLKMOD2.
Blinky Always On/Continuous

Laser Scan Angle

The laser scan angle can be set to Reduced Laser Beam Sweep (35°) or Full Laser Beam Sweep (48°). Laser Scan Angle is not available for wide angle models. *Default = Full Laser Beam Sweep (48°).*



LASANG0.

* Full Laser Beam Sweep (48°)



LASANG1.

Reduced Laser Beam Sweep
(35°)

Decode Security

This selection allows you to adjust the decode security needed while scanning. For good quality codes, choose **Low** to achieve fast scan speed. For codes prone to misreads, choose **High**. *Default = Low.*

Note: Increasing the security level may decrease the scan speed.



PAPLS1.

* Low



PAPLS2.

Low/Medium



PAPLS3.

Medium/High



PAPLS4.

High

Continuous Scan Mode

This programs the engine to continuously scan and decode, with the laser and motor staying on.



PAPP3.

Continuous Scan Mode

Power Save Mode Timeout

This allows you to set the length (in seconds) for power save timeout. To set the length scan the **Power Save Timeout** bar code below, then set the timeout (from 0-65535 seconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. The scan engine goes into a power save mode (Sleep or Hibernate) at timeout after a successful scan or the duration of inactivity. *Default = 600 seconds.*



PWRLPT.

Power Save Timeout



PWRLPT600.

*** 600 Seconds**

Power Save Mode

The scan engine has three Power Save Modes: Off, Sleep Mode, and Hibernate. In **Off** mode, all components are powered on and the scan engine is in operating mode. In **Sleep Mode**, the laser, motor, and micro are powered off. In **Hibernate**, all components are powered off. The scan engine enters Power Save Mode after the timeout occurs. See [Power Save Mode Timeout](#) on page 3-15 for further information. *Default = Off.*



PWRMOD0.

*** Off**



PWRMOD1.

Sleep Mode



PWRMOD2.

Hibernate

Aimer Control

To control engine's aimer before and after scanning or to control the aimer with an external aiming pin, scan one of the bar codes below. *Default = Aimer Always Off.*

When **Aimer on 100 milliseconds** is selected, the aimer is on for 100 milliseconds before the scan engine starts normal scanning operation.

Note: Aimer is not available in Class 1 Laser models.



SCNAIT0;SCNDLY0.

*** Aimer Always Off**



SCNAIT65535;SCNDLY0.

Aimer Always On



SCNAIT65535;SCNDLY65535.

Aimer Controlled by External Aiming Pin



SCNAIT0;SCNDLY100.

Aimer on 100 milliseconds

User-Specified Aimer Delays

If you want to set your own length for the duration of the delay *before* activation, scan the **Before Activation** bar code below, then set the time-out by scanning digits (0-65535 seconds) from the [Programming Chart](#), then scanning **Save**. Default = 0 seconds.



SCNDLY.

Before Activation

If you want to set your own length for the duration of the delay *after* activation, scan the **After Activation** bar code below, then set the time-out by scanning digits (0-65535 seconds) from the [Programming Chart](#), then scanning **Save**. Default = 0 seconds.



SCNAIT.

After Activation

Output Sequence Overview

Require Output Sequence

When turned off, the bar code data will be output to the host as the engine decodes it. When turned on, all output data must conform to an edited sequence or the engine will not transmit the output data to the host device. See [Require Output Sequence](#) on page 3-21 for further information.

Output Sequence Editor

This programming selection allows you to program the engine to output data (when scanning more than one symbol) in whatever order your application requires, regardless of the order in which the bar codes are scanned. Reading the **Default Sequence** symbol programs the engine to the following Universal values. These are the defaults. Be **certain** you want to delete or clear all formats before you read the **Default Sequence** symbol.

Note: If CodeGate is enabled, you must hold the external trigger down while reading each bar code in a sequence.

Note: To make Output Sequence Editor selections, you'll need to know the code I.D., code length, and character match(es) your application requires. Use the Alphanumeric symbols on the [Programming Chart](#) to read these options.

To Add an Output Sequence

1. Scan the **Enter Sequence** symbol (see [Require Output Sequence](#), page 3-21).
2. **Code I.D.**
On the [Symbology Charts](#) on page A-1, find the symbology to which you want to apply the output sequence format. Locate the Hex value for that symbology and scan the 2 digit hex value from the [Programming Chart](#) (inside back cover).
3. **Length**
Specify what length (up to 9999 characters) of data output will be acceptable for this symbology. Scan the four digit data length from the [Programming Chart](#). (Note: 50 characters is entered as 0050. 9999 is

a universal number, indicating all lengths.) When calculating the length, you must count any programmed prefixes, suffixes, or formatted characters as part of the length (unless using 9999).

4. **Character Match Sequences**

On the [ASCII Conversion Chart](#), page A-3, find the Hex value that represents the character(s) you want to match. Use the [Programming Chart](#) to read the alphanumeric combination that represents the ASCII characters. (99 is the Universal number, indicating all characters.)

5. **End Output Sequence Editor**

Scan **FF** to enter an Output Sequence for an additional symbology, or **Save** to save your entries.

Other Programming Selections

- **Discard**

This exits without saving any Output Sequence changes.

Output Sequence Example

In this example, you are scanning Code 93, Code 128, and Code 39 bar codes, but you want the engine to output Code 39 1st, Code 128 2nd, and Code 93 3rd, as shown below.

Note: Code 93 must be enabled to use this example.



A - Code 39



B - Code 128



C - Code 93

You would set up the sequence editor with the following command line:

```
SEQBLK62999941FF6A999942FF69999943FF
```

The breakdown of the command line follows:

SEQBLKsequence editor start command

62 code identifier for **Code 39**

9999 code length that must match for Code 39, 9999 = all lengths

41 start character match for Code 39, 41h = "A"

FF termination string for first code

-
- 6A code identifier for **Code 128**
 - 9999 code length that must match for Code 128, 9999 = all lengths
 - 42 start character match for Code 128, 42h = "B"
 - FF termination string for second code
 - 69 code identifier for **Code 93**
 - 9999 code length that must match for Code 93, 9999 = all lengths
 - 43 start character match for Code 93, 43h = "C"
 - FF termination string for third code

To program the previous example using specific lengths, you would have to count any programmed prefixes, suffixes, or formatted characters as part of the length. If you use the example on [page 3-18](#), but assume a <CR> suffix and specific code lengths, you would use the following command line:

SEQBLK62001241FF6A001342FF69001243FF

The breakdown of the command line follows:

SEQBLKsequence editor start command

- 62 code identifier for **Code 39**
- 0012 A - Code 39 sample length (11) plus CR suffix (1) = 12
- 41 start character match for Code 39, 41h = "A"
- FF termination string for first code
- 6A code identifier for **Code 128**
- 0013 B - Code 128 sample length (12) plus CR suffix (1) = 13
- 42 start character match for Code 128, 42h = "B"
- FF termination string for second code
- 69 code identifier for **Code 93**
- 0012 C - Code 93 sample length (11) plus CR suffix (1) = 12
- 43 start character match for Code 93, 43h = "C"
- FF termination string for third code

Output Sequence Editor



SEQBLK.

Enter Sequence



SEQDFT.

Default Sequence

Sequence Timeout

You may wish to set the maximum time between bar code scans in an output sequence. If that maximum time is not met, the output sequence operation is terminated. Set the length (in milliseconds) for a timeout by scanning the following bar code, then setting the timeout (from 1-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 5000 msec.*



SEQDLY.

Sequence Timeout

Sequence Match Beeper

By default, the engine beeps when a sequence match is found. If you want the engine to remain silent, scan the following **Sequence Match Beeper Off** bar code. *Default = Sequence Match Beeper On.*



SEQBEP0.

Sequence Match Beeper Off



SEQBEP1.

* Sequence Match Beeper On

Partial Sequence

If an output sequence operation is terminated before all your output sequence criteria are met, the bar code data acquired to that point is a "partial sequence."

Scan **Discard Partial Sequence** to discard partial sequences when the output sequence operation is terminated before completion.

Scan **Transmit Partial Sequence** to transmit partial sequences. (Any fields in the sequence where no data match occurred will be skipped in the output.) If you have programmed a **Sequence Timeout** (page 3-20) and the timeout is reached, the partial sequence is transmitted. *Default = Discard Partial Sequence.*



SEQTTS1.

Transmit Partial Sequence



SEQTTS0.

*** Discard Partial Sequence**

Require Output Sequence

When an output sequence is **Required**, all output data must conform to an edited sequence or the engine will not transmit the output data to the host device. When it's **On/Not Required**, the engine will attempt to get the output data to conform to an edited sequence but, if it cannot, the engine transmits all output data to the host device as is.

When the output sequence is **Off**, the bar code data is output to the host as the engine decodes it. *Default = Off.*



SEQ_EN2.

Required



SEQ_EN1.

On/Not Required



SEQ_EN0.

***Off**

No Read

With No Read turned **On**, the engine notifies you if a code cannot be read. If using an EZConfig-Scanning Tool Scan Data Window (see page 8-2), an “NR” appears when a code cannot be read. If No Read is turned **Off**, the “NR” will not appear. *Default = Off.*



SHWNRD1.

On



SHWNRD0.

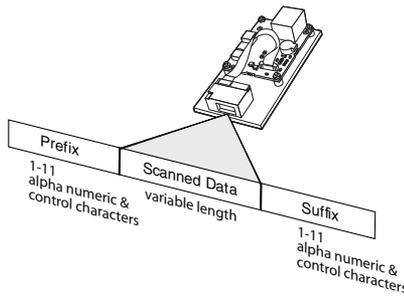
*** Off**

If you want a different notation than “NR,” for example, “Error,” or “Bad Code,” you can edit the output message (see [Data Formatting](#) beginning on page 5-1). The hex code for the No Read symbol is 9C.

Prefix/Suffix Overview

When a bar code is scanned, additional information is sent to the host computer along with the bar code data. This group of bar code data and additional, user-defined data is called a “message string.” The selections in this section are used to build the user-defined data into the message string.

Prefix and Suffix characters are 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. The following illustration shows the breakdown of a message string:



Points to Keep In Mind

- It is not necessary to build a message string. The selections in this chapter are only used if you wish to alter the default settings. *Default prefix = None. Default suffix is dependent on interface.*
- A prefix or suffix may be added or cleared from one symbology or all symbologies.
- You can add any prefix or suffix from the [ASCII Conversion Chart](#), beginning on page A-3, plus Code I.D. and AIM I.D.
- You can string together several entries for several symbologies at one time.
- Enter prefixes and suffixes in the order in which you want them to appear on the output.
- When setting up for specific symbologies (as opposed to all symbologies), the specific symbology ID value counts as an added prefix or suffix character.
- The maximum size of a prefix or suffix configuration is 32 characters, which includes header information.

To Add a Prefix or Suffix:

- Step 1.** Scan the **Add Prefix** or **Add Suffix** symbol ([page 4-3](#)).
- Step 2.** Determine the 2 digit Hex value from the Symbology Chart (included in the [Symbology Charts](#), beginning on page A-1) for the

symbology to which you want to apply the prefix or suffix. For example, for Code 128, Code ID is “j” and Hex ID is “6A”.

- Step 3.** Scan the 2 hex digits from the [Programming Chart](#) inside the back cover of this manual or scan **9, 9** for all symbologies.
- Step 4.** Determine the hex value from the [ASCII Conversion Chart](#) on page A-3, for the prefix or suffix you wish to enter.
- Step 5.** Scan the 2 digit hex value from the [Programming Chart](#) inside the back cover of this manual.
- Step 6.** Repeat Steps 4 and 5 for every prefix or suffix character.
- Step 7.** To add the Code I.D., scan **5, C, 8, 0**.
To add AIM I.D., scan **5, C, 8, 1**.
To add a backslash (\), scan **5, C, 5, C**.

Note: To add a backslash (\) as in Step 7, you must scan 5C twice – once to create the leading backslash and then to create the backslash itself.

- Step 8.** Scan **Save** to exit and save, or scan **Discard** to exit without saving. Repeat Steps 1-6 to add a prefix or suffix for another symbology.

Example: Add a Suffix to a specific symbology

To send a CR (carriage return) Suffix for U.P.C. only:

- Step 1.** Scan **Add Suffix**.
- Step 2.** Determine the 2 digit hex value from the Symbology Chart (included in the [Symbology Charts](#), beginning on page A-1) for U.P.C.
- Step 3.** Scan **6, 3** from the [Programming Chart](#) inside the back cover of this manual.
- Step 4.** Determine the hex value from the [ASCII Conversion Chart](#) on page A-3, for the CR (carriage return).
- Step 5.** Scan **0, D** from the [Programming Chart](#) inside the back cover of this manual.
- Step 6.** Scan **Save**, or scan **Discard** to exit without saving.

To Clear One or All Prefixes or Suffixes

You can clear a single prefix or suffix, or clear all prefixes/suffixes for a symbology. If you have been entering prefixes and suffixes for single symbologies, you can use **Clear One Prefix (Suffix)** to delete a specific character from a symbology. When you **Clear All Prefixes (Suffixes)**, all the prefixes or suffixes for a symbology are deleted.

-
- Step 1.** Scan the **Clear One Prefix** or **Clear One Suffix** symbol.
 - Step 2.** Determine the 2 digit Hex value from the Symbology Chart (included in the [Symbology Charts](#), beginning on page A-1) for the symbology from which you want to clear the prefix or suffix.
 - Step 3.** Scan the 2 digit hex value from the [Programming Chart](#) inside the back cover of this manual or scan **9, 9** for all symbologies.

Your change is automatically saved.

To Add a Carriage Return Suffix to All Symbologies

Scan the following bar code if you wish to add a carriage return suffix to all symbologies at once. This action first clears all current suffixes, then programs a carriage return suffix for all symbologies.



VSUFCR.
Add CR Suffix
All Symbologies

Prefix Selections



PREBK2.
Add Prefix



PRECL2.
Clear One Prefix



PRECA2.
Clear All Prefixes

Suffix Selections



SUFBK2.
Add Suffix



SUFCL2.
Clear One Suffix



SUFCA2.
Clear All Suffixes

Transmit Alternate Extended ASCII Characters

You may need to emulate special keyboard functions, such as up or down arrows, Alt/Make or Alt/Break commands, that are not supported in the Extended ASCII Character table. Refer to [Alternate Extended ASCII Characters](#) (page 4-5) for a range of keyboard function keys and corresponding decimal and hex characters. If you scan the **Transmit Alternate Extended ASCII** code, any hex entries in a prefix or suffix will result in the corresponding Keyboard Function output.

Example: **Transmit Alternate Extended ASCII** is enabled, and you scan **Add Suffix**, then scan **9 9 8 9**. All symbologies (99) would have a suffix of a Page Down (hex 89) added to them.

When **Transmit Normal Extended ASCII** is selected, the normal extended ASCII character is transmitted (see [ASCII Conversion Chart](#) on page A-3).

Example: **Transmit Normal Extended ASCII** is enabled, and you scan **Add Suffix**, then scan **9 9 8 9**. All symbologies (99) would have a suffix of a % character added to them.

Default = Transmit Alternate Extended ASCII.



KBDEXT0.

* **Transmit Alternate Extended ASCII**



KBDEXT1.

Transmit Normal Extended ASCII

| Alternate Extended ASCII Characters | | | | | |
|-------------------------------------|-----|----------------------|-----|-----|--------------------------------|
| DEC | HEX | Keyboard Function | DEC | HEX | Keyboard Function |
| 128 | 80 | up arrow ↑ | 152 | 98 | F9 |
| 129 | 81 | down arrow ↓ | 153 | 99 | F10 |
| 130 | 82 | right arrow → | 154 | 9A | F11 |
| 131 | 83 | left arrow ← | 155 | 9B | F12 |
| 132 | 84 | Insert | 156 | 9C | Numeric Keypad + |
| 133 | 85 | Delete | 157 | 9D | Numeric Keypad - |
| 134 | 86 | Home | 158 | 9E | Numeric Keypad * |
| 135 | 87 | End | 159 | 9F | Caps Lock |
| 136 | 88 | Page Up | 160 | A0 | Num Lock |
| 137 | 89 | Page Down | 161 | A1 | Left Alt |
| 138 | 8A | Right ALT | 162 | A2 | Left Ctrl |
| 139 | 8B | Right CTRL | 163 | A3 | Left Shift |
| 140 | 8C | Reserved | 164 | A4 | Right Shift |
| 141 | 8D | Reserved | 165 | A5 | Print Screen |
| 142 | 8E | Numeric Keypad Enter | 166 | A6 | Tab |
| 143 | 8F | Numeric Keypad / | 167 | A7 | Shift Tab |
| 144 | 90 | F1 | 168 | A8 | Enter |
| 145 | 91 | F2 | 169 | A9 | Esc |
| 146 | 92 | F3 | 170 | AA | Alt Make |
| 147 | 93 | F4 | 171 | AB | Alt Break |
| 148 | 94 | F5 | 172 | AC | Control Make |
| 149 | 95 | F6 | 173 | AD | Control Break |
| 150 | 96 | F7 | 174 | AE | Alt Sequence with 1 Character |
| 151 | 97 | F8 | 175 | AF | Ctrl Sequence with 1 Character |

Function Code Transmit

When this selection is enabled and function codes are contained within the scanned data, the engine transmits the function code to the terminal. Charts of these function codes are provided in [Supported Interface Keys](#) starting on [page 7-2](#). When the engine is in keyboard wedge mode, the scan code is converted to a key code before it is transmitted. *Default = Enable.*



RMVFNC0.

* Enable



RMVFNC1.

Disable

Communication Check Character

To enhance security, you can specify the transmission type of a check character; either LRC where the calculation starts on the first transmitted character, LRC where the calculation starts on the second transmitted character, or CRC.

Note: This option adds a check character to the bar code data for all symbologies. If you need to enable or disable check characters for individual symbologies, see [Symbologies](#) beginning on page 6-1.

Scan the following bar code to set the communication check character type.

Default = None.



HSTXRC0.

* None



HSTXRC1.

LRC Starts on 1st Character



HSTXRC2.

LRC Starts on 2nd Character



HSTXRC3.

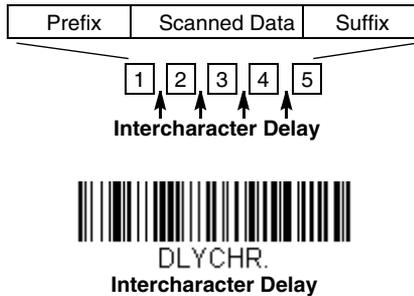
CRC

Intercharacter, Interfunction, and Intermassage Delays

Some terminals drop information (characters) if data comes through too quickly. Intercharacter, interfunction, and intermessage delays slow the transmission of data, increasing data integrity.

Intercharacter Delay

An intercharacter delay of up to 5000 milliseconds (in 5ms increments) may be placed between the transmission of each character of scanned data. Scan the following **Intercharacter Delay** bar code, then scan the number of 5ms delays, and the **Save** bar code using the **Programming Chart** inside the back cover of this manual.



To remove this delay, scan the **Intercharacter Delay** bar code, then set the number of delays to 0. Scan the **Save** bar code using the **Programming Chart** inside the back cover of this manual.

Note: Intercharacter delays are not supported in USB serial emulation.

User Specified Intercharacter Delay

An intercharacter delay of up to 5000 milliseconds (in 5ms increments) may be placed after the transmission of a particular character of scanned data. Scan the following **Delay Length** bar code, then scan the number of 5ms delays, and the **Save** bar code using the **Programming Chart** inside the back cover of this manual.

Next, scan the **Character to Trigger Delay** bar code, then the 2-digit hex value for the ASCII character that will trigger the delay [ASCII Conversion Chart](#) on page A-3.



DLYCRX.
Delay Length

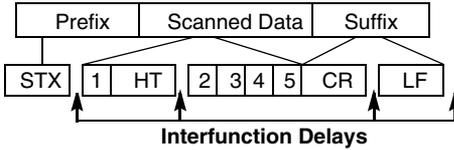


DLY_XX.
Character to Trigger Delay

To remove this delay, scan the **Delay Length** bar code, and set the number of delays to 0. Scan the **Save** bar code using the [Programming Chart](#) inside the back cover of this manual.

Interfunction Delay

An interfunction delay of up to 5000 milliseconds (in 5ms increments) may be placed between the transmission of each segment of the message string. Scan the following **Interfunction Delay** bar code, then scan the number of 5ms delays, and the **Save** bar code using the [Programming Chart](#) inside the back cover of this manual.

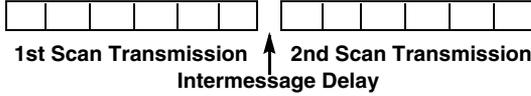


DLYFNC.
Interfunction Delay

To remove this delay, scan the **Interfunction Delay** bar code, then set the number of delays to 0. Scan the **Save** bar code using the [Programming Chart](#) inside the back cover of this manual.

Intermessage Delay

An intermessage delay of up to 5000 milliseconds (in 5ms increments) may be placed between each scan transmission. Scan the following **Intermessage Delay** bar code, then scan the number of 5ms delays, and the **Save** bar code using the [Programming Chart](#) inside the back cover of this manual.



DLYMSG.

Intermessage Delay

To remove this delay, scan the **Intermessage Delay** bar code, then set the number of delays to 0. Scan the **Save** bar code using the [Programming Chart](#) inside the back cover of this manual.



Data Format Editor Introduction

You may use the Data Format Editor to change the engine's output. For example, you can use the Data Format Editor to insert characters at certain points in bar code data as it is scanned. The selections in the following pages are used only if you wish to alter the output. *Default Data Format setting = None.*

Normally, when you scan a bar code, it gets outputted automatically; however when you create a format, you must use a "send" command (see [Send Commands](#) on page 5-4) within the format program to output data.

Multiple formats may be programmed into the engine. They are stacked in the order in which they are entered. However, the following list presents the order in which formats are applied:

1. Specific Terminal ID, Actual Code ID, Actual Length
2. Specific Terminal ID, Actual Code ID, Universal Length
3. Specific Terminal ID, Universal Code ID, Actual Length
4. Specific Terminal ID, Universal Code ID, Universal Length
5. Universal Terminal ID, Actual Code ID, Actual Length
6. Universal Terminal ID, Actual Code ID, Universal Length
7. Universal Terminal ID, Universal Code ID, Actual Length
8. Universal Terminal ID, Universal Code ID, Universal Length

The maximum size of a data format configuration is 2000 bytes, which includes header information.

