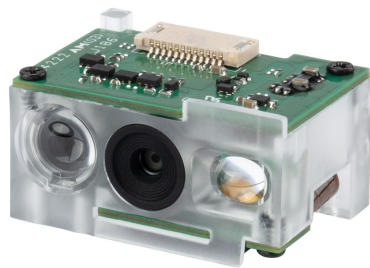


**Honeywell**

# N5780/CM5780

Decoded Scan Engine and 2D Imager Modules  
N5780SR and CM5780SR



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**User Guide**

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# Customer Support and Technical Assistance

For customer support, contact your local Honeywell Sales Representative or fill out the support form at [sensing.honeywell.com/contact-support-form](https://sensing.honeywell.com/contact-support-form).

For our latest contact information, see [sensing.honeywell.com/contact](https://sensing.honeywell.com/contact).



## Introduction

The N5780 bar code scan engine is a fully decoded, compact 2D scan engine that uses Honeywell's latest imaging and decoding technology. It is available in either RS-232 TTL serial or USB versions with industry standard 12-pin ZIF connector. It is a drop-in replacement for Honeywell's N4680.

## About This Manual

This User Guide provides demonstration and programming instructions for the N5780 2D scan engine.

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

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

## Unpack Your Device

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

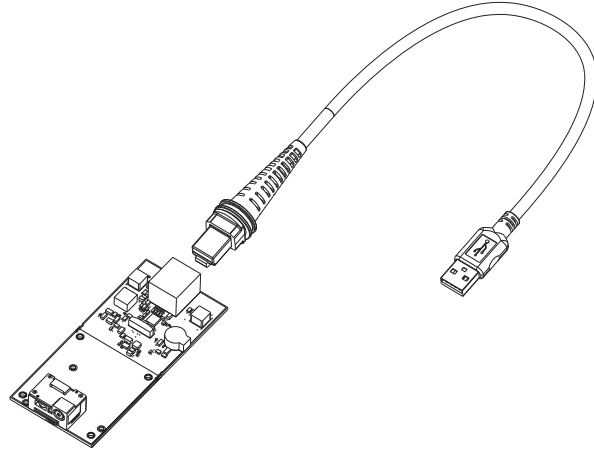
- Check for damage during shipment. Report damage immediately to the carrier who delivered the carton.
- Make sure the items in the carton match your order.
- Save the shipping container for later storage or shipping.

# Connect the N5780 Scan Engine to a PC

The N5780 scan engine can connect to a PC for evaluation using an interface board.

## Connect with USB

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.



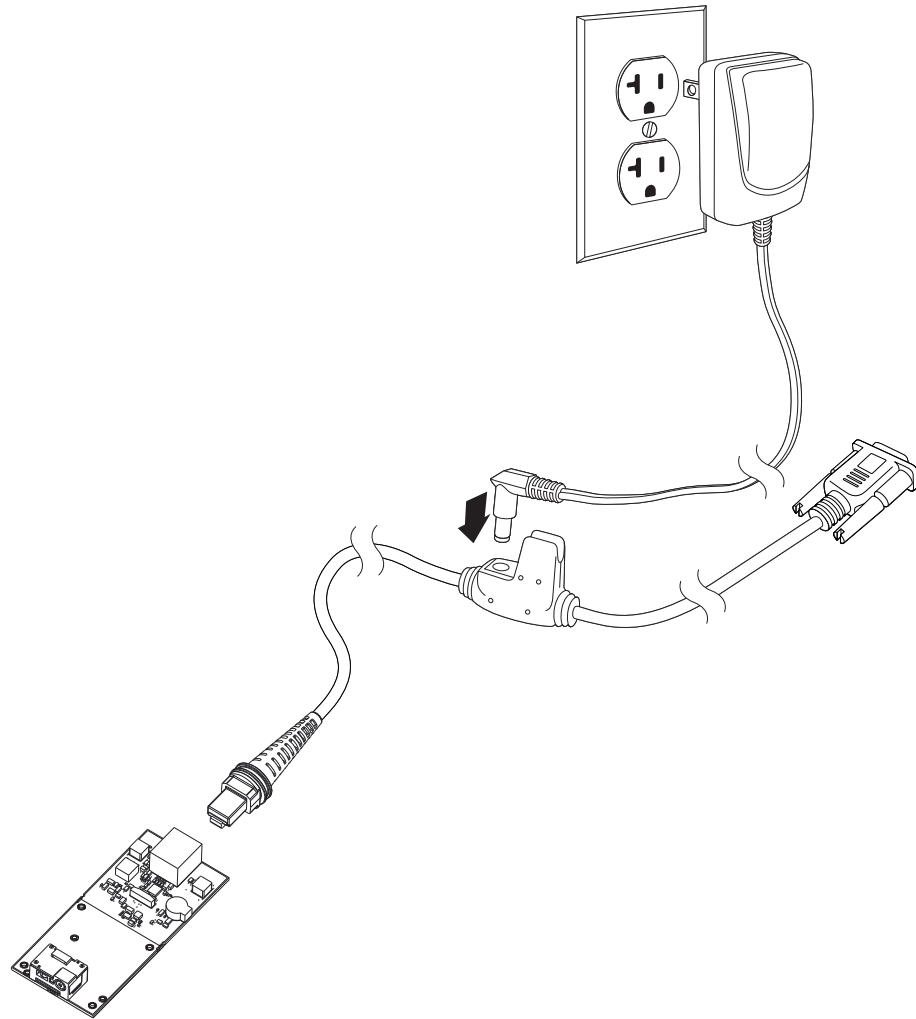
3. Verify the scan engine operation by scanning a bar code from the [Sample Symbols](#) in the back of this manual. The scan engine beeps once when a bar code is successfully decoded.

**Note:** The default interface is USB Serial, so you will need to install the USB driver. See "[USB Serial](#)" on page 2-9.



## Connect 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 scan engine beeps.
4. If connecting the scan engine using an RS-232 interface, all communication parameters between the scan 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 scan 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.



**TERMID0;232BAD9;232WRD2**

**RS-232 Interface**

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

To connect a scan engine to your host system, refer to the N5780 Integration Manual.

## Connect the CM5780 to a Host

For information on connecting the CM5780 to a host, see the *CM5780 Quick Start Guide* available from your local OEM representative.

**Note:** *The CM5780 only supports USB interface. All settings for other interfaces are not supported.*

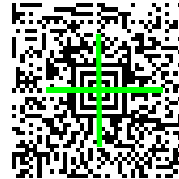
# Reading Techniques

The scan engine has a view finder that projects a bright green cross aimer. The aiming beam should be centered over the bar code, but it can also be positioned outside of the center for a good read.

Linear bar code



2D Matrix symbol



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

## Menu Bar Code Security Settings

Honeywell scan engines are programmed by scanning menu bar codes or by sending serial commands to the scan engine. If you want to restrict the ability to scan menu codes, you can use the Menu Bar Code Security settings. Contact your Honeywell OEM representative for more information.

## Set 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.



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.

## Reset the Custom Defaults

If you want the custom default settings restored to your scan engine, scan the Activate Custom Defaults bar code below. This is the recommended default bar code for most users. It resets the scan engine to the custom default settings. If there are no custom defaults, it will reset the scan 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

**Note:** To remove custom defaults, see ["Resetting the Factory Defaults" on page 8-188.](#)

## Introduction

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

## Programming the Interface

Use the following configuration bar codes to program the interface.

