Honeywell

# N86XX Decoded Engine

## User's Guide

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*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, please contact:

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### *CB Scheme*

IEC 60950-1 Second Edition

### *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.

## *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 imager and lens. When stocking the unit, keep it in its protective packaging. Dust and other external contaminants will eventually degrade unit performance.

### *RoHS*

The 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 Information Technology Equipment product safety, as a component assembly.

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# 1 Getting Started

## Introduction

The N86XX 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 image-based scanning into a variety of devices, including hand held computers (medical instrumentation, kiosks, diagnostic equipment, and robotics.

Three different decoding configurations provide OEMs the flexibility required to address various application-specific needs. The N8610/8613, with linear decoding, delivers laser-like reading on linear codes. The N8680/8683 unit decodes linear as well as 2D and postal codes. In addition to linear, 2D, and postal codes, the N8690/8693 unit includes the OCR feature. For software updates and additional information, visit the Honeywell website at www.honeywellaidc.com.

## About This Manual

This User's Guide provides demonstration, installation, and programming instructions for the N86XX engine. Dimensions, warranty, and customer support information are also included.

Honeywell's bar code scanners 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.

## *OEM Engine Models*

There are three models of the OEM engine, which may be used with the interfaces described in this manual. Refer to the chart below to determine the models that can be used with your interface.

| Models | Interface | Decoding Capability |
|---|---|---|
| N868XX-XXX-XX2 | TTL Level 232 | Linear, 2D, postal |
| N868XX-XXX-XX3 | Full-Speed USB | Linear, 2D, postal |
| N868XX-XXX-XX5 | High-Speed USB | Linear, 2D, postal |
| N869XX-XXX-XX2 | TTL Level 232 | Linear, 2D, postal, OCR |
| N869XX-XXX-XX3 | Full-Speed USB | Linear, 2D, postal, OCR |
| N869XX-XXX-XX5 | High-Speed USB | Linear, 2D, postal, OCR |

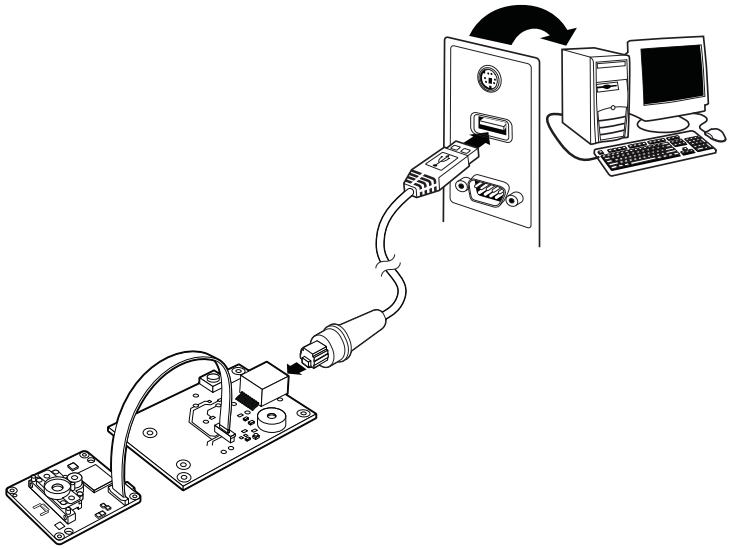
## *Connecting the Development Engine to the PC*

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

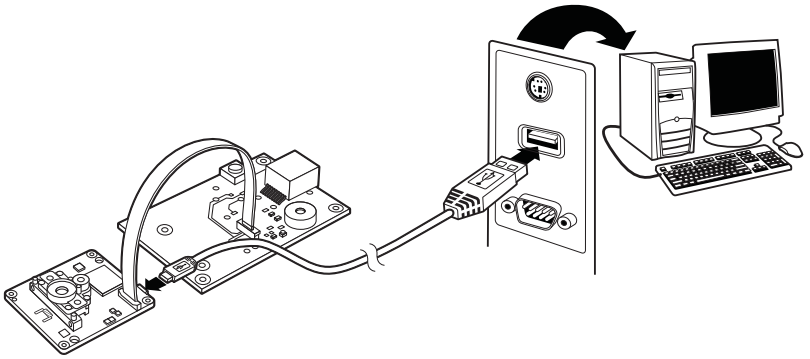
### *Connecting with USB*

*Note: If using the N86XXX-XXX-XX5 engine with USB Micro-B, do not supply power through the flex connector. Doing so may damage the host or engine. The N86XXX-XXX-XX5 engine will only communicate USB through the Micro-B connector. The N86XXX-XXX-XX3 engine will only communicate USB through the 10 pin modular connector.*

1. Turn off power to the terminal/computer.
2. If using full-speed USB, connect the USB interface cable to the interface board and to the matching USB port on the computer.



2a. If using hi-speed USB, connect the USB interface cable to the side of the engine and to the USB port on the computer.



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

3. When connecting the engine using full-speed or high-speed USB, all communication parameters between the engine and terminal must match for correct data transfer using USB protocol. Scan the appropriate USB interface bar code below.

USBSPD0.

Full-Speed USB

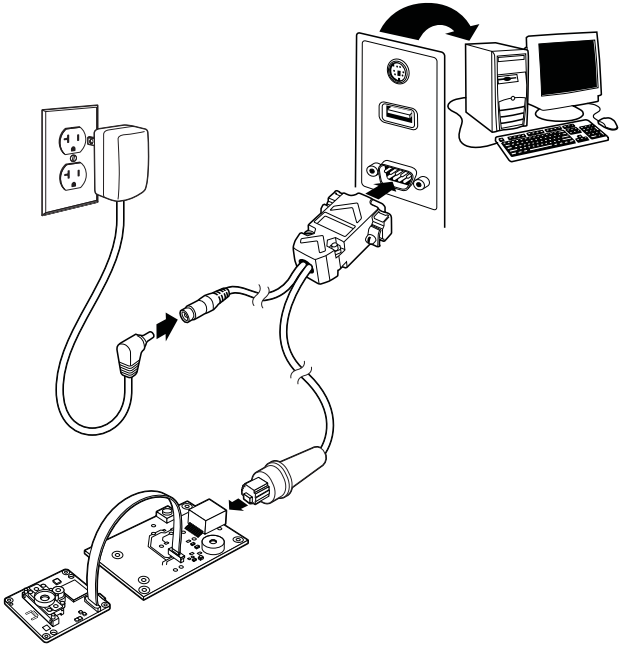
USBSPD1.

High-Speed USB

4. 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.

## *Connecting with RS232 Serial Port*

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



2. Connect the power supply connector to the serial interface cable. Plug in the power supply.

3. Turn the terminal/computer power back on. The engine beeps.

4. If connecting the engine using an RS-232 interface, all communication parameters between the engine and 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 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

5. 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 an engine to your host system, refer to the N86XX Integration Manual.

## Menu Bar Code Security Settings

Honeywell scanners 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. Contact the nearest technical support office (see Technical Assistance on page 12-1) 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 scanning the menu commands for your custom defaults. If a menu command requires scanning numeric codes from the back cover, then a **Save** code, that entire sequence will be 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.

**Set Custom Defaults**

**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 is the recommended default bar code for most users. It 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.

**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.

**Remove Custom Defaults**

**Activate Defaults**

The Menu Commands, beginning on page 10-5 list the factory default settings for each of the commands (indicated by an asterisk (*) on the programming pages).

# 2 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. It also changes the trigger mode to manual.

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

**RS232 Interface**

### USB PC

Scan the following code to program the engine for USB PC Keyboard. Scanning this code also adds a CR and LF.

**USB Keyboard (PC)**

### USB COM Port Emulation

Scan the following code 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.

**USB COM Port Emulation**

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

### *CTS/RTS Emulation*

**CTS/RTS Emulation On**

*** CTS/RTS Emulation Off**

### *ACK/NAK Mode*

**ACK/NAK Mode On**

*** ACK/NAK Mode Off**

## *Verifone® Ruby Terminal Default Settings*

Scan the following Plug and Play code to program the scanner for a Verifone Ruby terminal. This bar code sets the baud rate to 1200 bps and the data format to 8 data bits, no parity bit, 1 stop bit. 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 |

**Verifone Ruby Settings**

## *Gilbarco® Terminal Default Settings*

Scan the following Plug and Play code to program the scanner 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 |

**Gilbarco Settings**

## *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**

KBDCTY87.
**United States (Dvorak)**

KBDCTY88.
**United States (Dvorak left)**

KBDCTY89.
**United States (Dvorak right)**

KBDCTY30.
**United States (International)**

KBDCTY35.
**Albania**

KBDCTY81.
**Azeri (Cyrillic)**

KBDCTY80.
**Azeri (Latin)**

KBDCTY82.
**Belarus**

KBDCTY1.
**Belgium**

KBDCTY33.
**Bosnia**

KBDCTY16.
**Brazil**

## *Keyboard Country (continued)*

KBDCTY52.
**Bulgaria (Cyrillic)**

KBDCTY54.
**Canada (French legacy)**

KBDCTY55.
**Canada (Multilingual)**

KBDCTY15.
**Czech**

KBDCTY39.
**Czech (QWERTY)**

KBDCTY8.
**Denmark**

KBDCTY59.
**Brazil (MS)**

KBDCTY53.
**Bulgaria (Latin)**

KBDCTY18.
**Canada (French)**

KBDCTY32.
**Croatia**

KBDCTY40.
**Czech (Programmers)**

KBDCTY38.
**Czech (QWERTZ)**

KBDCTY11.
**Dutch (Netherlands)**

## *Keyboard Country (continued)*

KBDCTY83.
**Faeroese**

KBDCTY3.
**France**

KBDCTY4.
**Germany**

KBDCTY64.
**Greek (220 Latin)**

KBDCTY65.
**Greek (319 Latin)**

KBDCTY63.
**Greek (Latin)**

KBDCTY41.
**Estonia**

KBDCTY2.
**Finland**

KBDCTY84.
**Gaelic**

KBDCTY17.
**Greek**

KBDCTY61.
**Greek (220)**

KBDCTY62.
**Greek (319)**

KBDCTY66.
**Greek (MS)**

## *Keyboard Country (continued)*

KBDCTY12.
**Hebrew**

KBDCTY19.
**Hungary**

KBDCTY73.
**Irish**

KBDCTY5.
**Italy**

KBDCTY78.
**Kazakh**

KBDCTY14.
**Latin America**

KBDCTY60.
**Greek (Polytonic)**

KBDCTY50.
**Hungarian (101 key)**

KBDCTY75.
**Iceland**

KBDCTY56.
**Italian (142)**

KBDCTY28.
**Japan ASCII**

KBDCTY79.
**Kyrgyz (Cyrillic)**

KBDCTY42.
**Latvia**

## *Keyboard Country (continued)*

KBDCTY44.
**Lithuania**

KBDCTY34.
**Macedonia**

KBDCTY86.
**Mongolian (Cyrillic)**

KBDCTY20.
**Poland**

KBDCTY58.
**Polish (Programmers)**

KBDCTY25.
**Romania**

KBDCTY43.
**Latvia (QWERTY)**

KBDCTY45.
**Lithuania (IBM)**

KBDCTY74.
**Malta**

KBDCTY9.
**Norway**

KBDCTY57.
**Polish (214)**

KBDCTY13.
**Portugal**

KBDCTY26.
**Russia**

## *Keyboard Country (continued)*

KBDCTY68.
**Russian (Typewriter)**

KBDCTY37.
**Serbia (Cyrillic)**

KBDCTY22.
**Slovakia**

KBDCTY48.
**Slovakia (QWERTZ)**

KBDCTY10.
**Spain**

KBDCTY23.
**Sweden**

KBDCTY67.
**Russian (MS)**

KBDCTY21.
**SCS**

KBDCTY36.
**Serbia (Latin)**

KBDCTY49.
**Slovakia (QWERTY)**

KBDCTY31.
**Slovenia**

KBDCTY51.
**Spanish variation**

KBDCTY29.
**Switzerland (French)**

## *Keyboard Country (continued)*

KBDCTY85.
**Tatar**

KBDCTY24.
**Turkey Q**

KBDCTY7.
**United Kingdom**

KBDCTY88.
**United States (Dvorak left)**

KBDCTY30.
**United States (International)**

KBDCTY6.
**Switzerland (German)**

KBDCTY27.
**Turkey F**

KBDCTY76.
**Ukrainian**

KBDCTY89.
**United Stated (Dvorak right)**

KBDCTY87.
**United States (Dvorak)**

KBDCTY77.
**Uzbek (Cyrillic)**

## *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**

**Automatic Caps Lock** is used if you change the Caps Lock key on and off. The software tracks and reflects if you have Caps Lock on or off. This selection can only be used with systems that have an LED that notes the Caps Lock status (AT keyboards).

KBDSTY6.

**Automatic Caps 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).

**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 lower-case. 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.

*Note: If your interface is a keyboard wedge, first scan the menu code for Automatic Caps Lock (page 2-11). Otherwise, your output may not be as expected.*

*Default = Keyboard Conversion Off.*

*** Keyboard Conversion Off**

**Convert All Characters to Upper Case**

**Convert All Characters to Lower Case**

## *Control Character Output*

This selection sends a text string instead of a control character. For example, when the control character for a carriage return is expected, the output would display [CR] instead of the ASCII code of 0D. Refer to ASCII Conversion Chart (Code Page 1252) on page A-4. Only codes 00 through 1F are converted (the first column of the chart).

*Note: Control + ASCII Mode overrides this mode.*

*Default = Off.*

**Control Character Output On**

*** Control Character Output Off**

## *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. 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. Refer to Keyboard Function Relationships, page 8-1 for CTRL+ ASCII Values.

**Windows Mode Prefix/Suffix Off:** The engine sends key combinations for ASCII control characters for values 00-1F, but it does not transmit any prefix or suffix information.

*Default = Control + ASCII Mode Off.*

**Windows Mode Control + ASCII Mode On**

*** Control + ASCII Mode Off**

**DOS Mode Control + ASCII Mode On**

**Windows Mode Prefix/Suffix Off**

**Turbo Mode:** The engine sends characters to a terminal faster. If the terminal drops characters, do not use Turbo Mode. *Default = Off*

KBDTMD1.
**Turbo Mode On**

KBDTMD0.
*** Turbo Mode 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**

**Automatic Direct Connect Mode:** This selection can be used if you have an IBM AT style terminal and the system is dropping characters. *Default = Off*

KBDADC1.
**Automatic Direct Connect Mode On**

KBDADC0.
*** Automatic Direct Connect Mode Off**

## *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**

232BAD1.
**600**

232BAD2.
**1200**

232BAD3.
**2400**

232BAD4.
**4800**

232BAD5.
*** 9600**

232BAD6.
**19200**

232BAD7.
**38400**

232BAD8.
**57,600**

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**

## *RS232 Receiver Time-Out*

The unit stays awake to receive data until the RS232 Receiver Time-Out expires. A manual or serial trigger resets the time-out. When an RS232 receiver is sleeping, a character may be sent to wake up the receiver and reset the time-out. A transaction on the CTS line will also wake up the receiver. The receiver takes 300 milliseconds to completely come up. Change the RS232 receiver time-out by scanning the bar code below, then scanning digits from the inside back cover of this manual, then scanning **Save**. The range is 0 to 300 seconds. *Default = 0 seconds (no time-out - always on).*

**RS232 Receiver Time-Out**

## *RS232 Handshaking*

RS232 Handshaking allows control of data transmission from the engine using software commands from the host device. When RTS/CTS is turned **Off**, no data flow control is used.