If you have changed data format settings, and wish to clear all formats and return to the factory defaults, scan the **Default Data Format** code below.



DFMDF3.

* Default Data Format

Add a Data Format

Step 1. Scan the **Enter Data Format** symbol ([page 5-3](#)).

Step 2. Select **Primary/Alternate Format**

Determine if this will be your primary data format, or one of 3 alternate formats. This allows you to save a total of 4 different data formats. To program your primary format, scan **0** using the [Programming Chart](#) inside the back cover of this manual. If you are programming an alternate format, scan **1**, **2**, or **3**, depending on which alternate format

you are programming. (See [Primary/Alternate Data Formats](#) on page 5-17 for further information.)

Step 3. Terminal Type

Refer to [Terminal ID Table](#) (page 5-4) and locate the Terminal ID number for your PC. Scan three numeric bar codes on the inside back cover to program the engine for your terminal ID (you must enter 3 digits). For example, scan **0 0 3** for an AT wedge.

Note: 099 indicates all terminal types.

Step 4. Code I.D.

In the [Symbology Charts](#), beginning on page A-1, find the symbology to which you want to apply the data format. Locate the Hex value for that symbology and scan the 2 digit hex value from the [Programming Chart](#) inside the back cover of this manual.

If you wish to create a data format for all symbologies, with the exception of some specific symbologies, refer to B8 ([page 5-15](#)).

If you are creating a data format for Batch Mode Quantity, use 35 for the Code I.D.

Note: 99 indicates all symbologies.

Step 5. Length

Specify what length (up to 9999 characters) of data will be acceptable for this symbology. Scan the four digit data length from the [Programming Chart](#) inside the back cover of this manual. For example, 50 characters is entered as 0050.

Note: 9999 indicates all lengths.

Step 6. Editor Commands

Refer to [Data Format Editor Commands](#) (page 5-4). Scan the symbols that represent the command you want to enter. 94 alphanumeric characters may be entered for each symbology data format.

Step 7. Scan **Save** to save your data format, or **Discard** to exit without saving your changes.



Other Programming Selections

Clear One Data Format

This deletes one data format for one symbology. If you are clearing the primary format, scan **0** from the [Programming Chart](#) inside the back cover of this manual. If you are clearing an alternate format, scan **1**, **2**, or **3**, depending on the format you are clearing. Scan the Terminal Type and Code I.D. (see [Symbology Charts](#) on page A-1), and the bar code data length for the specific data format that you want to delete. All other formats remain unaffected.

Clear all Data Formats

This clears all data formats.

Save to exit and save your data format changes.

Discard to exit without saving any data format changes.



Terminal ID Table

| Terminal | Model(s) | Terminal ID |
|----------|------------------------------|-------------|
| USB | PC keyboard (HID) | 124 |
| | Mac Keyboard | 125 |
| | PC Keyboard (Japanese) | 134 |
| | Serial (COM driver required) | 130 |
| | HID POS | 131 |
| | USB SurePOS Handheld | 128 |
| | USB SurePOS Tabletop | 129 |
| Serial | RS232 TTL | 000 |
| | RS232 True | 000 |
| | RS485 (IBM-HHBCR 1+2, 46xx) | 051 |
| Keyboard | PS2 compatibles | 003 |
| | AT compatibles | 002 |

Data Format Editor Commands

When working with the Data Format Editor, a virtual cursor is moved along your input data string. The following commands are used to both move this cursor to different positions, and to select, replace, and insert data into the final output. For examples that use the Data Format Editor commands, refer to [Data Formatter](#) on page 5-15.

Send Commands

Send all characters

- F1 Include in the output message all of the characters from the input message, starting from current cursor position, followed by an insert character. *Syntax = F1xx* where xx stands for the insert character's hex value for its ASCII code. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

Send a number of characters

- F2 Include in the output message a number of characters followed by an insert character. Start from the current cursor position and continue for "nn" characters or through the last character in the input message, followed by character "xx." *Syntax = F2nnxx* where nn stands for the numeric value (00-99) for the number of characters, and xx stands for the the insert character's hex value for its ASCII code. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

F2 Example: Send a number of characters



1234567890ABCDEFGHIJ

Send the first 10 characters from the bar code above, followed by a carriage return. Command string: **F2100D**

F2 is the “Send a number of characters” command

10 is the number of characters to send

0D is the hex value for a CR

The data is output as: **1234567890**

F2 and F1 Example: Split characters into 2 lines

Send the first 10 characters from the bar code above, followed by a carriage return, followed by the rest of the characters.

Command string: **F2100DF10D**

F2 is the “Send a number of characters” command

10 is the number of characters to send for the first line

0D is the hex value for a CR

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **1234567890
ABCDEFGHIJ
<CR>**

Send all characters up to a particular character

- F3 Include in the output message all characters from the input message, starting with the character at the current cursor position and continuing to, but not including, the search character “ss,” followed by an insert character. The cursor is moved forward to the “ss” character. *Syntax* = F3ssxx where ss stands for the search character’s hex value for its ASCII code, and xx stands for the insert character’s hex value for its ASCII code. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

F3 Example: Send all characters up to a particular character



1234567890ABCDEFGHIJ

Using the bar code above, send all characters up to but not including “D,” followed by a carriage return.

Command string: **F3440D**

F3 is the “Send all characters up to a particular character” command

44 is the hex value for a 'D'
0D is the hex value for a CR
The data is output as: **1234567890ABC**
<CR>

Send all characters up to a string

- B9 Include in the output message all characters from the input message, starting with the character at the current cursor position and continuing to, but not including, the search string “s...s.” The cursor is moved forward to the beginning of the “s...s” string. *Syntax = B9nnns...s* where nnnn stands for the length of the string, and s...s stands for the string to be matched. The string is made up of hex values for the characters in the string. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

B9 Example: Send all characters up to a defined string



Using the bar code above, send all characters up to but not including “AB.”

Command string: **B90024142**

B9 is the “Send all characters up to a string” command

0002 is the length of the string (2 characters)

41 is the hex value for A

42 is the hex value for B

The data is output as: **1234567890**

Send all but the last characters

- E9 Include in the output message all but the last “nn” characters, starting from the current cursor position. The cursor is moved forward to one position past the last input message character included. *Syntax = E9nn* where nn stands for the numeric value (00-99) for the number of characters that will not be sent at the end of the message.

Insert a character multiple times

- F4 Send “xx” character “nn” times in the output message, leaving the cursor in the current position. *Syntax = F4xxnn* where xx stands for the insert character’s hex value for its ASCII code, and nn is the numeric value (00-99) for the number of times it should be sent. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

E9 and F4 Example: Send all but the last characters, followed by 2 tabs



Send all characters except for the last 8 from the bar code above, followed by 2 tabs.

Command string: **E908F40902**

E9 is the “Send all but the last characters” command

08 is the number of characters at the end to ignore

F4 is the “Insert a character multiple times” command

09 is the hex value for a horizontal tab

02 is the number of time the tab character is sent

The data is output as: **1234567890AB <tab><tab>**

Insert a string

- BA Send “ss” string of “nn” length in the output message, leaving the cursor in the current position. *Syntax = BAnnnns...s* where nnnn stands for the length of the string, and s...s stands for the string. The string is made up of hex values for the characters in the string. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

B9 and BA Example: Look for the string “AB” and insert 2 asterisks ()**



Using the bar code above, send all characters up to but not including “AB.” Insert 2 asterisks at that point, and send the rest of the data with a carriage return after.

Command string: **B900024142BA00022A2AF10D**

B9 is the “Send all characters up to a string” command

0002 is the length of the string (2 characters)

41 is the hex value for A

42 is the hex value for B

BA is the “Insert a string” command

0002 is the length of the string to be added (2 characters)

2A is the hex value for an asterisk (*)

2A is the hex value for an asterisk (*)

F1 is the "Send all characters" command

0D is the hex value for a CR

The data is output as: **1234567890**ABCDEFGHIJ
<CR>**

Insert symbology name

- B3 Insert the name of the bar code's symbology in the output message, without moving the cursor. Only symbologies with a Honeywell ID are included (see [Symbology Charts](#) on page A-1). Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

Insert bar code length

- B4 Insert the bar code's length in the output message, without moving the cursor. The length is expressed as a numeric string and does not include leading zeroes.

B3 and B4 Example: Insert the symbology name and length



Send the symbology name and length before the bar code data from the bar code above. Break up these insertions with spaces. End with a carriage return.

Command string: **B3F42001B4F42001F10D**

B3 is the "Insert symbology name" command

F4 is the "Insert a character multiple times" command

20 is the hex value for a space

01 is the number of time the space character is sent

B4 is the "Insert bar code length" command

F4 is the "Insert a character multiple times" command

20 is the hex value for a space

01 is the number of time the space character is sent

F1 is the "Send all characters" command

0D is the hex value for a CR

The data is output as: **Code128 20 1234567890ABCDEFGHIJ
<CR>**

Move Commands

Move the cursor forward a number of characters

- F5 Move the cursor ahead "nn" characters from current cursor position. *Syntax = F5nn* where nn is the numeric value (00-99) for the number of characters the cursor should be moved ahead.

F5 Example: Move the cursor forward and send the data



1234567890ABCDEFGHIJ

Move the cursor forward 3 characters, then send the rest of the the bar code data from the bar code above. End with a carriage return.

Command string: **F503F10D**

F5 is the "Move the cursor forward a number of characters" command

03 is the number of characters to move the cursor

F1 is the "Send all characters" command

0D is the hex value for a CR

The data is output as: **4567890ABCDEFGHIJ**
<CR>

Move the cursor backward a number of characters

- F6 Move the cursor back "nn" characters from current cursor position. *Syntax = F6nn* where nn is the numeric value (00-99) for the number of characters the cursor should be moved back.

Move the cursor to the beginning

- F7 Move the cursor to the first character in the input message. *Syntax = F7.*

FE and F7 Example: Manipulate bar codes that begin with a 1



1234567890ABCDEFGHIJ

Search for bar codes that begin with a 1. If a bar code matches, move the cursor back to the beginning of the data and send 6 characters followed by a carriage return. Using the bar code above:

Command string: **FE31F7F2060D**

FE is the "Compare characters" command

31 is the hex value for 1

F7 is the "Move the cursor to the beginning" command

F2 is the "Send a number of characters" command

06 is the number of characters to send

0D is the hex value for a CR

The data is output as: **123456**
<CR>

Move the cursor to the end

- EA Move the cursor to the last character in the input message. *Syntax = EA.*

Search Commands

Search forward for a character

- F8 Search the input message forward for “xx” character from the current cursor position, leaving the cursor pointing to the “xx” character. *Syntax = F8xx* where xx stands for the search character’s hex value for its ASCII code. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

F8 Example: Send bar code data that starts after a particular character



Search for the letter “D” in bar codes and send all the data that follows, including the “D.” Using the bar code above:

Command string: **F844F10D**

F8 is the “Search forward for a character” command

44 is the hex value for “D”

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **DEFGHIJ**
<CR>

Search backward for a character

- F9 Search the input message backward for “xx” character from the current cursor position, leaving the cursor pointing to the “xx” character. *Syntax = F9xx* where xx stands for the search character’s hex value for its ASCII code. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

Search forward for a string

- B0 Search forward for “s” string from the current cursor position, leaving cursor pointing to “s” string. *Syntax = B0nnnnS* where nnnn is the string length (up to 9999), and S consists of the ASCII hex value of each character in the match string. For example, B0000454657374 will search forward for the first occurrence of the 4 character string “Test.” Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

B0 Example: Send bar code data that starts after a string of characters



Search for the letters “FGH” in bar codes and send all the data that follows, including “FGH.” Using the bar code above:

Command string: **B0003464748F10D**

B0 is the “Search forward for a string” command

0003 is the string length (3 characters)

46 is the hex value for “F”

47 is the hex value for “G”

48 is the hex value for “H”

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **FGHIJ**
<CR>

Search backward for a string

- B1 Search backward for “s” string from the current cursor position, leaving cursor pointing to “s” string. Syntax = B1nnnnS where nnnn is the string length (up to 9999), and S consists of the ASCII hex value of each character in the match string. For example, B1000454657374 will search backward for the first occurrence of the 4 character string “Test.” Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

Search forward for a non-matching character

- E6 Search the input message forward for the first non-“xx” character from the current cursor position, leaving the cursor pointing to the non-“xx” character. Syntax = E6xx where xx stands for the search character’s hex value for its ASCII code. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

E6 Example: Remove zeroes at the beginning of bar code data



This example shows a bar code that has been zero filled. You may want to ignore the zeroes and send all the data that follows. E6 searches forward for the first character that is not zero, then sends all the data after, followed by a carriage return. Using the bar code above:

Command string: **E630F10D**

E6 is the “Search forward for a non-matching character” command

30 is the hex value for 0

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **37692**
<CR>

Search backward for a non-matching character

- E7 Search the input message backward for the first non-“xx” character from the current cursor position, leaving the cursor pointing to the non-“xx” character. *Syntax = E7xx* where xx stands for the search character’s hex value for its ASCII code. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

Miscellaneous Commands

Suppress characters

- FB Suppress all occurrences of up to 15 different characters, starting at the current cursor position, as the cursor is advanced by other commands. When the FC command is encountered, the suppress function is terminated. The cursor is not moved by the FB command. *Syntax = FBnnxxyy . .zz* where nn is a count of the number of suppressed characters in the list, and xxyy .. zz is the list of characters to be suppressed.

FB Example: Remove spaces in bar code data



This example shows a bar code that has spaces in the data. You may want to remove the spaces before sending the data. Using the bar code above:

Command string: **FB0120F10D**

FB is the “Suppress characters” command

01 is the number of character types to be suppressed

20 is the hex value for a space

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **34567890**
<CR>

Stop suppressing characters

- FC Disables suppress filter and clear all suppressed characters. *Syntax = FC.*

Replace characters

- E4 Replaces up to 15 characters in the output message, without moving the cursor. Replacement continues until the E5 command is encountered. *Syntax* = E4nnxx₁xx₂yy₁yy₂...zz₁zz₂ where nn is the total count of the number of characters in the list (characters to be replaced plus replacement characters); xx₁ defines characters to be replaced and xx₂ defines replacement characters, continuing through zz₁ and zz₂.

E4 Example: Replace zeroes with CRs in bar code data



If the bar code has characters that the host application does not want included, you can use the E4 command to replace those characters with something else. In this example, you will replace the zeroes in the bar code above with carriage returns.

Command string: **E402300DF10D**

E4 is the "Replace characters" command

02 is the total count of characters to be replaced, plus the replacement characters (0 is replaced by CR, so total characters = 2)

30 is the hex value for 0

0D is the hex value for a CR (the character that will replace the 0)

F1 is the "Send all characters" command

0D is the hex value for a CR

The data is output as: **1234
5678
ABC
<CR>**

Stop replacing characters

- E5 Terminates character replacement. *Syntax* = E5.

Compare characters

- FE Compare the character in the current cursor position to the character "xx." If characters are equal, move the cursor forward one position. *Syntax* = FExx where xx stands for the comparison character's hex value for its ASCII code. Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

Compare string

- B2 Compare the string in the input message to the string "s." If the strings are equal, move the cursor forward past the end of the string. *Syntax* = B2nnnnS where nnnn is the string length (up to 9999), and S consists of the ASCII hex value of each character in the match string. For

example, B2000454657374 will compare the string at the current cursor position with the 4 character string "Test." Refer to the [ASCII Conversion Chart](#), beginning on page A-3 for decimal, hex and character codes.

Check for a number

- EC Check to make sure there is an ASCII number at the current cursor position. The format is aborted if the character is not numeric.

EC Example: Only output the data if the bar code begins with a number

If you will only accept data from bar codes that begin with a number, you can use EC to check for the number.

Command string: **ECF10D**

EC is the "Check for a number" command

F1 is the "Send all characters" command

0D is the hex value for a CR

If this bar code is read,  the format fails.
AB1234

If this bar code is read:  the data is output as:
1234AB

1234AB
<CR>

Check for non-numeric character

- ED Check to make sure there is a non-numeric ASCII character at the current cursor position. The format is aborted if the character is numeric.

ED Example: Only output the data if the bar code begins with a letter

If you will only accept data from bar codes that begin with a letter, you can use ED to check for the number.

Command string: **EDF10D**

ED is the "Check for a non-numeric character" command

F1 is the "Send all characters" command

0D is the hex value for a CR

If this bar code is read,  the format fails.
1234AB

If this bar code is read:



the data is output as:

AB1234
<CR>

Insert a delay

- EF Inserts a delay of up to 49,995 milliseconds (in multiples of 5), starting from the current cursor position. Syntax = EFnnnn where nnnn stands for the delay in 5ms increments, up to 9999. This command can only be used with keyboard emulation.

Discard Data

- B8 Discards types of data. For example, you may want to discard Code 128 bar codes that begin with the letter A. In step 4 ([page 5-2](#)), select 6A (for Code 128), and in step 5, select 9999 (for all lengths). Enter FE41B8 to compare and discard Code 128 bar codes that begin with the letter A. *Syntax = B8.*

*Note: The B8 command must be entered after all other commands. The Data Format must be **Required** (see [page 5-16](#)) in order for the B8 command to work. If Data Format is On, but Not Required ([page 5-16](#)), bar code data that meets the B8 format is scanned and output as usual. Other data format settings impact the B8 command. If Data Format Non-Match Error Tone is **On** ([page 5-17](#)), the engine emits an error tone. If Data format Non-Match Error Tone is **Off**, the code is disabled for reading and no tone is sounded.*

Data Formatter

When Data Formatter is turned Off, the bar code data is output to the host as read, including prefixes and suffixes.



DFM_END.

Data Formatter Off

You may wish to require the data to conform to a data format you have created and saved. The following settings can be applied to your data format:

Data Formatter On, Not Required, Keep Prefix/Suffix

Scanned data is modified according to your data format, and prefixes and suffixes are transmitted.

Data Formatter On, Not Required, Drop Prefix/Suffix

Scanned data is modified according to your data format. If a data format is found for a particular symbol, those prefixes and suffixes are not transmitted. If a data format is *not* found for that symbol, the prefixes and suffixes *are* transmitted.

Data Format Required, Keep Prefix/Suffix

Scanned data is modified according to your data format, and prefixes and suffixes are transmitted. Any data that does not match your data format requirements generates an error tone and the data in that bar code is not transmitted. If you wish to process this type of bar code without generating an error tone, see [Data Format Non-Match Error Tone](#).

Data Format Required, Drop Prefix/Suffix

Scanned data is modified according to your data format. If a data format is found for a particular symbol, those prefixes and suffixes are not transmitted. Any data that does not match your data format requirements generates an error tone. If you wish to process this type of bar code without generating an error tone, see [Data Format Non-Match Error Tone](#).

Choose one of the following options. *Default = Data Formatter On, Not Required, Keep Prefix/Suffix.*



DFM_EN3.

**Data Formatter On,
Not Required,
Drop Prefix/Suffix**



DFM_EN4.

**Data Format Required,
Drop Prefix/Suffix**



DFM_EN1.

*** Data Formatter On,
Not Required,
Keep Prefix/Suffix**



DFM_EN2.

**Data Format Required,
Keep Prefix/Suffix**

Data Format Non-Match Error Tone

When a bar code is encountered that doesn't match your required data format, the engine normally generates an error tone. However, you may want to continue scanning bar codes without hearing the error tone. If you scan the **Data Format Non-Match Error Tone Off** bar code, data that doesn't conform to your data format is not transmitted, and no error tone will sound.

If you wish to hear the error tone when a non-matching bar code is found, scan the **Data Format Non-Match Error Tone On** bar code. *Default = Data Format Non-Match Error Tone On.*



DFMDEC1.

**Data Format Non-Match
Error Tone Off**



DFMDEC0.

*** Data Format Non-Match Error
Tone On**

Primary/Alternate Data Formats

You can save up to four data formats, and switch between these formats. Your primary data format is saved under **0**. Your other three formats are saved under **1**, **2**, and **3**. To set your device to use one of these formats, scan one of the bar codes below.



ALTFNM0.

Primary Data Format



ALTFNM1.

Data Format 1



ALTFNM2.

Data Format 2



ALTFNM3.

Data Format 3

Single Scan Data Format Change

You can also switch between data formats for a single scan. The next bar code is scanned using an alternate data format, then reverts to the format you have selected above (either Primary, 1, 2, or 3).

For example, you may have set your device to the data format you saved as Data Format 3. You can switch to Data Format 1 for a single trigger pull by scanning the **Single Scan-Data Format 1** bar code below. The next bar code that is scanned uses Data Format 1, then reverts back to Data Format 3.



VSAF_1.

Single Scan-Data Format 1



VSAF_3.

Single Scan-Data Format 3



VSAF_0.

**Single Scan-Primary
Data Format**



VSAF_2.

Single Scan-Data Format 2

Symbologies

This programming section contains the following menu selections. Refer to [Chapter 9](#) for settings and defaults.

- All Symbologies
- Airline Code 5 - see Straight 2 of 5 IATA (two-bar start/stop)
- China Post (Hong Kong 2 of 5)
- Codabar
- Code 11
- Code 128
- Code 32 Pharmaceutical (PARAF)
- Code 39
- Code 93
- EAN/JAN-13
- EAN/JAN-8
- GS1 DataBar Expanded
- GS1 DataBar Limited
- GS1 DataBar Omnidirectional
- GS1 Emulation
- GS1-128
- Interleaved 2 of 5
- ISBT 128
- Matrix 2 of 5
- MSI
- NEC 2 of 5
- Plessey Code
- Postal Codes
- Straight 2 of 5 IATA (two-bar start/stop)
- Straight 2 of 5 Industrial (three-bar start/stop)
- Telepen
- Trioptic Code
- UPC-A
- UPC-A/EAN-13 with Extended Coupon Code
- UPC-E0

All Symbologies

If you want to decode all the symbologies allowable for your engine, scan the **All Symbologies On** code. If on the other hand, you want to decode only a particular symbology, scan **All Symbologies Off** followed by the On symbol for that particular symbology.