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

### RS232 Serial Port

**Note:** Not supported by CM5780.

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



TERMID0;232BAD9;232WRD2

RS-232 Interface

## USB IBM SurePos

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

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

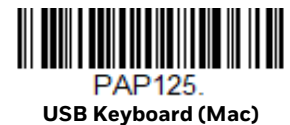


Each bar code above also programs the following suffixes for each symbology:

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

## USB PC or Macintosh Keyboard

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



## USB HID

Scan the following code to program the scan engine for USB HID.



TERMID131.

USB HID

## USB Serial

Scan the following code to program the scan 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](http://www.honeywellaidc.com)). The driver will use the next available COM Port number. Apple® Macintosh computers recognize the scan engine as a USB CDC class device and automatically use a class driver.



TERMID130.

USB Serial

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

## CTS/RTS Emulation



USBCTS1.

CTS/RTS Emulation On



USBCTS0.

\* CTS/RTS Emulation Off

## ACK/NAK Mode



USBACK1.

ACK/NAK Mode On



USBACK0.

\* ACK/NAK Mode Off

# Remote MasterMind™ for USB

When using a USB interface, you may wish to configure your scanner to communicate with Remote MasterMind Scanner Management Software (ReM). Scan the ReM On bar code to communicate with ReM. To disable this capability, scan ReM Off. *Default = 0.*



REMIFC0.  
\*ReM Off



REMIFC1.  
ReM On



# Keyboard Country Layout

If your interface is USB Keyboard or Keyboard Wedge, your keyboard layout default is a US keyboard. To change this layout, refer to the chart below for your keyboard country. Scan the appropriate bar code below to change the layout.

By default, national character replacements are used for the following characters: # \$ @ [ \ ] ^ { | } ~ See [ISO 2022/ISO 646 Character Replacements](#) on page A-232 to view the character replacements for each country.

## Keyboard Countries



KBDCTY0.  
\* United States



KBDCTY35.  
Albania



KBDCTY81.  
Azeri (Cyrillic)



KBDCTY80.  
Azeri (Latin)



KBDCTY82.  
Belarus



KBDCTY1.  
Belgium



KBDCTY33.  
Bosnia



KBDCTY16.  
Brazil



KBDCTY59.  
Brazil (MS)

## Keyboard Countries (Continued)



**KBDCTY53.**  
Bulgaria (Latin)



**KBDCTY18.**  
Canada (French)



**KBDCTY32.**  
Croatia



**KBDCTY40.**  
Czech (Programmers)



**KBDCTY38.**  
Czech (QWERTZ)



**KBDCTY11.**  
Dutch (Netherlands)



**KBDCTY52.**  
Bulgaria (Cyrillic)



**KBDCTY54.**  
Canada (French legacy)



**KBDCTY55.**  
Canada (Multilingual)



**KBDCTY15.**  
Czech



**KBDCTY39.**  
Czech (QWERTY)



**KBDCTY8.**  
Denmark

**Keyboard Countries (Continued)**



## Keyboard Countries (Continued)



KBDCTY60.  
Greek (Polytonic)



KBDCTY50.  
Hungarian (101 key)



KBDCTY75.  
Iceland



KBDCTY56.  
Italian (142)



KBDCTY28.  
Japan ASCII



KBDCTY79.  
Kyrgyz (Cyrillic)



KBDCTY66.  
Greek (MS)



KBDCTY12.  
Hebrew



KBDCTY19.  
Hungary



KBDCTY73.  
Irish



KBDCTY5.  
Italy



KBDCTY78.  
Kazakh

**Keyboard Countries (Continued)**



## Keyboard Countries (Continued)



KBDCTY25.  
Romania



KBDCTY67.  
Russian (MS)



KBDCTY21.  
SCS



KBDCTY36.  
Serbia (Latin)



KBDCTY49.  
Slovakia (QWERTY)



KBDCTY31.  
Slovenia



KBDCTY13.  
Portugal



KBDCTY26.  
Russia



KBDCTY68.  
Russian (Typewriter)



KBDCTY37.  
Serbia (Cyrillic)



KBDCTY22.  
Slovakia



KBDCTY48.  
Slovakia (QWERTZ)

**Keyboard Countries (Continued)**



**KBDCTY51.**  
Spanish variation



**KBDCTY29.**  
Switzerland (French)



**KBDCTY85.**  
Tatar



**KBDCTY24.**  
Turkey Q



**KBDCTY7.**  
United Kingdom



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



**KBDCTY10.**  
Spain



**KBDCTY23.**  
Sweden



**KBDCTY6.**  
Switzerland (German)



**KBDCTY27.**  
Turkey F



**KBDCTY76.**  
Ukrainian



**KBDCTY87.**  
United States (Dvorak)

## Keyboard Countries (Continued)



# Keyboard Wedge Modifiers

## ALT Mode

If your bar code contains special characters from the extended ASCII chart, for example, an e with an accent grave (è), you will use ALT Mode. (See [Lower ASCII Reference Table](#) on page 227.)

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

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







KBDALT4.

Windows System CP



KBDALT5.

DOS System CP



KBDALT6.

3 Characters



KBDALT7.

4 Characters

## Keyboard Style

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

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



KBDSTY0.

\* Regular

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



KBDSTY1.

Caps Lock

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



KBDSTY2.

Shift Lock

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).



KBDSTY5.  
Emulate External Keyboard

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

## Keyboard Conversion

Alphabetic keyboard characters can be forced to be all upper case or all lowercase. So if you have the following bar code: “abc569GK,” you can make the output “ABC569GK” by scanning Convert All Characters to Upper Case, or to “abc569gk” by scanning Convert All Characters to Lower Case.

These settings override [Keyboard Style](#) selections.

**Note:** If your interface is a keyboard wedge, first scan the menu code for [Automatic Caps Lock](#) (page 20). Otherwise, your output may not be as expected.

Default = Keyboard Conversion Off.



KBDCNV0.  
\* Keyboard Conversion Off



KBDENV1.

Convert All Characters  
to Upper Case



KBDENV2.

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 226. Only codes 00 through 1F are converted (the first column of the chart).

**Note:** *Control + X (Control + ASCII) Mode overrides this mode.*

Default = Off



KBDNPE1.

Control Character Output On



KBDNPE0.

\* Control Character Output Off

## Keyboard Modifiers

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

**Control + X (Control + ASCII) Mode On:** The scan 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.

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

Default = Control + X Mode Off.



**KBDCAS2.**  
Windows Mode Control + X  
Mode On



**KBDCAS1.**  
DOS Mode Control + X Mode On



**KBDCAS4.**  
DOS Mode Control + X Mode On  
with Windows Mode Prefix/  
Suffix



**KBDCAS0.**  
\* Control + X Mode Off



**KBDCAS3.**  
Windows Mode Prefix/Suffix



**KBDCAS5.**  
Control + ASCII Notepad

**Turbo Mode:** The scan 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 Modifiers

**Note:** Not supported by CM5780.

## RS232 Baud Rate

Baud Rate sends the data from the scan engine to the terminal at the specified rate. The host terminal must be set for the same baud rate as the scan engine. *Default = 115,200.*



232BAD0.

300



232BAD1.

600



232BAD2.

1200



232BAD3.

2400



232BAD4.

4800



232BAD5.