**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.

**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 2-18) 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.*

**Flow Control, No Timeout**

**Two-Direction Flow Control**

**Flow Control with Timeout**

*** RTS/CTS Off**

## *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 inside back cover, then scanning **Save**.

**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.*

**XON/XOFF On**

*** 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.*

**ACK/NAK On**

*** ACK/NAK Off**

# 3 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 - Scanner.*

**Power Up Beeper Off - Scanner**

*** Power Up Beeper On - Scanner**

## Beep on BEL Character

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

***Beep on BEL Off**

**Beep on BEL On**

## *Trigger Click*

To hear an audible click every time the trigger is pressed, scan the **Trigger Click On** bar code below. Scan the **Trigger Click Off** code if you don't wish to hear the click. (This feature has no effect on serial or automatic triggering.) *Default = Trigger Click Off.*

***Trigger Click Off**

**Trigger Click 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.*

**Beeper - Good Read Off**

*** Beeper - Good Read On**

## *Beeper Volume – Good Read*

The beeper volume codes modify the volume of the beep the engine emits on a good read. *Default = High.*

BEPLVL1.
**Low**

BEPLVL2.
**Medium**

BEPLVL3.
*** High**

BEPLVL0.
**Off**

## *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)**

BEPFQ12700.
*** Medium (2700 Hz)**

BEPFQ14200.
**High (4200 Hz)**

## *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.*

*** Razz (250 Hz)**

**Medium (3250 Hz)**

**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.*

*** Normal Beep**

**Short Beep**

## *LED – Good Read*

The LED indicator can be programmed **On** or **Off** in response to a good read. *Default = On.*

*** LED - Good Read On**

**LED - Good Read Off**

## *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. To change the number of beeps, scan the bar code below 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. To change the number of error beeps, scan the bar code below 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**

### *Good Read Delay*

This sets the minimum amount of time before the engine can read another bar code. *Default = 0 ms (No Delay).*

DLYGRD0.

*** No Delay**

DLYGRD500.

**Short Delay (500 ms)**

DLYGRD1000.

**Medium Delay (1,000 ms)**

DLYGRD1500.

**Long Delay (1,500 ms)**

### *User-Specified Good Read Delay*

If you want to set your own length for the good read delay, scan the bar code below, then set the delay (from 0-30,000 milliseconds) by scanning digits from the inside back cover, then scanning **Save**.

DLYGRD.

**User-Specified Good Read Delay**

## *Manual Trigger Modes*

When in manual trigger mode, the scanner scans until a bar code is read, or until the trigger is released. Two modes are available, **Normal** and **Enhanced**. Normal mode offers good scan speed and the longest working ranges (depth of field). Enhanced mode will give you the highest possible scan speed but

slightly less range than Normal mode. Enhanced mode is best used when you require a very fast scan speed and don't require a long working range. *Default = Manual Trigger-Normal.*

*** Manual Trigger - Normal**

**Manual Trigger - Enhanced**

## *Serial Trigger Mode*

You can activate the scanner either by pressing the trigger, or using a serial trigger command (see Trigger Commands on page 10-4). When in serial mode, the scanner scans until a bar code has been read or until the deactivate command is sent. The scanner 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 scanner's trigger when using serial commands to trigger the scanner. Once the scanner has timed out, you can activate the scanner either by pressing the 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.*

**Read Time-Out**

## *Image Snap and Ship*

**Image Snap and Ship** tells the engine to take a picture (rather than read a bar code) when the trigger is pressed. Once the picture is snapped, it is shipped to the host system as a jpeg file by default. To revert to bar code reading, you must change to a different trigger mode (see Manual Trigger Modes beginning on page 3-6).

**Image Snap and Ship**

*Note: You must send a serial command for Manual Trigger Modes (see page 10-13) in order to use menu codes after using Image Snap and Ship.*

## *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. Reread Delay only works in presentation modes. *Default = Medium.*

**Short (500 ms)**

*** Medium (750 ms)**

**Long (1000 ms)**

**Extra Long (2000 ms)**

## *User-Specified Reread Delay*

If you want to set your own length for the reread delay, scan the bar code below, then set the delay (from 0-30,000 milliseconds) by scanning digits from the inside back cover, then scanning **Save**.

**User-Specified Reread Delay**

## *Illumination Lights*

If you want the illumination lights on while reading a bar code, scan the **Lights On** bar code, below. However, if you want to turn just the lights off, scan the **Lights Off** bar code. *Default = Lights On.*

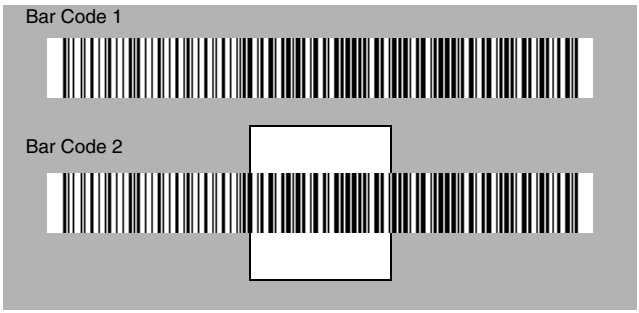
*** Lights On**

**Lights Off**

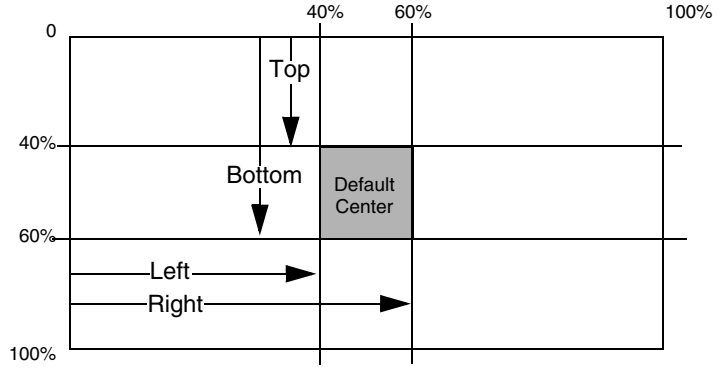
## *Centering*

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.

In the example below, the gray area is the full engine field of view and the white area is the centering window. Bar Code 1 will not be read, while Bar Code 2 will be.



The default centering window is a 169x128 pixel area in the center of the engine's field of view. The following diagram illustrates the default top, bottom, left, and right pixel positions, measured from the top and the left side of the engine's field of view, which is 844 by 640 pixels.




If a bar code is not within the predefined window, it will not be decoded or output by the engine. If centering is turned on by scanning **Centering On**, the engine only reads codes that intersect the centering window you specify using the **Top**, **Bottom**, **Left**, or **Right** bar codes.

Scan **Centering On**, then scan one of the following bar codes to change the top, bottom, left, or right of the centering window. Then scan the percent you want to shift the centering window using digits on the inside back cover of this manual. Scan **Save**. *Default Centering = 40% for Top and Left, 60% for Bottom and Right.*

DECWIN1.
**Centering On**

DECWIN0.
*** Centering Off**

DECTOP.
**Top of Centering Window**

DECBOT.
**Bottom of Centering Window**

DECLFT.
**Left of Centering Window**

DECRGT.
**Right of Centering Window**

## *Preferred Symbology*

The engine can be programmed to specify one symbology as a higher priority over other symbologies in situations where both bar code symbologies appear on the same label, but the lower priority symbology cannot be disabled.

For example, you may be using the engine in a retail setting to read U.P.C. symbols, but have occasional need to read a code on a drivers license. Since some licenses have a Code 39 symbol as well as the PDF417 symbol, you can use Preferred Symbology to specify that the PDF417 symbol be read instead of the Code 39.

Preferred Symbology classifies each symbology as **high priority**, **low priority**, or as an **unspecified type**. When a low priority symbology is presented, the engine ignores it for a set period of time (see Preferred Symbology Time-out on page 3-12) while it searches for the high priority symbology. If a high priority symbology is located during this period, then that data is read immediately.

If the time-out period expires before a high priority symbology is read, the engine will read any bar code in its view (low priority or unspecified). If there is no bar code in the engine's view after the time-out period expires, then no data is reported.

Scan a bar code below to enable or disable Preferred Symbology. *Default = Preferred Symbology Off.*

**Preferred Symbology On**

*** Preferred Symbology Off**

### *High Priority Symbology*

To specify the high priority symbology, scan the High Priority Symbology bar code below. On the Symbology Chart on page A-1, find the symbology you want to set as high priority. Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart (inside back cover). Scan **Save** to save your selection. *Default = None*

**High Priority Symbology**

## *Low Priority Symbology*

To specify the low priority symbology, scan the Low Priority Symbology bar code below. On the Symbology Chart on page A-1, find the symbology you want to set as low priority. Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart (inside back cover).

If you want to set additional low priority symbologies, scan **FF**, then scan the 2 digit hex value from the Programming Chart for the next symbology. You can program up to 5 low priority symbologies. Scan **Save** to save your selection. *Default = None*

**Low Priority Symbology**

## *Preferred Symbology Time-out*

Once you have enabled Preferred Symbology and entered the high and low priority symbologies, you must set the time-out period. This is the period of time the engine will search for a high priority bar code after a low priority bar code has been encountered. Scan the bar code below, then set the delay (from 1-3,000 milliseconds) by scanning digits from the inside back cover, then scanning **Save**. *Default = 500 ms.*

**Preferred Symbology Time-out**

## *Preferred Symbology Default*

Scan the bar code below to set all Preferred Symbology entries to their default values.

**Preferred Symbology Default**

# 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.

*Note: This selection is unavailable when the Multiple Symbols Selection is turned on.*

## 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 Universal values, shown below. These are the defaults. Be **certain** you want to delete or clear all formats before you read the ***Default Sequence*** symbol.

*Note: You must hold the trigger 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 (inside back cover) to read these options.*

## To Add an Output Sequence

1. Scan the ***Enter Sequence*** symbol (see Require Output Sequence, page 3-16).

2. **Code I.D.**
   On the Symbology Chart 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 Code Page Mapping of Printed Bar Codes, page A-6, 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 ***F F*** 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 is shown below:

| | |
|---|---|
| SEQBLK | sequence 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 3-14, but assume a <CR> suffix and specific code lengths, you would use the following command line:

**SEQBLK62001241FF6A001342FF69001243FF**

The breakdown of the command line is shown below:

SEQBLK sequence 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*

**Enter Sequence**

**Default Sequence**

## *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.)

**Transmit Partial Sequence**

*** 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.*

*Note: This selection is unavailable when the Multiple Symbols Selection is turned on.*

**Required**

**On/Not Required**

***Off**

# *Multiple Symbols*

When this programming selection is turned **On**, it allows you to read multiple symbols with a single pull of the trigger. If you press and hold the trigger, aiming at a series of symbols, it reads unique symbols once, beeping (if turned on)

for each read. The engine attempts to find and decode new symbols as long as the trigger is pulled. When this programming selection is turned **Off**, the engine will only read the symbol closest to the center of the image. *Default = Off.*

**On**

*** Off**

## *No Read*

With No Read turned **On**, the engine notifies you if a code cannot be read. If using an EZConfig Tool Scan Data Window (see page 9-3), an “NR” appears when a code cannot be read. If No Read is turned **Off**, the “NR” will not appear. *Default = Off.*

**On**

*** 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.

## *Video Reverse*

Video Reverse is used to allow the engine to read bar codes that are inverted. The **Video Reverse Off** bar code below is an example of this type of bar code. Scan **Video Reverse Only** to read *only* inverted bar codes. Scan **Video Reverse and Standard Bar Codes** to read both types of codes.

*Note: After scanning **Video Reverse Only**, menu bar codes cannot be read. You must scan **Video Reverse Off** or **Video Reverse and Standard Bar Codes** in order to read menu bar codes.*

*Note: Images downloaded from the unit are not reversed. This is a setting for decoding only.*

VIDREV1.

**Video Reverse Only**

VIDREV2

**Video Reverse and Standard Bar Codes**

VIDREV0.

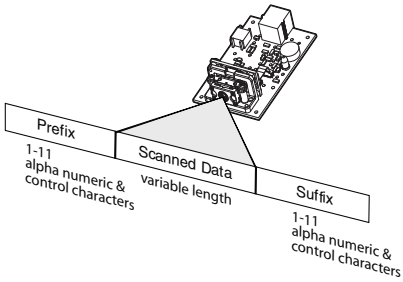
*** Video Reverse Off**

# 4 Data Editing

## 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 break-down 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 = None*.
- 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 (Code Page 1252), beginning on page A-4, 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 200 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 Chart, 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 (Code Page 1252), beginning on page A-4, 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 Chart, 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 (Code Page 1252), beginning on page A-4, 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 Chart, 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.

**Add CR Suffix**
**All Symbologies**

## *Prefix Selections*

**Add Prefix**

**Clear One Prefix**

**Clear All Prefixes**

## Suffix Selections

**Add Suffix**

**Clear One Suffix**

**Clear All Suffixes**

## 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 8-2. When the engine is in keyboard wedge mode, the scan code is converted to a key code before it is transmitted. *Default = Enable.*

*** Enable**

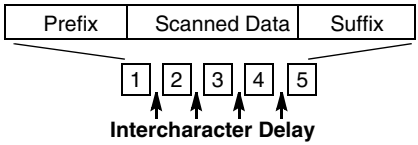
**Disable**

## Intercharacter, Interfunction, and Intermessage 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 **Intercharacter Delay** bar code below, then scan the number of 5ms delays, and the **Save** bar code using the Programming Chart inside the back cover of this manual.



**Intercharacter Delay**

**Intercharacter Delay**

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 **Delay Length** bar code below, 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 (Code Page 1252), beginning on page A-4.

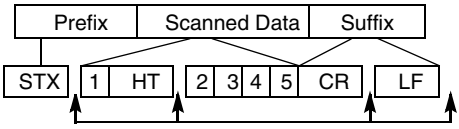
**Delay Length**

**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 **Interfunction Delay** bar code below, then scan the number of 5ms delays, and the **Save** bar code using the Programming Chart inside the back cover of this manual.

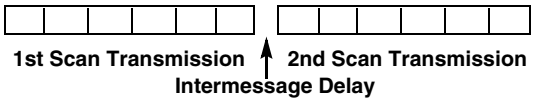


**Interfunction Delay**

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 **Intermessage Delay** bar code below, then scan the number of 5ms delays, and the **Save** bar code using the Programming Chart inside the back cover of this manual.



**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.

# 5 Data Formatting

## 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.

*** Default Data Format**

## To Add a Data Format

**Step 1.** Scan the **Enter Data Format** symbol (page 5-2).

**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 5-10 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: The wildcard for all terminal types is 099.*

**Step 4. Code I.D.**

In the Symbology Chart, 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.

**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. (Note: 50 characters is entered as 0050. 9999 is a universal number, indicating 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.