ALLEN.A1.

All Symbologies On



ALLEN.A0.

All Symbologies Off

Message Length Description

You are able to set the valid reading length of some of the bar code symbologies. If the data length of the scanned bar code doesn't match the valid reading length, the engine will issue an error tone. You may wish to set the same value for minimum and maximum length to force the engine to read fixed length bar code data. This helps reduce the chances of a misread.

EXAMPLE: Decode only those bar codes with a count of 9-20 characters.
Min. length = 09Max. length = 20

EXAMPLE: Decode only those bar codes with a count of 15 characters.
Min. length = 15Max. length = 15

For a value other than the minimum and maximum message length defaults, scan the bar codes included in the explanation of the symbology, then scan the digit value of the message length and **Save** bar codes on the [Programming Chart](#) inside the back cover of this manual. The minimum and maximum lengths and the defaults are included with the respective symbologies.

Codabar

<Default All Codabar Settings>



Codabar On/Off



Codabar Start/Stop Characters

Start/Stop characters identify the leading and trailing ends of the bar code. You may either transmit, or not transmit Start/Stop characters. *Default = Don't Transmit.*



Codabar Check Character

Codabar check characters are created using different “modulos.” You can program the engine to read only Codabar bar codes with Modulo 16, Modulo 7 CD, or CLSI check characters. *Default = No Check Character.*

No Check Character indicates that the engine reads and transmits bar code data with or without a check character.

When Check Character is set to **Validate and Transmit**, the engine will only read Codabar bar codes printed with a check character, and will transmit this character at the end of the scanned data.

When Check Character is set to **Validate, but Don't Transmit**, the unit will only read Codabar bar codes printed **with** a check character, but will not transmit the check character with the scanned data.



CBRCK20.

* No Check Character



CBRCK22.

Validate Modulo 16
and Transmit



CBRCK24.

Validate Modulo 7 CD and
Transmit



CBRCK26.

Validate CLSI and Transmit



CBRCK21.

Validate Modulo 16, but
Don't Transmit



CBRCK23.

Validate Modulo 7 CD, but Don't
Transmit



CBRCK25.

Validate CLSI, but Don't
Transmit

Codabar Concatenation

Codabar supports symbol concatenation. When you enable concatenation, the engine looks for a Codabar symbol having a "D" start character, adjacent to a symbol having a "D" stop character. In this case the two messages are concatenated into one with the "D" characters omitted.



A 1 2 3 4 D



D 5 6 7 8 A

Select **Require** to prevent the engine from decoding a single “D” Codabar symbol without its companion. This selection has no effect on Codabar symbols without Stop/Start D characters.



CBRCT1.

On



CBRCT0.

* Off



CBRCT2.

Require

Concatenation Timeout

When searching for bar codes during concatenation, you may wish to set a delay used to find the next bar code. Set the length (in milliseconds) for this delay by scanning the following bar code, then setting the timeout (from 1-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 750.*



DLYCCT.

Concatenation Timeout

Codabar Redundancy

If you are encountering errors when reading Codabar bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the following **Codabar Redundancy** bar code, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



CBRVOT.

Codabar Redundancy

Codabar Message Length

Scan the following bar codes to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



CBRMIN.

Minimum Message Length



CBRMAX.

Maximum Message Length

Code 39

< Default All Code 39 Settings >



C39DFT.

Code 39 On/Off



C39ENA1.

*** On**



C39ENA0.

Off

Code 39 Start/Stop Characters

Start/Stop characters identify the leading and trailing ends of the bar code. You may either transmit, or not transmit Start/Stop characters. *Default = Don't Transmit.*



C39SSX1.

Transmit



C39SSXD.

*** Don't Transmit**

Code 39 Check Character

No Check Character indicates that the engine reads and transmits bar code data with or without a check character.

When Check Character is set to **Validate, but Don't Transmit**, the unit only reads Code 39 bar codes printed with a check character, but will not transmit the check character with the scanned data.

When Check Character is set to **Validate and Transmit**, the engine only reads Code 39 bar codes printed with a check character, and will transmit this character at the end of the scanned data.

Default = No Check Character.



C39CK2D.

*** No Check Character**



C39CK21.

Validate, but Don't Transmit



C39CK22.

Validate and Transmit

Code 39 Redundancy

If you are encountering errors when reading Code 39 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **Code**

39 Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



C39VOT.

Code 39 Redundancy

Code 39 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



C39MIN.

Minimum Message Length



C39MAX.

Maximum Message Length

Code 32 Pharmaceutical (PARAF)

Code 32 Pharmaceutical is a form of the Code 39 symbology used by Italian pharmacies. This symbology is also known as PARAF. *Default = Off.*



C39B321.

On



C39B320.

*** Off**

Full ASCII

If Full ASCII Code 39 decoding is enabled, certain character pairs within the bar code symbol will be interpreted as a single character. For example: \$V will be decoded as the ASCII character SYN, and /C will be decoded as the ASCII character #. *Default = Off.*

| | | | | | | | | | | | | | |
|---------|---------|----|-------|---|----|---|----|---|----|---|----|-----|----|
| NUL %U | DLE \$P | SP | SPACE | 0 | 0 | @ | %V | P | P | ' | %W | p | +P |
| SOH \$A | DC1 \$Q | ! | /A | 1 | 1 | A | A | Q | Q | a | +A | q | +Q |
| STX \$B | DC2 \$R | " | /B | 2 | 2 | B | B | R | R | b | +B | r | +R |
| ETX \$C | DC3 \$S | # | /C | 3 | 3 | C | C | S | S | c | +C | s | +S |
| EOT \$D | DC4 \$T | \$ | /D | 4 | 4 | D | D | T | T | d | +D | t | +T |
| ENQ \$E | NAK \$U | % | /E | 5 | 5 | E | E | U | U | e | +E | u | +U |
| ACK \$F | SYN \$V | & | /F | 6 | 6 | F | F | V | V | f | +F | v | +V |
| BEL \$G | ETB \$W | ' | /G | 7 | 7 | G | G | W | W | g | +G | w | +W |
| BS \$H | CAN \$X | (| /H | 8 | 8 | H | H | X | X | h | +H | x | +X |
| HT \$I | EM \$Y |) | /I | 9 | 9 | I | I | Y | Y | i | +I | y | +Y |
| LF \$J | SUB \$Z | * | /J | : | /Z | J | J | Z | Z | j | +J | z | +Z |
| VT \$K | ESC %A | + | /K | ; | %F | K | K | [| %K | k | +K | { | %P |
| FF \$L | FS %B | , | /L | < | %G | L | L | \ | %L | l | +L | | %Q |
| CR \$M | GS %C | - | - | = | %H | M | M |] | %M | m | +M | } | %R |
| SO \$N | RS %D | . | . | > | %I | N | N | ^ | %N | n | +N | ~ | %S |
| SI \$O | US %E | / | /O | ? | %J | O | O | _ | %O | o | +O | DEL | %T |

Character pairs /M and /N decode as a minus sign and period respectively. Character pairs /P through /Y decode as 0 through 9.



C39ASCII.
Full ASCII On



C39ASCII.
* Full ASCII Off

Interleaved 2 of 5

< Default All Interleaved 2 of 5 Settings >



Interleaved 2 of 5 On/Off



Follett Formatting



NULL Characters

Interleaved 2 of 5 requires an even number of characters. When an odd number of characters is present, it is due to NULL characters embedded in the bar code. Scan the **On** bar code below to decode this type of Interleaved 2 of 5 bar code. *Default = Off.*



Check Digit

No Check Digit indicates that the engine reads and transmits bar code data with or without a check digit.

When Check Digit is set to **Validate, but Don't Transmit**, the unit only reads Interleaved 2 of 5 bar codes printed with a check digit, but will not transmit the check digit with the scanned data.

When Check Digit is set to **Validate and Transmit**, the engine only reads Interleaved 2 of 5 bar codes printed with a check digit, and will transmit this digit at the end of the scanned data. *Default = No Check Digit.*



125CK20.

* No Check Digit



125CK21.

Validate, but Don't Transmit



125CK22.

Validate and Transmit

Interleaved 2 of 5 Redundancy

If you are encountering errors when reading Interleaved 2 of 5 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **Interleaved 2 of 5 Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



125VOT.

Interleaved 2 of 5 Redundancy

Interleaved 2 of 5 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 6, Maximum Default = 80.



I25MIN.

Minimum Message Length



I25MAX.

Maximum Message Length

NEC 2 of 5

< Default All NEC 2 of 5 Settings >



N25DFT.

NEC 2 of 5 On/Off



N25ENA1.

On



N25ENA0.

*** Off**

Check Digit

No Check Digit indicates that the engine reads and transmits bar code data with or without a check digit.

When Check Digit is set to **Validate, but Don't Transmit**, the unit only reads NEC 2 of 5 bar codes printed with a check digit, but will not transmit the check digit with the scanned data.

When Check Digit is set to **Validate and Transmit**, the engine only reads NEC 2 of 5 bar codes printed with a check digit, and will transmit this digit at the end of the scanned data. *Default = No Check Digit.*



N25CK20.

* No Check Digit



N25CK21.

Validate, but Don't Transmit



N25CK22.

Validate and Transmit

NEC 2 of 5 Redundancy

If you are encountering errors when reading NEC 2 of 5 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **NEC 2 of 5 Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



N25VOT.

NEC 2 of 5 Redundancy

NEC 2 of 5 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



N25MIN.

Minimum Message Length



N25MAX.

Maximum Message Length

Code 93

< Default All Code 93 Settings >



Code 93 On/Off



Code 93 Redundancy

If you are encountering errors when reading Code 93 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **Code 93 Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



Code 93 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



C93MIN.

Minimum Message Length



C93MAX.

Maximum Message Length

Straight 2 of 5 Industrial (three-bar start/stop)

<Default All Straight 2 of 5 Industrial Settings>



R25DFT.

Straight 2 of 5 Industrial On/Off



R25ENA1.

On



R25ENAO.

* Off

Straight 2 of 5 Industrial Redundancy

If you are encountering errors when reading Straight 2 of 5 Industrial bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **Straight 2 of 5 Industrial Redundancy** bar code below, then

scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code.
Default = 0.



R25VOT.

**Straight 2 of 5 Industrial
Redundancy**

Straight 2 of 5 Industrial Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



R25MIN.

Minimum Message Length



R25MAX.

Maximum Message Length

Straight 2 of 5 IATA (two-bar start/stop)

Note: This symbology is also known as Airline Code 5.

<Default All Straight 2 of 5 IATA Settings>



Straight 2 of 5 IATA On/Off



Straight 2 of 5 IATA Redundancy

If you are encountering errors when reading Straight 2 of 5 IATA bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **Straight 2 of 5 IATA Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the [Save](#) bar code. *Default = 0.*



Straight 2 of 5 IATA Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 13, Maximum Default = 15.



A25MIN.

Minimum Message Length



A25MAX.

Maximum Message Length

Matrix 2 of 5

<Default All Matrix 2 of 5 Settings>



X25DFT.

Matrix 2 of 5 On/Off



X25ENA1.

On



X25ENA0.

*** Off**

Matrix 2 of 5 Check Character

No Check Character indicates that the engine reads and transmits bar code data with or without a check character.

When Check Character is set to **Validate, but Don't Transmit**, the unit only reads Matrix 2 of 5 bar codes printed with a check character, but will not transmit the check character with the scanned data.

When Check Character is set to **Validate and Transmit**, the engine only reads Matrix 2 of 5 bar codes printed with a check character, and will transmit this character at the end of the scanned data. *Default = No Check Character.*



X25CK20.

* **No Check Character**



X25CK21.

Validate, but Don't Transmit



X25CK22.

Validate and Transmit

Matrix 2 of 5 Redundancy

If you are encountering errors when reading Matrix 2 of 5 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **Matrix 2 of 5 Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



X25VOT.

Matrix 2 of 5 Redundancy

Matrix 2 of 5 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



X25MIN.

Minimum Message Length



X25MAX.

Maximum Message Length

Code 11

<Default All Code 11 Settings>



C11DFT.

Code 11 On/Off



C11ENA1.

On



C11ENAD.

* Off

Check Digits Required

These options set whether 1 or 2 check digits are required with Code 11 bar codes. **Auto Select Check Digits** determines the number of check digits based on the length of the bar code. If the bar code is 10 digits or more, 2 check digits are required. If it is 9 digits or less, 1 check digit is required. The check digit data is only transmitted if you program that feature (see [Check Digit Validation](#) on page 6-21). *Default = Two Check Digits Required.*



C11CK20.

One Check Digit Required



C11CK21.

* Two Check Digits Required



C11CK22.

Auto Select Check Digits
Required

Check Digit Validation

When Check Character is set to **Validate and Transmit**, the engine will only read Code 11 bar codes printed with the specified type check character(s), and will transmit the character(s) at the end of the scanned data.



C11CK23.

**Validate and Transmit One
Check Digit**



C11CK24.

**Validate and Transmit Two
Check Digits**



C11CK25.

**Validate and Transmit Auto
Select Check Digits**

Code 11 Redundancy

If you are encountering errors when reading Code 11 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **Code 11 Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



C11VOT.

Code 11 Redundancy

Code 11 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



C11MIN.

Minimum Message Length



C11MAX.

Maximum Message Length

Code 128

<Default All Code 128 Settings>



Code 128 On/Off



128 Group Separator Output

If you wish to convert FNC1 characters into group separator characters "GS" (0x1D hex) with your Code 128 bar code output, scan the **On** bar code. When **Off** is scanned, the group separator is not output. *Default =Off.*



Code 128 Redundancy

If you are encountering errors when reading Code 128 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **Code**

128 Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



128VOT.

Code 128 Redundancy

Code 128 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



128MIN.

Minimum Message Length



128MAX.

Maximum Message Length

ISBT 128

ISBT is a variation of Code 128 that supports concatenation of neighboring symbols on a blood product label. Use the bar codes below to turn ISBT 128 concatenation on or off. *Default = Off.*



ISBENA1.

On



ISBENA0.

*** Off**

Concatenation Timeout

When searching for bar codes during concatenation, you may wish to set a delay used to find the next bar code. Set the length (in milliseconds) for this delay by scanning the bar code below, then setting the timeout (from 1-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 750.*



DLYCCT.

Concatenation Timeout

ISBT 128 Predefined Concatenation Sequences

Note: You must enable Code 128 and ISBT 128 to use this feature.

The following bar codes are used to select the pre-defined ISBT 128 Concatenation Sequence you wish to use. Once you have selected the concatenation sequence, use [ISBT 128 Predefined Concatenation Sequences On/Off](#) to enable this feature. *Default = Donation ID Number (001) and ABO/RhD Blood Groups (002).*



ISBPCS0.

* Donation ID Number (001)
and ABO/RhD Blood Groups (002)



ISBPCS2.

Donation ID Number (001) and
Confidential Unit Exclusion
Status



ISBPCS4.

Product Code (003) and
Expiration Date (Form 2)



ISBPCS6.

Product Code (003) and
Expiration Date (Form 4)



ISBPCS1.

Donation ID Number (001) and
Donor ID Number (019)



ISBPCS3.

Product Code (003) and
Expiration Date (Form 1)



ISBPCS5.

Product Code (003) and
Expiration Date (Form 3)

ISBT 128 Predefined Concatenation Sequences On/Off

The following selections allow you to enable or require the Predefined ISBT 128 Concatenation Sequences.

If you scan **Off**, the predefined concatenation sequences are disabled.

If you scan the **Allow Predefined Sequence** code, then the engine will output only the data combination specified in the predefined concatenation sequence you selected.

If you scan the **Require Predefined Sequence** code, the data combination specified in the predefined concatenation sequence you selected is required to transmit the data. No data is output unless the sequence is read.

Default = Off.



ISBPCE0.
* Off



ISBPCE1.
Allow Predefined Sequence



ISBPCE2.
Require Predefined Sequence

ISBT 128 User-Defined Concatenation Sequences

Note: You must enable Code 128 and ISBT 128 to use this feature.

The following bar codes are used to create a custom ISBT 128 Concatenation Sequence. Select the identifiers you want to transmit in the 1st and 2nd positions, both left and right. Refer to the ISBT 128 Standard Technical Specification for the list of data identifiers.

Use the [ASCII Conversion Chart](#), beginning on page A-3, to find the characters needed for the identifier. Locate the hex value for each character and scan that 2 digit/character value from the [Programming Chart](#) inside the back cover of this manual.

Example: You want to create a concatenation sequence that has the Donation Identification Number (001) as the left identifier, and Product Code (003) as the right identifier.

The ISBT Index of Data Structures shows that for the Donation Identification Number, the first character is “=” and the second character can be from A-N; P-Z; 1-9. For this example, use “G.” The Product Code first character is “=” and the second character is “<.”

-
- Step 1.** Scan the **1st Left Identifier** bar code, below.
 - Step 2.** Use the [Programming Chart](#) to scan **3, D** (hex for “=”).
 - Step 3.** Scan **Save**.
 - Step 4.** Scan the **2nd Left Identifier** bar code, below.
 - Step 5.** Use the [Programming Chart](#) to scan **4, 7** (hex for “G”).
 - Step 6.** Scan **Save**.
 - Step 7.** Scan the **1st Right Identifier** bar code, below.
 - Step 8.** Use the [Programming Chart](#) to scan **3, D** (hex for “=”).
 - Step 9.** Scan **Save**.
 - Step 10.** Scan the **2nd Right Identifier** bar code, below.
 - Step 11.** Use the [Programming Chart](#) to scan **3, C** (hex for “<”).
 - Step 12.** Scan **Save**.

Once you have programmed the concatenation sequence, use [ISBT 128 User-Defined Concatenation Sequences On/Off](#) to enable this feature.

Default = 0.



ISBUL1.

1st Left Identifier



ISBUL2.

2nd Left Identifier



ISBUR1.

1st Right Identifier



ISBUR2.

2nd Right Identifier

ISBT 128 User-Defined Concatenation Sequences On/Off

The following selections allow you to enable or require the User-Defined ISBT 128 Concatenation Sequences.

If you scan **Off**, the User-Defined concatenation sequences are disabled.

If you scan the **Allow User-Defined Sequence** code, then the engine will output only the data combination specified in the User-Defined concatenation sequence you created.

If you scan the **Require User-Defined Sequence** code, the data combination specified in the User-Defined concatenation sequence is required to transmit the data. No data is output unless the sequence is read.

Default = Off.



ISBUCE0.
* **Off**



ISBUCE1.
Allow User-Defined Sequence



ISBUCE2.

Require User-Defined Sequence

Content Verification

When the **On** bar code is scanned, the check character values are output along with the bar code data, thus allowing you to verify that the check character is in agreement with that calculated for the data stream. *Default = Off.*



ISBXM01.
On



ISBXM00.
* **Off**

Transmit Identifiers

You may disable the transmission of the ISBT Code 128 data identifiers by scanning **Off**. When this selection is **Off**, the first 2 data (ID) characters are removed from the data stream unless the ISBT code contains the Donation Identification Number identifiers. If the code contains the Dona-

tion Identification Number identifiers, only the first ID character is removed from the Donation Identification Number. The second character is transmitted as normal data. *Default = On.*



ISBXM11.

* On



ISBXM10.

Off

Flag Digit Conversion

Type 3 flag digits are a part of the Donation Identification Number in an ISBT 128 bar code. If you select **On**, the flag data is converted into a single MOD (37, 2) character and transmitted with the bar code data. Scan **Off** if you do not want the flag digits transmitted. *Default = Off.*



ISBXM21.

On



ISBXM20.

* Off

GS1-128

<Default All GS1-128 Settings>



GS1-128 On/Off



GS1-128 Application Identifier Parsing

This allows a single GS1-128 bar code to be broken into multiple transmissions based on the presence of application identifiers (AI) embedded in the bar code. Scan **Transmit Without Identifiers** if you want the bar code broken into packets and stripped of the AI. If you want the AI included, scan **Transmit With Identifiers**. *Default = Off.*



GS1-128 Redundancy

If you are encountering errors when reading GS1-128 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **GS1-**

128 Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



GS1VOT.

GS1-128 Redundancy

GS1-128 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



GS1MIN.

Minimum Message Length



GS1MAX.

Maximum Message Length

Telepen

<Default All Telepen Settings>



Telepen On/Off



Telepen Output

Using AIM Telepen Output, the engine reads symbols with start/stop pattern 1 and decodes them as standard full ASCII (start/stop pattern 1). When Original Telepen Output is selected, the engine reads symbols with start/stop pattern 1 and decodes them as compressed numeric with optional full ASCII (start/stop pattern 2). *Default = AIM Telepen Output.*



Telepen Redundancy

If you are encountering errors when reading Telepen bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the

Telepen Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



TELVOT.

Telepen Redundancy

Telepen Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



TELMIN.

Minimum Message Length



TELMAX.

Maximum Message Length

UPC-A

<Default All UPC-A Settings>



UPC-A On/Off



Convert UPC-A to EAN-13



* Transmit UPC-A as UPC-A



UPC-A Number System and Check Digit

UPC-A sample showing the number system and check digit:



UPC-A Number System

The numeric system digit of a U.P.C. symbol is normally transmitted at the beginning of the scanned data, but the engine can be programmed

so it will not transmit it. *Default = On.*



UPANSX1.

* On



UPANSX0.

Off

UPC-A Check Digit

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data or not. *Default = On.*



UPACKX1.

* On



UPACKX0.

Off

UPC-A Addenda

This selection adds 2 or 5 digits to the end of all scanned UPC-A data. *Default = Off for both 2 Digit and 5 Digit Addenda.*



UPAAD21.

2 Digit Addenda On



UPAAD20.

* 2 Digit Addenda Off



UPAAD51.

5 Digit Addenda On



UPAAD50.

* 5 Digit Addenda Off

UPC-A Addenda Required

When **Required** is scanned, the engine will only read UPC-A bar codes that have addenda. You must then turn on a 2 or 5 digit addenda listed on [page 6-35](#). *Default = Not Required.*



UPAARQ1.

Required



UPAARQ0.

*** Not Required**

Addenda Timeout

You can set a time during which the engine looks for an addenda. If an addenda is not found within this time period, the data can be either transmitted or discarded, based on the setting you are using for [UPC-A Addenda Required](#) (see page 6-36). Set the length (in milliseconds) for this timeout by scanning the bar code below, then setting the timeout (from 0-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 100.*

Note: The Addenda Timeout setting is applied to all addenda and coupon code searches.