9600



## 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.*





## 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 Handshaking

RS232 Handshaking allows control of data transmission from the scan 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 scan 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 scan 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 scan engine asserts RTS when it has data to send and waits for a delay (see [RS232 Timeout](#) on page 26) 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.*



232CTS1.

**Flow Control, No Timeout**



232CTS2.

**Two-Direction Flow Control**



232CTS3.

**Flow Control with Timeout**



232CTS0.

**\* 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.



232DEL.

**RS232 Timeout**



## XON/XOFF

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



232XON1.  
XON/XOFF On



232XON0.  
\* XON/XOFF Off

## ACK/NAK

After transmitting data, the scan 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 scan engine looks for more bar codes. If NAK is received, the last set of bar code data is retransmitted and the scan engine waits for ACK/NAK again. Turn on the ACK/NAK protocol by scanning the ACK/NAK On bar code below. To turn off the protocol, scan ACK/NAK Off. *Default = ACK/NAK Off.*



232ACK1.  
ACK/NAK On



232ACK0.  
\* ACK/NAK Off

## ACK Beeper

If ACK/NAK mode is on (232ACK1), then use this command to enable the beeper when an ACK is not received by the end of the timeout. The scanner will be 3 times. *Default = Off.*



## RS232 Stop Mode

Scan the following bar code to force the engine into a stop mode. Restart the engine by using a trigger pull, nWake, or RxD toggle.



## Scanner to Bioptic Communication

The following settings are used to set up communication between Honeywell scan engines and bioptic scanners.

**Note:** *The scan engine's baud rate must be set to 38400 and the RS232 timeout must be set to 3000 in order to communicate with a bioptic scanner. See "RS232 Baud Rate" on page 23, and [RS232 Timeout](#) on page 26 for further information.*

## Scanner-Bioptic Packet Mode

**Packet Mode On** must be scanned to set the scan engine's format so it is compatible with a bioptic scanner. *Default = Packet Mode Off.*



232PKT0.

\* Packet Mode Off



232PKT2.

Packet Mode On

## Scanner-Bioptic ACK/NAK Mode

**Bioptic ACK/Nak On** must be scanned so the scan engine will wait for an ACK or NAK from a bioptic scanner after each packet is sent. The Scanner-Bioptic ACK/NAK Timeout (below) controls how long the scanner will wait for a response.

*Default = Bioptic ACK/NAK Off.*



232NAK0.

\* Bioptic ACK/NAK Off



232NAK1.

Bioptic ACK/NAK On

## Scanner-Bioptic ACK/NAK Timeout

This allows you to set the length (in milliseconds) for a timeout for a bioptic scanner's ACK/NAK response. Scan the bar code below, then set the timeout (from 1-30,000 milliseconds) by scanning digits from the inside back cover, then scanning Save. *Default = 5100.*



232DLK.

ACK/NAK Timeout



## Power Up Beeper

The scan engine can be programmed to beep when it's powered up. Scan the **Off** bar code(s) if you don't want a power up beep. *Default = Power Up Beeper On - Scanner.*



BEPPWR0.

Power Up Beeper Off -  
Scanner



BEPPWR1.

\* Power Up Beeper On -  
Scanner

## Beep on BEL Character

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



BELBEP0.

\*Beep on BEL Off



BELBEP1.

Beep on BEL On

# Trigger Click

To hear an audible click every time the scanner 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.*



BEPTRG0.  
\*Trigger Click Off



BEPTRG1.  
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.*



BEPBEP0.  
Beeper - Good Read Off



BEPBEP1.  
\* Beeper - Good Read On

## Beeper Volume – Good Read

The beeper volume codes modify the volume of the beep the scan 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 scan 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 scan engine emits when there is a bad read or error. *Default = Razz.*



BEPFQ2250.

\* Razz (250 Hz)



BEPFQ23250.

Medium (3250 Hz)



BEPFQ24200.

High (4200 Hz)

## Beeper Duration – Good Read

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



BEPBIP0.

\* Normal Beep



BEPBIP1.

Short Beep

## LED – Good Read

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



BEPLED1.

\* LED - Good Read On



BEPLED0.

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.*



BEPRPT.

Number of Good Read Beeps/LED Flashes

## Number of Beeps – Error

The number of beeps and LED flashes emitted by the scan 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.*



BEPERR.

Number of Error Beeps/LED Flashes

## Good Read Delay

This sets the minimum amount of time before the scan 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

## Beeper Signal Inversion

Beeper signal inversion 0=PWM active low (idle high), 1=PWM active high (idle low), 2=DC active low (idle high), 3=DC active high (idle low). *Default = 0.*



\* PWM active low (idle high)



PWM active high (idle low)



DC active low (idle high)



DC active high (idle low)

## Trigger Modes

**Note:** *Only Presentation trigger modes and settings are supported by CM5780 because the module does not have a trigger.*

## Manual Trigger Mode

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

## LED Illumination - Manual Trigger

If you wish to set the illumination LED brightness, scan one of the bar codes below. This sets the LED illumination for the scan engine when the trigger is pressed. *Default = High.*

**Note:** The LEDs are like a flash on a camera. The lower the ambient light in the room, the brighter the LEDs need to be so the scan engine can “see” the bar codes.

**Note:** Lower LED illumination settings are more visible to the user on rolling shutter engines than global shutter engines.



PWRNOL0.  
Off



PWRNOL100.  
Low



PWRNOL120.  
Medium



PWRNOL150.  
\* High

## Trigger Toggle

Trigger Toggle mode lets you quickly hit the trigger two or three times to put the scanner into either imaging mode or centering mode, then toggle back to scanning. So, like a double-click with a mouse, you can control what the next scanner’s action will be. For example, you could double-press the trigger to go into imaging mode, then the next trigger press takes the image. The scanner then reverts to scanning mode. Use the following codes to configure what action you would like the scanner to take when in Trigger Toggle mode. *Default = Off.*



TRGTGM0.  
\*Trigger Toggle Off



TRGTGM1.  
Trigger Toggle - Image Capture



## Trigger Number

This sets the number of trigger presses required to activate the Trigger Toggle Mode. *Default = 3 Quick Triggers.*



## Trigger Toggle Timeout

This sets the length of time the scanner stays in trigger toggle mode before reverting to scan mode. After scanning the **Trigger Toggle Timeout** bar code, set the time-out duration (from 0 to 65 seconds) by scanning digits from the [Programming Chart](#), beginning on page 237, then **Save**. *Default = 5 seconds.*

**Note:** *If this is set to 0, you must repeat the toggle sequence to return to the default scanning mode. For example, if 2 quick trigger presses puts the scanner into centering mode and the Trigger Timing is 0, you would have to do 2 quick presses again to go back to the default scanning mode.*



## Trigger Toggle Indicator

When using the Trigger Toggle Mode, you can enable beep and LED indicators that indicate when switching to primary mode. When on, beeper beeps twice, first time 100 ms at 1800 Hz, second beep 150 ms at 1000 Hz. Default = Off.



## Serial Trigger Mode

You can activate the scan engine either by pressing the trigger, or using a serial trigger command (see [Trigger Commands](#) on page 193). You must be in a serial interface mode in order to use serial triggering. Refer to RS232 Serial Port ([page 7](#)) or USB Serial ([page 9](#)) for further information. When in serial mode, the scan engine scans until a bar code has been read or until the deactivate command is sent. The scan engine can also be set to turn itself off after a specified time has elapsed (see [Read Time-Out](#), which follows).