**Enter Data Format**

**Save**

**Discard**

## *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 Chart 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.

DFMCL3.
**Clear One Data Format**

DFMCA3.
**Clear All Data Formats**

MNUSAV.
**Save**

MNUABT.
**Discard**

## *Terminal ID Table*

| Interface | Description | Terminal ID |
|---|---|---|
| RS232 | TTL | 000 |
| USB | COM Port Emulation | 130 |
| | PC Keyboard | 124 |

# *Data Format Editor Commands*

## *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 (Code Page 1252), page A-4 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 insert character's hex value for its ASCII code.
Refer to the ASCII Conversion Chart (Code Page 1252), page A-4 for decimal, hex and character codes.

### *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 (Code Page 1252), page A-4 for decimal, hex and character codes.

### *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 (Code Page 1252), page A-4 for decimal, hex and character codes.

### *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 Chart on page A-1).
Refer to the ASCII Conversion Chart (Code Page 1252), page A-4 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.

## *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.

### *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.*

### *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 (Code Page 1252), page A-4 for decimal, hex and character codes.

### *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 (Code Page 1252), page A-4 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 (Code Page 1252), page A-4 for decimal, hex and character codes.

### *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 (Code Page 1252), page A-4 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 (Code Page 1252), page A-4 for decimal, hex and character codes.

### *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 (Code Page 1252), page A-4 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.

### *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 = E4nnxx$_1$xx$_2$yy$_1$yy$_2$...zz$_1$zz$_2$* where nn is the total count of the number of characters in the list (characters to be replaced plus replacement characters); xx$_1$ defines characters to be replaced and xx$_2$ defines replacement characters, continuing through zz$_1$ and zz$_2$.

### *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 (Code Page 1252), page A-4 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 (Code Page 1252), page A-4 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.

### *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 not numeric.

### *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 wedge interfaces.

## *Data Formatter*

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

**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.

**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_EN1.
*** Data Formatter On, Not Required, Keep Prefix/Suffix**

DFM_EN3.
**Data Formatter On, Not Required, Drop Prefix/Suffix**

DFM_EN2.
**Data Format Required, Keep Prefix/Suffix**

DFM_EN4.
**Data Format Required, Drop 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*.

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

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

## *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.

**Primary Data Format**

**Data Format 1**

**Data Format 2**

**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.

**Single Scan-Primary Data Format**

**Single Scan-Data Format 1**

**Single Scan-Data Format 2**

**Single Scan-Data Format 3**

# 6 Symbologies

This programming section contains the following menu selections. Refer to Chapter 10 for settings and defaults.

- All Symbologies
- Aztec Code
- China Post (Hong Kong 2 of 5)
- Chinese Sensible (Han Xin) Code
- Codabar
- Codablock A
- Codablock F
- Code 11
- Code 128
- Code 32 Pharmaceutical (PARAF)
- Code 39
- Code 93
- Data Matrix
- EAN/JAN-13
- EAN/JAN-8
- GS1 Composite Codes
- GS1 DataBar Expanded
- GS1 DataBar Limited
- GS1 DataBar Omnidirectional
- GS1 Emulation
- GS1-128
- Interleaved 2 of 5
- Korea Post
- Matrix 2 of 5
- MaxiCode
- MicroPDF417
- MSI
- NEC 2 of 5
- Postal Codes - 2D
- Postal Codes - Linear
- PDF417
- GS1 DataBar Omnidirectional
- QR Code
- Straight 2 of 5 IATA (two-bar start/stop)
- Straight 2 of 5 Industrial (three-bar start/stop)
- TCIF Linked Code 39 (TLC39)
- Telepen
- Trioptic Code
- UPC-A
- UPC-A/EAN-13 with Extended Coupon Code
- UPC-E0
- UPC-E1

## 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.

**All Symbologies On**

**All Symbologies Off**

*Note: When All Symbologies On is scanned, 2D Postal Codes are not enabled. 2D Postal Codes must be enabled separately.*

## 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*

*** 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.*

**Transmit**

*** 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 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**

CBRCK21.
**Validate Modulo 16, but Don't Transmit**

CBRCK22.
**Validate Modulo 16 and 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.

CBRCCT1.
**On**

CBRCCT0.
*** Off**

CBRCCT2.
**Require**

## *Codabar 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 = 2-60. Minimum Default = 4, Maximum Default = 60.

**Minimum Message Length**

**Maximum Message Length**

## Code 39

*< Default All Code 39 Settings >*

### Code 39 On/Off

*** On**

**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.*

**Transmit**

*** 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.*

*** No Check Character**

**Validate, but Don't Transmit**

**Validate and Transmit**

## *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 = 0-48. Minimum Default = 0, Maximum Default = 48.

**Minimum Message Length**

**Maximum Message Length**

## *Code 39 Append*

This function allows the engine to append the data from several Code 39 bar codes together before transmitting them to the host computer. When this function is enabled, the engine stores those Code 39 bar codes that start with a space (excluding the start and stop symbols), and does not immediately transmit the data. The engine stores the data in the order in

which the bar codes are read, deleting the first space from each. The engine transmits the appended data when it reads a Code 39 bar code that starts with a character other than a space. *Default = Off.*

C39APP1.
**On**

C39APP0.
*** Off**

## *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.

*Note: Trioptic Code (page 6-39) must be turned off while scanning Code 32 Pharmaceutical codes.*

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.

**Full ASCII On**

*** Full ASCII Off**

## *Code 39 Code Page*

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the bar code being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, scan the bar code below, select the code page with which the bar codes were created (see Code Page Mapping of Printed Bar Codes on page A-6),

and scan the value and the **Save** bar code from the Programming Chart on the inside the back cover of this manual. The data characters should then appear properly.

**Code 39 Code Page**

## *Interleaved 2 of 5*

*< Default All Interleaved 2 of 5 Settings >*

### *Interleaved 2 of 5 On/Off*

*** On**

**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.*

*** No Check Digit**

**Validate, but Don't Transmit**

**Validate and Transmit**

## *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 = 2-80. Minimum Default = 4, Maximum Default = 80.

**Minimum Message Length**

**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 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 = 2-80. Minimum Default = 4, Maximum Default = 80.

**Minimum Message Length**

**Maximum Message Length**

## Code 93

*< Default All Code 93 Settings >*

### Code 93 On/Off

*** On**

**Off**

### 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 = 0-80. Minimum Default = 0, Maximum Default = 80.

**Minimum Message Length**

**Maximum Message Length**

### Code 93 Code Page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the bar code being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, scan the bar code below, select the code page with which the bar codes were created (see Code Page Mapping of Printed Bar Codes on page A-6),

and scan the value and the **Save** bar code from the Programming Chart on the inside the back cover of this manual. The data characters should then appear properly.

C93DCP.

**Code 93 Code Page**

## *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**

R25ENA0.

*** Off**

### *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 = 1-48. Minimum Default = 4, Maximum Default = 48.

R25MIN.

**Minimum Message Length**

R25MAX.

**Maximum Message Length**

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

*<Default All Straight 2 of 5 IATA Settings>*

### *Straight 2 of 5 IATA On/Off*

**On**

*** Off**

### *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 = 1-48. Minimum Default = 4, Maximum Default = 48.

**Minimum Message Length**

**Maximum Message Length**

## *Matrix 2 of 5*

*<Default All Matrix 2 of 5 Settings>*

### *Matrix 2 of 5 On/Off*

**On**

*** Off**

### *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 = 4, Maximum Default = 80.

**Minimum Message Length**

**Maximum Message Length**

## Code 11

*<Default All Code 11 Settings>*

### Code 11 On/Off

**On**

*** Off**

### Check Digits Required

This option sets whether 1 or 2 check digits are required with Code 11 bar codes. *Default = Two Check Digits.*

**One Check Digit**

*** Two Check Digits**

### *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 = 4, Maximum Default = 80.

**Minimum Message Length**

**Maximum Message Length**

## *Code 128*

*<Default All Code 128 Settings>*

### *Code 128 On/Off*

*** On**

**Off**

### *ISBT 128 Concatenation*

In 1994 the International Society of Blood Transfusion (ISBT) ratified a standard for communicating critical blood information in a uniform manner. The use of ISBT formats requires a paid license. The ISBT 128 Application Specification describes 1) the critical data elements for labeling blood products, 2) the current recommendation to use Code 128 due to its high degree of security and its space-efficient design, 3) a variation of Code 128

that supports concatenation of neighboring symbols, and 4) the standard layout for bar codes on a blood product label. Use the bar codes below to turn concatenation on or off. *Default =Off.*

**On**

*** Off**

## *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 = 0-90. Minimum Default = 0, Maximum Default = 90.

**Minimum Message Length**

**Maximum Message Length**

## *Code 128 Append*

This function allows the engine to append the data from several Code 128 bar codes together before transmitting them to the host computer. When this function is enabled, the engine stores those Code 128 bar codes that start with a space (excluding the start and stop symbols), and does not immediately transmit the data. The engine stores the data in the order in which the bar codes are read, deleting the first space from each. The engine transmits the appended data when it reads a Code 128 bar code that starts with a character other than a space. *Default = Off.*

**On**

*** Off**

## *Code 128 Code Page*

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the bar code being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, scan the bar code below, select the code page with which the bar codes were created (see Code Page Mapping of Printed Bar Codes on page A-6), and scan the value and the **Save** bar code from the Programming Chart on the inside the back cover of this manual. The data characters should then appear properly.

**Code 128 Code Page**

## GS1-128

*<Default All GS1-128 Settings>*

### GS1-128 On/Off

*** On**

**Off**

### 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 = 1, Maximum Default = 80.

**Minimum Message Length**

**Maximum Message Length**

## *Telepen*

*<Default All Telepen Settings>*

TELDFT.

### *Telepen On/Off*

TELENA1.

**On**

TELENA0.

*** 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.*

TELOLD0.

*** AIM Telepen Output**

TELOLD1.

**Original Telepen Output**

### *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 = 1-60. Minimum Default = 1, Maximum Default = 60.

**Minimum Message Length**

**Maximum Message Length**

## *UPC-A*

*<Default All UPC-A Settings>*

### *UPC-A On/Off*

*** On**

**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*.

*** On**

**Off**

## *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 unit can be programmed so it will not transmit it. *Default = On.*

UPANSX1.
*** On**

UPANSX0.
**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 6-25. *Default = Not Required.*

UPAARQ1.
**Required**

UPAARQ0.
*** Not Required**

### *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 = On.*

*** On**

**Off**

## *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.*

*** Off**

**Allow Concatenation**

**Require Concatenation**

## *UPC-E0*

*<Default All UPC-E Settings>*

### *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 UPC-E1 (page 6-30). *Default = On.*

*** UPC-E0 On**

**UPC-E0 Off**

### *UPC-E0 Expand*

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

**On**

*** Off**

## *UPC-E0 Addenda Required*

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

**Required**

*** Not Required**

## *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 = On.*

*** On**

**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 = On.*

*** On**

**Off**

## *UPC-E0 Number System*

The numeric system digit of a U.P.C. symbol is normally transmitted at the beginning of the scanned data, but the unit can be programmed so it will not transmit it. To prevent transmission, scan **Off**. *Default = On.*

*** On**

**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.*

**2 Digit Addenda On**

*** 2 Digit Addenda Off**

**5 Digit Addenda On**

*** 5 Digit Addenda Off**

## *UPC-E1*

Most U.P.C. bar codes lead with the 0 number system. For these codes, use UPC-E0 (page 6-27). If you need to read codes that lead with the 1 number system, use the **UPC-E1 On** selection. *Default = Off.*

UPEEN11.
**UPC-E1 On**

UPEEN10.
*** UPC-E1 Off**

## *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/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 = On.*

*** On**

**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 6-26).*

## *ISBN Translate*

When **On** is scanned, EAN-13 Bookland symbols are translated into their equivalent ISBN number format. *Default = Off.*

**On**

*** Off**

## *EAN/JAN-8*

*<Default All EAN/JAN-8 Settings>*

EA8DFT.

### *EAN/JAN-8 On/Off*

EA8ENA1.
*** On**

EA8ENA0.
**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**

EA8CKX0.
**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 and 5 Digit Addenda.*

EA8AD21.
**2 Digit Addenda On**

EA8AD20.
*** 2 Digit Addenda Off**

EA8AD51.
**5 Digit Addenda On**

EA8AD50.
*** 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.*

EA8ARQ1.
**Required**

EA8ARQ0.
*** Not Required**

## *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 = On.*

EA8ADS1.
*** On**

EA8ADS0.
**Off**

## *MSI*

*<Default All MSI Settings>*

### *MSI On/Off*

**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 10/11 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 10/11, 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.

MSICHK0.

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

MSICHK1.

**Validate Type 10 and Transmit**

MSICHK2.

**Validate 2 Type 10 Characters, but Don't Transmit**

MSICHK3.

**Validate 2 Type 10 Characters and Transmit**

MSICHK4.

**Validate Type 10 then Type 11 Character, but Don't Transmit**

MSICHK5.

**Validate Type 10 then Type 11 Character and Transmit**

MSICHK6.

**Disable MSI Check Characters**

## *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 = 4-48. Minimum Default = 4, Maximum Default = 48.

MSIMIN.

**Minimum Message Length**

MSIMAX.

**Maximum Message Length**

## *GS1 DataBar Omnidirectional*

*< Default All GS1 DataBar Omnidirectional Settings >*

### *GS1 DataBar Omnidirectional On/Off*

*** On**

**Off**

## *GS1 DataBar Limited*

*< Default All GS1 DataBar Limited Settings >*

### *GS1 DataBar Limited On/Off*

*** On**

**Off**

## GS1 DataBar Expanded

*< Default All GS1 DataBar Expanded Settings >*

### GS1 DataBar Expanded On/Off

*** On**

**Off**

### 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 = 4-74. Minimum Default = 4, Maximum Default = 74.

**Minimum Message Length**

**Maximum Message Length**

## Trioptic Code

*Note: If you are going to scan Code 32 Pharmaceutical codes (page 6-8), Trioptic Code must be off.*

Trioptic Code is used for labeling magnetic storage media.

**On**

*** Off**

## Codablock A

*<Default All Codablock A Settings>*

### Codablock A On/Off

**On**

*** Off**

## *Codablock A 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 = 1-600. Minimum Default = 1, Maximum Default = 600.

**Minimum Message Length**

**Maximum Message Length**

## *Codablock F*

*<Default All Codablock F Settings>*

### *Codablock F On/Off*

**On**

*** Off**

### *Codablock F 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 = 1-2048. Minimum Default = 1, Maximum Default = 2048.

**Minimum Message Length**

**Maximum Message Length**

## *PDF417*

*< Default All PDF417 Settings >*

### *PDF417 On/Off*

*** On**

**Off**

### *PDF417 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 = 1-2750. Minimum Default = 1, Maximum Default = 2750.

**Minimum Message Length**

**Maximum Message Length**

## *MicroPDF417*

*< Default All MicroPDF417 Settings >*

### *MicroPDF417 On/Off*

**On**

*** Off**

### *MicroPDF417 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 = 1-366. Minimum Default = 1, Maximum Default = 366.

**Minimum Message Length**

**Maximum Message Length**

## GS1 Composite Codes

Linear codes are combined with a unique 2D composite component to form a new class called GS1 Composite symbology. GS1 Composite symbologies allow for the co-existence of symbologies already in use.