DLYADD.

Addenda Timeout

UPC-A Addenda Separator

When this feature is on, there is a space between the data from the bar code and the data from the addenda. When turned off, there is no space. *Default = Off.*



UPAADS1.

On



UPAADS0.

*** Off**

UPC-A Redundancy

If you are encountering errors when reading UPC-A bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **UPC-A Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



UPC-A/EAN-13 with Extended Coupon Code

Use the following codes to enable or disable UPC-A and EAN-13 with Extended Coupon Code. When left on the default setting (**Off**), the engine treats Coupon Codes and Extended Coupon Codes as single bar codes.

If you scan the **Allow Concatenation** code, when the engine sees the coupon code and the extended coupon code in a single scan, it transmits both as separate symbologies. Otherwise, it transmits the first coupon code it reads.

If you scan the **Require Concatenation** code, the engine must see and read the coupon code and extended coupon code in a single read to transmit the data. No data is output unless both codes are read.

Default = Off.



UPC-A/Code 128 Coupon Code Output

If you scan the **Multiple Code Output** code, when the engine sees the coupon code and the Code 128 code in a single scan, it transmits both as separate bar codes with separate terminators.

If you scan the **Single Code Output** code, when the engine sees the coupon code and Code 128 code in a single scan, it transmits the data as one extended bar code.

Default = Multiple Code Output.



CPNSTY0.

* Multiple Code Output



CPNSTY1.

Single Code Output

UPC-A Number System 4 Addenda Required

This setting programs the engine to require a coupon code only on UPC-A bar codes that begin with a “4.” The following settings can be programmed:

Require Coupon Code: All UPC-A bar codes that begin with a “4” must have a coupon code. The UPC-A bar code with the coupon code is then transmitted as a single, concatenated bar code. If a coupon code is not found within the [Addenda Timeout](#) period, the UPC-A bar code is discarded.

Don't Require Coupon Code: If you have selected **Require Coupon Code**, and you want to disable this feature, scan **Don't Require Coupon Code**. UPC-A bar codes are transmitted, depending on the setting you are using for [UPC-A/EAN-13 with Extended Coupon Code](#).

Default = Don't Require Coupon Code.



ARQSY40.

* Don't Require Coupon Code



ARQSY41.

Require Coupon Code

UPC-A Number System 5 Addenda Required

This setting programs the engine to require any combination of a coupon code, a 2 digit addenda, or a 5 digit addenda on UPC-A bar codes that begin with a “5.” The following settings can be programmed:

Require Coupon Code/Addenda: All UPC-A bar codes that begin with a “5” must have a coupon code, a 2 digit addenda, a 5 digit addenda, or a combination of these addenda. The UPC-A bar code with the coupon code and/or addenda is then transmitted as a single, concatenated bar code. If a coupon code and/or required addenda is not found within the [Addenda Timeout](#) period, the UPC-A bar code is discarded.

Don't Require Coupon Code/Addenda: If you have selected **Require Coupon Code/Addenda**, and you want to disable this feature, scan **Don't Require Coupon Code/Addenda**. UPC-A bar codes are transmitted, depending on the setting you are using for [UPC-A/EAN-13 with Extended Coupon Code](#).

Default = Don't Require Coupon Code/Addenda.



ARQSY50.

* Don't Require Coupon Code/
Addenda



ARQSY51.

Require 2 Digit Addenda



ARQSY52.

Require 5 Digit Addenda



ARQSY53.

Require 2 or 5 Digit Addenda



ARQSY54.

Require Coupon Code



ARQSY55.

Require Coupon Code or 2 Digit
Addenda



ARQSY56.

Require Coupon Code or 5 Digit
Addenda



ARQSY57.

Require Coupon Code, 2 Digit
Addenda, or 5 Digit Addenda

Addenda Timeout

You can set a time during which the engine looks for a coupon code. If a coupon code is not found within this time period, the data can be either transmitted or discarded, based on the setting you are using for [UPC-A/EAN-13 with Extended Coupon Code](#) or [If you scan the Multiple Code Output code](#), when the engine sees the coupon code and the Code 128 code in a single scan, it transmits both as separate bar codes with separate terminators. . Set the length (in milliseconds) for this timeout by scanning

the bar code below, then setting the timeout (from 0-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 100.*

Note: The Addenda Timeout setting is applied to all addenda and coupon code searches.



DLYADD.

Addenda Timeout

UPC-E0

<Default All UPC-E0 Settings>



UPEDFT.

UPC-E0 On/Off

Most U.P.C. bar codes lead with the 0 number system. To read these codes, use the **UPC-E0 On** selection. If you need to read codes that lead with the 1 number system, use [EAN/JAN-13](#) (page 6-44). *Default = On.*



UPEEND1.

* **UPC-E0 On**



UPEEND0.

UPC-E0 Off

UPC-E0 Expand

UPC-E Expand expands the UPC-E code to the 12 digit, UPC-A format. *Default = Off.*



UPEEXP1.

On



UPEEXP0.

* **Off**

UPC-E0 Number System and Check Digit

UPC-E0 sample showing the number system and check digit:



UPC-E0 Number System

The numeric system digit of a UPC-A symbol is normally transmitted at the beginning of scanned data. When using UPC-E Expand, the unit can be programmed so it will not transmit it. *Default = On.*



UPEEXN1.
* On



UPEEXN0.
Off

UPC-E0 Check Digit

Check Digit specifies whether the check digit should be transmitted at the end of the scanned data or not. *Default = Off.*



UPECKX1.
On



UPECKX0.
* Off

UPC-E0 Leading Zero

This feature allows the transmission of a leading zero (0) at the beginning of scanned data. To prevent transmission, scan **Off**. *Default = Off.*



UPENSX1.

On



UPENSX0.

*** Off**

UPC-E0 Addenda

This selection adds 2 or 5 digits to the end of all scanned UPC-E data. *Default = Off for both 2 Digit and 5 Digit Addenda.*



UPEAD21.

2 Digit Addenda On



UPEAD20.

*** 2 Digit Addenda Off**



UPEAD51.

5 Digit Addenda On



UPEAD50.

*** 5 Digit Addenda Off**

UPC-E0 Addenda Required

When **Required** is scanned, the engine will only read UPC-E bar codes that have addenda. *Default = Not Required.*



UPEARQ1.

Required



UPEARQ0.

*** Not Required**

Addenda Timeout

You can set a time during which the engine looks for an addenda. If an addenda is not found within this time period, the data can be either transmitted or discarded, based on the setting you are using for **UPC-E0 Addenda Required** (page 6-42). Set the length (in milliseconds) for this timeout by scanning the bar code below, then setting the timeout (from 0-65535 milliseconds) by scanning digits from the **Programming Chart**, then scanning **Save**. *Default = 100.*

Note: The Addenda Timeout setting is applied to all addenda and coupon code searches.



DLYADD.

Addenda Timeout

UPC-E0 Addenda Separator

When this feature is **On**, there is a space between the data from the bar code and the data from the addenda. When turned **Off**, there is no space. *Default = Off.*



UPEADS1.

On



UPEADS0.

*** Off**

UPC-E0 Redundancy

If you are encountering errors when reading UPC-E0 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **UPC-E0 Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the **Programming Chart** inside the back cover of this manual. Then scan the **Save** bar code. *Default = 1.*



UPEVOT.

UPC-E0 Redundancy

EAN/JAN-13

<Default All EAN/JAN Settings>



E13DFT.

EAN/JAN-13 On/Off



E13ENA1.

* On



E13ENA0.

Off

EAN/JAN-13 Check Digit

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data or not. *Default = On.*



E13CKX1.

* On



E13CKX0.

Off

EAN/JAN-13 Addenda

This selection adds 2 or 5 digits to the end of all scanned EAN/JAN-13 data. *Default = Off for both 2 Digit and 5 Digit Addenda.*



E13AD21.
2 Digit Addenda On



E13AD20.
*** 2 Digit Addenda Off**



E13AD51.
5 Digit Addenda On



E13AD50.
*** 5 Digit Addenda Off**

EAN/JAN-13 Addenda Required

When **Required** is scanned, the engine will only read EAN/JAN-13 bar codes that have addenda. *Default = Not Required.*



E13ARQ1.
Required



E13ARQ0.
*** Not Required**

EAN-13 Beginning with 2 Addenda Required

This setting programs the engine to require a 2 digit addenda only on EAN-13 bar codes that begin with a “2.” The following settings can be programmed:

Require 2 Digit Addenda: All EAN-13 bar codes that begin with a “2” must have a 2 digit addendum. The EAN-13 bar code with the 2 digit addendum is then transmitted as a single, concatenated bar code. If a 2 digit addendum is not found within the [Addenda Timeout](#) period, the EAN-13 bar code is discarded.

Note: if you are using [EAN-13 Beginning with 290 Addenda Required](#) (page 6-46), that setting will take precedence over this one.

Don't Require 2 Digit Addenda: If you have selected **Require 2 Digit Addenda**, and you want to disable this feature, scan **Don't Require 2 Digit Addenda**. EAN-13 bar codes are transmitted, depending on the setting you are using for [EAN/JAN-13 Addenda Required](#).

Default = Don't Require 2 Digit Addenda.



ARQSY20.

* Don't Require 2 Digit Addenda



ARQSY21.

Require 2 Digit Addenda

EAN-13 Beginning with 290 Addenda Required

This setting programs the engine to require a 5 digit addenda only on EAN-13 bar codes that begin with "290." The following settings can be programmed:

Require 5 Digit Addenda: All EAN-13 bar codes that begin with "290" must have a 5 digit addendum. The EAN-13 bar code with the 5 digit addendum is then transmitted as a single, concatenated bar code. If a 5 digit addendum is not found within the [Addenda Timeout](#) period, the EAN-13 bar code is discarded.

Note: if you are using [EAN-13 Beginning with 2 Addenda Required](#) (page 6-45), this setting will take precedence.

Don't Require 5 Digit Addenda: If you have selected **Require 5 Digit Addenda**, and you want to disable this feature, scan **Don't Require 5 Digit Addenda**. EAN-13 bar codes are transmitted, depending on the setting you are using for [EAN/JAN-13 Addenda Required](#).

Default = Don't Require 5 Digit Addenda.



ARQ2900.

* Don't Require 5 Digit Addenda



ARQ2901.

Require 5 Digit Addenda

EAN-13 Beginning with 378/379 Addenda Required

This setting programs the engine to require any combination of a 2 digit addenda or a 5 digit addenda on EAN-13 bar codes that begin with a "378" or "379." The following settings can be programmed:

Require Addenda: All EAN-13 bar codes that begin with a “378” or “379” must have a 2 digit addenda, a 5 digit addenda, or a combination of these addenda. The EAN-13 bar code with the addenda is then transmitted as a single, concatenated bar code. If the required addenda is not found within the [Addenda Timeout](#) period, the EAN-13 bar code is discarded.

Don't Require Addenda: If you have selected **Require Addenda**, and you want to disable this feature, scan **Don't Require Addenda**. EAN-13 bar codes are transmitted, depending on the setting you are using for [EAN/JAN-13 Addenda Required](#).

Default = Don't Require Addenda.



ARQ3780.

* **Don't Require Addenda**



ARQ3782.

Require 5 Digit Addenda



ARQ3781.

Require 2 Digit Addenda



ARQ3783.

Require 2 or 5 Digit Addenda

EAN-13 Beginning with 414/419 Addenda Required

This setting programs the engine to require any combination of a 2 digit addenda or a 5 digit addenda on EAN-13 bar codes that begin with a “414” or “419.” The following settings can be programmed:

Require Addenda: All EAN-13 bar codes that begin with a “414” or “419” must have a 2 digit addenda, a 5 digit addenda, or a combination of these addenda. The EAN-13 bar code with the addenda is then transmitted as a single, concatenated bar code. If the required addenda is not found within the [Addenda Timeout](#) period, the EAN-13 bar code is discarded.

Don't Require Addenda: If you have selected **Require Addenda**, and you want to disable this feature, scan **Don't Require Addenda**. EAN-13 bar codes are transmitted, depending on the setting you are using for [EAN/JAN-13 Addenda Required](#).

Default = Don't Require Addenda.



ARQ4140.

* Don't Require Addenda



ARQ4142.

Require 5 Digit Addenda



ARQ4141.

Require 2 Digit Addenda



ARQ4143.

Require 2 or 5 Digit Addenda

EAN-13 Beginning with 434/439 Addenda Required

This setting programs the engine to require any combination of a 2 digit addenda or a 5 digit addenda on EAN-13 bar codes that begin with a "434" or "439." The following settings can be programmed:

Require Addenda: All EAN-13 bar codes that begin with a "434" or "439" must have a 2 digit addenda, a 5 digit addenda, or a combination of these addenda. The EAN-13 bar code with the addenda is then transmitted as a single, concatenated bar code. If the required addenda is not found within the [Addenda Timeout](#) period, the EAN-13 bar code is discarded.

Don't Require Addenda: If you have selected **Require Addenda**, and you want to disable this feature, scan **Don't Require Addenda**. EAN-13 bar codes are transmitted, depending on the setting you are using for [EAN/JAN-13 Addenda Required](#).

Default = Don't Require Addenda.



ARQ4340.

* Don't Require Addenda



ARQ4342.

Require 5 Digit Addenda



ARQ4341.

Require 2 Digit Addenda



ARQ4343.

Require 2 or 5 Digit Addenda

EAN-13 Beginning with 977 Addenda Required

This setting programs the engine to require a 2 digit addenda only on EAN-13 bar codes that begin with "977." The following settings can be programmed:

Require 2 Digit Addenda: All EAN-13 bar codes that begin with "977" must have a 2 digit addendum. The EAN-13 bar code with the 2 digit addendum is then transmitted as a single, concatenated bar code. If a 2 digit addendum is not found within the [Addenda Timeout](#) period, the EAN-13 bar code is discarded.

Don't Require 2 Digit Addenda: If you have selected **Require 2 Digit Addenda**, and you want to disable this feature, scan **Don't Require 2 Digit Addenda**. EAN-13 bar codes are transmitted, depending on the setting you are using for [EAN/JAN-13 Addenda Required](#).

Default = Don't Require 2 Digit Addenda.



ARQ9770.

* Don't Require 2 Digit Addenda



ARQ9771.

Require 2 Digit Addenda

EAN-13 Beginning with 978 Addenda Required

These settings program the engine to require a 5 digit addenda only on EAN-13 bar codes that begin with "978." The following settings can be programmed:

Require 5 Digit Addenda: All EAN-13 bar codes that begin with “978” must have a 5 digit addendum. The EAN-13 bar code with the 5 digit addendum is then transmitted as a single, concatenated bar code. If a 5 digit addendum is not found within the [Addenda Timeout](#) period, the EAN-13 bar code is discarded.

Don't Require 5 Digit Addenda: If you have selected **Require 5 Digit Addenda**, and you want to disable this feature, scan **Don't Require 5 Digit Addenda**. EAN-13 bar codes are transmitted, depending on the setting you are using for [EAN/JAN-13 Addenda Required](#).

Default = Don't Require 5 Digit Addenda.



ARQ9780.

* Don't Require 5 Digit Addenda



ARQ9781.

Require 5 Digit Addenda

EAN-13 Beginning with 979 Addenda Required

These settings program the engine to require a 5 digit addenda only on EAN-13 bar codes that begin with “979.” The following settings can be programmed:

Require 5 Digit Addenda: All EAN-13 bar codes that begin with “979” must have a 5 digit addendum. The EAN-13 bar code with the 5 digit addendum is then transmitted as a single, concatenated bar code. If a 5 digit addendum is not found within the [Addenda Timeout](#) period, the EAN-13 bar code is discarded.

Don't Require 5 Digit Addenda: If you have selected **Require 5 Digit Addenda**, and you want to disable this feature, scan **Don't Require 5 Digit Addenda**. EAN-13 bar codes are transmitted, depending on the setting you are using for [EAN/JAN-13 Addenda Required](#).

Default = Don't Require 5 Digit Addenda.



ARQ9790.

* Don't Require 5 Digit Addenda



ARQ9791.

Require 5 Digit Addenda

Addenda Timeout

You can set a time during which the engine looks for an addenda. If an addenda is not found within this time period, the data can be either transmitted or discarded, based on the setting you are using for [EAN/JAN-13 Addenda Required](#). Set the length (in milliseconds) for this timeout by scanning the bar code below, then setting the timeout (from 0-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning [Save](#). *Default = 100.*

Note: The Addenda Timeout setting is applied to all addenda and coupon code searches.



DLYADD.

Addenda Timeout

EAN/JAN-13 Addenda Separator

When this feature is **On**, there is a space between the data from the bar code and the data from the addenda. When turned **Off**, there is no space. *Default = Off.*



E13ADS1.

On



E13ADS0.

*** Off**

Note: If you want to enable or disable EAN13 with Extended Coupon Code, refer to [UPC-A/EAN-13 with Extended Coupon Code](#) (page 6-37).

EAN/JAN-13 Redundancy

If you are encountering errors when reading EAN/JAN-13 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **EAN/JAN-13 Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the [Save](#) bar code. *Default = 0.*



E13VOT.

EAN/JAN-13 Redundancy

ISBN Translate

ISBNs are printed on books using the EAN-13 bar code symbology. To translate EAN-13 Bookland symbols into their equivalent ISBN number format, scan the **On** bar code below. *Default = Off.*



E13ISB1.

On



E13ISB0.

*** Off**

Convert ISBN to 13-Digit

When translating EAN-13 codes to the ISBN format, you can convert the bar code to a 13 digit format by scanning the **Convert to 13-Digit On** bar code below. *Default = Convert to 13-Digit Off.*



E13I131.

Convert to 13-Digit On



E13I130.

***Convert to 13-Digit Off**

ISBN Reformat

In normal use, the first two or three digits of an EAN-13 bar code identify the country of origin. The country prefixes are 978 and 979. To reformat ISBN codes so the country prefix is dropped out, scan the **Reformat On** bar code below. *Default = Reformat Off.*



E13IBR1.

Reformat On



E13IBR0.

***Reformat Off**

ISSN Translate

When **On** is scanned, EAN-13 977 Bookland symbols are translated into their equivalent 8-digit ISSN number format. For example, 9770123456787 will be transmitted as 01234560. *Default = Off.*



E13ISS1.

On



E13ISS0.

*** Off**

ISSN Reformat

When **Reformat On** is scanned, EAN-13 977 Bookland symbols are translated into their equivalent 8-digit ISSN number format, with hyphens added to the output. For example, 9770123456787 will be transmitted as 0123-456-0. (You must first scan ISSN Translate **On** (page 6-53) before scanning **Reformat On**.) *Default = Reformat Off.*



E13ISR1.

Reformat On



E13ISR0.

*** Reformat Off**

EAN/JAN-8

<Default All EAN/JAN-8 Settings>



EA8DFT.

EAN/JAN-8 On/Off



EA8ENA1.

* On



EA8ENAD.

Off

EAN/JAN-8 Check Digit

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data or not. *Default = On.*



EA8CKX1.

* On



EA8CKXD.

Off

EAN/JAN-8 Addenda

This selection adds 2 or 5 digits to the end of all scanned EAN/JAN-8 data. *Default = Off for both 2 Digit Addenda and 5 Digit Addenda.*



EABAD21.
2 Digit Addenda On



EABAD20.
*** 2 Digit Addenda Off**



EABAD51.
5 Digit Addenda On



EABAD50.
*** 5 Digit Addenda Off**

EAN/JAN-8 Addenda Required

When **Required** is scanned, the engine will only read EAN/JAN-8 bar codes that have addenda. *Default = Not Required.*



EABARQ1.
Required



EABARQ0.
*** Not Required**

Addenda Timeout

You can set a time during which the engine looks for an addenda. If an addenda is not found within this time period, the data can be either transmitted or discarded, based on the setting you are using for [EAN/JAN-8 Addenda Required](#). Set the length (in milliseconds) for this timeout by

scanning the bar code below, then setting the timeout (from 0-65535 milliseconds) by scanning digits from the [Programming Chart](#), then scanning **Save**. *Default = 100.*

Note: The Addenda Timeout setting is applied to all addenda and coupon code searches.



DLYADD.

Addenda Timeout

EAN/JAN-8 Addenda Separator

When this feature is **On**, there is a space between the data from the bar code and the data from the addenda. When turned **Off**, there is no space. *Default = Off.*



EA8ADS1.

On



EA8ADS0.

*** Off**

EAN/JAN-8 Redundancy

If you are encountering errors when reading EAN/JAN-8 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **EAN/JAN-8 Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



EABVOT.

EAN/JAN-8 Redundancy

MSI

<Default All MSI Settings>



MSI On/Off



MSI Check Character

Different types of check characters are used with MSI bar codes. You can program the engine to read MSI bar codes with Type 10 check characters. *Default = Validate Type 10, but Don't Transmit.*

When Check Character is set to **Validate Type 10 and Transmit**, the engine will only read MSI bar codes printed with the specified type check character(s), and will transmit the character(s) at the end of the scanned data.

When Check Character is set to **Validate Type 10, but Don't Transmit**, the unit will only read MSI bar codes printed with the specified type check character(s), but will not transmit the check character(s) with the scanned data.



MSICK0.

* **Validate Type 10, but Don't Transmit**



MSICK1.

Validate Type 10 and Transmit



MSICK2.

Validate 2 Type 10 Characters, but Don't Transmit



MSICK3.

Validate 2 Type 10 Characters and Transmit



MSICK6.

Disable MSI Check Characters

MSI Redundancy

If you are encountering errors when reading MSI bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **MSI Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



MSIVOT.

MSI Redundancy

MSI Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



MSIMIN.

Minimum Message Length



MSIMAX.

Maximum Message Length

Plessey Code

< Default All Plessey Code Settings >



PLSDFT.

Plessey Code On/Off



PLSENA1.

On



PLSENA0.

*** Off**

Plessey Check Character

No Check Character indicates that the engine reads and transmits bar code data with or without a check character.

When Check Character is set to **Validate, but Don't Transmit**, the unit only reads Plessey bar codes printed with a check character, but will not transmit the check character with the scanned data.