## Read Time-Out

Use this selection to set a time-out (in milliseconds) of the scan engine's trigger when using serial commands to trigger the scan engine. Once the scan engine has timed out, you can activate the scan engine 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.*



## Snap & Ship Trigger Mode

Use the Snap and Ship trigger mode to take a picture and send it to the host. The image will be sent to the host as a BMP file. This mode does not decode bar codes.



## Presentation Mode

Presentation Mode uses ambient light and scan engine illumination to detect bar codes. When in Presentation Mode, the LEDs remain dim until a bar code is presented to the scan engine, then the aimer turns on and the LEDs turn up to read the code. If the light level in the room is not high enough, Presentation Mode may not work properly.

Scan the following bar code to program your scan engine for Presentation Mode.



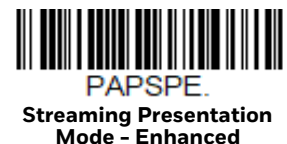
## Presentation Mode—Full Depth of Field

Often Presentation Mode is used to read bar codes at a close distance. However there may be applications where you need to read bar codes at a further distance. In this case use Presentation Mode—Full Depth of Field when scanning at a far distance.



## Streaming Presentation™ Mode

When in Streaming Presentation mode, the scan engine's aimer goes out after a short time, but the scan illumination remains on all the time to continuously search for bar codes. 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.



When using [Preferred Symbology](#) (page 3-55), a lower priority symbol must be centered on the aiming pattern to be read in Streaming Presentation Mode.

## LED Illumination - Presentation Mode

If you wish to set the illumination LED brightness, scan one of the bar codes below. This sets the LED illumination for the scanner when it is in Presentation Mode. (If the scanner is triggered manually, the LED illumination will switch to the setting for a manual trigger. See "LED Illumination - Manual Trigger" on page 37.) *Default = High.*

**Note:** *The LEDs are like a flash on a camera. The lower the ambient light in the room, the brighter the LEDs need to be so the scanner can “see” the bar codes.*

**Note:** *Lower LED illumination settings are more visible to the user on rolling shutter engines than global shutter engines.*



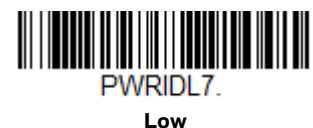
**Note:** *LED Illumination - Presentation Mode does not apply to [Streaming Presentation™ Mode](#) or [Mobile Phone Read Mode](#).*

## Idle Illumination - Presentation Mode

**Note:** *This setting is not supported by N360X Series.*

Scan one of the bar codes below to set the LED illumination for the scanner when it is in an idle state in Presentation Mode. *Default = High.*

**Note:** *If you use one of the lower Idle Illumination settings, and there is not enough ambient light, the scanner may have difficulty detecting when a bar code is presented to it. If the scanner has difficulty “waking up” to read bar codes, you may need to set the Idle Illumination to a brighter setting.*





## Presentation LED Behavior after Decode

When a scan engine is in presentation mode, the LEDs dim 30 seconds after a bar code is decoded. If you wish to dim the LEDs immediately after a bar code is decoded, scan the **LEDs Off** bar code, below. *Default = LEDs On.*



## Presentation Sensitivity

Presentation Sensitivity is a numeric range that increases or decreases the scan engine's reaction time to bar code presentation. To set the sensitivity, scan the **Sensitivity** bar code, then scan the degree of sensitivity (from 0-20) from the inside back cover, and **Save**. 0 is the most sensitive setting, and 20 is the least sensitive. *Default = 1.*



## Presentation Centering

Use Presentation Centering to narrow the scanner's field of view when it is in the stand to make sure the scanner reads only those bar codes intended by the user. For instance, if multiple codes are placed closely together, Presentation Centering will insure that only the desired codes are read.

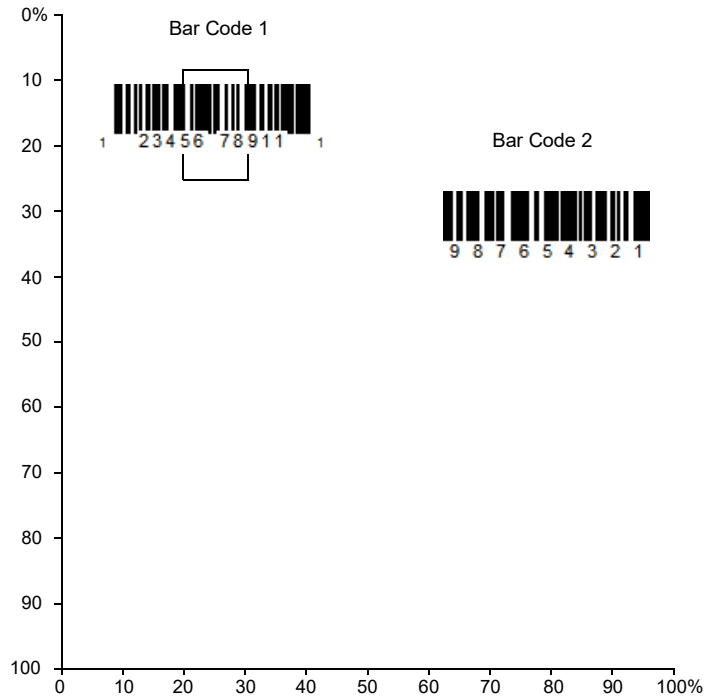
**Note:** To adjust centering when the scanner is hand-held, see [Centering](#) (page 3-53).

If a bar code is not touched by a predefined window, it will not be decoded or output by the scanner. If Presentation Centering is turned on by scanning **Presentation Centering On**, the scanner only reads codes that pass through the centering win-



How you specify using the **Top of Presentation Centering Window**, **Bottom of Presentation Centering Window**, **Left**, and **Right of Presentation Centering Window** bar codes.

In the example below, the white box is the centering window. The centering window has been set to 20% left, 30% right, 8% top, and 25% bottom. Since Bar Code 1 passes through the centering window, it will be read. Bar Code 2 does not pass through the centering window, so it will not be read.



**Note:** A bar code needs only to be touched by the centering window in order to be read. It does not need to pass completely through the centering window.

Scan **Presentation 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 Presentation Centering = 40% for Top and Left, 60% for Bottom and Right.





**PDCTOP.**  
**Top of Presentation**  
**Centering Window**



**PDCBOT.**  
**Bottom of Presentation**  
**Centering Window**



**PDCLFT.**  
**Left of**  
**Presentation Centering**  
**Window**



**PDCRGT.**  
**Right of Presentation**  
**Centering Window**

## Mobile Phone Read Mode

When this mode is selected, your scan engine is optimized to read bar codes from mobile phone or other LED displays. However, the speed of scanning printed bar codes may be slightly lower when this mode is enabled. You can enable **Mobile Phone Reading** for either a hand held device, or for a hands-free (presentation) application.