**On**

*** Off**

### UPC/EAN Version

Scan the ***UPC/EAN Version On*** bar code to decode GS1 Composite symbols that have a U.P.C. or an EAN linear component. (This does not affect GS1 Composite symbols with a GS1-128 or GS1 linear component.)

**UPC/EAN Version On**

*** UPC/EAN Version Off**

### GS1 Composite Code 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 = 1-2435. Minimum Default = 1, Maximum Default = 2435.

**Minimum Message Length**

**Maximum Message Length**

## *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 Chart 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, ]e*m* (see Symbology Chart 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 6-27) setting. If the AIM ID is enabled, the value will be the GS1-128 AIM ID, ]C1 (see Symbology Chart on page A-1).

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

*Default = GS1 Emulation Off.*

**GS1-128 Emulation**

**GS1 DataBar Emulation**

**GS1 Code Expansion Off**

**EAN8 to EAN13 Conversion**

*** GS1 Emulation Off**

## *TCIF Linked Code 39 (TLC39)*

This code is a composite code since it has a Code 39 linear component and a MicroPDF417 stacked code component. All bar code readers are capable of reading the Code 39 linear component. The MicroPDF417 component can only be decoded if **TLC39 On** is selected. The linear component may be decoded as Code 39 even if TLC39 is off. *Default = Off.*

T39ENA1.
**On**

T39ENA0.
*** Off**

## *QR Code*

*< Default All QR Code Settings >*

QRCDFT.

### *QR Code On/Off*

This selection applies to both QR Code and Micro QR Code.

QRCENA1.
*** On**

QRCENA0.
**Off**

## QR Code 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 = 1-7089. Minimum Default = 1, Maximum Default = 7089.

**Minimum Message Length**

**Maximum Message Length**

## QR Code Append

This function allows the scanner to append the data from several QR Code bar codes together before transmitting them to the host computer. When the scanner encounters an QR Code bar code with the append trigger character(s), it buffers the number of QR Code bar codes determined by information encoded in those bar codes. Once the proper number of codes is reached, the data is output in the order specified in the bar codes. *Default = On.*

*** On**

**Off**

## Data Matrix

*< Default All Data Matrix Settings >*

IDMDFT.

### Data Matrix On/Off

IDMENA1.

*** On**

IDMENA0.

**Off**

### Data Matrix 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 = 1-3116. Minimum Default = 1, Maximum Default = 3116.

IDMMIN.

**Minimum Message Length**

IDMMAX.

**Maximum Message Length**

### Data Matrix Code Page

Data Matrix Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the bar code being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, scan the bar code below, select the code page with which the bar codes were created (see Code Page Mapping of Printed Bar Codes on

page A-6), and scan the value and the **Save** bar code from the Programming Chart on the inside the back cover of this manual. The data characters should then appear properly.

**Data Matrix Code Page**

## *MaxiCode*

*< Default All MaxiCode Settings >*

### *MaxiCode On/Off*

**On**

***Off**

### *MaxiCode 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 = 1-150. Minimum Default = 1, Maximum Default = 150.

**Minimum Message Length**

**Maximum Message Length**

## Aztec Code

*< Default All Aztec Code Settings >*

### Aztec Code On/Off

*** On**

**Off**

### Aztec Code 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 = 1-3832. Minimum Default = 1, Maximum Default = 3832.

**Minimum Message Length**

**Maximum Message Length**

### Aztec Code Page

Aztec Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the bar code being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, scan the bar code below, select the code page with which the bar codes were created (see Code Page Mapping of Printed Bar Codes on page A-6),

and scan the value and the **Save** bar code from the Programming Chart on the inside the back cover of this manual. The data characters should then appear properly.

AZTDCP.
**Aztec Code Page**

## *Chinese Sensible (Han Xin) Code*

*< Default All Han Xin Settings >*

HX_DFT.

### *Han Xin Code On/Off*

HX_ENA1.
**On**

HX_ENA0.
*** Off**

### *Han Xin Code 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 = 1-7833. Minimum Default = 1, Maximum Default = 7833.

HX_MIN.
**Minimum Message Length**

HX_MAX.
**Maximum Message Length**

## Postal Codes - 2D

The following lists the possible 2D postal codes, and 2D postal code combinations that are allowed. Only one 2D postal code selection can be active at a time. If you scan a second 2D postal code selection, the first selection is overwritten. *Default = 2D Postal Codes Off.*

*** 2D Postal Codes Off**

### Single 2D Postal Codes:

**Australian Post On**

**British Post On**

**Canadian Post On**

**Intelligent Mail Bar Code On**

**Japanese Post On**

**KIX Post On**

**Planet Code On**

*Also see Planet Code Check Digit, page 6-55.*

**Postal-4i On**

**Postnet On**

*Also see Postnet Check Digit, page 6-55.*

**Postnet with B and B' Fields On**

**InfoMail On**

## *Combination 2D Postal Codes:*

**InfoMail and British Post On**

**Intelligent Mail Bar Code and Postnet with B and B' Fields On**

**Postnet and Postal-4i On**

**Postnet and Intelligent Mail Bar Code On**

**Postal-4i and Intelligent Mail Bar Code On**

**Postal-4i and Postnet with B and B' Fields On**

**Planet Code and Postnet On**

**Planet Code and Postnet with B and B' Fields On**

POSTAL13.

**Planet Code and Postal-4i On**

POSTAL15.

**Planet Code and Intelligent Mail Bar Code On**

POSTAL21.

**Planet Code, Postnet, and Postal-4i On**

POSTAL22.

**Planet Code, Postnet, and Intelligent Mail Bar Code On**

POSTAL23.

**Planet Code, Postal-4i, and Intelligent Mail Bar Code On**

POSTAL24.

**Postnet, Postal-4i, and Intelligent Mail Bar Code On**

POSTAL25.

**Planet Code, Postal-4i, and Postnet with B and B' Fields On**

POSTAL26.

**Planet Code, Intelligent Mail Bar Code, and Postnet with B and B' Fields On**

POSTAL27.

**Postal-4i, Intelligent Mail Bar Code, and Postnet with B and B' Fields On**

POSTAL28.

**Planet Code, Postal-4i, Intelligent Mail Bar Code, and Postnet On**

POSTAL29.

**Planet Code, Postal-4i, Intelligent Mail Bar Code, and Postnet with B and B' Fields On**

### *Planet Code Check Digit*

This selection allows you to specify whether the check digit should be transmitted at the end of Planet Code data. *Default = Don't Transmit.*

PLNCKX1.

**Transmit Check Digit**

PLNCKX0.

*** Don't Transmit Check Digit**

### *Postnet Check Digit*

This selection allows you to specify whether the check digit should be transmitted at the end of Postnet data. *Default = Don't Transmit.*

NETCKX1.

**Transmit Check Digit**

NETCKX0.

*** Don't Transmit Check Digit**

## *Postal Codes - Linear*

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*

**On**

*** Off**

### *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 = 2-80. Minimum Default = 4, Maximum Default = 80.

**Minimum Message Length**

**Maximum Message Length**

## *Korea Post*

*<Default All Korea Post Settings>*

KPCDFT.

### *Korea Post*

KPCENA1.

**On**

KPCENA0.

*** Off**

### *Korea Post 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 = 2-80. Minimum Default = 4, Maximum Default = 48.

KPCMIN.

**Minimum Message Length**

KPCMAX.

**Maximum Message Length**

### *Korea Post Check Digit*

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data. *Default = Don't Transmit.*

KPCCHK1.

**Transmit Check Digit**

KPCCHK0.

*** Don't Transmit Check Digit**

# 7 Imaging Commands

The engine is like a digital camera in the way it captures, manipulates, and transfers images. The following commands allow you to alter the way the engine performs these functions.

## Single-Use Basis

Imaging Commands with their modifiers send instructions to the engine on a single-use basis, and take effect for a single image capture. Once that capture is complete, the engine reverts to its imaging default settings. If you want to permanently change a setting, you must use the serial default commands (see Chapter 10). When the serial default command is used, that selection becomes the new, permanent setting for the engine.

## Command Syntax

Multiple modifiers and commands can be issued within one sequence. If additional modifiers are to be applied to the same command, just add the modifiers to that command. For example, to add 2 modifiers to the Image Snap command, such as setting the Imaging Style to 1P and the Wait for Trigger to 1T, you would enter **IMGSNP1P1T.**

*Note: After processing an image capture command (IMGSNP or IMGBOX), you must follow it with an IMGSHP command if you want to see it on your terminal.*

To add a command to a sequence, each new command is separated with a semicolon. For example, to add the Image Ship command to the above sequence, you would enter **IMGSNP1P1T;IMGSHP.**

The imaging commands are:

Image Snap - IMGSNP (page 7-2)

Image Ship - IMGSHP (page 7-5)

Intelligent Signature Capture - IMGBOX (page 7-14)

The modifiers for each of these commands follow the command description.

*Note: The images included with each command description are examples only. The results you achieve may be different from those included in this manual. The quality of the output you receive will vary depending on lighting, quality of the initial image/object being captured, and distance of the engine from the image/object. To achieve a high quality image, it is recommended that you position your engine 4-6" (10.2-15.2 cm) away from the image/object you are capturing.*

# Step 1 - Take a Picture Using IMGSNP

# Image Snap - IMGSNP

An image is taken whenever the hardware button is pressed, or when the Image Snap (IMGSNP) command is processed.

The image snap command has many different modifiers that can be used to change the look of the image in memory. Modifiers always begin with numbers and end with a letter (case insensitive). Any number of modifiers may be appended to the IMGSNP command. For example, you can use the following command to snap an image, increase the gain, and have the beeper sound once the snap is complete: **IMGSNP2G1B**

## IMGSNP Modifiers

**P - Imaging Style**

This sets the Image Snap style.

0P **Decoding Style**. This processing allows a few frames to be taken until the exposure parameters are met. The last frame is then available for further use.

1P **Photo Style *(default)***. This mimics a simple digital camera, and results in a visually optimized image.

2P **Manual Style**. This is an advanced style that should only be used by an experienced user. It allows you the most freedom to set up the engine, and has no auto-exposure.

**B - Beeper**

Causes a beep to sound after an image is snapped.

0B No beep *(default)*

1B Sounds a beep when the image is captured.

**T - Wait for Trigger**

Waits for a hardware button push before taking the image. This is only available when using Photo Style (1P).

0T Takes image immediately *(default)*

1T Waits for a button push, then takes the image

**L - LED State**

Determines if the LEDs should be on or off, and when. Ambient illumination (0L) is preferred for taking pictures of color documents, such as ID cards, especially when the scanner is in a stand. LED illumination (1L) is preferred when the device is handheld. LED State is not available when using Decoding Style (0P).

0L LEDs off *(default)*

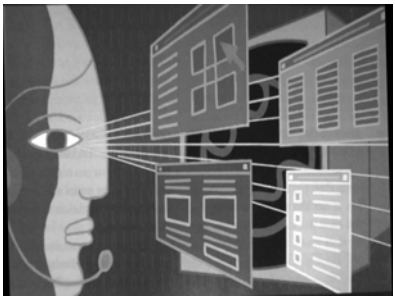
1L LEDs on

**E - Exposure**

Exposure is used in Manual Style only (2P), and allows you to set the exposure time. This is similar to setting a shutter speed on a camera. The exposure time determines how long the engine takes to record an image. On a bright day, exposure times can be very short because plenty of light is available to help record an image. At nighttime, exposure time can increase dramatically due to the near absence of light. Units are 127 microseconds. *(Default = 7874)*

*n*E Range: 1 - 7874

Example of Exposure at 7874E with fluorescent lighting:



Example of Exposure at 100E with fluorescent lighting:

**G - Gain**

Gain is used in Manual Style only (2P). Gain brightens images. Your Exposure setting will affect your results when using Gain. As you increase the gain, the noise in an image is also amplified.

1G No gain *(default)*

2G Medium gain

4G Heavy gain

8G Maximum gain

Example of Gain at 1G:

Example of Gain at 4G:

Example of Gain at 8G:

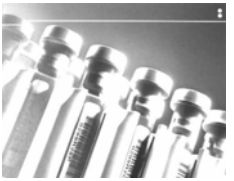
**W - Target White Value**

Sets the target for the median grayscale value in the captured image. For capturing close-up images of high contrast documents, a lower setting, such as 75, is recommended. Higher settings result in longer exposure times and brighter images, but if the setting is too high, the image may be overexposed. Target White Value is only available when using Photo Style (1P). *(Default = 125)*

*n*W Range: 0 - 255

Example of White Value at 75W:

Example of White Value at 125W:



Example of White Value at 200W:

**D - Delta for Acceptance**

This sets the allowable range for the white value setting (see W - Target White Value). Delta is only available when using Photo Style (1P). *(Default = 25)*

*n*D Range: 0 - 255

**U - Update Tries**

This sets the maximum number of frames the engine should take to reach the D - Delta for Acceptance. Update Tries is only available when using Photo Style (1P). *(Default = 6)*

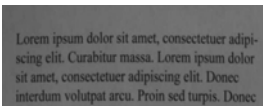
*n*U Range: 0 - 10

**% - Target Set Point Percentage**

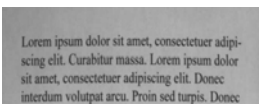
Sets the target point for the light and dark values in the captured image. A setting of 75% means 75% of the pixels are at or below the target white value, and 25% of the pixels are above the target white value. Altering this setting from the default is not recommended under normal circumstances. To alter grayscale values, W - Target White Value should be used. *(Default = 50)*

n% Range: 1 - 99

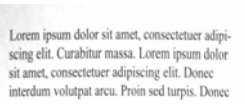
Example of Target Set Point Percentage at 97%:




Example of Target Set Point Percentage at 50%:




Example of Target Set Point Percentage at 40%:



## *Step 2 - Ship a Picture Using IMGSHP*

## *Image Ship - IMGSHP*

An image is taken whenever the button is pressed, or when the Image Snap (IMGSNP) command is processed. The last image is always stored in memory. You can “ship” the image by using the IMGSHP command.

The image ship commands have many different modifiers that can be used to change the look of the image output. Modifiers affect the image that is transmitted, but do not affect the image in memory. Modifiers always begin with a number and end with a letter (case insensitive). Any number of modifiers may be appended to the IMGSHP command. For example, you can use the following command to snap and ship a bitmap image with gamma correction and document image filtering: **IMGSNP;IMGSHP8F75K26U**

### *IMGSHP Modifiers*

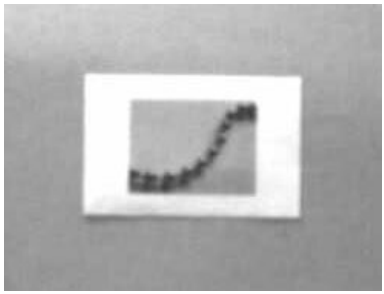
**A - Infinity Filter**

Enhances pictures taken from very long distances (greater than 10 feet or 3m). The Infinity Filter should not be used with IMGSHP Modifiers (page 7-5).