When Check Character is set to **Validate and Transmit**, the engine only reads Plessey bar codes printed with a check character, and will transmit this character at the end of the scanned data. *Default = No Check Character.*



PLSCHK0.

* No Check Character



PLSCHK1.

Validate, but Don't Transmit



PLSCHK2.

Validate and Transmit

Plessey Redundancy

If you are encountering errors when reading Plessey bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **Plessey Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



PLSVOT.

Plessey Redundancy

Plessey Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



PLSMIN.

Minimum Message Length



PLSMAX.

Maximum Message Length

GS1 DataBar Omnidirectional

< Default All GS1 DataBar Omnidirectional Settings >



RSSDFT.

GS1 DataBar Omnidirectional On/Off



RSSENA1.

* On



RSSENA0.

Off

GS1 DataBar Omnidirectional Redundancy

If you are encountering errors when reading GS1 DataBar Omnidirectional bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **GS1 DataBar Omnidirectional Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



RSSVOT.

**GS1 DataBar Omnidirectional
Redundancy**

GS1 DataBar Limited

< Default All GS1 DataBar Limited Settings >



RSLDFT.

GS1 DataBar Limited On/Off



RSLENA1.

* On



RSLENA0.

Off

GS1 DataBar Limited Redundancy

If you are encountering errors when reading GS1 DataBar Limited bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **GS1 DataBar Limited Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



RSLVOT.

**GS1 DataBar Limited
Redundancy**

GS1 DataBar Expanded

< Default All GS1 DataBar Expanded Settings >



RSEDFT.

GS1 DataBar Expanded On/Off



RSEENA1.

* On



RSEENA0.

Off

GS1 DataBar Expanded Redundancy

If you are encountering errors when reading GS1 DataBar Expanded bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **GS1 DataBar Expanded Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



RSEVOT.

**GS1 DataBar Expanded
Redundancy**

GS1 DataBar Expanded Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



RSEMIN.

Minimum Message Length



RSEMAX.

Maximum Message Length

Trioptic Code

Trioptic Code is used for labeling magnetic storage media.



TRIENA1.

On



TRIENA0.

* Off

Trioptic Redundancy

If you are encountering errors when reading Trioptic bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **Trioptic Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



TRIVOT.

Tripotic Redundancy

GS1 Emulation

The engine can automatically format the output from any GS1 data carrier to emulate what would be encoded in an equivalent GS1-128 or GS1 DataBar symbol. GS1 data carriers include UPC-A and UPC-E, EAN-13 and EAN-8, ITF-14, GS1-128, and GS1-128 DataBar and GS1 Composites. (Any application that accepts GS1 data can be simplified since it only needs to recognize one data carrier type.)

If **GS1-128 Emulation** is scanned, all retail codes (U.P.C., UPC-E, EAN8, EAN13) are expanded out to 16 digits. If the AIM ID is enabled, the value will be the GS1-128 AIM ID,]C1 (see [Symbology Charts](#) on page A-1).

If **GS1 DataBar Emulation** is scanned, all retail codes (U.P.C., UPC-E, EAN8, EAN13) are expanded out to 16 digits. If the AIM ID is enabled, the value will be the GS1-DataBar AIM ID,]em (see [Symbology Charts](#) on page A-1).

If **GS1 Code Expansion Off** is scanned, retail code expansion is disabled, and UPC-E expansion is controlled by the [UPC-E0 Expand](#) (page 6-40) setting. If the AIM ID is enabled, the value will be the GS1-128 AIM ID,]C1 (see [Symbology Charts](#) on page A-1).

If **EAN8 to EAN13 Conversion** is scanned, all EAN8 bar codes are converted to EAN13 format.

Default = GS1 Emulation Off.



EANEMU1.

GS1-128 Emulation



EANEMU3.

GS1 Code Expansion Off



EANEMU4.

*** GS1 Emulation Off**



EANEMU2.

GS1 DataBar Emulation



EANEMU4.

EAN8 to EAN13 Conversion

Postal Codes

The following lists linear postal codes. Any combination of linear postal code selections can be active at a time.

China Post (Hong Kong 2 of 5)

<Default All China Post (Hong Kong 2 of 5) Settings>



CPCDFT.

China Post (Hong Kong 2 of 5) On/Off



CPCENA1.

On



CPCENAD.

* Off

China Post (Hong Kong 2 of 5) Redundancy

If you are encountering errors when reading China Post (Hong Kong 2 of 5) bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the **China Post (Hong Kong 2 of 5) Redundancy** bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#) inside the back cover of this manual. Then scan the **Save** bar code. *Default = 0.*



CPCVOT.

China Post (Hong Kong 2 of 5)
Redundancy

China Post (Hong Kong 2 of 5) Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 3, Maximum Default = 80.



CPCMIN.

Minimum Message Length



CPCMAX.

Maximum Message Length



Keyboard Function Relationships

The following Keyboard Function Code, Hex/ASCII Value, and Full ASCII “CTRL”+ relationships apply to all terminals that can be used with the engine. Refer to [page 2-14](#) enable Control + ASCII mode.

| Function Code | HEX/ASCII Value | Full ASCII “CTRL” + |
|---------------|-----------------|---------------------|
| NUL | 00 | @ |
| SOH | 01 | A |
| STX | 02 | B |
| ETX | 03 | C |
| EOT | 04 | D |
| ENQ | 05 | E |
| ACK | 06 | F |
| BEL | 07 | G |
| BS | 08 | H |
| HT | 09 | I |
| LF | 0A | J |
| VT | 0B | K |
| FF | 0C | L |
| CR | 0D | M |
| SO | 0E | N |
| SI | 0F | O |
| DLE | 10 | P |
| DC1 | 11 | Q |
| DC2 | 12 | R |
| DC3 | 13 | S |
| DC4 | 14 | T |
| NAK | 15 | U |
| SYN | 16 | V |
| ETB | 17 | W |
| CAN | 18 | X |
| EM | 19 | Y |
| SUB | 1A | Z |
| ESC | 1B | [|
| FS | 1C | \ |
| GS | 1D |] |
| RS | 1E | ^ |
| US | 1F | _ |

The last five characters in the Full ASCII "CTRL" column ([\] 6 -), apply to US only. The following chart indicates the equivalents of these five characters for different countries.

Note: Not all countries may be supported by your device.

| Country | Codes | | | | |
|----------------|-------|---|----|---|---|
| United States | [| \ |] | 6 | - |
| Belgium | [| < |] | 6 | - |
| Scandinavia | 8 | < | 9 | 6 | - |
| France | ^ | 8 | \$ | 6 | = |
| Germany | | Ã | + | 6 | - |
| Italy | | \ | + | 6 | - |
| Switzerland | | < | .. | 6 | - |
| United Kingdom | [| ç |] | 6 | - |
| Denmark | 8 | \ | 9 | 6 | - |
| Norway | 8 | \ | 9 | 6 | - |
| Spain | [| \ |] | 6 | - |

Supported Interface Keys

| ASCII | HEX | IBM AT/XT and PS/2 Compatibles, WYSE PC/AT Supported Keys | Apple Mac/iMac Supported Keys |
|-------|-----|---|-------------------------------|
| NUL | 00 | Reserved | Reserved |
| SOH | 01 | Enter (KP) | Enter/Numpad Enter |
| STX | 02 | Cap Lock | CAPS |
| ETX | 03 | ALT make | ALT make |
| EOT | 04 | ALT break | ALT break |
| ENQ | 05 | CTRL make | CNTRL make |
| ACK | 06 | CTRL break | CNTRL break |
| BEL | 07 | CR/Enter | RETURN |
| BS | 08 | Reserved | APPLE make |
| HT | 09 | Tab | TAB |
| LF | 0A | Reserved | APPLE break |
| VT | 0B | Tab | TAB |
| FF | 0C | Delete | Del |

| ASCII | HEX | IBM AT/XT and PS/2 Compatibles, WYSE PC/AT Supported Keys | Apple Mac/iMac Supported Keys |
|--------------|------------|--|--|
| CR | 0D | CR/Enter | RETURN |
| SO | 0E | Insert | Ins Help |
| SI | 0F | Escape | ESC |
| DLE | 10 | F11 | F11 |
| DC1 | 11 | Home | Home |
| DC2 | 12 | Print | Prnt Scrn |
| DC3 | 13 | Back Space | BACKSPACE |
| DC4 | 14 | Back Tab | LSHIFT TAB |
| NAK | 15 | F12 | F12 |
| SYN | 16 | F1 | F1 |
| ETB | 17 | F2 | F2 |
| CAN | 18 | F3 | F3 |
| EM | 19 | F4 | F4 |
| SUB | 1A | F5 | F5 |
| ESC | 1B | F6 | F6 |
| FS | 1C | F7 | F7 |
| GS | 1D | F8 | F8 |
| RS | 1E | F9 | F9 |
| US | 1F | F10 | F10 |
| DEL | 7F | | BACKSPACE |



To Add a Test Code I.D. Prefix to All Symbologies

This selection allows you to turn on transmission of a Code I.D. before the decoded symbology. (See the [Symbology Charts](#), beginning on page A-1) for the single character code that identifies each symbology.) This action first clears all current prefixes, then programs a Code I.D. prefix for all symbologies. This is a temporary setting that will be removed when the unit is power cycled.



PRECA2,BK2995C80!

**Add Code I.D. Prefix to
All Symbologies (Temporary)**

Show Software Revision

Scan the bar code below to output the current software revision, unit serial number, and other product information for the engine.



REVINF.

Show Revision

Show Data Format

Scan the bar code below to show current data format settings.



DFMBK3?.

Data Format Settings

Test Menu

When you scan the Test Menu **On** code, then scan a programming code in this manual, the engine displays the content of a programming code. The programming function will still occur, but in addition, the content of that programming code is output to the terminal.

Note: This feature should not be used during normal engine operation.



TSTMNU1.

On



TSTMNU0.

*** Off**

EZConfig-Scanning Introduction

EZConfig-Scanning provides a wide range of PC-based programming functions that can be performed on an engine connected to your PC's COM port. EZConfig-Scanning allows you to download upgrades to the engine's firmware, change programmed parameters, and create and print programming bar codes. Using EZConfig-Scanning, you can even save/open the programming parameters for an engine. This saved file can be e-mailed or, if required, you can create a single bar code that contains all the customized programming parameters and mail or fax that bar code to any location. Users in other locations can scan the bar code to load in the customized programming.

To communicate with an engine, EZConfig-Scanning requires that the PC have at least one available serial communication port, or a serial port emulation using a physical USB port. If you are using the serial port and RS232 cable, an external power supply is required. When using a USB serial port emulation, only a USB cable is required.

EZConfig-Scanning Operations

The EZConfig-Scanning software performs the following operations:

Scan Data

Scan Data allows you to scan bar codes and display the bar code data in a window. Scan Data lets you send serial commands to the engine and receive engine response that can be seen in the Scan Data window. The data displayed in the Scan Data window can either be saved in a file or printed.

Configure

Configure displays the programming and configuration data of the engine. The engine's programming and configuration data is grouped into different categories. Each category is displayed as a tree item

under the “Configure” tree node in the application explorer. When one of these tree nodes is clicked, the right-hand side is loaded with the parameters' form belonging to that particular category. The Configure tree option has all the programming and configuration parameters specified for an engine. You can set or modify these parameters as required. You can later write the modified settings to the engine, or save them to a dcf file.

Installing EZConfig-Scanning from the Web

Note: EZConfig-Scanning requires .NET framework. If .NET is not installed on your PC, you will be prompted to install it during the EZConfig-Scanning installation.

1. Access the Honeywell web site at www.honeywellaidc.com
2. Click on the **Downloads** tab. Select **Software**.
3. Click on the dropdown for **Select Product Number** and select the number of your product.
4. Click on the listing for **EZConfig-Scanning**.
5. Follow the security directions as prompted on the screen.
6. When prompted, select **Save**, and save the file to the **c:\windows\temp** directory.
7. Once you have finished downloading the file, exit the web site.
8. Using Explorer, go to the **c:\windows\temp** file.
9. Double click on the **EZConfig-Scanning Setup.exe** file. Follow the screen prompts to install the EZConfig-Scanning program.
10. If you've selected the defaults during installation, you can click on **Start Menu-All Programs-Honeywell-EZConfig-Scanning**.



Serial Programming Commands

The serial programming commands can be used in place of the programming bar codes. Both the serial commands and the programming bar codes will program the engine. For complete descriptions and examples of each serial programming command, refer to the corresponding programming bar code in this manual.

The device must be set to an RS232 interface (see [page 2-1](#)). The following commands can be sent via a PC COM port using terminal emulation software.

Conventions

The following conventions are used for menu and query command descriptions:

parameter A label representing the actual value you should send as part of a command.

[*option*] An optional part of a command.

{*Data*} Alternatives in a command.

bold Names of menus, menu commands, buttons, dialog boxes, and windows that appear on the screen.

Menu Command Syntax

Menu commands have the following syntax (spaces have been used for clarity only):

Prefix Tag SubTag {Data} [, SubTag {Data}] [: Tag SubTag {Data}] [...] *Storage*

Prefix Three ASCII characters: **SYN M CR** (ASCII 22,77,13).

Tag A 3 character case-insensitive field that identifies the desired menu command group. For example, all RS232 configuration settings are identified with a Tag of **232**.

SubTag A 3 character case-insensitive field that identifies the desired menu command within the tag group. For example, the SubTag for the RS232 baud rate is **BAD**.

Data The new value for a menu setting, identified by the Tag and SubTag.

Storage A single character that specifies the storage table to which the command is applied. An exclamation point (!) performs the command's operation on the device's volatile menu configuration table. A period (.) performs the command's operation on the device's non-volatile menu configuration table. Use the non-volatile table only for semi-permanent changes you want saved through a power cycle.

Query Commands

Several special characters can be used to query the device about its settings.

^ What is the default value for the setting(s).

-
- ? What is the device's current value for the setting(s).
 - * What is the range of possible values for the setting(s). (The device's response uses a dash (-) to indicate a continuous range of values. A pipe (|) separates items in a list of non-continuous values.)

Tag Field Usage

When a query is used in place of a Tag field, the query applies to the *entire* set of commands available for the particular storage table indicated by the Storage field of the command. In this case, the SubTag and Data fields should not be used because they are ignored by the device.

SubTag Field Usage

When a query is used in place of a SubTag field, the query applies only to the subset of commands available that match the Tag field. In this case, the Data field should not be used because it is ignored by the device.

Data Field Usage

When a query is used in place of the Data field, the query applies only to the specific command identified by the Tag and SubTag fields.

Concatenation of Multiple Commands

Multiple commands can be issued within one Prefix/Storage sequence. Only the Tag, SubTag, and Data fields must be repeated for each command in the sequence. If additional commands are to be applied to the same Tag, then the new command sequence is separated with a comma (,) and only the SubTag and Data fields of the additional command are issued. If the additional command requires a different Tag field, the command is separated from previous commands by a semicolon (;).

Responses

The device responds to serial commands with one of three responses:

ACK Indicates a good command which has been processed.

ENQ Indicates an invalid Tag or SubTag command.

NAK Indicates the command was good, but the Data field entry was out of the allowable range for this Tag and SubTag combination, e.g., an entry for a minimum message length of 100 when the field will only accept 2 characters.

When responding, the device echoes back the command sequence with the status character inserted directly before each of the punctuation marks (the period, exclamation point, comma, or semicolon) in the command.

Examples of Query Commands

In the following examples, a bracketed notation [] depicts a non-displayable response.

Example: What is the range of possible values for Codabar Coding Enable?

Enter: **cbrena*.**

Response: **CBRENA0-1[ACK]**

This response indicates that Codabar Coding Enable (CBRENA) has a range of values from 0 to 1 (off and on).

Example: What is the default value for Codabar Coding Enable?

Enter: **cbrena^.**

Response: **CBRENA1[ACK]**

This response indicates that the default setting for Codabar Coding Enable (CBRENA) is 1, or on.

Example: What is the device's current setting for Codabar Coding Enable?

Enter: **cbrena?.**

Response: **CBRENA1[ACK]**

This response indicates that the device's Codabar Coding Enable (CBRENA) is set to 1, or on.

Example: What are the device's settings for all Codabar selections?

Enter: **cbr?.**

Response: **CBRENA1[ACK],**
SSX0[ACK],
CK20[ACK],
CCT1[ACK],
MIN2[ACK],
MAX60[ACK],
DFT[ACK].

This response indicates that the device's Codabar Coding Enable (CBRENA) is set to 1, or on;
the Start/Stop Character (SSX) is set to 0, or Don't Transmit;
the Check Character (CK2) is set to 0, or Not Required;
concatenation (CCT) is set to 1, or Enabled;
the Minimum Message Length (MIN) is set to 2 characters;
the Maximum Message Length (MAX) is set to 60 characters;
and the Default setting (DFT) has no value.

Serial Trigger Commands

You can activate and deactivate the engine with serial trigger commands. The button is activated and deactivated by sending the following commands:

Activate: **SYN T CR**

Deactivate: **SYN U CR**

The engine scans until a bar code has been read or until the deactivate command is sent. The engine can also be set to turn itself off after a specified time has elapsed (see [Read Time-Out](#), which follows).

Read Time-Out

Use this selection to set a time-out (in milliseconds) of the engine's external trigger when using serial commands to trigger the engine. Once the engine has timed out, you can activate the engine either by the external trigger or using a serial trigger command. After scanning the **Read Time-Out** bar code, set the time-out duration (from 0-300,000 milliseconds) by scanning digits on the [Programming Chart](#) inside the back cover, then scanning **Save**. *Default = 30,000 ms.*



TRGSTO.
Read Time-Out

Resetting the Standard Product Defaults

If you aren't sure what programming options are in your engine, or you've changed some options and want the factory default settings restored, scan the **Standard Product Default Settings** bar code below.



DEFAULT.
Standard Product Default Settings

The charts on the following pages list the factory default settings for each of the commands (indicated by an asterisk (*) on the programming pages).