**PAPHHC.**  
**Hand Held Scanning - Mobile**  
**Phone**



**PAPSPC.**  
**Streaming Presentation -**  
**Mobile Phone**



**PAPPTC.**  
**Presentation Mode - Mobile**  
**Phone**

**Note:** To turn off Mobile Phone Read Mode, scan a different trigger mode.

**Note:** PAPPTC is only supported on firmware v185 and above.

# CodeGate®

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



## Character Activation Mode

You may use a character sent from the host to trigger the scan engine to begin scanning. When the activation character is received, the scan engine continues scanning until either the [Character Activation Timeout](#) (page 3-46), the deactivation character is received (see [Deactivation Character](#) on page 47), or a bar code is transmitted. Scan the following **On** bar code to use character activation, then use **Activation Character** (following) to select the character you will send from the host to start scanning. *Default = Off.*



## Activation Character

This sets the character used to trigger scanning when using Character Activation Mode. On the [ASCII Conversion Chart \(Code Page 1252\)](#), page 226, find the hex value that represents the character you want to use to trigger scanning. Scan the

following bar code, then use the [Programming Chart](#) to read the alphanumeric combination that represents that ASCII character. Scan **Save** to finish. *Default = 12 [DC2].*



## End Character Activation After Good Read

After a bar code is successfully detected and read from the scan engine, the illumination can be programmed either to remain on and scanning, or to turn off. When **End Character Activation After Good Read** is enabled, the illumination turns off and stops scanning after a good read. If you scan **Do Not End Character Activation After Good Read**, the illumination remains on after a good read. *Default = Do Not End Character Activation After Good Read.*



## Character Activation Timeout

You can set a timeout for the length of time the illumination remains on and attempting to decode bar codes when using Character Activation Mode. Set the length (in milliseconds) for a timeout by scanning the following bar code, then setting the timeout (from 1-300,000 milliseconds) by scanning digits from the [Programming Chart](#) inside the back cover of this manual, then scanning **Save**. *Default = 30,000 ms.*



# Character Deactivation Mode

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



## Deactivation Character

This sets the character used to terminate scanning when using Character Deactivation Mode. On the [ASCII Conversion Chart \(Code Page 1252\)](#), page 226, find the hex value that represents the character you want to use to terminate scanning. Scan the following bar code, then use the [Programming Chart](#) inside the back cover of this manual to read the alphanumeric combination that represents that ASCII character. Scan Save to finish. *Default = 14 [DC4].*



# Poor Quality Codes

## Poor Quality 1D Codes

This setting improves the scanner's ability to read damaged or badly printed linear bar codes. When **Poor Quality 1D Reading On** is scanned, poor quality linear bar code reading is improved, but the scanner's snappiness is decreased, making it less aggressive when reading good quality bar codes. This setting does not affect 2D bar code reading. *Default = Poor Quality 1D Reading Off.*



**Poor Quality 1D Reading On**



**\* Poor Quality 1D Reading Off**

## Poor Quality PDF Bar Codes

This setting improves the scanner's ability to read damaged or badly printed PDF bar codes by combining information from multiple images. When **Poor Quality PDF On** is scanned, poor quality PDF bar code reading is improved, but the scanner's snappiness is decreased, making it less aggressive when reading good quality bar codes. This setting does not affect 1D bar code reading. *Default = Poor Quality PDF Reading Off.*



**Poor Quality PDF Reading On**



**\* Poor Quality PDF Reading Off**

# Decode Security

Robust and aggressive processing on Code 39, UPC, and Code 128 for handling of damaged codes, print errors, and under sampling. **Very High Reading Tolerance** is the most permissive mode. When enabled, the scanner reads codes of variable quality. **Low Reading Tolerance** is the least permissive mode. *Default = Medium Reading Tolerance.*



**Very High Reading Tolerance**



**High Reading Tolerance**



**\* Medium Reading Tolerance**



**Low Reading Tolerance**

# Decode Time-Out

This setting defines the overall decode time-out. It is a number in milliseconds.

Scan the **Decode Time-Out** bar code, then scan the time-out duration from 0-2500 ms on the inside back cover, and **Save**. Default = 600 ms.



**Decode Time-Out**

# Hands Free Time-Out

The Presentation Modes are referred to as “hands free” modes. If the scanner’s trigger is pulled when using a hands free mode, the scanner changes to manual trigger mode. You can set the time the scanner should remain in manual trigger mode by setting the **Hands Free Time-Out**. Once the time-out value is reached, (if there have been no further trigger pulls) the scanner reverts to the original hands free mode.

Scan the **Hands Free Time-Out** bar code, then scan the time-out duration (from 0-300,000 milliseconds) from the inside back cover, and **Save**. *Default = 5,000 ms.*



## Reread Delay

This sets the time period before the scan 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 when in a [Presentation Mode](#) (see page 40). *Default = Medium.*



## 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**.





# 2D Reread Delay

Sometimes 2D bar codes can take longer to read than other bar codes. If you wish to set a separate Reread Delay for 2D bar codes, scan one of the programming codes that follows. **2D Reread Delay Off** indicates that the time set for **Reread Delay** is used for both 1D and 2D bar codes. *Default = 2D Reread Delay Off.*



DLY2RR0.

\* 2D Reread Delay Off



DLY2RR1000.

Short (1000ms)



DLY2RR2000.

Medium (2000ms)



DLY2RR3000.

Long (3000ms)



DLY2RR4000.

Extra Long (4000ms)

# Illumination Lights

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

**Note:** *This setting does not affect the aimer light. The aiming light can be set using [Aimer Mode](#) (page 53).*



SCNLED1.  
\* Lights On



SCNLED0.  
Lights Off



SCNLED3.  
Lights On - Mobile phone  
Reading

# Aimer Delay

The aimer delay allows a delay time for the operator to aim the scan engine before the picture is taken. Use these codes to set the time between when the trigger is pulled and when the picture is taken. During the delay time, the aiming light will appear, but the illumination LEDs won't turn on until the delay time is over. *Default = Off.*



SCNDLY200.  
200 milliseconds



SCNDLY400.  
400 milliseconds



SCNDLY0.  
\* Off (no delay)

## User-Specified Aimer Delay

If you want to set your own length for the duration of the delay, scan the bar code below, then set the time-out by scanning digits (0 - 4,000 ms) from the [Programming Chart](#) inside the back cover of this manual, then scan **Save**.



## Aimer Mode

This feature allows you to turn the aimer on and off. When the Interlaced bar code is scanned, the aimer is interlaced with the illumination LEDs, when Concurrent is selected the aimer and illumination are on at the same time. *Default = Interlaced.*

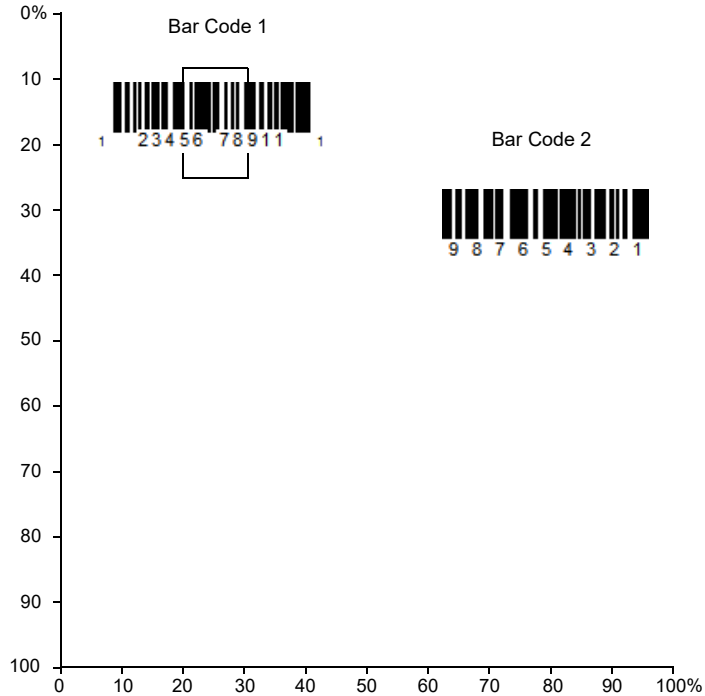


## Centering

Use Centering to narrow the scan engine's field of view to make sure that when the scanner is hand-held, it 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. (Centering can be used in conjunction with [Aimer Delay](#), page 52, for the most error-free operation in applications where multiple codes are spaced closely together. Using the Aimer Delay and Centering features, the scanner can emulate the operation of older systems, such as linear laser bar code scanners.)