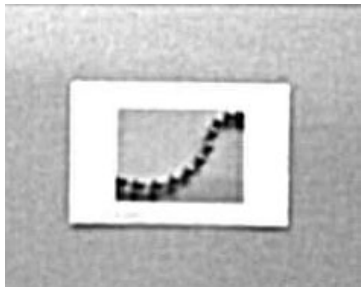
0A Infinity filter off *(default)*

1A Infinity filter on

Example of Infinity Filter off (0A) from approximately 12 feet (3.66m) away:



Example of Infinity Filter on (1A) from approximately 12 feet (3.66m) away:



**C - Compensation**

Flattens the image to account for variations in illumination across the image.

0C Compensation disabled *(default)*

1C Compensation enabled

Example of Compensation at 0C:

Example of Compensation at 1C:

**D - Pixel Depth**

Indicates the number of bits per pixel in the transmitted image (KIM or BMP format only).

8D 8 bits per pixel, grayscale image *(default)*

1D 1 bit per pixel, black and white image

24D 24 bits per pixels (for BMP format)

**E - Edge Sharpen**

An edge sharpen filter cleans up the edges of an image, making it look cleaner and sharper. While edge sharpening does make the image look cleaner, it also removes some fine detail from the original image. The strength of the edge sharpen filter can be entered from 1 to 24. Entering a 23E gives the sharpest edges, but also increases noise in the image.

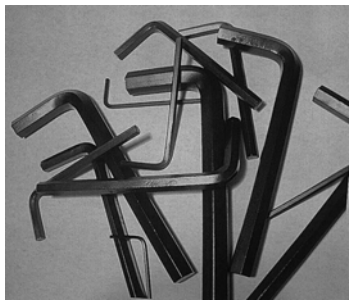
0E Don't sharpen image *(default)*

14E Apply edge sharpen for typical image

*n*e Apply edge sharpen using strength *n* (*n* = 1-24)

Example of Edge Sharpen at 0E:

Example of Edge Sharpen at 24E:



**F - File Format**

Indicates the desired format for the image.

0F KIM format

1F TIFF binary

2F TIFF binary group 4, compressed

3F TIFF grayscale

4F Uncompressed binary (upper left to lower right, 1 pixel/bit, 0 padded end of line)

5F Uncompressed grayscale (upper left to lower right, bitmap format)

6F JPEG image *(default)*

8F BMP format (lower right to upper left, uncompressed)

10F TIFF color compressed image

11F TIFF color uncompressed image

12F JPEG color image

14F BMP color format

15F BMP Uncompressed raw image

**H - Histogram Stretch**

Increases the contrast of the transmitted image. Not available with some image formats.

0H No stretch *(default)*

1H Histogram stretch

Example of Histogram Stretch at 0H:

Example of Histogram Stretch at 1H:

**I - Invert Image**

Invert image is used to rotate the image around the X or Y axis.

1ix Invert around the X axis (flips picture upside down)

1iy Invert around the Y axis (flips picture left to right)

Example of image not inverted:

Example of image with Invert Image set to 1ix:

Example of image with Invert Image set to 1iy:

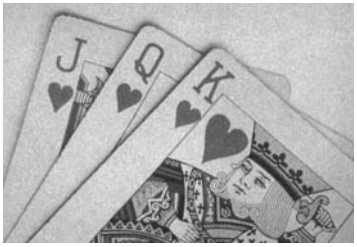
**IF- Noise Reduction**

Used to reduce the salt and pepper noise in an image.

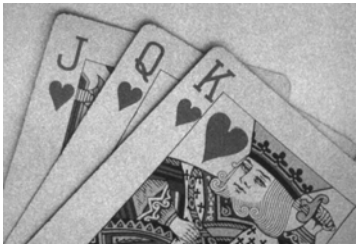
0if No salt and pepper noise reduction (default)

1if Salt and pepper noise reduction

Example of Noise Reduction Off (0if):



Example of Noise Reduction On (1if):



**IR - Image Rotate**

0ir Image as snapped (rightside up) (default)

1ir Rotate image 90 degrees to the right

2ir Rotate image 180 degrees (upside down)

3ir Rotate image 90 degrees to the left

Example of Image Rotate set to 0ir:

Example of Image Rotate set to 2ir:

Example of Image Rotate set to 1ir:

Example of Image Rotate set to 3ir:

**J - JPEG Image Quality**

Sets the desired quality when the JPEG image format is selected. Higher numbers result in higher quality, but larger files. Smaller numbers result in greater amounts of lossy compression, faster transmission times, lower quality, but smaller files. *(Default = 50)*

*n*J Image is compressed as much as possible while preserving quality factor of *n* (*n* = 0 - 100)

0J worst quality (smallest file)

100Jbest quality (largest file)

**K - Gamma Correction**

Gamma measures the brightness of midtone values produced by the image. You can brighten or darken an image using gamma correction. A higher gamma correction yields an overall brighter image. The lower the setting, the darker the image. The optimal setting for text images is 50K.

0K Gamma correction off *(default)*

50K Apply gamma correction for brightening typical document image

*n*K Apply gamma correction factor *n* (*n* = 0-1,000)

Example of Gamma Correction set to 0K:

Example of Gamma Correction set to 50K:

Example of Gamma Correction set to 255K:

**L, R, T, B, M - Image Cropping**

*Note: Image Cropping should not be used with IMGSHP Modifiers (see page 7-5).*

Ships a window of the image by specifying the left, right, top, and bottom pixel coordinates. Device columns are numbered 0 through 1279, and device rows are numbered 0 through 959.

*n*L The left edge of the shipped image corresponds to column *n* of the image in memory. Range: 000 - 640. *(Default = 0)*

*n*R The right edge of the shipped image corresponds to column *n* - 1 of the image in memory. Range: 000 - 640. *(Default = all columns)*

*n*T The top edge of the shipped image corresponds to row *n* of the image in memory. Range: 000 - 480. *(Default = 0)*

*n*B The bottom edge of the shipped image corresponds to row *n* - 1 of the image in memory. Range: 000 - 480. *(Default = all rows)*

Uncropped Image:

Example of Image Crop set to 300R:

Example of Image Crop set to 300L:

Example of Image Crop set to 200B:

Example of Image Crop set to 200T:

Alternately, specify the number of pixels to cut from the outside margin of the image; thus only the center pixels are transmitted.

*n*M Margin: cut *n* columns from the left, *n* + 1 columns from the right, *n* rows from the top, and *n* + 1 rows from the bottom of the image. Ship the remaining center pixels. Range: 0 - 238. *(Default = 0, or full image)*

Example of Image Crop set to 238M:

**P - Protocol**

Used for shipping an image. Protocol covers two features of the image data being sent to the host. It addresses the protocol used to send the data (Hmodem, which is an Xmodem 1K variant that has additional header information), and the format of the image data that is sent.

0P None (raw data)

2P None *(default for USB)*

3P Hmodem compressed *(default for RS232)*

4P Hmodem

**S - Pixel Ship**

Pixel Ship sizes an image in proportion to its original size. It decimates the image by shipping only certain, regularly spaced pixels. For example, **4S** would transmit every fourth pixel from every fourth line. The smaller number of pixels shipped, the smaller the image, however, after a certain point the image becomes unusable.

1S ship every pixel *(default)*

2S ship every 2nd pixel, both horizontally and vertically

3S ship every 3rd pixel, both horizontally and vertically

Example of Pixel Ship set to 1S:

Example of Pixel Ship set to 2S:

Example of Pixel Ship set to 3S:

**U - Document Image Filter**

Allows you to input parameters to sharpen the edges and smooth the area between the edges of text in an image. This filter should be used with gamma correction (see page 7-10), with the scanner in a stand, and the image captured using the command:

**IMGSNP1P0L168W90%32D**

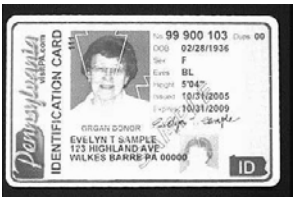
This filter typically provides better JPEG compression than the standard E - Edge Sharpen command (see page 7-13). This filter also works well when shipping pure black and white images (1 bit per pixel). The optimal setting is 26U.

0U Document image filter off *(default)*

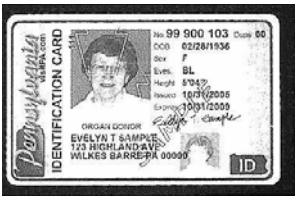
26U Apply document image filter for typical document image

*n*U Apply document image filter using grayscale threshold n. Use lower numbers when the image contrast is lower. 1U will have a similar effect to setting E - Edge Sharpen (page 7-7) to 22e. Range: 0-255.

Example of Document Image Filter set to 0U:




Example of Document Image Filter set to 26U:



**V - Blur Image**

Smooths transitions by averaging the pixels next to the hard edges of defined lines and shaded areas in an image.

0V Don't blur *(default)*

1V Blur

Example of Blur Image Off (0V):

Example of Blur Image On (1V):

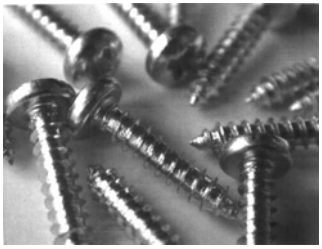
**W - Histogram Ship**

A histogram gives a quick picture of the tonal range of an image, or key type. A low-key image has detail concentrated in the shadows; a high-key image has detail concentrated in the highlights; and an average-key image has detail concentrated in the midtones. This modifier ships the histogram for an image.

0W Don't ship histogram *(default)*

1W Ship histogram

Image used for histogram:



Histogram of image at left:

### *Image Size Compatibility*

If you have applications that expect an image ship to return exactly 640x480 pixels, scan the Force VGA Resolution bar code. *Default = Native Resolution*

**Force VGA Resolution**

*** Native Resolution**

## *Intelligent Signature Capture - IMGBOX*

IMGBOX allows you to configure the size and location of a signature capture area relative to its proximity to a bar code. This allows you to tailor a signature capture area to a specific form. In order to use IMGBOX, you need a set form where the signature box location is in a known location relative to a bar code. You can input the overall size of the signature area, as well as specify how far the signature area is from the bar code, vertically and horizontally. You can also set the resolution and file format for the final output of the signature capture image.

*Note: IMGBOX commands can only be triggered by one of the following types of bar codes: PDF417, Code 39, Code 128, Aztec, Codabar, and Interleaved 2 of 5. Once one of these symbologies has been read, the image is retained for a possible IMGBOX command.*

### *Signature Capture Optimize*

If you will be using your engine to capture signatures frequently, you should optimize it for this purpose. However, the speed of scanning bar codes may be slowed when this mode is enabled. *Default = Off.*

**Optimize On**

*** Optimize Off**

The following IMGBOX example was executed and viewed using QuickView software. This software is available at www.honeywellaidc.com. Click on **Software Downloads**. Select **4600r** from the Products list, then select **QuickView Software Utility**.

Below is an example of a signature capture application. In this example, the signature capture area should be centered in the image when the trigger is pressed. A single beep is emitted, indicating that the engine has read a Code 128 bar code and the data has been transferred to the host. An IMGBOX command may now be sent from the host to specify the coordinates of the signature capture area below that code, and indicating that only that area containing the signature should be transferred as an image to the host.

To see this example, align the signature area (not the bar code) in the center of the image, then press the trigger.

Send the following IMGBOX command string after the button push:

***Example: IMGBOX245w37h55y.***

*Note: Case is not important in the command string. It is used here only for clarity.*

The following image is captured:

The IMGBOX commands have many different modifiers that can be used to change the size and appearance of the signature image output by the engine. Modifiers affect the image that is transmitted, but do not affect the image in memory. Modifiers always begin with a number and end with a letter (case insensitive). Any number of modifiers may be appended to the IMGBOX command.

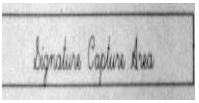
*Note: The IMGBOX command will return a NAK unless a window size (width and height) are specified. See H - Height of Signature Capture Area (page 7-17) and W - Width of Signature Capture Area (page 7-18).*

## *IMGBOX Modifiers*

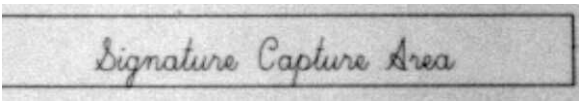
**A - Output Image Width**

This option is used to size the image horizontally. If using this option, set the resolution (R) to zero.

Example of Image Width set to 200A:



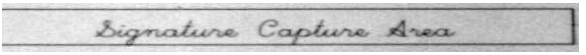

Example of Image Width set to 600A:



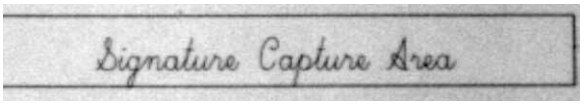

**B - Output Image Height**

This option is used to size the image vertically. If using this option, set the resolution (R) to zero.

Example of Image Height set to 50B:




Example of Image Height set to 100B:




**D - Pixel Depth**

This indicates the number of bits per pixel in the transmitted image, which defines whether it will be grayscale or black and white.

8D 8 bits per pixel, grayscale image *(default)*

1D 1 bit per pixel, black and white image

**F - File Format**

This option indicates the type of file format in which to save the image.

0F KIM format

1F TIFF binary

2F TIFF binary group 4, compressed

3F TIFF grayscale

4F Uncompressed Binary

5F Uncompressed grayscale

6F JPEG image *(default)*

7F Outlined image

8F BMP format

**H - Height of Signature Capture Area**

The height of the signature capture area must be measured in inches divided by .01. In the example, the height of the area to be captured is 3/8 inch, resulting in a value of H = .375/0.01 = 37.5.

*Example:* IMGBOX245w**37h**55y.

**K - Gamma Correction**

Gamma measures the brightness of midtone values produced by the image. You can brighten or darken an image using gamma correction. A higher gamma correction yields an overall brighter image. The lower the setting, the darker the image. The optimal setting for text images is 50K.

0K Gamma correction off *(default)*

50K Apply gamma correction for brightening typical document image

*n*K Apply gamma correction factor *n* (*n* = 0-1000)

Example of Gamma Correction set to 0K:

Example of Gamma Correction set to 50K:

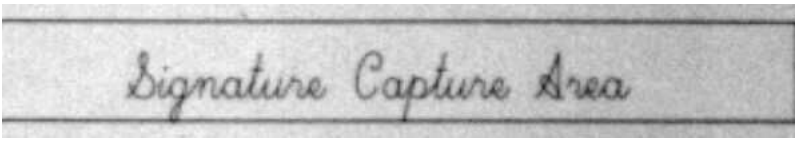
Example of Gamma Correction set to 255K:

**R - Resolution of Signature Capture Area**

The resolution is the number of pixels that the engine outputs per each minimum bar width. The higher the value for R, the higher the quality of the image, but also the larger the file size. Values begin at 1000. The engine automatically inserts a decimal point between the first and second digit.

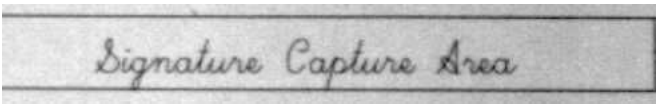
For example, use 2500 to specify a resolution of 2.5. Set to zero when using the A and B modifiers (see A - Output Image Width and B - Output Image Height on page 7-16).