Menu Commands

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|----------------------------------|---|--|------|
| Product Default Settings | | | |
| Setting Custom Defaults | Set Custom Defaults | MNUCDF | 1-4 |
| | Save Custom Defaults | DEFAULT | 1-4 |
| Resetting the Custom Defaults | Activate Custom Defaults | DEFAULT | 1-4 |
| Resetting the Factory Defaults | Remove Custom Defaults | DEFOVR | 1-5 |
| | Activate Defaults | DEFAULT | 1-5 |
| Programming the Interface | | | |
| Plug and Play Codes | RS232 Serial Port | PAP232 | 2-1 |
| OPOS Mode | OPOS Mode | PAPOPS | 2-2 |
| Plug and Play Codes: IBM SurePos | USB IBM SurePos Handheld | PAPSPH | 2-2 |
| | USB IBM SurePos Tabletop | PAPSPT | 2-2 |
| IBM Secondary Interface | * Enable Secondary Interface | REMIFC1 | 2-3 |
| | Disable Secondary Interface | REMIFC0 | 2-3 |
| Plug and Play Codes: USB | USB Keyboard (PC) | PAP124 | 2-3 |
| | USB Keyboard (Mac) | PAP125 | 2-3 |
| | USB Japanese Keyboard (PC) | PAP134 | 2-3 |
| | USB HID | PAP131 | 2-4 |
| HID Fallback Mode | HID Fallback Mode (Range 0-60 *5 minutes) | USBFTO | 2-4 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|---------------------|---|---|-------------|
| USB Serial Commands | USB Serial Emulation for Windows XP, Windows Server 2003, and later | PAP130 | 2-5 |
| | USB Serial Emulation for Windows 2000 | REMIFCO;PAP130 | 2-5 |
| | CTS/RTS Emulation On | USBCTS1 | 2-5 |
| | CTS/RTS Emulation Off* | USBCTS0 | 2-5 |
| | ACK/NAK Mode On | USBACK1 | 2-6 |
| | ACK/NAK Mode Off* | USBACK0 | 2-6 |
| | Communication Timeout (Range 0-65535) *2000 ms | 232DLK##### | 2-6 |
| | Timeout Retries | HSTRTY | 2-6 |
| | Communication Timeout Beeper - Off | HSTTOA0 | 2-7 |
| | *Communication Timeout Beeper - On | HSTTOA1 | 2-7 |
| | NAK Retries (Range 0-255) *0 | HSTRTN### | 2-7 |
| | BEL/CAN Mode On | BELCAN1 | 2-7 |
| | BEL/CAN Mode Off* | BELCAN0 | 2-7 |
| Plug and Play Codes | Verifone Ruby Terminal | PAPRBY | 2-8 |
| | Gilbarco Terminal | PAPGLB | 2-8 |
| | Wincor Nixdorf Terminal | PAPWNX | 2-9 |
| | Wincor Nixdorf Beetle | PAPBTL | 2-9 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|---------------------------------|--|---|----------------------|
| Program Keyboard Country | *U.S.A. | KBDCTY0 | 2-10 |
| | Arabic | KBDCTY91 | 2-10 |
| | Belgium | KBDCTY1 | 2-10 |
| | Chinese | KBDCTY92 | 2-10 |
| | Finland | KBDCTY2 | 2-10 |
| | France | KBDCTY3 | 2-10 |
| | Germany | KBDCTY4 | 2-10 |
| | Hungary | KBDCTY19 | 2-10 |
| | IBM Financial | KBDCTY90 | 2-10 |
| | Italy | KBDCTY5 | 2-10 |
| | Japan ASCII | KBDCTY28 | 2-10 |
| | Korea | KBDCTY93 | 2-10 |
| | Russia | KBDCTY26 | 2-11 |
| | Slovenia | KBDCTY31 | 2-11 |
| | Spain | KBDCTY10 | 2-11 |
| | Switzerland (German) | KBDCTY6 | 2-11 |
| | Thailand | KBDCTY94 | 2-11 |
| | Turkey Q | KBDCTY24 | 2-11 |
| United Kingdom | KBDCTY7 | 2-11 | |
| Vietnam | KBDCTY95 | 2-11 | |
| Keyboard Wedge Modifiers | | | |
| ALT Mode | *Off | KBDALT0 | 2-12 |
| | 3 Characters | KBDALT6 | 2-12 |
| | 4 Characters | KBDALT7 | 2-12 |
| Keyboard Style | *Regular | KBDSTY0 | 2-12 |
| | Caps Lock | KBDSTY1 | 2-12 |
| | Shift Lock | KBDSTY2 | 2-13 |
| | Autocaps via NumLock | KBDSTY7 | 2-13 |
| | Emulate External Keyboard | KBDSTY5 | 2-13 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|-------------------------|--|---|----------------------|
| Keyboard Conversion | *Keyboard Conversion Off | KBDCNV0 | 2-14 |
| | Convert all Characters to Upper Case | KBDCNV1 | 2-14 |
| | Convert all Characters to Lower Case | KBDCNV1 | 2-14 |
| Keyboard Modifiers | *Control + ASCII Off | KBDCAS0 | 2-15 |
| | DOS Mode Control + ASCII | KBDCAS1 | 2-15 |
| | Windows Mode Control + ASCII | KBDCAS2 | 2-15 |
| | Windows Mode Prefix/Suffix Off | KBDCAS3 | 2-15 |
| | *Numeric Keypad Off | KBDNPS0 | 2-15 |
| | Numeric Keypad On | KBDNPS1 | 2-15 |
| RS-232 Modifiers | | | |
| RS232 Baud Rate | 300 BPS | 232BAD0 | 2-16 |
| | 600 BPS | 232BAD1 | 2-16 |
| | 1200 BPS | 232BAD2 | 2-16 |
| | 2400 BPS | 232BAD3 | 2-16 |
| | 4800 BPS | 232BAD4 | 2-16 |
| | *9600 BPS | 232BAD5 | 2-16 |
| | 19200 BPS | 232BAD6 | 2-16 |
| | 38400 BPS | 232BAD7 | 2-16 |
| | 57600 BPS | 232BAD8 | 2-16 |
| | 115200 BPS | 232BAD9 | 2-16 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|---|--|---|----------------------|
| Word Length: Data Bits, Stop Bits, and Parity | 7 Data, 1 Stop, Parity Even | 232WRD3 | 2-17 |
| | 7 Data, 1 Stop, Parity None | 232WRD0 | 2-17 |
| | 7 Data, 1 Stop, Parity Odd | 232WRD6 | 2-17 |
| | 7 Data, 2 Stop, Parity Even | 232WRD4 | 2-17 |
| | 7 Data, 2 Stop, Parity None | 232WRD1 | 2-17 |
| | 7 Data, 2 Stop, Parity Odd | 232WRD7 | 2-17 |
| | 8 Data, 1 Stop, Parity Even | 232WRD5 | 2-17 |
| | *8 Data, 1 Stop, Parity None | 232WRD2 | 2-17 |
| | 8 Data, 1 Stop, Parity Odd | 232WRD8 | 2-17 |
| | 7 Data, 1 Stop, Parity Space | 232WRD9 | 2-17 |
| | 7 Data, 2 Stop, Parity Space | 232WRD10 | 2-18 |
| | 8 Data, 1 Stop, Parity Space | 232WRD11 | 2-18 |
| | 7 Data, 1 Stop, Parity Mark | 232WRD12 | 2-18 |
| | 7 Data, 2 Stop, Parity Mark | 232WRD13 | 2-18 |
| | 8 Data, 1 Stop, Parity Mark | 232WRD14 | 2-18 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|-------------------|---|---|----------------------|
| RS232 Handshaking | *RTS/CTS Off, RTS Active | 232CTS0 | 2-19 |
| | Flow Control, No Timeout | 232CTS1 | 2-19 |
| | Character-Based Flow Control, No Timeout | 232CTS7 | 2-19 |
| | Two-Direction Flow Control | 232CTS2 | 2-19 |
| | Flow Control with Timeout | 232CTS3 | 2-19 |
| | Character-Based Flow Control with Timeout | 232CTS9 | 2-19 |
| | RTS/CTS Off, RTS Inactive | 232CTS10 | 2-19 |
| | RS232 Timeout (Range 1-5100) *1000 ms | 232DEL#### | 2-19 |
| | *XON/XOFF Off | 232XON0 | 2-20 |
| | XON/XOFF On | 232XON1 | 2-20 |
| | *ACK/NAK Off | 232ACK0 | 2-20 |
| | ACK/NAK On | 232ACK1 | 2-20 |
| | Communication Timeout (Range 1-65535) *2000 ms | 232DLK##### | 2-20 |
| | Communication Timeout Beeper - Off | HSTTOA0 | 2-21 |
| | *Communication Timeout Beeper - On | HSTTOA1 | 2-21 |
| | BEL/CAN Mode On | BELCAN1 | 2-22 |
| *BEL/CAN Mode Off | BELCAN0 | 2-22 | |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|---------------------------------------|--|---|-------------|
| RS232 Defaults | Reset RS232 Defaults | 232DFT | 2-22 |
| <i>Input/Output Selections</i> | | | |
| Power Up Beeper | Power Up Beeper Off - Engine | BEP PWR0 | 3-1 |
| | *Power Up Beeper On - Engine | BEP PWR1 | 3-1 |
| Beep on BEL Character | Beep on BEL On | BELBEP1 | 3-1 |
| | *Beep on BEL Off | BELBEP0 | 3-1 |
| Beeper - Good Read | Off | BEPBEP0 | 3-2 |
| | *On | BEPBEP1 | 3-2 |
| Beeper Pitch - Good Read (Frequency) | Low (1600 Hz) | BEPFQ11600 | 3-2 |
| | *Medium (2350 Hz) | BEPFQ12350 | 3-2 |
| | High (4200 Hz) | BEPFQ14200 | 3-2 |
| Beeper - Transmit Order | *Before Transmission | BEPWHN1 | 3-3 |
| | After Transmission | BEPWHN2 | 3-3 |
| Beeper Pitch - Error (Frequency) | *Razz (100 Hz) | BEPFQ2100 | 3-3 |
| | Medium (2000 Hz) | BEPFQ22000 | 3-3 |
| | High (4200 Hz) | BEPFQ24200 | 3-3 |
| Beeper Duration - Good Read | *Normal Beep | BEPBIP0 | 3-3 |
| | Short Beep | BEPBIP1 | 3-3 |
| Number of Beeps - Good Read | Range 1 - 9 (*1) | BEP RPT# | 3-4 |
| Number of Beeps - Error | Range 1 - 9 (*1) | BEPERR# | 3-4 |
| LED Settings | LED Off | LEDFN10 | 3-5 |
| | *LED On with Good Scan | LEDFN11 | 3-5 |
| | LED On with Laser | LEDFN12 | 3-5 |
| | LED On when CodeGate Disabled | LEDFN14 | 3-5 |
| | LED On with CTS | LEDFN1128 | 3-5 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|---------------------|--|---|-------------|
| Activation Settings | Activation Defaults | AOSDFT | 3-5 |
| | Presentation Mode | PAPPM1 | 3-6 |
| | Presentation Mode with CodeGate | PAPPM2 | 3-6 |
| | Manual Activation Mode Off | AOSMEN0 | 3-6 |
| | *Manual Activation Mode On | AOSMEN1 | 3-6 |
| | Do Not End Manual Activation After Good Read | AOSMGD0 | 3-7 |
| | *End Manual Activation After Good Read | AOSMGD1 | 3-7 |
| | Laser Timeout - External Trigger Hold (Range 1 - 65525) *5000 ms | AOSMPT##### | 3-7 |
| | Laser Timeout - External Trigger Hold (Range 1 - 65525) *0 ms | AOSMRT##### | 3-7 |
| | CodeGate Off | AOSCGD0 | 3-8 |
| | *CodeGate On | AOSCGD1 | 3-8 |
| | Object Detection Mode On | AOSOEN1 | 3-8 |
| | *Object Detection Mode Off | AOSOEN0 | 3-8 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|------------------------------------|--|---|-------------|
| Activation Settings (continued) | Do Not End Object Detection After Good Read | AOSOGD0 | 3-9 |
| | *End Object Detection After Good Read | AOSOGD1 | 3-9 |
| | Object Detection Laser Timeout (Range 1 - 65525) *5000 ms | AOSODT##### | 3-9 |
| | Object Detection Distance - Short | AOSRNG2 | 3-9 |
| | *Object Detection Distance - Long | AOSRNG1 | 3-9 |
| Character Activation Mode | *Off | HSTCEN0 | 3-10 |
| | On | HSTCEN1 | 3-10 |
| | Activation Character | HSTACH## | 3-10 |
| | Do Not End Character Activation After Good Read | HSTCGD0 | 3-11 |
| | *End Character Activation After Good Read | HSTCGD1 | 3-11 |
| | Character Activation Laser Timeout (Range 1 - 65525) *5000 ms | HSTCDT##### | 3-11 |
| Character Deactivation Mode | *Off | HSTDEN0 | 3-11 |
| | On | HSTDEN1 | 3-11 |
| | Deactivation Character | HSTDCH## | 3-12 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|-----------------------------|--|---|----------------------|
| Reread Delay | Short (500 ms) | DLYRRD500 | 3-12 |
| | *Medium (750 ms) | DLYRRD750 | 3-12 |
| | Long (1000 ms) | DLYRRD1000 | 3-12 |
| | Extra Long (2000 ms) | DLYRRD2000 | 3-12 |
| User-Specified Reread Delay | Range 0 - 30,000 ms | DLYRRD##### | 3-12 |
| Centering | Centering On | DECWIN1 | 3-13 |
| | *Centering Off | DECWIN0 | 3-13 |
| | Left of Centering Window (*40%) | DECLFT## | 3-13 |
| | Right of Centering Window (*60%) | DECRGT## | 3-13 |
| Blinky Mode | *Blinky Mode Off | BLKMOD0 | 3-13 |
| | Blinky Mode On | BLKMOD1 | 3-13 |
| | Blinky Always On/ Continuous | BLKMOD2 | 3-13 |
| Laser Scan Angle | 48° Scan Angle | LASANG0 | 3-14 |
| | 35° Scan Angle | LASANG1 | 3-14 |
| Decode Security | Low | PAPLS1 | 3-14 |
| | Low/Medium | PAPLS2 | 3-14 |
| | Medium/High | PAPLS3 | 3-14 |
| | High | PAPLS4 | 3-14 |
| Continuous Scan Mode | Continuous Scan Mode | PAPPM3 | 3-14 |
| Power Save Mode Timeout | Range 0-65535 seconds | PWRLPT##### | 3-15 |
| | *600 seconds | PWRLPT600 | 3-15 |
| Power Save Mode | *Off | PWRMOD0 | 3-15 |
| | Sleep Mode | PWRMOD1 | 3-15 |
| | Hibernate | PWRMOD2 | 3-15 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--|--|---|----------------------|
| Aimer Control | *Aimer Always Off | SCNAIT0;SCNDLY0 | 3-16 |
| | Aimer Always On | SCNAIT65535;SCNDLY0 | 3-16 |
| | Aimer Controlled by External Aiming Pin | SCNAIT65535;SCNDLY65535 | 3-16 |
| | Aimer on 100 milliseconds | SCNAIT0;SCNDLY100 | 3-16 |
| User-Specified Aimer Delays | Before Activation | SCNDLY##### | 3-16 |
| | After Activation | SCNAIT##### | 3-17 |
| Output Sequence Editor | Enter Sequence | SEQBLK | 3-20 |
| | Default Sequence | SEQDFT | 3-20 |
| Sequence Timeout | (Range 1 - 65535) *5000 ms | SEQDLY##### | 3-20 |
| Sequence Match Beeper | *On | SEQBEP1 | 3-20 |
| | Off | SEQBEP0 | 3-20 |
| Partial Sequence | Transmit Partial Sequence | SEQTTS1 | 3-21 |
| | *Discard Partial Sequence | SEQTTS0 | 3-21 |
| Require Output Sequence | Required | SEQ_EN2 | 3-21 |
| | On/Not Required | SEQ_EN1 | 3-21 |
| | *Off | SEQ_EN0 | 3-21 |
| No Read | On | SHWNRD1 | 3-22 |
| | *Off | SHWNRD0 | 3-22 |
| <i>Prefix/Suffix Selections</i> | | | |
| Add CR Suffix to All Symbologies | | VSUF CR | 4-3 |
| Prefix | Add Prefix | PREBK2## | 4-3 |
| | Clear One Prefix | PRECL2 | 4-3 |
| | Clear All Prefixes | PRECA2 | 4-3 |
| Suffix | Add Suffix | SUFBK2## | 4-4 |
| | Clear One Suffix | SUFCL2 | 4-4 |
| | Clear All Suffixes | SUFCA2 | 4-4 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--|--|---|-------------|
| Transmit Alternate Extended ASCII Characters | *Transmit Alternate Extended ASCII | KBDEXT0 | 4-4 |
| | Transmit Normal Extended ASCII | KBDEXT1 | 4-4 |
| Function Code Transmit | *Enable | RMVFNC0 | 4-6 |
| | Disable | RMVFNC1 | 4-6 |
| Communication Check Character | *None | HSTXRC0 | 4-6 |
| | LRC Starts on 1st Character | HSTXRC1 | 4-6 |
| | LRC Starts on 2nd Character | HSTXRC2 | 4-6 |
| | CRC | HSTXRC3 | 4-6 |
| Intercharacter Delay | Range 0 - 1000 (5ms increments) | DLYCHR## | 4-7 |
| User Specified Intercharacter Delay | Delay Length 0 - 1000 (5ms increments) | DLYCRX## | 4-8 |
| | Character to Trigger Delay | DLY_XX## | 4-8 |
| Interfunction Delay | Range 0 - 1000 (5ms increments) | DLYFNC## | 4-8 |
| Intermessage Delay | Range 0 - 1000 (5ms increments) | DLYMSG## | 4-9 |
| Data Formatter Selections | | | |
| Data Format Editor | *Default Data Format (None) | DFMDF3 | 5-1 |
| | Enter Data Format | DFMBK3## | 5-3 |
| | Clear One Data Format | DFMCL3 | 5-3 |
| | Clear All Data Formats | DFMCA3 | 5-3 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|----------------------------------|--|---|----------------------|
| Data Formatter | Data Formatter Off | DFM_EN0 | 5-15 |
| | *Data Formatter On, Not Required, Keep Prefix/Suffix | DFM_EN1 | 5-16 |
| | Data Format Required, Keep Prefix/Suffix | DFM_EN2 | 5-16 |
| | Data Formatter On, Not Required, Drop Prefix/Suffix | DFM_EN3 | 5-16 |
| | Data Format Required, Drop Prefix/Suffix | DFM_EN4 | 5-16 |
| Data Format Non-Match Error Tone | *Data Format Non-Match Error Tone On | DFMDEC0 | 5-17 |
| | Data Format Non-Match Error Tone Off | DFMDEC1 | 5-17 |
| Primary/Alternate Data Formats | Primary Data Format | ALTFNM0 | 5-17 |
| | Data Format 1 | ALTFNM1 | 5-17 |
| | Data Format 2 | ALTFNM2 | 5-17 |
| | Data Format 3 | ALTFNM3 | 5-17 |
| Single Scan Data Format Change | Single Scan-Primary Data Format | VSAF_0 | 5-18 |
| | Single Scan-Data Format 1 | VSAF_1 | 5-18 |
| | Single Scan-Data Format 2 | VSAF_2 | 5-18 |
| | Single Scan-Data Format 3 | VSAF_3 | 5-18 |
| Symbologies | | | |
| All Symbologies | All Symbologies Off | ALLENA0 | 6-1 |
| | All Symbologies On | ALLENA1 | 6-1 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--------------------------|--|---|-------------|
| Codabar | Default All Codabar Settings | CBRDFT | 6-3 |
| | Off | CBRENA0 | 6-3 |
| | *On | CBRENA1 | 6-3 |
| Codabar Start/Stop Char. | *Don't Transmit | CBRSSX0 | 6-3 |
| | Transmit | CBRSSX1 | 6-3 |
| Codabar Check Char. | *No Check Char. | CBRCK20 | 6-4 |
| | Validate Modulo 16, But Don't Transmit | CBRCK21 | 6-4 |
| | Validate Modulo 16, and Transmit | CBRCK22 | 6-4 |
| | Validate Modulo 7 CD, But Don't Transmit | CBRCK23 | 6-4 |
| | Validate Modulo 7 CD, and Transmit | CBRCK24 | 6-4 |
| | Validate CLSI, But Don't Transmit | CBRCK25 | 6-4 |
| | Validate CLSI, and Transmit | CBRCK26 | 6-4 |
| Codabar Concatenation | *Off | CBRCCT0 | 6-5 |
| | On | CBRCCT1 | 6-5 |
| | Require | CBRCCT2 | 6-5 |
| | Concatenation Timeout | DLYCCT | 6-5 |
| Codabar Redundancy | Range (0 - 10) *0 | CBRVOT## | 6-5 |
| Codabar Message Length | Minimum (1 - 80) *3 | CBRMIN## | 6-6 |
| | Maximum (1 - 80) *80 | CBRMAX## | 6-6 |
| Code 39 | Default All Code 39 Settings | C39DFT | 6-6 |
| | Off | C39ENA0 | 6-6 |
| | *On | C39ENA1 | 6-6 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--------------------------------|--|---|-------------|
| Code 39 Start/Stop Char. | *Don't Transmit | C39SSX0 | 6-7 |
| | Transmit | C39SSX1 | 6-7 |
| Code 39 Check Char. | *No Check Char. | C39CK20 | 6-7 |
| | Validate, But Don't Transmit | C39CK21 | 6-7 |
| | Validate, and Transmit | C39CK22 | 6-7 |
| Code 39 Redundancy | Range (0 - 10) *0 | C39VOT## | 6-8 |
| Code 39 Message Length | Minimum (1 - 80) *3 | C39MIN## | 6-8 |
| | Maximum (1 - 80) *80 | C39MAX## | 6-8 |
| Code 32 Pharmaceutical (PARAF) | *Off | C39B320 | 6-8 |
| | On | C39B321 | 6-8 |
| Code 39 Full ASCII | *Off | C39ASC0 | 6-9 |
| | On | C39ASC1 | 6-9 |
| Interleaved 2 of 5 | Default All Interleaved 2 of 5 Settings | I25DFT | 6-10 |
| | Off | I25ENA0 | 6-10 |
| | *On | I25ENA1 | 6-10 |
| Follett Formatting | *Off | I25FOL0 | 6-10 |
| | On | I25FOL1 | 6-10 |
| NULL Characters | *Off | I25NUL0 | 6-10 |
| | On | I25NUL1 | 6-10 |
| Interleaved 2 of 5 Check Digit | *No Check Char. | I25CK20 | 6-11 |
| | Validate, But Don't Transmit | I25CK21 | 6-11 |
| | Validate, and Transmit | I25CK22 | 6-11 |
| Interleaved 2 of 5 Redundancy | Range (0 - 10) *0 | I25VOT## | 6-11 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|---------------------------------------|---|---|----------------------|
| Interleaved 2 of 5 Message Length | Minimum (1 - 80) *6 | I25MIN## | 6-12 |
| | Maximum (1 - 80) *80 | I25MAX## | 6-12 |
| NEC 2 of 5 | Default All NEC 2 of 5 Settings | N25DFT | 6-12 |
| | *Off | N25ENA0 | 6-12 |
| | On | N25ENA1 | 6-12 |
| NEC 2 of 5 Check Digit | *No Check Char. | N25CK20 | 6-13 |
| | Validate, But Don't Transmit | N25CK21 | 6-13 |
| | Validate, and Transmit | N25CK22 | 6-13 |
| NEC 2 of 5 Redundancy | Range (0 - 10) *0 | N25VOT## | 6-13 |
| NEC 2 of 5 Message Length | Minimum (1 - 80) *3 | N25MIN## | 6-13 |
| | Maximum (1 - 80) *80 | N25MAX## | 6-13 |
| Code 93 | Default All Code 93 Settings | C93DFT | 6-14 |
| | Off | C93ENA0 | 6-14 |
| | *On | C93ENA1 | 6-15 |
| Code 93 Redundancy | Range (0 - 10) *0 | C93VOT## | 6-14 |
| Code 93 Message Length | Minimum (1 - 80) *3 | C93MIN## | 6-15 |
| | Maximum (1 - 80) *80 | C93MAX## | 6-15 |
| Straight 2 of 5 Industrial | Default All Straight 2 of 5 Industrial Settings | R25DFT | 6-15 |
| | *Off | R25ENA0 | 6-15 |
| | On | R25ENA1 | 6-15 |
| Straight 2 of 5 Industrial Redundancy | Range (0 - 10) *0 | R25VOT## | 6-16 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|---|--|---|-------------|
| Straight 2 of 5 Industrial Message Length | Minimum (1 - 80) *3 | R25MIN## | 6-16 |
| | Maximum (1 - 80) *80 | R25MAX## | 6-16 |
| Straight 2 of 5 IATA | Default All Straight 2 of 5 IATA Settings | A25DFT | 6-17 |
| Straight 2 of 5 IATA | *Off | A25ENA0 | 6-17 |
| | On | A25ENA1 | 6-17 |
| Straight 2 of 5 IATA Redundancy | Range (0 - 10) *0 | A25VOT## | 6-17 |
| Straight 2 of 5 IATA Message Length | Minimum (1 - 80) *13 | A25MIN## | 6-18 |
| | Maximum (1 - 80) *15 | A25MAX## | 6-18 |
| Matrix 2 of 5 | Default All Matrix 2 of 5 Settings | X25DFT | 6-18 |
| | *Off | X25ENA0 | 6-18 |
| | On | X25ENA1 | 6-18 |
| Matrix 2 of 5 Redundancy | Range (0 - 10) *0 | X25VOT## | 6-19 |
| Matrix 2 of 5 Message Length | Minimum (1 - 80) *3 | X25MIN## | 6-19 |
| | Maximum (1 - 80) *80 | X25MAX## | 6-19 |
| Matrix 2 of 5 Check Char. | *No Check Char. | X25CK20 | 6-19 |
| | Validate, But Don't Transmit | X25CK21 | 6-19 |
| | Validate and Transmit | X25CK22 | 6-19 |
| Code 11 | Default All Code 11 Settings | C11DFT | 6-20 |
| | *Off | C11ENA0 | 6-20 |
| | On | C11ENA1 | 6-20 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|-------------------------------|--|---|----------------------|
| Code 11 Check Digits Required | 1 Check Digit Required | C11CK20 | 6-20 |
| | *2 Check Digits Required | C11CK21 | 6-20 |
| | Auto Select Check Digits Required | C11CK22 | 6-20 |
| Check Digit Validation | Validate and Transmit One Check Digit | C11CK23 | 6-21 |
| | Validate and Transmit Two Check Digits | C11CK24 | 6-21 |
| | Validate and Transmit Auto Select Check Digits | C11CK25 | 6-21 |
| Code 11 Redundancy | Range (0 - 10) *0 | C11VOT## | 6-21 |
| Code 11 Message Length | Minimum (1 - 80) *3 | C11MIN## | 6-22 |
| | Maximum (1 - 80) *80 | C11MAX## | 6-22 |
| Code 128 | Default All Code 128 Settings | 128DFT | 6-23 |
| | Off | 128ENA0 | 6-23 |
| | *On | 128ENA1 | 6-23 |
| 128 Group Separator Output | *Off | 128GSE0 | 6-23 |
| | On | 128GSE1 | 6-23 |
| Code 128 Redundancy | Range (0 - 10) *0 | 128VOT## | 6-24 |
| Code 128 Message Length | Minimum (1 - 80) *3 | 128MIN## | 6-24 |
| | Maximum (1 - 80) *80 | 128MAX## | 6-24 |
| ISBT 128 | *Off | ISBENA0 | 6-24 |
| | On | ISBENA1 | 6-24 |
| | Concatenation Timeout | DLYCCT | 6-25 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--|---|---|----------------------|
| ISBT128 Predefined Concatenation Sequences | * Donation ID Number (001) and ABO/RhD Blood Groups (002) | ISBPCS0 | 6-25 |
| | Donation ID Number (001) and Donor ID Number (019) | ISBPCS1 | 6-25 |
| | Donation ID Number (001) and Confidential Unit Exclusion Status | ISBPCS2 | 6-25 |
| | Product Code (003) and Expiration Date (Form 1) | ISBPCS3 | 6-25 |
| | Product Code (003) and Expiration Date (Form 2) | ISBPCS4 | 6-25 |
| | Product Code (003) and Expiration Date (Form 3) | ISBPCS5 | 6-25 |
| | Product Code (003) and Expiration Date (Form 4) | ISBPCS6 | 6-25 |
| ISBT 128 Predefined Concatenation Sequences On/Off | *Off | ISBPCE0 | 6-26 |
| | Allow Predefined Sequence | ISBPCE1 | 6-26 |
| | Require Predefined Sequence | ISBPCE2 | 6-26 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--|--|---|----------------------|
| ISBT 128 User-Defined Concatenation Sequences | 1st Left Identifier (0-255) *0 | ISBUL1## | 6-27 |
| | 2nd Left Identifier (0-255) *0 | ISBUL2## | 6-27 |
| | 1st Right Identifier (0-255) *0 | ISBUR1## | 6-27 |
| | 2nd Right Identifier (0-255) *0 | ISBUR2## | 6-27 |
| ISBT 128 User-Defined Concatenation Sequences On/Off | *Off | ISBUCE0 | 6-28 |
| | Allow User-Defined Sequence | ISBUCE1 | 6-28 |
| | Require User-Defined Sequence | ISBUCE2 | 6-28 |
| Content Verification | *Off | ISBXM00 | 6-28 |
| | On | ISBXM01 | 6-28 |
| Transmit Identifiers | Off | ISBXM10 | 6-29 |
| | *On | ISBXM11 | 6-29 |
| Flag Conversion | *Off | ISBXM20 | 6-29 |
| | On | ISBXM21 | 6-29 |
| GS1-128 | Default All GS1-128 Settings | GS1DFT | 6-30 |
| | *On | GS1ENA1 | 6-30 |
| | Off | GS1ENA0 | 6-30 |
| GS1-128 Application Identifier Parsing | *Off | GS1EMU0 | 6-30 |
| | Transmit Without Identifiers | GS1EMU1 | 6-30 |
| | Transmit With Identifiers | GS1EMU2 | 6-30 |
| GS1-128 Redundancy | Range (0 - 10) *0 | GS1VOT## | 6-31 |
| GS1-128 Message Length | Minimum (1 - 80) *3 | GS1MIN | 6-31 |
| | Maximum (0 - 80) *80 | GS1MAX | 6-31 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|-------------------------|--|---|-------------|
| Telepen | Default All Telepen Settings | TELDFT | 6-32 |
| | *Off | TELENA0 | 6-32 |
| | On | TELENA1 | 6-32 |
| Telepen Output | *AIM Telepen Output | TELOLD0 | 6-32 |
| | Original Telepen Output | TELOLD1 | 6-32 |
| Telepen Redundancy | Range (0 - 10) *0 | TELVOT## | 6-33 |
| Telepen Message Length | Minimum (1 - 80) *3 | TELMIN## | 6-33 |
| | Maximum (1 - 80) *80 | TELMAX## | 6-33 |
| UPC-A | Default All UPC-A Settings | UPADFT | 6-34 |
| | *On | UPBENA1 | 6-34 |
| | Off | UPBENA0 | 6-34 |
| Convert UPC-A to EAN-13 | Transmit UPC-A as EAN-13 | UPAENA0 | 6-34 |
| | *Transmit UPC-A asn UPC-A | UPAENA1 | 6-34 |
| UPC-A Number System | Off | UPANSX0 | 6-35 |
| | *On | UPANSX1 | 6-35 |
| UPC-A Check Digit | Off | UPACKX0 | 6-34 |
| | *On | UPACKX1 | 6-35 |
| UPC-A 2 Digit Addenda | *Off | UPAAD20 | 6-35 |
| | On | UPAAD21 | 6-35 |
| UPC-A 5 Digit Addenda | *Off | UPAAD50 | 6-35 |
| | On | UPAAD51 | 6-35 |
| UPC-A Addenda Required | *Not Required | UPAARQ0 | 6-36 |
| | Required | UPAARQ1 | 6-36 |
| Addenda Timeout | Range (0 - 65535) *100 | DLYADD##### | 6-36 |
| UPC-A Addenda Separator | *Off | UPAADS0 | 6-36 |
| | On | UPAADS1 | 6-36 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--|--|---|----------------------|
| UPC-A Redundancy | Range (0 - 10) *0 | UPAVOT## | 6-37 |
| UPC-A/EAN-13 with Extended Coupon Code | *Off | CPNENA0 | 6-37 |
| | Allow Concatenation | CPNENA1 | 6-37 |
| | Require Concatenation | CPNENA2 | 6-37 |
| UPC-A/Code 128 Coupon Code Output | * Multiple Code Output | CPNSTY0 | 6-38 |
| | Single Code Output | CPNSTY1 | 6-38 |
| UPC-A Number System 4 Addenda Required | * Don't Require Coupon Code | ARQSY40 | 6-38 |
| | Require Coupon Code | ARQSY41 | 6-38 |
| UPC-A Number System 5 Addenda Required | * Don't Require Coupon Code/ Addenda | ARQSY50 | 6-39 |
| | Require 2 Digit Addenda | ARQSY51 | 6-39 |
| | Require 5 Digit Addenda | ARQSY52 | 6-39 |
| | Require 2 or 5 Digit Addenda | ARQSY53 | 6-39 |
| | Require Coupon Code | ARQSY54 | 6-39 |
| | Require Coupon Code or 2 Digit Addenda | ARQSY55 | 6-39 |
| | Require Coupon Code or 5 Digit Addenda | ARQSY56 | 6-39 |
| | Require Coupon Code, 2 Digit Addenda, or 5 Digit Addenda | ARQSY57 | 6-39 |
| Addenda Timeout | Range (0 - 65535) *100 | DLYADD##### | 6-40 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--------------------------|--|---|-------------|
| UPC-E0 | Default All UPC-E Settings | UPEDFT | 6-40 |
| | Off | UPEEN00 | 6-40 |
| | *On | UPEEN01 | 6-40 |
| UPC-E0 Expand | *Off | UPEEXP0 | 6-40 |
| | On | UPEEXP1 | 6-40 |
| UPC-E0 Number System | *On | UPEEXN1 | 6-41 |
| | Off | UPEEXN0 | 6-41 |
| UPC-E0 Check Digit | *Off | UPECKX0 | 6-41 |
| | On | UPECKX1 | 6-41 |
| UPC-E0 Leading Zero | *Off | UPENSX0 | 6-42 |
| | On | UPENSX1 | 6-42 |
| UPC-E0 Addenda | 2 Digit Addenda On | UPEAD21 | 6-42 |
| | *2 Digit Addenda Off | UPEAD20 | 6-42 |
| | 5 Digit Addenda On | UPEAD51 | 6-42 |
| | *5 Digit Addenda Off | UPEAD50 | 6-42 |
| UPC-E0 Addenda Required | Required | UPEARQ1 | 6-42 |
| | *Not Required | UPEARQ0 | 6-42 |
| Addenda Timeout | Range (0 - 65535) *100 | DLYADD##### | 6-43 |
| UPC-E0 Addenda Separator | On | UPEADS1 | 6-43 |
| | *Off | UPEADS0 | 6-43 |
| UPC-E0 Redundancy | Range (0 - 10) *1 | UPEVOT## | 6-43 |
| EAN/JAN-13 | Default All EAN/JAN Settings | E13DFT | 6-44 |
| | Off | E13ENA0 | 6-44 |
| | *On | E13ENA1 | 6-44 |
| EAN/JAN-13 Check Digit | Off | E13CKX0 | 6-44 |
| | *On | E13CKX1 | 6-44 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--|--|---|-------------|
| EAN/JAN-13 2 Digit Addenda | 2 Digit Addenda On | E13AD21 | 6-45 |
| | *2 Digit Addenda Off | E13AD20 | 6-45 |
| | 5 Digit Addenda On | E13AD51 | 6-45 |
| | *5 Digit Addenda Off | E13AD50 | 6-45 |
| EAN/JAN-13 Addenda Required | *Not Required | E13ARQ0 | 6-45 |
| | Required | E13ARQ1 | 6-45 |
| EAN-13 Beginning with 2 Addenda Required | * Don't Require 2 Digit Addenda | ARQSY20 | 6-46 |
| | Require 2 Digit Addenda | ARQSY21 | 6-46 |
| EAN-13 Beginning with 290 Addenda Required | * Don't Require 5 Digit Addenda | ARQ2900 | 6-46 |
| | Require 5 Digit Addenda | ARQ2901 | 6-46 |
| EAN-13 Beginning with 378/379 Addenda Required | * Don't Require Addenda | ARQ3780 | 6-47 |
| | Require 2 Digit Addenda | ARQ3781 | 6-47 |
| | Require 5 Digit Addenda | ARQ3782 | 6-47 |
| | Require 2 or 5 Digit Addenda | ARQ3783 | 6-47 |
| EAN-13 Beginning with 414/419 Addenda Required | * Don't Require Addenda | ARQ4140 | 6-48 |
| | Require 2 Digit Addenda | ARQ4141 | 6-48 |
| | Require 5 Digit Addenda | ARQ4142 | 6-48 |
| | Require 2 or 5 Digit Addenda | ARQ4143 | 6-48 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--|--|---|-------------|
| EAN-13 Beginning with 434/439 Addenda Required | * Don't Require Addenda | ARQ4340 | 6-49 |
| | Require 2 Digit Addenda | ARQ4341 | 6-49 |
| | Require 5 Digit Addenda | ARQ4342 | 6-49 |
| | Require 2 or 5 Digit Addenda | ARQ4343 | 6-49 |
| EAN-13 Beginning with 977 Addenda Required | * Don't Require 2 Digit Addenda | ARQ9770 | 6-49 |
| | Require 2 Digit Addenda | ARQ9771 | 6-49 |
| EAN-13 Beginning with 978 Addenda Required | * Don't Require 5 Digit Addenda | ARQ9780 | 6-50 |
| | Require 5 Digit Addenda | ARQ9781 | 6-50 |
| EAN-13 Beginning with 979 Addenda Required | * Don't Require 5 Digit Addenda | ARQ9790 | 6-50 |
| | Require 5 Digit Addenda | ARQ9791 | 6-50 |
| Addenda Timeout | Range (0 - 65535) *100 | DLYADD##### | 6-51 |
| EAN/JAN-13 Addenda Separator | *Off | E13ADS0 | 6-51 |
| | On | E13ADS1 | 6-52 |
| EAN/JAN-13 Redundancy | Range (0 - 10) *0 | E13VOT## | 6-51 |
| ISBN Translate | *Off | E13ISB0 | 6-52 |
| | On | E13ISB1 | 6-52 |
| | Convert to 13-Digit On | E13I131 | 6-52 |
| | *Convert to 13-Digit Off | E13I130 | 6-52 |
| | Reformat On | E13IBR1 | 6-52 |
| | *Reformat Off | E13IBR0 | 6-52 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--------------------------------|--|---|----------------------|
| ISSN Translate | *Off | E13ISS0 | 6-53 |
| | On | E13ISS1 | 6-53 |
| | Reformat On | E13ISR1 | 6-53 |
| | *Reformat Off | E13ISR0 | 6-53 |
| EAN/JAN-8 | Default All EAN/ JAN 8 Settings | EA8DFT | 6-54 |
| | Off | EA8ENA0 | 6-54 |
| | *On | EA8ENA1 | 6-54 |
| EAN/JAN-8 Check Digit | Off | EA8CKX0 | 6-54 |
| | *On | EA8CKX1 | 6-54 |
| EAN/JAN-8 Addenda | *2 Digit Addenda Off | EA8AD20 | 6-55 |
| | 2 Digit Addenda On | EA8AD21 | 6-55 |
| | *5 Digit Addenda Off | EA8AD50 | 6-55 |
| | 5 Digit Addenda On | EA8AD51 | 6-55 |
| EAN/JAN-8 Addenda Required | *Not Required | EA8ARQ0 | 6-55 |
| | Required | EA8ARQ1 | 6-55 |
| Addenda Timeout | Range (0 - 65535) *100 | DLYADD##### | 6-56 |
| EAN/JAN-8 Addenda Separator | *Off | EA8ADS0 | 6-56 |
| | On | EA8ADS1 | 6-56 |
| EAN/JAN-8 Redundancy | Range (0 - 10) *0 | EA8VOT## | 6-56 |
| MSI | Default All MSI Settings | MSIDFT | 6-57 |
| | *Off | MSIENA0 | 6-57 |
| | On | MSIENA1 | 6-57 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|-----------------------------|--|---|-------------|
| MSI Check Character | *Validate Type 10, but Don't Transmit | MSICLK0 | 6-58 |
| | Validate Type 10 and Transmit | MSICLK1 | 6-58 |
| | Validate 2 Type 10 Chars, but Don't Transmit | MSICLK2 | 6-58 |
| | Validate 2 Type 10 Chars and Transmit | MSICLK3 | 6-58 |
| | Disable MSI Check Characters | MSICLK6 | 6-58 |
| MSI Redundancy | Range (0 - 10) *0 | MSIVOT## | 6-58 |
| MSI Message Length | Minimum (1 - 80) *3 | MSIMIN## | 6-59 |
| | Maximum (1 - 80) *80 | MSIMAX## | 6-59 |
| Plessey Code | Default All Plessey Code Settings | PLSDFT | 6-59 |
| | Off | PLSENA0 | 6-59 |
| | *On | PLSENA1 | 6-59 |
| Plessey Check Char. | *No Check Char. | PLSCHK0 | 6-60 |
| | Validate, But Don't Transmit | PLSCHK1 | 6-60 |
| | Validate, and Transmit | PLSCHK2 | 6-60 |
| Plessey Redundancy | Range (0 - 10) *0 | PLSVOT## | 6-60 |
| Plessey Message Length | Minimum (1 - 80) *3 | PLSMIN## | 6-60 |
| | Maximum (1 - 80) *80 | PLSMAX## | 6-60 |
| GS1 DataBar Omnidirectional | Default All GS1 DataBar Omnidirectional Settings | RSSDFT | 6-61 |
| | Off | RSSENA0 | 6-61 |
| | *On | RSSENA1 | 6-61 |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|--|--|---|----------------------|
| GS1 DataBar Omnidirectional Redundancy | Range (0 - 10) *0 | RSSVOT## | 6-61 |
| GS1 DataBar Limited | Default All GS1 DataBar Limited Settings | RSLDFT | 6-62 |
| | Off | RSLENA0 | 6-62 |
| | *On | RSLENA1 | 6-62 |
| GS1 DataBar Limited Redundancy | Range (0 - 10) *0 | RSLVOT## | 6-62 |
| GS1 DataBar Expanded | Default All GS1 DataBar Expanded Settings | RSEDFT | 6-63 |
| | Off | RSEENA0 | 6-63 |
| | *On | RSEENA1 | 6-63 |
| GS1 DataBar Expanded Redundancy | Range (0 - 10) *0 | RSEVOT## | 6-63 |
| GS1 DataBar Expanded Msg. Length | Minimum (1 - 80) *3 | RSEMIN## | 6-64 |
| | Maximum (1 - 80) *80 | RSEMAX## | 6-64 |
| Trioptic Code | *Off | TRIENA0 | 6-64 |
| | On | TRIENA1 | 6-64 |
| Trioptic Code Redundancy | Range (0-10) *0 | TRIVOT## | 6-64 |
| GS1 Emulation | GS1-128 Emulation | EANEMU1 | 6-65 |
| | GS1 DataBar Emulation | EANEMU2 | 6-65 |
| | GS1 Code Expansion Off | EANEMU3 | 6-65 |
| | EAN8 to EAN13 Conversion | EANEMU4 | 6-65 |
| | *GS1 Emulation Off | EANEMU0 | 6-65 |
| Postal Codes | | | |