If a bar code is not touched by a predefined window, it will not be decoded or output by the scan engine. If centering is turned on by scanning **Centering On**, the scan engine only reads codes that pass through the centering window you specify using the **Top of Centering Window** and **Bottom of Centering Window** bar codes.

In the example below, the white box is the centering window. The centering window has been set to 8% top and 25% bottom. Since Bar Code 1 passes through the centering window, it will be read. Bar Code 2 does not pass through the centering window, so it will not be read.



A bar code needs only to be touched by the centering window in order to be read. It does not need to pass completely through the centering window.

Scan **Centering On**, then scan one of the following bar codes to change the top and bottom 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, 60% for Bottom.*



# Preferred Symbology

The scan 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 scanner 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 scanner ignores it for a set period of time (see [Preferred Symbology Time-out](#) on page 56) 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 scanner will read any bar code in its view (low priority or unspecified). If there is no bar code in the scanner's view after the time-out period expires, then no data is reported.

**Note:** A low priority symbol must be centered on the aiming pattern to be read.

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



# High Priority Symbology

To specify the high priority symbology, scan the High Priority Symbology bar code below. On the [Symbology Charts](#) on page 223, 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*



## Low Priority Symbology

To specify the low priority symbology, scan the Low Priority Symbology bar code below. On the [Symbology Charts](#) on page 223, 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*



## 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 scan 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 Default

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



## Output Sequence Overview

### Output Sequence Editor

This programming selection allows you to program the scan 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 scan 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:** 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. You must hold the trigger while reading each bar code in the sequence.

## To Add an Output Sequence

1. Scan the **Enter Sequence** symbol (see [Require Output Sequence](#), page 60).
2. **Code I.D.**  
On the [Symbology Charts](#) on page 223, find the symbology to which you want to apply the output sequence format. Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart (inside back cover).
3. **Length**  
Specify what length (up to 9999 characters) of data output will be acceptable for this symbology. Scan the four digit data length from the Programming Chart. (Note: 50 characters is entered as 0050. 9999 is a universal number, indicating all lengths.) When calculating the length, you must count any programmed prefixes, suffixes, or formatted characters as part of the length (unless using 9999).
4. **Character Match Sequences**  
On the [ASCII Conversion Chart \(Code Page 1252\)](#), page 226, find the Hex value that represents the character(s) you want to match. Use the Programming Chart to read the alphanumeric combination that represents the ASCII characters. (99 is the Universal number, indicating all characters.)
5. **End Output Sequence Editor**  
Scan **FF** to enter an Output Sequence for an additional symbology, or **Save** to save your entries.

## Other Programming Selections

- **Discard**  
This exits without saving any Output Sequence changes.

# Output Sequence Example

In this example, you are scanning Code 93, Code 128, and Code 39 bar codes, but you want the scanner 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**

SEQBLK	sequence editor start command
62	code identifier for <b>Code 39</b>
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 <b>Code 128</b>
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 <b>Code 93</b>
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 58](#), but assume a <CR> suffix and specific code lengths, you would use the following command line:

**SEQBLK62001241FF6A001342FF69001243FF**

SEQBLK	sequence editor start command
62	code identifier for <b>Code 39</b>
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 <b>Code 128</b>
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 <b>Code 93</b>
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



## 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.)



## Require Output Sequence

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

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



## Multiple Symbols

When this programming selection is turned **On**, it allows you to read multiple symbols with a single pull of the scanner's trigger. If you press and hold the trigger, aiming the scanner at each symbol in a series, it reads unique symbols once, beeping (if turned on) for each read. The scanner continues to scan and decode new symbols as long as the trigger is still pulled. When this programming selection is turned **Off**, the scanner will only read the symbol closest to the aiming beam. *Default = Off.*



# No Read

With No Read turned **On**, the scan engine notifies you if a code cannot be read. If using an EZConfig-Scanning Tool Scan Data Window (see page 185), an “NR” appears when a code cannot be read. If No Read is turned **Off**, the “NR” will not appear. *Default = 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 5-69). The hex code for the No Read symbol is 9C.

# Video Reverse

Video Reverse is used to allow the scan 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.

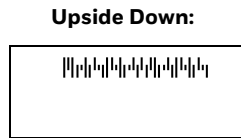
**Note:** After scanning **Video Reverse Only**, menu bar codes cannot be read. You must scan **Video Reverse Off** or **Video Reverse and Standard Bar Codes** in order to read menu bar codes.

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



# Working Orientation

Some bar codes are direction-sensitive. For example, KIX codes and OCR can mis-read when scanned sideways or upside down. Use the working orientation settings if your direction-sensitive codes will not usually be presented upright to the scanner. *Default = Upright.*



**Vertical, Top to Bottom:**  
(Rotate CW 90°)



**Vertical, Bottom to Top:**  
(Rotate CCW 90°)



ROTATN0.

\* Upright



ROTATN1.

Vertical, Bottom to Top



ROTATN2.

Upside Down



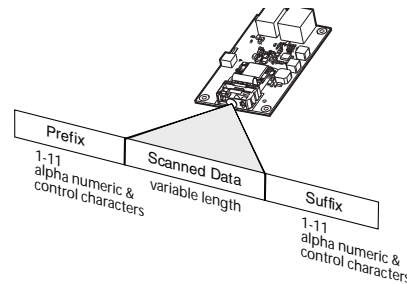
ROTATN3.

Vertical, Top to Bottom

## Prefix/Suffix Overview

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

Prefix and Suffix characters are data characters that can be sent before and after scanned data. You can specify if they should be sent with all symbologies, or only with specific symbologies. The following illustration shows the breakdown of a message string:



## Points to Keep In Mind

- It is not necessary to build a message string. The selections in this chapter are only used if you wish to alter the default settings. *Default prefix = None. Default suffix = 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 226, 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 65](#)).
- Step 2. Determine the 2 digit Hex value from the Symbology Chart (included in the [Symbology Charts](#), beginning on page 223) 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 226, for the prefix or suffix you wish to enter.

**Note:** 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**.

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 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. 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 Tab Suffix to All Symbologies

- Step 1. Scan **Add Suffix**.
  - Step 2. Scan **9, 9** from the [Programming Chart](#) inside the back cover of this manual to apply this suffix to all symbologies.
  - Step 3. Scan **0, 9** from the [Programming Chart](#) inside the back cover of this manual. This corresponds with the hex value for a horizontal tab, shown in the [ASCII Conversion Chart \(Code Page 1252\)](#), beginning on page 226.
- Scan **Save**, or scan **Discard** to exit without saving.