Example of Resolution set to 0R:




Example of Resolution set to 1000R:

Example of Resolution set to 2000R:




**S - Bar Code Aspect Ratio**

All dimensions used in IMGBOX are measured as multiples of the minimum element size of the bar code. The bar code aspect ratio allows you to set the ratio of the bar code height to the narrow element width. In the example, the narrow element width is .010 inches and the bar code height is 0.400 inches, resulting in a value of S = 0.4/0.01 = 40.

**W - Width of Signature Capture Area**

The width of the signature capture area must be measured in inches divided by .01. In the example, the width of the area to be captured is 2.4 inches, resulting in a value of W = 2.4/0.01 = 240. (A value of 245 was used in the example to accommodate a slightly wider image area.)

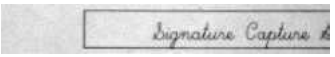
*Example:* ***IMGBOX245w37h55y.***

**X - Horizontal Bar Code Offset**

The horizontal bar code offset allows you to offset the horizontal center of the signature capture area. Positive values move the horizontal center to the right and negative values to the left. Measurements are in multiples of the minimum bar width.

Example of Horizontal Offset set to 75X:

Example of Horizontal Offset set to -75X:

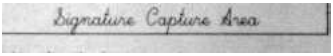


**Y - Vertical Bar Code Offset**

The vertical bar code offset allows you to offset the vertical center of the signature capture area. Negative numbers indicate that the signature capture is above the bar code, and positive numbers indicate that the area is below the bar code. Measurements are in multiples of the minimum bar width.

Example of Vertical Offset set to -7Y:

Example of Vertical Offset set to 65Y:



# 8 Interface Keys

## 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 2-13 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.

| Country | Codes | | | | |
|---|---|---|---|---|---|
| United States | [ | \ | ] | 6 | - |
| Belgium | [ | < | ] | 6 | - |
| Scandinavia | 8 | < | 9 | 6 | - |
| France | ^ | 8 | $ | 6 | = |
| Germany | | Ã | + | 6 | - |
| Italy | | \ | + | 6 | - |
| Switzerland | | < | . . | 6 | - |
| United Kingdom | [ | ¢ | ] | 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 | IBM XTs and Compatibles Supported Keys | IBM, DDC, Memorex Telex, Harris* Supported Keys |
|---|---|---|---|---|
| NUL | 00 | Reserved | Reserved | Reserved |
| SOH | 01 | Enter (KP) | CR/Enter | Enter |
| STX | 02 | Cap Lock | Caps Lock | F11 |
| ETX | 03 | ALT make | Reserved | F12 |
| EOT | 04 | ALT break | Reserved | F13 |
| ENQ | 05 | CTRL make | Reserved | F14 |
| ACK | 06 | CTRL break | Reserved | F15 |
| BEL | 07 | CR/Enter | CR/Enter | New Line |
| BS | 08 | Reserved | Reserved | F16 |
| HT | 09 | Tab | Tab | F17 |
| LF | 0A | Reserved | Reserved | F18 |
| VT | 0B | Tab | Tab | Tab/Field Forward |
| FF | 0C | Delete | Delete | Delete |
| CR | 0D | CR/Enter | CR/Enter | Field Exit/New Line |

| ASCII | HEX | IBM AT/XT and PS/2 Compatibles, WYSE PC/AT Supported Keys | IBM XTs and Compatibles Supported Keys | IBM, DDC, Memorex Telex, Harris* Supported Keys |
|---|---|---|---|---|
| SO | 0E | Insert | Insert | Insert |
| SI | 0F | Escape | Escape | F19 |
| DLE | 10 | F11 | Reserved | Error Reset |
| DC1 | 11 | Home | Home | Home |
| DC2 | 12 | Print | Print | F20 |
| DC3 | 13 | Back Space | Back Space | Back Space |
| DC4 | 14 | Back Tab | Back Tab | Backfield/Back Tab |
| NAK | 15 | F12 | Reserved | F21 |
| SYN | 16 | F1 | F1 | F1 |
| ETB | 17 | F2 | F2 | F2 |
| CAN | 18 | F3 | F3 | F3 |
| EM | 19 | F4 | F4 | F4 |
| SUB | 1A | F5 | F5 | F5 |
| ESC | 1B | F6 | F6 | F6 |
| FS | 1C | F7 | F7 | F7 |
| GS | 1D | F8 | F8 | F8 |
| RS | 1E | F9 | F9 | F9 |
| US | 1F | F10 | F10 | F10 |

* IBM 3191/92, 3471/72, 3196/97, 3476/77, Telex (all models)

## *Supported Interface Keys*

| ASCII | HEX | IBM, Memorex Telex (102)* Supported Keys | Memorex Telex (88)** Supported Keys |
|---|---|---|---|
| NUL | 00 | Reserved | Reserved |
| SOH | 01 | Enter | Enter |
| STX | 02 | F11 | PF10 |
| ETX | 03 | F12 | PF11 |
| EOT | 04 | F13 | PF12 |
| ENQ | 05 | F14 | Reserved |
| ACK | 06 | F15 | Reserved |
| BEL | 07 | New Line | New Line |
| BS | 08 | F16 | Field Forward |

| ASCII | HEX | IBM, Memorex Telex (102)* Supported Keys | Memorex Telex (88)** Supported Keys |
|---|---|---|---|
| HT | 09 | F17 | Field Forward |
| LF | 0A | F18 | Reserved |
| VT | 0B | Tab/Field Forward | Field Forward |
| FF | 0C | Delete | Delete |
| CR | 0D | Field Exit | New Line |
| SO | 0E | Insert | Insert |
| SI | 0F | Clear | Erase |
| DLE | 10 | Error Reset | Error Reset |
| DC1 | 11 | Home | Reserved |
| DC2 | 12 | Print | Print |
| DC3 | 13 | Back Space | Back Space |
| DC4 | 14 | Back Tab | Back Field |
| NAK | 15 | F19 | Reserved |
| SYN | 16 | F1 | PF1 |
| ETB | 17 | F2 | PF2 |
| CAN | 18 | F3 | PF3 |
| EM | 19 | F4 | PF4 |
| SUB | 1A | F5 | PF5 |
| ESC | 1B | F6 | PF6 |
| FS | 1C | F7 | PF7 |
| GS | 1D | F8 | PF8 |
| RS | 1E | F9 | PF9 |
| US | 1F | F10 | Home |

* IBM 3196/97, 3476/77, 3191/92, 3471/72, Memorex Telex (all models) with 102 key keyboards
** Memorex Telex with 88 key keyboards

## *Supported Interface Keys*

| ASCII | HEX | Esprit 200, 400 ANSI Supported Keys | Esprit 200, 400 ASCII Supported Keys | Esprit 200, 400 PC Supported Keys |
|---|---|---|---|---|
| NUL | 00 | Reserved | Reserved | Reserved |
| SOH | 01 | New Line | New Line | New Line |
| STX | 02 | N/A | N/A | N/A |
| ETX | 03 | N/A | N/A | N/A |

| ASCII | HEX | Esprit 200, 400 ANSI Supported Keys | Esprit 200, 400 ASCII Supported Keys | Esprit 200, 400 PC Supported Keys |
|---|---|---|---|---|
| EOT | 04 | N/A | N/A | N/A |
| ENQ | 05 | N/A | N/A | N/A |
| ACK | 06 | N/A | N/A | N/A |
| BEL | 07 | New Line | New Line | New Line |
| BS | 08 | N/A | N/A | N/A |
| HT | 09 | Tab | Tab | Tab |
| LF | 0A | N/A | N/A | N/A |
| VT | 0B | Tab | Tab | Tab |
| FF | 0C | N/A | N/A | Delete |
| CR | 0D | New Line | New Line | New Line |
| SO | 0E | N/A | N/A | Insert |
| SI | 0F | Escape | Escape | Escape |
| DLE | 10 | F11 | F11 | F11 |
| DC1 | 11 | Insert | Insert | Home |
| DC2 | 12 | F13 | F13 | Print |
| DC3 | 13 | Back Space | Back Space | Back Space |
| DC4 | 14 | Back Tab | Back Tab | Back Tab |
| NAK | 15 | F12 | F12 | F12 |
| SYN | 16 | F1 | F1 | F1 |
| ETB | 17 | F2 | F2 | F2 |
| CAN | 18 | F3 | F3 | F3 |
| EM | 19 | F4 | F4 | F4 |
| SUB | 1A | F5 | F5 | F5 |
| ESC | 1B | F6 | F6 | F6 |
| FS | 1C | F7 | F7 | F7 |
| GS | 1D | F8 | F8 | F8 |
| RS | 1E | F9 | F9 | F9 |
| US | 1F | F10 | F10 | F10 |

## *Supported Interface Keys*

| ASCII | HEX | Apple Mac/iMac Supported Keys |
|---|---|---|
| NUL | 00 | Reserved |
| SOH | 01 | Enter/Numpad Enter |

| ASCII | HEX | Apple Mac/iMac Supported Keys |
|---|---|---|
| STX | 02 | CAPS |
| ETX | 03 | ALT make |
| EOT | 04 | ALT break |
| ENQ | 05 | CNTRL make |
| ACK | 06 | CNTRL break |
| BEL | 07 | RETURN |
| BS | 08 | APPLE make |
| HT | 09 | TAB |
| LF | 0A | APPLE break |
| VT | 0B | TAB |
| FF | 0C | Del |
| CR | 0D | RETURN |
| SO | 0E | Ins Help |
| SI | 0F | ESC |
| DLE | 10 | F11 |
| DC1 | 11 | Home |
| DC2 | 12 | Prnt Scrn |
| DC3 | 13 | BACKSPACE |
| DC4 | 14 | LSHIFT TAB |
| NAK | 15 | F12 |
| SYN | 16 | F1 |
| ETB | 17 | F2 |
| CAN | 18 | F3 |
| EM | 19 | F4 |
| SUB | 1A | F5 |
| ESC | 1B | F6 |
| FS | 1C | F7 |
| GS | 1D | F8 |
| RS | 1E | F9 |
| US | 1F | F10 |
| DEL | 7F | BACKSPACE |

# 9 Utilities

## 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 Chart, 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.

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

## Show Decoder Revision

Scan the bar code below to output the decoder revision.

**Show Decoder Revision**

## Show Scan Driver Revision

Scan the bar code below to output the scan driver revision. The scan driver controls image capture.

**Show Scan Driver Revision**

## Show Software Revision

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

**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**

## *TotalFreedom*

TotalFreedom is an open system architecture that makes it possible for you create applications that reside on your engine. Two types of apps can be created using TotalFreedom: Decoding and Data Formatting. For further information about TotalFreedom, go to our website at www.honeywellaidc.com.

## *Application Plug-Ins (Apps)*

Any apps that you are using can be turned off or on by scanning the following bar codes. Apps are stored in groups: Decoding and Formatting. You can enable and disable these groups of apps by scanning that group's **On** or **Off** bar code below. You can also scan the **List Apps** bar code to output a list of all your apps.

*** Decoding Apps On**

**Decoding Apps Off**

*** Formatting Apps On**

**Formatting Apps Off**

**List Apps**

*Note: You must reset your device in order for the apps setting to take effect.*

## *EZConfig Introduction*

EZConfig provides a wide range of PC-based programming functions that can be performed on an engine connected to your PC's COM port. EZConfig allows you to download upgrades to the engine's firmware, change programmed parameters, and create and print programming bar codes. Using EZConfig, 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 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 Operations*

The EZConfig 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 a 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.

### *Imaging*

Imaging provides all the image-related functions that a 2D engine can perform. You can capture an image using the current settings, and the image will be displayed in an image window. Images captured from the engine can be saved to files in different image formats. You can modify the image settings and save the image settings to an INI file, which can be loaded later to capture new images. Imaging also lets you preview the images continuously captured by the engine.

## *Installing EZConfig from the Web*

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

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

# 10 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 RS-232 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 RS-232 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.)

### :Name: Field Usage (Optional)

This command returns the query information from the engine.

### 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.

## *Trigger Commands*

You can activate and deactivate the engine with serial trigger commands. First, the engine must be put in Manual Trigger Mode by scanning a Manual Trigger Mode bar code (page 3-6), or by sending a serial menu command for triggering (page 10-13). Once the engine is in serial trigger mode, the trigger 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, until the deactivate command is sent, or until the serial time-out has been reached (see "Read Time-Out" on page 3-7 for a description, and the serial command on page 10-13).