| Selection | Setting <i>* Indicates default</i> | Serial Command <i># Indicates a numeric entry</i> | Page |
|---|--|---|----------------------|
| China Post (Hong Kong 2 of 5) | Default All China Post (Hong Kong 2 of 5) Settings | CPCDFT | 6-66 |
| | *Off | CPCENA0 | 6-66 |
| | On | CPCENA1 | 6-66 |
| China Post (Hong Kong 2 of 5) Redundancy | Range (0 - 10) *0 | CPCVOT## | 6-66 |
| China Post (Hong Kong 2 of 5) Msg. Length | Minimum (1 - 80) *3 | CPCMIN## | 6-67 |
| | Maximum (1 - 80) *80 | CPCMAX## | 6-67 |
| <i>Serial Trigger Commands</i> | | | |
| Read Time-Out | 0 - 300,000 *30,000 ms | TRGSTO#### | 9-4 |



Repairs

Repairs and/or upgrades are not to be performed on this product. These services are to be performed only by an authorized service center (see [Customer Support](#) on page 11-1).

Maintenance

Your device provides reliable and efficient operation with a minimum of care. Although specific maintenance is not required, the following periodic checks ensure dependable operation:

Inspecting Cords and Connectors

Inspect the interface cable and connector for wear or other signs of damage. A badly worn cable or damaged connector may interfere with engine operation. Contact your distributor for information about cable replacement.

Troubleshooting

The engine automatically performs self-tests whenever you turn it on. If your engine is not functioning properly, review the following Troubleshooting Guide to try to isolate the problem.

Is the power on? Is the laser aimer on?

If the laser aimer isn't illuminated, check that:

- The cable is connected properly.
- The host system power is on (if external power isn't used).

Is the engine having trouble reading your symbols?

If the engine isn't reading symbols well, check that the symbols:

- Aren't smeared, rough, scratched, or exhibiting voids.
- Aren't coated with frost or water droplets on the surface.
- Are enabled in the engine or in the decoder to which the engine connects.

Is the bar code displayed but not entered?

The bar code is displayed on the host device correctly, but you still have to press a key to enter it (the Enter/Return key or the Tab key, for example).

- You need to program a suffix. Programming a suffix enables the engine to output the bar code data plus the key you need (such as "CR") to enter the data into your application. Refer to [Prefix/Suffix Overview](#) on page 4-1 for further information.

Does the engine read the bar code incorrectly?

If the engine reads a bar code, but the data is not displayed correctly on the host screen:

- The engine may not be programmed for the appropriate terminal interface.
For example, you scan “12345” and the host displays “@es%.”

Reprogram the engine with the correct Plug and Play bar code. See [Programming the Interface](#) beginning on page 2-1.

- The engine may not be programmed to output your bar code data properly.
For example, you scan “12345” and the host displays “A12345B.”

Reprogram the engine with the proper symbology selections. See [Chapter 6](#).

The engine won't read your bar code at all.

1. Scan the sample bar codes in the back of this manual. If the engine reads the sample bar codes, check that your bar code is readable. Verify that your bar code symbology is enabled (see [Chapter 6](#)).
2. If the engine still can't read the sample bar codes, scan [All Symbologies On](#), page 6-1.

If you aren't sure what programming options have been set in the engine, or if you want the factory default settings restored, refer to [Setting Custom Defaults](#) on page 1-4.

Technical Assistance

If you need assistance installing or troubleshooting your device, please contact us by using one of the methods below:

Knowledge Base: www.hsmknowledgebase.com

Our Knowledge Base provides thousands of immediate solutions. If the Knowledge Base cannot help, our Technical Support Portal (see below) provides an easy way to report your problem or ask your question.

Technical Support Portal: www.hsmsupportportal.com

The Technical Support Portal not only allows you to report your problem, but it also provides immediate solutions to your technical issues by searching our Knowledge Base. With the Portal, you can submit and track your questions online and send and receive attachments.

Web form: www.hsmcontactsupport.com

You can contact our technical support team directly by filling out our online support form. Enter your contact details and the description of the question/problem.

Telephone: www.honeywellaidc.com/locations

For our latest contact information, please check our website at the link above.

Product Service and Repair

Honeywell International Inc. provides service for all of its products through service centers throughout the world. To obtain warranty or non-warranty service, please visit www.honeywellaidc.com and select **Support > Contact Service and Repair** to see your region's instructions on how to obtain a Return Material Authorization number (RMA #). You should do this prior to returning the product.