## To Clear One or All Prefixes or Suffixes

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

- Step 1. Scan the **Clear One Prefix** or **Clear One Suffix** symbol.
- Step 2. Determine the 2 digit Hex value from the Symbology Chart (included in the [Symbology Charts](#), beginning on page 223) for the symbology from which you want to clear the prefix or suffix.
- Step 3. Scan the 2 digit hex value from the [Programming Chart](#) inside the back cover of this manual or scan **9, 9** for all symbologies.

Your change is automatically saved.

## To Add a Carriage Return Suffix to All Symbologies

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



VSUFCR.  
Add CR Suffix  
All Symbologies

## Prefix Selections



PREBK2.  
Add Prefix



PRECA2.  
Clear All Prefixes



PRECL2.  
Clear One Prefix

# Suffix Selections



SUFBK2.  
Add Suffix



SUFCL2.  
Clear One Suffix



SUFCA2.  
Clear All Suffixes

# Function Code Transmit

When this selection is enabled and function codes are contained within the scanned data, the scan engine transmits the function code to the terminal. Charts of these function codes are provided in [ASCII Conversion Chart \(Code Page 1252\)](#) starting on [page 226](#). When the scanner is in keyboard wedge mode, the scan code is converted to a key code before it is transmitted. *Default = Enable.*



RMVFNC0.  
\* Enable



RMVFNC1.  
Disable

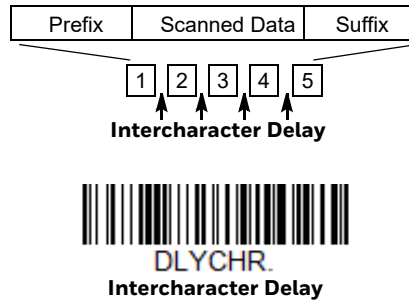
# Intercharacter, Interfunction, and Intermessage Delays

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.



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.

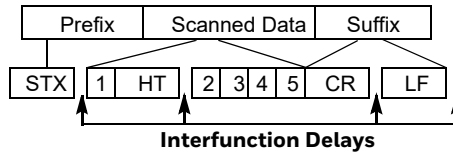
Next, scan the Character to Trigger Delay bar code, then the 2-digit hex value for the ASCII character that will trigger the delay [ASCII Conversion Chart \(Code Page 1252\)](#), beginning on page 226.



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 control character in 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.



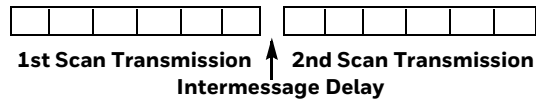
DLYFNC.

Interfunction Delay

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

# Intermessage Delay

An intermessage delay of up to 5000 milliseconds (in 5ms increments) may be placed between each scan transmission. Scan the **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.



DLYMSG.

Intermessage Delay

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

## Data Format Editor Introduction

You may use the Data Format Editor to change the scan 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 is output automatically. However, when you create a format, you must use a "send" command (see [Send Commands](#) on page 72) within the format program to output data.

Multiple formats may be programmed into the scan 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 a bar code is read that fails the first data format, the next data format, if there is one, will be used on the bar code data. If there is no other data format, the raw data is output.

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.



## Add a Data Format

- Step 1. Scan the **Enter Data Format** symbol ([page 71](#)).
- 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 86 for further information.)
- Step 3. **Terminal Type**  
Refer to [Terminal ID Table](#) (page 72) and locate the Terminal ID number for your PC. Scan three numeric bar codes on the inside back cover to program the scan engine for your terminal ID (you must enter 3 digits). For example, scan 0 0 3 for an AT wedge.

**Note:** 099 indicates all terminal types.

- Step 4. **Code I.D.**  
In the [Symbology Charts](#), beginning on page 223, find the symbology to which you want to apply the data format. Locate the Hex value for that symbology and scan the 2 digit hex value from the [Programming Chart](#) inside the back cover of this manual.

If you wish to create a data format for all symbologies, with the exception of some specific symbologies, refer to B8 ([page 84](#)).

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

**Note:** 99 indicates all symbologies.

- Step 5. **Length**  
Specify what length (up to 9999 characters) of data will be acceptable for this symbology. Scan the four digit data length from the [Programming Chart](#) inside the back cover of this manual. For example, 50 characters is entered as 0050.

**Note:** 9999 indicates all lengths.

- Step 6. **Editor Commands**  
Refer to [Data Format Editor Commands](#) (page 72). Scan the symbols that represent the command you want to enter.

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



## Other Programming Selections

- **Clear One Data Format**  
This deletes one data format for one symbology. If you are clearing the primary format, scan 0 from the [Programming Chart](#) inside the back cover of this manual. If you are clearing an alternate format, scan 1, 2, or 3, depending on the format you are clearing. Scan the Terminal Type and Code I.D. (see [Symbology Charts](#) on page 223), and the bar code data length for the specific data format that you want to delete. All other formats remain unaffected.
- **Clear all Data Formats**  
This clears all data formats.
- **Save** to exit and save your data format changes.
- **Discard** to exit without saving any data format changes.



**Terminal ID Table**

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

## Data Format Editor Commands

When working with the Data Format Editor, a virtual cursor is moved along your input data string. The following commands are used to both move this cursor to different positions, and to select, replace, and insert data into the final output.

### Send Commands

#### F1—Send All Characters

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

#### F2—Send a number of characters

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

**Example:** Send a number of characters



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

F2	“Send a number of characters” command
10	Number of characters to send
0D	Hex value for a CR

The data is output as: **1234567890**

**Example:** Split characters into 2 lines

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

Command string: F2100DF10D

F2	“Send a number of characters” command
10	Number of characters to send for the first line
0D	Hex value for a CR
F1	“Send all characters” command
0D	Hex value for a CR

The data is output as:

**1234567890**  
**ABCDEFGHIJ**  
**<CR>**

### F3—Send all characters up to a particular character

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

**Example:** Send all characters up to a particular character



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

Command string: F3440D

F3	“Send all characters up to a particular character” command
44	Hex value for a 'D’
0D	Hex value for a CR

The data is output as:

**1234567890ABC**  
**<CR>**

## B9—Send all characters up to a string

Include in the output message all characters from the input message, starting with the character at the current cursor position and continuing to, but not including, the search string “s...s.” The cursor is moved forward to the beginning of the “s...s” string. *Syntax = B9nnns...s* where nnnn stands for the length of the string, and s...s stands for the string to be matched. The string is made up of hex values for the characters in the string. Refer to the [ASCII Conversion Chart \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

B9 Example: Send all characters up to a defined string



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

Command string: B900024142

B9	“Send all characters up to a string” command
0002	Length of the string (2 characters)
41	Hex value for A
42	Hex value for B

The data is output as: **1234567890**

## E9—Send all but the last characters

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.