## *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.

**Activate Custom Defaults**

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<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| ***Product Default Settings*** | | | |
| Setting Custom Defaults | Set Custom Defaults | MNUCDF | 1-6 |
| | Save Custom Defaults | MNUCDS | 1-6 |
| Resetting the Custom Defaults | Activate Custom Defaults | DEFALT | 1-7 |
| Resetting the Factory Defaults | Remove Custom Defaults | DEFOVR | 1-7 |
| | Activate Defaults | DEFALT | 1-7 |
| ***Programming the Interface*** | | | |
| Plug and Play Codes | RS232 Serial Port | PAP232 | 2-1 |
| Plug and Play Codes: USB | USB Keyboard (PC) | PAP124 | 2-1 |
| | USB Serial | TERMID130 | 2-2 |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
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| | *On | UPECKX1 | 6-28 |
| UPC-E0 Number System | Off | UPENSX0 | 6-29 |
| | *On | UPENSX1 | 6-29 |
| UPC-E0 Addenda | 2 Digit Addenda On | UPEAD21 | 6-29 |
| | *2 Digit Addenda Off | UPEAD20 | 6-29 |
| | 5 Digit Addenda On | UPEAD51 | 6-29 |
| | *5 Digit Addenda Off | UPEAD50 | 6-29 |
| UPC-E1 | *Off | UPEEN10 | 6-30 |
| | On | UPEEN11 | 6-30 |
| EAN/JAN-13 | Default All EAN/ JAN Settings | E13DFT | 6-30 |
| | Off | E13ENA0 | 6-30 |
| | *On | E13ENA1 | 6-30 |
| EAN/JAN-13 Check Digit | Off | E13CKX0 | 6-30 |
| | *On | E13CKX1 | 6-30 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| EAN/JAN-13 2 Digit Addenda | 2 Digit Addenda On | E13AD21 | 6-31 |
| | *2 Digit Addenda Off | E13AD20 | 6-31 |
| | 5 Digit Addenda On | E13AD51 | 6-31 |
| | *5 Digit Addenda Off | E13AD50 | 6-31 |
| EAN/JAN-13 Addenda Required | *Not Required | E13ARQ0 | 6-31 |
| | Required | E13ARQ1 | 6-31 |
| EAN/JAN-13 Addenda Separator | Off | E13ADS0 | 6-32 |
| | *On | E13ADS1 | 6-32 |
| ISBN Translate | *Off | E13ISB0 | 6-32 |
| | On | E13ISB1 | 6-32 |
| EAN/JAN-8 | Default All EAN/ JAN 8 Settings | EA8DFT | 6-33 |
| | Off | EA8ENA0 | 6-33 |
| | *On | EA8ENA1 | 6-33 |
| EAN/JAN-8 Check Digit | Off | EA8CKX0 | 6-33 |
| | *On | EA8CKX1 | 6-33 |
| EAN/JAN-8 Addenda | *2 Digit Addenda Off | EA8AD20 | 6-34 |
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| | *5 Digit Addenda Off | EA8AD50 | 6-34 |
| | 5 Digit Addenda On | EA8AD51 | 6-34 |
| EAN/JAN-8 Addenda Required | *Not Required | EA8ARQ0 | 6-34 |
| | Required | EA8ARQ1 | 6-34 |
| EAN/JAN-8 Addenda Separator | Off | EA8ADS0 | 6-34 |
| | *On | EA8ADS1 | 6-34 |
| MSI | Default All MSI Settings | MSIDFT | 6-35 |
| | *Off | MSIENA0 | 6-35 |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| MSI Check Character | *Validate Type 10, but Don't Transmit | MSICHK0 | 6-36 |
| | Validate Type 10 and Transmit | MSICHK1 | 6-36 |
| | Validate 2 Type 10 Chars, but Don't Transmit | MSICHK2 | 6-36 |
| | Validate 2 Type 10 Chars and Transmit | MSICHK3 | 6-36 |
| | Validate Type 10 then Type 11 Char, but Don't Transmit | MSICHK4 | 6-36 |
| | Validate Type 10 then Type 11 Char and Transmit | MSICHK5 | 6-36 |
| | Disable MSI Check Characters | MSICHK6 | 6-36 |
| MSI Message Length | Minimum (4 - 48) *4 | MSIMIN## | 6-36 |
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| GS1 DataBar Omnidirectional | Default All GS1 DataBar Omnidirectional Settings | RSSDFT | 6-37 |
| | Off | RSSENA0 | 6-37 |
| | *On | RSSENA1 | 6-37 |
| GS1 DataBar Limited | Default All GS1 DataBar Limited Settings | RSLDFT | 6-37 |
| | Off | RSLENA0 | 6-37 |
| | *On | RSLENA1 | 6-37 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| GS1 DataBar Expanded | Default All GS1 DataBar Expanded Settings | RSEDFT | 6-38 |
| | Off | RSEENA0 | 6-38 |
| | *On | RSEENA1 | 6-38 |
| GS1 DataBar Expanded Msg. Length | Minimum (4 - 74) *4 | RSEMIN## | 6-38 |
| | Maximum (4 - 74) *74 | RSEMAX## | 6-38 |
| Trioptic Code | *Off | TRIENA0 | 6-39 |
| | On | TRIENA1 | 6-39 |
| Codablock A | Default All Codablock A Settings | CBADFT | 6-39 |
| | *Off | CBAENA0 | 6-39 |
| | On | CBAENA1 | 6-39 |
| Codablock A Msg. Length | Minimum (1 - 600) *1 | CBAMIN#### | 6-40 |
| | Maximum (1 - 600) *600 | CBAMAX#### | 6-40 |
| Codablock F | Default All Codablock F Settings | CBFDFT | 6-39 |
| | *Off | CBFENA0 | 6-41 |
| | On | CBFENA1 | 6-41 |
| Codablock F Msg. Length | Minimum (1 - 2048) *1 | CBFMIN#### | 6-41 |
| | Maximum (1 - 2048) *2048 | CBFMAX#### | 6-41 |
| PDF417 | Default All PDF417 Settings | PDFDFT | 6-42 |
| | *On | PDFENA1 | 6-42 |
| | Off | PDFENA0 | 6-42 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| PDF417 Msg. Length | Minimum (1-2750) *1 | PDFMIN | 6-42 |
| | Maximum (1-2750) *2750 | PDFMAX | 6-42 |
| MicroPDF417 | Default All Micro PDF417 Settings | MPDDFT | 6-43 |
| | On | MPDENA1 | 6-43 |
| | *Off | MPDENA0 | 6-43 |
| MicroPDF417 Msg. Length | Minimum (1-366) *1 | MPDMIN | 6-43 |
| | Maximum (1-366) *366 | MPDMAX | 6-43 |
| GS1 Composite Codes | On | COMENA1 | 6-44 |
| | *Off | COMENA0 | 6-44 |
| UPC/EAN Version | On | COMUPC1 | 6-44 |
| | *Off | COMUPC0 | 6-44 |
| GS1 Composite Codes Msg. Length | Minimum (1-2435) *1 | COMMIN | 6-44 |
| | Maximum (1-2435) *2435 | COMMAX | 6-44 |
| GS1 Emulation | GS1-128 Emulation | EANEMU1 | 6-45 |
| | GS1 DataBar Emulation | EANEMU2 | 6-45 |
| | GS1 Code Expansion Off | EANEMU3 | 6-45 |
| | EAN8 to EAN13 Conversion | EANEMU4 | 6-45 |
| | *GS1 Emulation Off | EANEMU0 | 6-45 |
| TCIF Linked Code 39 | On | T39ENA1 | 6-46 |
| | *Off | T39ENA0 | 6-46 |
| QR Code | Default All QR Code Settings | QRCDFT | 6-46 |
| | *On | QRCENA1 | 6-46 |
| | Off | QRCENA0 | 6-46 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| QR Code Msg. Length | Minimum (1-7089) *1 | QRCMIN | 6-47 |
| | Maximum (1-7089) *7089 | QRCMAX | 6-47 |
| QR Code Append | *On | QRCAPP1 | 6-47 |
| | Off | QRCAPP0 | 6-47 |
| Data Matrix | Default All Data Matrix Settings | IDMDFT | 6-48 |
| | *On | IDMENA1 | 6-48 |
| | Off | IDMENA0 | 6-48 |
| Data Matrix Msg. Length | Minimum (1-3116) *1 | IDMMIN | 6-48 |
| | Maximum (1-3116) *3116 | IDMMAX | 6-48 |
| Data Matrix Code Page | Data Matrix Code Page (*51) | IDMDCP## | 6-49 |
| MaxiCode | Default All MaxiCode Settings | MAXDFT | 6-49 |
| | On | MAXENA1 | 6-49 |
| | *Off | MAXENA0 | 6-49 |
| MaxiCode Msg. Length | Minimum (1-150) *1 | MAXMIN | 6-49 |
| | Maximum (1-150) *150 | MAXMAX | 6-49 |
| Aztec Code | Default All Aztec Code Settings | AZTDFT | 6-50 |
| | *On | AZTENA1 | 6-50 |
| | Off | AZTENA0 | 6-50 |
| Aztec Code Msg. Length | Minimum (1-3832) *1 | AZTMIN | 6-50 |
| | Maximum (1-3832) *3832 | AZTMAX | 6-50 |
| Aztec Code Page | Aztec Code Page (*51) | AZTDCP## | 6-51 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Chinese Sensible (Han Xin) Code | Default All Han Xin Code Settings | HX_DFT | 6-51 |
| | On | HX_ENA1 | 6-51 |
| | *Off | HX_ENA0 | 6-51 |
| Chinese Sensible (Han Xin) Code Msg. Length | Minimum (1-7833) *1 | HX_MIN | 6-51 |
| | Maximum (1-7833) *7833 | HX_MAX | 6-51 |
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| 2D Postal Codes | *Off | POSTAL0 | 6-52 |
| Single 2D Postal Codes | Australian Post On | POSTAL1 | 6-52 |
| | British Post On | POSTAL7 | 6-52 |
| | Canadian Post On | POSTAL30 | 6-52 |
| | Intelligent Mail Bar Code On | POSTAL10 | 6-52 |
| | Japanese Post On | POSTAL3 | 6-52 |
| | KIX Post On | POSTAL4 | 6-52 |
| | Planet Code On | POSTAL5 | 6-52 |
| | Postal-4i On | POSTAL9 | 6-52 |
| | Postnet On | POSTAL6 | 6-53 |
| | Postnet with B and B' Fields On | POSTAL11 | 6-53 |
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| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Combination 2D Postal Codes | InfoMail and British Post On | POSTAL8 | 6-53 |
| | Intelligent Mail Bar Code and Postnet with B and B' Fields On | POSTAL20 | 6-53 |
| | Postnet and Postal-4i On | POSTAL14 | 6-53 |
| | Postnet and Intelligent Mail Bar Code On | POSTAL16 | 6-53 |
| | Postal-4i and Intelligent Mail Bar Code On | POSTAL17 | 6-53 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Combination 2D Postal Codes (continued) | Postal-4i and Postnet with B and B' Fields On | POSTAL19 | 6-53 |
| | Planet and Postnet On | POSTAL12 | 6-53 |
| | Planet and Postnet with B and B' Fields On | POSTAL18 | 6-53 |
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| | Planet and Intelligent Mail Bar Code On | POSTAL15 | 6-54 |
| | Planet, Postnet, and Postal-4i On | POSTAL21 | 6-54 |
| | Planet, Postnet, and Intelligent Mail Bar Code On | POSTAL22 | 6-54 |
| | Planet, Postal-4i, and Intelligent Mail Bar Code On | POSTAL23 | 6-54 |
| | Postnet, Postal-4i, and Intelligent Mail Bar Code On | POSTAL24 | 6-54 |
| | Planet, Postal-4i, and Postnet with B and B' Fields On | POSTAL25 | 6-54 |
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| | Postal-4i, Intelligent Mail Bar Code, and Postnet with B and B' Fields On | POSTAL27 | 6-54 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Combination 2D Postal Codes (continued) | Planet, Postal-4i, Intelligent Mail Bar Code, and Postnet On | POSTAL28 | 6-54 |
| | Planet, Postal-4i, Intelligent Mail Bar Code, and Postnet with B and B' Fields On | POSTAL29 | 6-54 |
| Planet Code Check Digit | Transmit | PLNCKX1 | 6-55 |
| | *Don't Transmit | PLNCKX0 | 6-55 |
| Postnet Check Digit | Transmit | NETCKX1 | 6-55 |
| | *Don't Transmit | NETCKX0 | 6-55 |
| ***Postal Codes - Linear*** | | | |
| China Post (Hong Kong 2 of 5) | Default All China Post (Hong Kong 2 of 5) Settings | CPCDFT | 6-55 |
| | *Off | CPCENA0 | 6-56 |
| | On | CPCENA1 | 6-56 |
| China Post (Hong Kong 2 of 5) Msg. Length | Minimum (2 - 80) *4 | CPCMIN## | 6-56 |
| | Maximum (2 - 80) *80 | CPCMAX## | 6-56 |
| Korea Post | Default All Korea Post Settings | KPCDFT | 6-57 |
| | *Off | KPCENA0 | 6-57 |
| | On | KPCENA1 | 6-57 |
| Korea Post Msg. Length | Minimum (2 - 80) *4 | KPCMIN## | 6-57 |
| | Maximum (2 - 80) *48 | KPCMAX## | 6-57 |
| Korea Post Check Digit | Transmit Check Digit | KPCCHK1 | 6-57 |
| | *Don't Transmit Check Digit | KPCCHK0 | 6-57 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| ***Imaging Default Commands*** | | | |
| Image Snap | Default all Imaging Commands | IMGDFT | 7-1 |
| | Imaging Style - Decoding | SNPSTY0 | 7-2 |
| | *Imaging Style - Photo | SNPSTY1 | 7-2 |
| | Imaging Style - Manual | SNPSTY2 | 7-2 |
| | Beeper On | SNPBEP1 | 7-2 |
| | *Beeper Off | SNPBEP0 | 7-2 |
| | *Wait for Trigger Off | SNPTRG0 | 7-2 |
| | Wait for Trigger On | SNPTRG1 | 7-2 |
| | *LED State - Off | SNPLED0 | 7-2 |
| | LED State - On | SNPLED1 | 7-2 |
| | Exposure (1-7874 microseconds) | SNPEXP | 7-3 |
| | *Gain - None | SNPGAN1 | 7-3 |
| | Gain - Medium | SNPGAN2 | 7-3 |
| | Gain - Heavy | SNPGAN4 | 7-3 |
| | Gain - Maximum | SNPGAN8 | 7-3 |
| | Target White Value (0-255) *125 | SNPWHT### | 7-4 |
| | Delta for Acceptance (0-255) *25 | SNPDEL### | 7-4 |
| | Update Tries (0-10) *6 | SNPTRY## | 7-4 |
| | Target Set Point Percentage (1-99) *50 | SNPPCT## | 7-4 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Image Ship | *Infinity Filter - Off | IMGINF0 | 7-5 |
| | Infinity Filter - On | IMGINF1 | 7-5 |
| | *Compensation Off | IMGCOR0 | 7-6 |
| | Compensation On | IMGCOR1 | 7-6 |
| | *Pixel Depth - 8 bits/ pixel (grayscale) | IMGBPP8 | 7-6 |
| | Pixel Depth - 1 bit/ pixel (B&W) | IMGBPP1 | 7-6 |
| | *Don't Sharpen Edges | IMGEDG0 | 7-7 |
| | Sharpen Edges (0-23) | IMGEDG## | 7-7 |
| | *File Format - JPEG | IMGFMT6 | 7-7 |
| | File Format - KIM | IMGFMT0 | 7-7 |
| | File Format - TIFF binary | IMGFMT1 | 7-7 |
| | File Format - TIFF binary group 4, compressed | IMGFMT2 | 7-7 |
| | File Format - TIFF grayscale | IMGFMT3 | 7-7 |
| | File Format - Uncompressed binary | IMGFMT4 | 7-7 |
| | File Format - Uncompressed grayscale | IMGFMT5 | 7-7 |
| | File Format - BMP | IMGFMT8 | 7-7 |
| | *Histogram Stretch Off | IMGHIS0 | 7-8 |
| | Histogram Stretch On | IMGHIS1 | 7-8 |
| | *Noise Reduction Off | IMGFSP0 | 7-9 |
| | Noise Reduction On | IMGFSP1 | 7-9 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Image Ship (continued) | Invert Image around X axis | IMGNVX1 | 7-8 |
| | Invert Image around Y axis | IMGNVY1 | 7-8 |
| | Rotate Image none | IMGROT0 | 7-9 |
| | Rotate Image 90° right | IMGROT1 | 7-9 |
| | Rotate Image 180° right | IMGROT2 | 7-9 |
| | Rotate Image 90° left | IMGROT3 | 7-9 |
| | JPEG Image Quality (0-100) *50 | IMGJQF### | 7-10 |
| | *Gamma Correction Off | IMGGAM0 | 7-10 |
| | Gamma Correction On (0-1000) | IMGGAM### | 7-10 |
| | Image Crop - Left (0-640) *0 | IMGWNL### | 7-10 |
| | Image Crop - Right (0-640) *639 | IMGWNR### | 7-10 |
| | Image Crop - Top (0-480) *0 | IMGWNT### | 7-10 |
| | Image Crop - Bottom (0-480) *479 | IMGWNB### | 7-11 |
| | Image Crop - Margin (1-238) *0 | IMGMAR### | 7-11 |
| | Protocol - None (raw) | IMGXFR0 | 7-11 |
| | Protocol - None (default USB) | IMGXFR2 | 7-11 |
| | Protocol - Hmodem Compressed | IMGXFR3 | 7-11 |
| | Protocol - Hmodem | IMGXFR4 | 7-11 |
| | Ship Every Pixel | IMGSUB1 | 7-12 |

| Selection | Setting<br>** Indicates default* | Serial Command<br>*# Indicates a numeric entry* | Page |
|---|---|---|---|
| Image Ship (continued) | Ship Every 2nd Pixel | IMGSUB2 | 7-12 |
| | Ship Every 3rd Pixel | IMGSUB3 | 7-12 |
| | *Document Image Filter Off | IMGUSH0 | 7-12 |
| | Document Image Filter On (0-255) | IMGUSH### | 7-12 |
| | *Don't Ship Histogram | IMGHST0 | 7-13 |
| | Ship Histogram | IMGHST1 | 7-13 |
| Image Size Compatibility | Force VGA Resolution | IMGVGA1 | 7-14 |
| | *Native Resolution | IMGVGA0 | 7-14 |
| Intelligent Signature Capture | Optimize On | DECBND1 | 7-14 |
| | *Optimize Off | DECBND0 | 7-14 |

# 11 Maintenance

## 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 12-1 for further information.

### Inspecting Cords and Connectors

Inspect the engine's 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 Honeywell 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?*

If the power is not on, 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 or Terminal selection bar code. See Chapter 2 and Chapter 3.