Limited Warranty

Honeywell International Inc. ("HII") warrants its products to be free from defects in materials and workmanship and to conform to HII's published specifications applicable to the products purchased at the time of shipment. This warranty does not cover any HII product which is (i) improperly installed or used; (ii) damaged by accident or negligence, including failure to follow the proper maintenance, service, and cleaning schedule; or (iii) damaged as a result of (A) modification or alteration by the purchaser or other party, (B) excessive voltage or current supplied to or drawn from the interface connections, (C) static electricity or electro-static discharge, (D) operation under conditions beyond the specified operating parameters, or (E) repair or service of the product by anyone other than HII or its authorized representatives.

This warranty shall extend from the time of shipment for the duration published by HII for the product at the time of purchase ("Warranty Period"). Any defective product must be returned (at purchaser's expense) during the Warranty Period to HII factory or authorized service center for inspection. No product will be accepted by HII without a Return Materials Authorization, which may be obtained by contacting HII. In the event that the product is returned to HII or its authorized service center within the Warranty Period and HII determines to its satisfaction that the product is defective due to defects in materials or workmanship, HII, at its sole option, will either repair or replace the product without charge, except for return shipping to HII.

EXCEPT AS MAY BE OTHERWISE PROVIDED BY APPLICABLE LAW, THE FOREGOING WARRANTY IS IN LIEU OF ALL OTHER COVENANTS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, ORAL OR WRITTEN, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT.

HII'S RESPONSIBILITY AND PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT WITH NEW OR REFURBISHED PARTS. IN NO EVENT SHALL HII BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, AND, IN NO EVENT, SHALL ANY LIABILITY OF HII ARISING IN CONNECTION WITH ANY PRODUCT SOLD HEREUNDER (WHETHER SUCH LIABILITY ARISES FROM A CLAIM BASED ON CONTRACT, WARRANTY, TORT, OR OTHERWISE) EXCEED THE ACTUAL AMOUNT PAID TO HII FOR THE PRODUCT. THESE LIMITATIONS ON LIABILITY SHALL REMAIN IN FULL FORCE AND EFFECT EVEN WHEN HII MAY HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH INJURIES, LOSSES, OR DAMAGES. SOME STATES, PROVINCES, OR COUNTRIES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

All provisions of this Limited Warranty are separate and severable, which means that if any provision is held invalid and unenforceable, such determination shall not affect the validity of enforceability of the other provisions hereof. Use of any peripherals not provided by the manufacturer may result in damage not covered by this warranty. This includes but is not limited to: cables, power supplies, bases, and docking stations. HII extends these warranties only to the first end-users of the products. These warranties are non-transferable.

The duration of the limited warranty for the N431X engine is 15 months.

Symbology Charts

Note: “m” represents the AIM modifier character. Refer to International Technical Specification, Symbology Identifiers, for AIM modifier character details.

Prefix/Suffix entries for specific symbologies override the universal (All Symbologies, 99) entry.

Refer to [Data Editing](#) beginning on page 4-1 and [Data Formatting](#) beginning on page 5-1 for information about using Code ID and AIM ID.

Linear Symbologies

| Symbology | AIM | | Honeywell | |
|------------------------------------|-----|------------------------|-----------|-----|
| | ID | Possible modifiers (m) | ID | Hex |
| <i>All Symbologies</i> | | | | 99 |
| Codabar |]Fm | 0-1 | a | 61 |
| Code 11 |]H3 | | h | 68 |
| Code 128 |]Cm | 0, 1, 2, 4 | j | 6A |
| Code 32 Pharmaceutical (PARAF) |]X0 | | < | 3C |
| Code 39 (supports Full ASCII mode) |]Am | 0, 1, 3, 4, 5, 7 | b | 62 |
| TCIF Linked Code 39 (TLC39) |]L2 | | T | 54 |
| Code 93 and 93i |]Gm | 0-9, A-Z, a-m | i | 69 |
| EAN |]Em | 0, 1, 3, 4 | d | 64 |
| EAN-13 (including Bookland EAN) |]E0 | | d | 64 |
| EAN-13 with Add-On |]E3 | | d | 64 |
| EAN-13 with Extended Coupon Code |]E3 | | d | 64 |
| EAN-8 |]E4 | | D | 44 |
| EAN-8 with Add-On |]E3 | | D | 44 |

| Symbology | AIM | | Honeywell | |
|---------------------------------|-----|---------------------------------|-----------|-----|
| | ID | Possible modifiers (<i>m</i>) | ID | Hex |
| GS1 | | | | |
| GS1 DataBar |]em | 0 | y | 79 |
| GS1 DataBar Limited |]em | | { | 7B |
| GS1 DataBar Expanded |]em | | } | 7D |
| GS1-128 |]C1 | | l | 49 |
| 2 of 5 | | | | |
| China Post (Hong Kong 2 of 5) |]X0 | | Q | 51 |
| Interleaved 2 of 5 |]lm | 0, 1, 3 | e | 65 |
| Matrix 2 of 5 |]X0 | | m | 6D |
| NEC 2 of 5 |]X0 | | Y | 59 |
| Straight 2 of 5 IATA |]Rm | 0, 1, 3 | f | 66 |
| Straight 2 of 5 Industrial |]S0 | | f | 66 |
| MSI |]Mm | 0, 1 | g | 67 |
| Telepen |]Bm | | t | 74 |
| UPC | | 0, 1, 2, 3, 8, 9, A, B, C | | |
| UPC-A |]E0 | | c | 63 |
| UPC-A with Add-On |]E3 | | c | 63 |
| UPC-A with Extended Coupon Code |]E3 | | c | 63 |
| UPC-E |]E0 | | E | 45 |
| UPC-E with Add-On |]E3 | | E | 45 |
| UPC-E1 |]X0 | | E | 45 |

| | | | | |
|-----------------------|--|--|---|------|
| Add Honeywell Code ID | | | | 5C80 |
| Add AIM Code ID | | | | 5C81 |
| Add Backslash | | | | 5C5C |
| Batch mode quantity | | | 5 | 35 |

Postal Symbologies

| Symbology | AIM | | Honeywell | |
|---------------------------|-----|------------------------|-----------|-----|
| | ID | Possible modifiers (m) | ID | Hex |
| All Symbologies | | | | 99 |
| Australian Post |]X0 | | A | 41 |
| British Post |]X0 | | B | 42 |
| Canadian Post |]X0 | | C | 43 |
| China Post |]X0 | | Q | 51 |
| InfoMail |]X0 | | , | 2c |
| Intelligent Mail Bar Code |]X0 | | M | 4D |
| Japanese Post |]X0 | | J | 4A |
| KIX (Netherlands) Post |]X0 | | K | 4B |
| Korea Post |]X0 | | ? | 3F |
| Planet Code |]X0 | | L | 4C |
| Postal-4i |]X0 | | N | 4E |
| Postnet |]X0 | | P | 50 |

ASCII Conversion Chart

In keyboard applications, ASCII Control Characters can be represented in 3 different ways, as shown below. The CTRL+X function is OS and application dependent. The following table lists some commonly used Microsoft functionality. This table applies to U.S. style keyboards. Certain characters may differ depending on your Country Code/PC regional settings.

| Non-printable ASCII control characters | | | Keyboard Control + ASCII (CTRL+X) Mode | | |
|--|-----|------|--|--|-------------------|
| DEC | HEX | Char | Control + X Mode Off (KBDCAS0) | Windows Mode Control + X Mode On (KBDCAS2) | |
| | | | | CTRL + X | CTRL + X function |
| 0 | 00 | NUL | Reserved | CTRL+ @ | |
| 1 | 01 | SOH | NP Enter | CTRL+ A | Select all |
| 2 | 02 | STX | Caps Lock | CTRL+ B | Bold |
| 3 | 03 | ETX | ALT Make | CTRL+ C | Copy |

| Non-printable ASCII control characters | | | Keyboard Control + ASCII (CTRL+X) Mode | | |
|--|-----|------|--|--|-------------------|
| DEC | HEX | Char | Control + X Mode Off (KBDCAS0) | Windows Mode Control + X Mode On (KBDCAS2) | |
| | | | | CTRL + X | CTRL + X function |
| 4 | 04 | EOT | ALT Break | CTRL+ D | Bookmark |
| 5 | 05 | ENQ | CTRL Make | CTRL+ E | Center |
| 6 | 06 | ACK | CTRL Break | CTRL+ F | Find |
| 7 | 07 | BEL | Enter / Ret | CTRL+ G | |
| 8 | 08 | BS | <i>(Apple Make)</i> | CTRL+ H | History |
| 9 | 09 | HT | Tab | CTRL+ I | Italic |
| 10 | 0A | LF | <i>(Apple Break)</i> | CTRL+ J | Justify |
| 11 | 0B | VT | Tab | CTRL+ K | hyperlink |
| 12 | 0C | FF | Delete | CTRL+ L | list, left align |
| 13 | 0D | CR | Enter / Ret | CTRL+ M | |
| 14 | 0E | SO | Insert | CTRL+ N | New |
| 15 | 0F | SI | ESC | CTRL+ O | Open |
| 16 | 10 | DLE | F11 | CTRL+ P | Print |
| 17 | 11 | DC1 | Home | CTRL+ Q | Quit |
| 18 | 12 | DC2 | PrtScn | CTRL+ R | |
| 19 | 13 | DC3 | Backspace | CTRL+ S | Save |
| 20 | 14 | DC4 | Back Tab | CTRL+ T | |
| 21 | 15 | NAK | F12 | CTRL+ U | |
| 22 | 16 | SYN | F1 | CTRL+ V | Paste |
| 23 | 17 | ETB | F2 | CTRL+ W | |
| 24 | 18 | CAN | F3 | CTRL+ X | |
| 25 | 19 | EM | F4 | CTRL+ Y | |
| 26 | 1A | SUB | F5 | CTRL+ Z | |
| 27 | 1B | ESC | F6 | CTRL+ [| |
| 28 | 1C | FS | F7 | CTRL+ \ | |
| 29 | 1D | GS | F8 | CTRL+] | |
| 30 | 1E | RS | F9 | CTRL+ ^ | |
| 31 | 1F | US | F10 | CTRL+ - | |
| 127 | 7F | ␣ | NP Enter | | |

Lower ASCII Reference Table

| Printable Characters | | | | | | | | |
|----------------------|-----|-----------|-----|-----|-----------|-----|-----|-----------|
| DEC | HEX | Character | DEC | HEX | Character | DEC | HEX | Character |
| 32 | 20 | <SPACE> | 64 | 40 | @ | 96 | 60 | ` |
| 33 | 21 | ! | 65 | 41 | A | 97 | 61 | a |
| 34 | 22 | " | 66 | 42 | B | 98 | 62 | b |
| 35 | 23 | # | 67 | 43 | C | 99 | 63 | c |
| 36 | 24 | \$ | 68 | 44 | D | 100 | 64 | d |
| 37 | 25 | % | 69 | 45 | E | 101 | 65 | e |
| 38 | 26 | & | 70 | 46 | F | 102 | 66 | f |
| 39 | 27 | ' | 71 | 47 | G | 103 | 67 | g |
| 40 | 28 | (| 72 | 48 | H | 104 | 68 | h |
| 41 | 29 |) | 73 | 49 | I | 105 | 69 | i |
| 42 | 2A | * | 74 | 4A | J | 106 | 6A | j |
| 43 | 2B | + | 75 | 4B | K | 107 | 6B | k |
| 44 | 2C | , | 76 | 4C | L | 108 | 6C | l |
| 45 | 2D | - | 77 | 4D | M | 109 | 6D | m |
| 46 | 2E | . | 78 | 4E | N | 110 | 6E | n |
| 47 | 2F | / | 79 | 4F | O | 111 | 6F | o |
| 48 | 30 | 0 | 80 | 50 | P | 112 | 70 | p |
| 49 | 31 | 1 | 81 | 51 | Q | 113 | 71 | q |
| 50 | 32 | 2 | 82 | 52 | R | 114 | 72 | r |
| 51 | 33 | 3 | 83 | 53 | S | 115 | 73 | s |
| 52 | 34 | 4 | 84 | 54 | T | 116 | 74 | t |
| 53 | 35 | 5 | 85 | 55 | U | 117 | 75 | u |
| 54 | 36 | 6 | 86 | 56 | V | 118 | 76 | v |
| 55 | 37 | 7 | 87 | 57 | W | 119 | 77 | w |
| 56 | 38 | 8 | 88 | 58 | X | 120 | 78 | x |
| 57 | 39 | 9 | 89 | 59 | Y | 121 | 79 | y |
| 58 | 3A | : | 90 | 5A | Z | 122 | 7A | z |
| 59 | 3B | ; | 91 | 5B | [| 123 | 7B | { |
| 60 | 3C | < | 92 | 5C | \ | 124 | 7C | |
| 61 | 3D | = | 93 | 5D |] | 125 | 7D | } |
| 62 | 3E | > | 94 | 5E | ^ | 126 | 7E | ~ |
| 63 | 3F | ? | 95 | 5F | _ | 127 | 7F | ␣ |

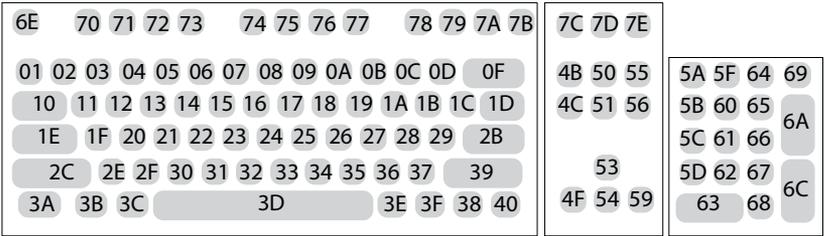
| Extended ASCII Characters | | | | |
|---------------------------|-----|-------|----------------------|---------------|
| DEC | HEX | ASCII | Alternate Extended | PS2 Scan Code |
| 128 | 80 | Ç | up arrow ↑ | 0x48 |
| 129 | 81 | ü | down arrow ↓ | 0x50 |
| 130 | 82 | é | right arrow → | 0x4B |
| 131 | 83 | â | left arrow ← | 0x4D |
| 132 | 84 | ä | Insert | 0x52 |
| 133 | 85 | à | Delete | 0x53 |
| 134 | 86 | á | Home | 0x47 |
| 135 | 87 | ç | End | 0x4F |
| 136 | 88 | ê | Page Up | 0x49 |
| 137 | 89 | ë | Page Down | 0x51 |
| 138 | 8A | è | Right ALT | 0x38 |
| 139 | 8B | ï | Right CTRL | 0x1D |
| 140 | 8C | î | Reserved | n/a |
| 141 | 8D | ì | Reserved | n/a |
| 142 | 8E | Ä | Numeric Keypad Enter | 0x1C |
| 143 | 8F | Å | Numeric Keypad / | 0x35 |
| 144 | 90 | É | F1 | 0x3B |
| 145 | 91 | æ | F2 | 0x3C |
| 146 | 92 | Æ | F3 | 0x3D |
| 147 | 93 | ô | F4 | 0x3E |
| 148 | 94 | ö | F5 | 0x3F |
| 149 | 95 | ò | F6 | 0x40 |
| 150 | 96 | û | F7 | 0x41 |
| 151 | 97 | ù | F8 | 0x42 |
| 152 | 98 | ÿ | F9 | 0x43 |
| 153 | 99 | Ö | F10 | 0x44 |
| 154 | 9A | Ü | F11 | 0x57 |
| 155 | 9B | ç | F12 | 0x58 |
| 156 | 9C | £ | Numeric Keypad + | 0x4E |
| 157 | 9D | ¥ | Numeric Keypad - | 0x4A |
| 158 | 9E | ƒ | Numeric Keypad * | 0x37 |
| 159 | 9F | f | Caps Lock | 0x3A |
| 160 | A0 | á | Num Lock | 0x45 |
| 161 | A1 | í | Left Alt | 0x38 |
| 162 | A2 | ó | Left Ctrl | 0x1D |
| 163 | A3 | ú | Left Shift | 0x2A |
| 164 | A4 | ñ | Right Shift | 0x36 |

| Extended ASCII Characters (Continued) | | | | |
|---------------------------------------|-----|-------|--------------------------------|---------------|
| DEC | HEX | ASCII | Alternate Extended | PS2 Scan Code |
| 165 | A5 | Ñ | Print Screen | n/a |
| 166 | A6 | ª | Tab | 0x0F |
| 167 | A7 | º | Shift Tab | 0x8F |
| 168 | A8 | ¿ | Enter | 0x1C |
| 169 | A9 | ƒ | Esc | 0x01 |
| 170 | AA | ¬ | Alt Make | 0x36 |
| 171 | AB | ½ | Alt Break | 0xB6 |
| 172 | AC | ¼ | Control Make | 0x1D |
| 173 | AD | ¡ | Control Break | 0x9D |
| 174 | AE | « | Alt Sequence with 1 Character | 0x36 |
| 175 | AF | » | Ctrl Sequence with 1 Character | 0x1D |
| 176 | B0 | ••••• | | |
| 177 | B1 | ••••• | | |
| 178 | B2 | ••••• | | |
| 179 | B3 | | | |
| 180 | B4 | ¬ | | |
| 181 | B5 | ƒ | | |
| 182 | B6 | ƒ | | |
| 183 | B7 | ƒ | | |
| 184 | B8 | ƒ | | |
| 185 | B9 | ƒ | | |
| 186 | BA | | | |
| 187 | BB | ƒ | | |
| 188 | BC | ƒ | | |
| 189 | BD | ƒ | | |
| 190 | BE | ƒ | | |
| 191 | BF | ƒ | | |
| 192 | C0 | └ | | |
| 193 | C1 | └ | | |
| 194 | C2 | └ | | |
| 195 | C3 | └ | | |
| 196 | C4 | — | | |
| 197 | C5 | ¡ | | |
| 198 | C6 | └ | | |
| 199 | C7 | └ | | |
| 200 | C8 | └ | | |
| 201 | C9 | └ | | |
| 202 | CA | └ | | |
| 203 | CB | └ | | |

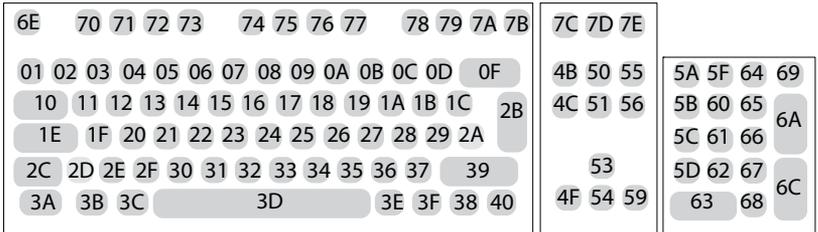
| Extended ASCII Characters (Continued) | | | | |
|---------------------------------------|-----|-------|--------------------|---------------|
| DEC | HEX | ASCII | Alternate Extended | PS2 Scan Code |
| 204 | CC | ⏏ | | |
| 205 | CD | = | | |
| 206 | CE | ⏏ | | |
| 207 | CF | ± | | |
| 208 | D0 | ⏏ | | |
| 209 | D1 | ⏏ | | |
| 210 | D2 | ⏏ | | |
| 211 | D3 | ⏏ | | |
| 212 | D4 | ⏏ | | |
| 213 | D5 | ⏏ | | |
| 214 | D6 | ⏏ | | |
| 215 | D7 | ⏏ | | |
| 216 | D8 | ⏏ | | |
| 217 | D9 | ⏏ | | |
| 218 | DA | ⏏ | | |
| 219 | DB | ■ | | |
| 220 | DC | ■ | | |
| 221 | DD | ■ | | |
| 222 | DE | ■ | | |
| 223 | DF | ■ | | |
| 224 | E0 | α | | |
| 225 | E1 | β | | |
| 226 | E2 | Γ | | |
| 227 | E3 | π | | |
| 228 | E4 | Σ | | |
| 229 | E5 | σ | | |
| 230 | E6 | μ | | |
| 231 | E7 | τ | | |
| 232 | E8 | Φ | | |
| 233 | E9 | Θ | | |
| 234 | EA | Ω | | |
| 235 | EB | δ | | |
| 236 | EC | ∞ | | |
| 237 | ED | φ | | |
| 238 | EE | ε | | |
| 239 | EF | ∩ | | |
| 240 | F0 | ≡ | | |
| 241 | F1 | ± | | |
| 242 | F2 | ≥ | | |

| Extended ASCII Characters (Continued) | | | | |
|---------------------------------------|-----|-------|--------------------|---------------|
| DEC | HEX | ASCII | Alternate Extended | PS2 Scan Code |
| 243 | F3 | ≤ | | |
| 244 | F4 | ∫ | | |
| 245 | F5 | ∫ | | |
| 246 | F6 | ÷ | | |
| 247 | F7 | ≈ | | |
| 248 | F8 | ° | | |
| 249 | F9 | · | | |
| 250 | FA | · | | |
| 251 | FB | √ | | |
| 252 | FC | ⁿ | | |
| 253 | FD | ² | | |
| 254 | FE | ■ | | |
| 255 | FF | | | |

Unicode Key Maps



104 Key U.S. Style Keyboard



105 Key European Style Keyboard



Sample Symbols

UPC-A



0 123456 7890

Interleaved 2 of 5



1234567890

Code 128



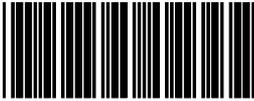
Code 128

EAN-13



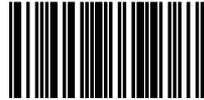
9 780330 290951

Code 39



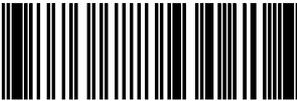
BC321

Codabar



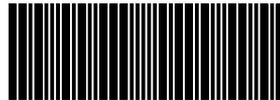
A13579B

Code 93



123456-9\$

Straight 2 of 5 Industrial



123456

Sample Symbols

Matrix 2 of 5



6543210

GS1 DataBar



(01)00123456789012

Programming Chart



K0K
0



K2K
2



K4K
4



K6K
6



K8K
8



K1K
1



K3K
3



K5K
5



K7K
7



K9K
9

Programming Chart



KAK

A



KCK

C



KEK

E



MNUSAV.

Save



RESET_.

Reset



KBK

B



KDK

D



KFK

F



MNUABT.

Discard

*Note: If you make an error while scanning the letters or digits (before scanning Save), scan Discard, scan the correct letters or digits, and **Save** again.*

Honeywell Scanning & Mobility

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Fort Mill, SC 29707