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 6-2.

If you aren’t sure what programming options have been set in the engine, or if you want the factory default settings restored, scan Resetting the Factory Defaults on page 1-7.

# 12 Customer Support

## 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, cradles, 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 N86XX engine is 15 months.

# A Reference Charts

## Symbology Chart

| Symbology | AIM ID | Possible AIM ID Modifiers (*m*) | Code ID (hex) |
|---|---|---|---|
| *All Symbologies* | | | (0x99) |
| Australian Post | ]X0 | | A (0x41) |
| Aztec Code | ]z*m* | 0-9, A-C | z (0x7A) |
| British Post | ]X0 | | B (0x42) |
| Canadian Post | ]X0 | | C (0x43) |
| China Post | ]X0 | | Q (0x51) |
| Chinese Sensible Code (Han Xin Code) | ]X0 | | H (0x48) |
| Codabar | ]F*m* | 0-1 | a (0x61) |
| Codablock A | ]O6 | 0, 1, 4, 5, 6 | V (0x56) |
| Codablock F | ]O*m* | 0, 1, 4, 5, 6 | q (0x71) |
| Code 11 | ]H3 | | h (0x68) |
| Code 128 | ]C*m* | 0, 1, 2, 4 | j (0x6A) |
| GS1-128 | ]C1 | | l (0x49) |
| Code 32 Pharmaceutical (PARAF) | ]X0 | | < (0x3C) |
| Code 39 (supports Full ASCII mode) | ]A*m* | 0, 1, 3, 4, 5, 7 | b (0x62) |
| Code 49 | ]T*m* | 0, 1, 2, 4 | l (0x6C) |
| Code 93 and 93i | ]G*m* | 0-9, A-Z, a-m | i (0x69) |
| Data Matrix | ]d*m* | 0-6 | w (0x77) |
| EAN-13 (including Bookland EAN) | ]E0 | | d (0x64) |
| EAN-13 with Add-On | ]E3 | | d (0x64) |
| EAN-13 with Extended Coupon Code | ]E3 | | d (0x64) |
| EAN-8 | ]E4 | | D (0x44) |
| EAN-8 with Add-On | ]E3 | | D (0x44) |

| Symbology | AIM ID | Possible AIM ID Modifiers (*m*) | Code ID (hex) |
|---|---|---|---|
| GS1 Composite | ]e*m* | 0-3 | y (0x79) |
| GS1 DataBar | ]e*m* | 0 | y (0x79) |
| InfoMail | ]X0 | | , (0x2c) |
| Intelligent Mail Barcode | ]X0 | | M (0x4D) |
| Interleaved 2 of 5 | ]I*m* | 0, 1, 3 | e (0x65) |
| Japanese Post | ]X0 | | J (0x4A) |
| KIX (Netherlands) Post | ]X0 | | K (0x4B) |
| Korea Post | ]X0 | | ? (0x3F) |
| Matrix 2 of 5 | ]X0 | | m (0x6D) |
| MaxiCode | ]U*m* | 0-3 | x (0x7 8) |
| MicroPDF417 | ]L*m* | 3-5 | R (0x52) |
| MSI | ]M*m* | 0 | g (0x67) |
| NEC 2 of 5 | ]X0 | | Y (0x59) |
| OCR MICR (E 13 B) | ]o3 | | O (0x4F) |
| OCR SEMI Font | ]o3 | | O (0x4F) |
| OCR-A | ]o1 | | O (0x4F) |
| OCR-B | ]o2 | | O (0x4F) |
| PDF417 | ]L*m* | 0-2 | r (0x72) |
| Planet Code | ]X0 | | L (0x4C) |
| Postal-4i | ]X0 | | N (0x4E) |
| Postnet | ]X0 | | P (0x50) |
| QR Code and Micro QR Code | ]Q*m* | 0-6 | s (0x73) |
| Straight 2 of 5 IATA | ]R*m* | 0, 1, 3 | f (0x66) |
| Straight 2 of 5 Industrial | ]S0 | | f (0x66) |
| TCIF Linked Code 39 (TLC39) | ]L2 | | T (0x54) |
| Telepen | ]B*m* | | t (0x54) |
| UPC-A | ]E0 | | c (0x63) |
| UPC-A with Add-On | ]E3 | | c (0x63) |

| Symbology | AIM ID | Possible AIM ID Modifiers (*m*) | Code ID (hex) |
|---|---|---|---|
| UPC-A with Extended Coupon Code | ]E3 | | c (0x63) |
| UPC-E | ]E0 | | E (0x45) |
| UPC-E with Add-On | ]E3 | | E (0x45) |
| UPC-E1 | ]X0 | | E (0x45) |

*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.

# *ASCII Conversion Chart (Code Page 1252)*

*Note: This table applies to U.S. style keyboards. Certain characters may differ depending on your Country Code/PC regional settings.*

| Non-Printable Characters | | | | | |
|---|---|---|---|---|---|
| **DEC** | **HEX** | **Character (Code)** | **DEC** | **HEX** | **Character (Code)** |
| 0 | 0 | NULL | 16 | 10 | DATA LINK ESCAPE (DLE) |
| 1 | 1 | START OF HEADING (SOH) | 17 | 11 | DEVICE CONTROL 1 (DC1) |
| 2 | 2 | START OF TEXT (STX) | 18 | 12 | DEVICE CONTROL 2 (DC2) |
| 3 | 3 | END OF TEXT (ETX) | 19 | 13 | DEVICE CONTROL 3 (DC3) |
| 4 | 4 | END OF TRANSMISSION (EOT) | 20 | 14 | DEVICE CONTROL 4 (DC4) |
| 5 | 5 | END OF QUERY (ENQ) | 21 | 15 | NEGATIVE ACKNOWLEDGE-MENT (NAK) |
| 6 | 6 | ACKNOWLEDGE (ACK) | 22 | 16 | SYNCHRONIZE (SYN) |
| 7 | 7 | BEEP (BEL) | 23 | 17 | END OF TRANSMISSION BLOCK (ETB) |
| 8 | 8 | BACKSPACE (BS) | 24 | 18 | CANCEL (CAN) |
| 9 | 9 | HORIZONTAL TAB (HT) | 25 | 19 | END OF MEDIUM (EM) |
| 10 | A | LINE FEED (LF) | 26 | 1A | SUBSTITUTE (SUB) |
| 11 | B | VERTICAL TAB (VT) | 27 | 1B | ESCAPE (ESC) |
| 12 | C | FF (FORM FEED) | 28 | 1C | FILE SEPARATOR (FS) RIGHT ARROW |
| 13 | D | CR (CARRIAGE RETURN) | 29 | 1D | GROUP SEPARATOR (GS) LEFT ARROW |
| 14 | E | SO (SHIFT OUT) | 30 | 1E | RECORD SEPARATOR (RS) UP ARROW |
| 15 | F | SI (SHIFT IN) | 31 | 1F | UNIT SEPARATOR (US) DOWN ARROW |

| 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 |

| Printable Characters (Continued) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DEC | HEX | Character | DEC | HEX | Character | DEC | HEX | Character |
| 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 | <DEL> |

| Extended ASCII Characters | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DEC | HEX | Character | DEC | HEX | Character | DEC | HEX | Character |
| 128 | 80 | € | 171 | AB | « | 214 | D6 | Ö |
| 129 | 81 | | 172 | AC | ¬ | 215 | D7 | × |
| 130 | 82 | ‚ | 173 | AD | | 216 | D8 | Ø |
| 131 | 83 | *ƒ* | 174 | AE | ® | 217 | D9 | Ù |
| 132 | 84 | „ | 175 | AF | ¯ | 218 | DA | Ú |
| 133 | 85 | … | 176 | B0 | ° | 219 | DB | Û |
| 134 | 86 | † | 177 | B1 | ± | 220 | DC | Ü |
| 135 | 87 | ‡ | 178 | B2 | ² | 221 | DD | Ý |
| 136 | 88 | ˆ | 179 | B3 | ³ | 222 | DE | Þ |
| 137 | 89 | ‰ | 180 | B4 | ´ | 223 | DF | ß |
| 138 | 8A | Š | 181 | B5 | µ | 224 | E0 | à |
| 139 | 8B | ‹ | 182 | B6 | ¶ | 225 | E1 | á |

| Extended ASCII Characters (Continued) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DEC | HEX | Character | DEC | HEX | Character | DEC | HEX | Character |
| 140 | 8C | Œ | 183 | B7 | · | 226 | E2 | â |
| 141 | 8D | | 184 | B8 | ¸ | 227 | E3 | ã |
| 142 | 8E | Ž | 185 | B9 | ¹ | 228 | E4 | ä |
| 143 | 8F | | 186 | BA | º | 229 | E5 | å |
| 144 | 90 | | 187 | BB | » | 230 | E6 | æ |
| 145 | 91 | ‘ | 188 | BC | ¼ | 231 | E7 | ç |
| 146 | 92 | ’ | 189 | BD | ½ | 232 | E8 | è |
| 147 | 93 | “ | 190 | BE | ¾ | 233 | E9 | é |
| 148 | 94 | ” | 191 | BF | ¿ | 234 | EA | ê |
| 149 | 95 | • | 192 | C0 | À | 235 | EB | ë |
| 150 | 96 | – | 193 | C1 | Á | 236 | EC | ì |
| 151 | 97 | — | 194 | C2 | Â | 237 | ED | í |
| 152 | 98 | ˜ | 195 | C3 | Ã | 238 | EE | î |
| 153 | 99 | ™ | 196 | C4 | Ä | 239 | EF | ï |
| 154 | 9A | š | 197 | C5 | Å | 240 | F0 | ð |
| 155 | 9B | › | 198 | C6 | Æ | 241 | F1 | ñ |
| 156 | 9C | œ | 199 | C7 | Ç | 242 | F2 | ò |
| 157 | 9D | | 200 | C8 | È | 243 | F3 | ó |
| 158 | 9E | ž | 201 | C9 | É | 244 | F4 | ô |
| 159 | 9F | Ÿ | 202 | CA | Ê | 245 | F5 | õ |
| 160 | A0 | | 203 | CB | Ë | 246 | F6 | ö |
| 161 | A1 | ¡ | 204 | CC | Ì | 247 | F7 | ÷ |
| 162 | A2 | ¢ | 205 | CD | Í | 248 | F8 | ø |
| 163 | A3 | £ | 206 | CE | Î | 249 | F9 | ù |
| 164 | A4 | ¤ | 207 | CF | Ï | 250 | FA | ú |
| 165 | A5 | ¥ | 208 | D0 | Ð | 251 | FB | û |
| 166 | A6 | ¦ | 209 | D1 | Ñ | 252 | FC | ü |
| 167 | A7 | § | 210 | D2 | Ò | 253 | FD | ý |
| 168 | A8 | ¨ | 211 | D3 | Ó | 254 | FE | þ |
| 169 | A9 | © | 212 | D4 | Ô | 255 | FF | ÿ |
| 170 | AA | ª | 213 | D5 | Õ | | | |

## *Code Page Mapping of Printed Bar Codes*

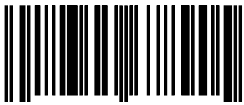
Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the barcode being scanned was created using a code page that is different from

the one the host program is expecting. If this is the case, select the code page with which the bar codes were created. The data characters should then appear properly.

| Code Page | Standard | Description |
|---|---|---|
| 1 | CP ISO646 | |
| 2 (Default) | ISO 2022 | Automatic National Replacement Characters |
| 3 | CP Binary | |
| 51 | ISO 8859 1 51 | Western European Replacement Characters |
| 82 | ISO 2022 11 Swe | Swedish Replacement Characters |
| 83 | ISO 2022 69 Fra | French/Belgium Replacement Characters |
| 81 | ISO 2022 25 Fra | French/Belgium Replacement Characters |
| 84 | ISO 2022 11 Ger | German Replacement Characters |
| 85 | ISO 2022 11 Ita | Italian Replacement Characters |
| 86 | ISO 2022 11 Swi | Swiss Replacement Characters |
| 87 | ISO 2022 11 UK | British Replacement Characters |
| 88 | ISO 2022 11 Dan | Danish Replacement Characters |
| 89 | ISO 2022 11 Nor | Norwegian Replacement Characters |
| 90 | ISO 2022 11 Spa | Spanish Replacement Characters |
| 91 | ISO 2022 85 | Spanish Replacement Characters |
| 92 | ISO 2022 16 | Portuguese Replacement Characters |
| 93 | ISO 2022 84 | Portuguese Replacement Characters |
| 94 | ISO 2022 60 | Norwegian Replacement Characters |

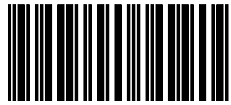
# *Sample Symbols*

**UPC-A**



0 123456 7890

**Interleaved 2 of 5**



1234567890

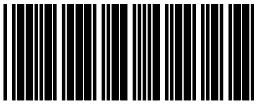
**Code 128**

Code 128

**EAN-13**

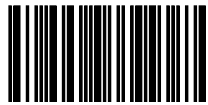
9 780330 290951

**Code 39**



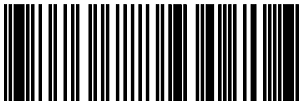
BC321

**Codabar**



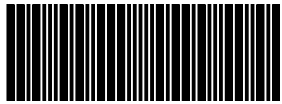
A13579B

**Code 93**



123456-9$

**Straight 2 of 5 Industrial**



123456

# *Sample Symbols*

**Matrix 2 of 5**

6543210

**GS1 DataBar**

(01)00123456789012

**PDF417**

Car Registration

**Postnet**

Zip Code

**Data Matrix**

Test Symbol

**QR Code**

Numbers

**4-CB (4-State Customer Bar Code)**

01,234,567094,987654321,01234567891

**ID-tag (UPU 4-State)**

J18CUSA8E6N062315014880T

# *Sample Symbols*

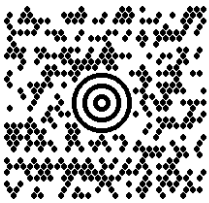
**Aztec**

Package Label

**Micro PDF417**

Test Message

**MaxiCode**



Test Message

# *Programming Chart*

**0**

**1**

**2**

**3**

**4**

**5**

**6**

**7**

**8**

**9**

# *Programming Chart*

**A**

**B**

**C**

**D**

**E**

**F**

**Save**

**Discard**

**Reset**

*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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