## F4—Insert a character multiple times

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

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



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

Command string: E908F40902

- E9 “Send all but the last characters” command
- 08 Number of characters at the end to ignore
- F4 “Insert a character multiple times” command
- 09 Hex value for a horizontal tab
- 02 Number of times the tab character is sent

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

## BA—Insert a string

Send “ss” string of “nn” length in the output message, leaving the cursor in the current position. *Syntax = BAnnnns...s* where nnnn stands for the length of the string, and s...s stands for the string. The string is made up of hex values for the characters in the string. Refer to the [ASCII Conversion Chart \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

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



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

Command string: B900024142BA00022A2AF10D

- B9 “Send all characters up to a string” command
- 0002 Length of the string (2 characters)
- 41 Hex value for A
- 42 Hex value for B
- BA “Insert a string” command
- 0002 Length of the string to be added (2 characters)

2A	Hex value for an asterisk (*)
2A	Hex value for an asterisk (*)
F1	“Send all characters” command
0D	Hex value for a CR

The data is output as:  
**1234567890\*\*ABCFGHIJ**  
**<CR>**

### B3—Insert symbology name

Insert the name of the bar code’s symbology in the output message, without moving the cursor. Only symbologies with a Honeywell ID are included (see [Symbology Charts](#) on page 223). Refer to the [ASCII Conversion Chart \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

### B4—Insert bar code length

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

B3 and B4 Example: Insert the symbology name and length



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

Command string: B3F42001B4F42001F10D

B3	“Insert symbology name” command
F4	“Insert a character multiple times” command
20	Hex value for a space
01	Number of times the space character is sent
B4	“Insert bar code length” command
F4	“Insert a character multiple times” command
20	Hex value for a space
01	Number of times the space character is sent
F1	“Send all characters” command
0D	Hex value for a CR

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

## B5—Insert key strokes

Insert a key stroke or combination of key strokes. Key strokes are dependent on your keyboard (see [Keyboard Key References](#) on page 234). Any key can be inserted, including arrows and functions. *Syntax* = B5xxssnn where xx is the number of keys pressed (without key modifiers), ss is the key modifier from the table below, and nn is the key number from the [Keyboard Key References](#), page 234.

Key Modifiers	
No Key Modifier	00
Shift Left	01
Shift Right	02
Alt Left	04
Alt Right	08
Control Left	10
Control Right	20

**Example:** B501021F inserts an “A” on a 104 key, U.S. style keyboard. B5 = the command, 01 = number of keys pressed (without the key modifier), 02 is the key modifier for Shift Right, and 1F is the “a” key. If a lower case “a” were to be inserted, B501001F would be entered.

If there are three keystrokes, the syntax would change from B5xxssnn for one keystroke to B5xxssnnssnnssnn. An example that would insert "abc" is as follows: B503001F00320030F833.

**Note:** Key modifiers can be added together when needed. Example: Control Left+Shift Left = 11.

## Move Commands

### F5—Move the cursor forward a number of characters

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

F5 Example: Move the cursor forward and send the data



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

Command string: F503F10D

F5        “Move the cursor forward a number of characters” command  
03        Number of characters to move the cursor

F1 "Send all characters" command  
0D Hex value for a CR

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

## F6—Move the cursor backward a number of characters

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.

## F7—Move the cursor to the beginning

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

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



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

Command string: FE31F7F2060D

FE "Compare characters" command  
31 Hex value for 1  
F7 "Move the cursor to the beginning" command  
F2 "Send a number of characters" command  
06 Number of characters to send  
0D Hex value for a CR

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

## EA—Move the cursor to the end

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

# Search Commands

## F8—Search forward for a character

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

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



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

Command string: F844F10D

- F8 “Search forward for a character” command
- 44 Hex value for “D”
- F1 “Send all characters” command
- 0D Hex value for a CR

The data is output as:

**DEFGHIJ**  
**<CR>**

## F9—Search backward for a character

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

## B0—Search forward for a string

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

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



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

Command string: B00003464748F10D

B0	“Search forward for a string” command
0003	String length (3 characters)
46	Hex value for “F”
47	Hex value for “G”
48	Hex value for “H”
F1	“Send all characters” command
0D	Hex value for a CR

The data is output as:

**FGHIJ**  
**<CR>**

## B1–Search backward for a string

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

## E6–Search forward for a non-matching character

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

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



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

Command string: E630F10D

E6	“Search forward for a non-matching character” command
30	Hex value for 0
F1	“Send all characters” command
0D	Hex value for a CR

The data is output as:

**37692**  
**<CR>**

## E7–Search backward for a non-matching character

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

## Miscellaneous Commands

### FB–Suppress characters

Suppress all occurrences of up to 15 different characters, starting at the current cursor position, as the cursor is advanced by other commands. When the FC command is encountered, the suppress function is terminated. The cursor is not moved by the FB command.

*Syntax = FBnnxxyy . .zz* where nn is a count of the number of suppressed characters in the list, and xxyy .. zz is the list of characters to be suppressed.

FB Example: Remove spaces in bar code data



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

Command string: FB0120F10D

FB	“Suppress characters” command
01	Number of character types to be suppressed
20	Hex value for a space
F1	“Send all characters” command
0D	Hex value for a CR

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

## FC—Stop suppressing characters

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

## E4—Replace characters

Replaces up to 15 characters in the output message, without moving the cursor. Replacement continues until the E5 command is encountered. *Syntax = E4nnxx-<sub>1</sub>xx<sub>2</sub>yy<sub>1</sub>yy<sub>2</sub>...zz<sub>1</sub>zz<sub>2</sub>* where nn is the total count of the number of characters in the list (characters to be replaced plus replacement characters); xx<sub>1</sub> defines characters to be replaced and xx<sub>2</sub> defines replacement characters, continuing through zz<sub>1</sub> and zz<sub>2</sub>.

E4 Example: Replace zeroes with CRs in bar code data



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

Command string: E402300DF10D

E4	“Replace characters” command
02	Total count of characters to be replaced, plus the replacement characters (0 is replaced by CR, so total characters = 2)
30	Hex value for 0
0D	Hex value for a CR (the character that will replace the 0)
F1	“Send all characters” command
0D	Hex value for a CR

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

## E5—Stop replacing characters

Terminates character replacement. *Syntax = E5.*



## FE—Compare characters

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

## B2—Compare string

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 \(Code Page 1252\)](#), beginning on page 226 for decimal, hex and character codes.

## EC—Check for a number


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

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

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

Command string: ECF10D

EC	“Check for a number” command
F1	“Send all characters” command
0D	Hex value for a CR

If this bar code is read,  the next data format, if there is one, will be used on the data. If there is no other format, the format fails and the raw data is output as **AB1234**.

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

**1234AB**  
<CR>

## ED—Check for non-numeric character


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

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

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

Command string: EDF10D

ED	“Check for a non-numeric character” command
F1	“Send all characters” command
0D	Hex value for a CR

If this bar code is read,  the next data format, if there is one, will be used on this data. If there is no other format, the format fails and the raw data is output as **1234AB**.

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

**AB1234**  
**<CR>**

## EF—Insert a delay

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

## B8—Discard Data

Discards types of data. For example, you may want to discard Code 128 bar codes that begin with the letter A. In step 4 ([page 70](#)), select 6A (for Code 128), and in step 5, select 9999 (for all lengths). Enter FE41B8 to compare and discard Code 128 bar codes that begin with the letter A. Syntax = B8.

**Note:** The B8 command must be entered after all other commands.

The Data Format must be Required (see [page 85](#)) in order for the B8 command to work.

If Data Format is On, but Not Required ([page 85](#)), bar code data that meets the B8 format is scanned and output as usual.

Because the data format needs to be On and Required ([page 86](#)) for the B8 command, you must input data formats for all bar codes you wish to discard as well as all bar codes you wish to output.

Other data format settings impact the B8 command. If Data Format Non-Match Error Tone is On ([page 86](#)), the scan engine emits an error tone. If Data format Non-Match Error Tone is Off, the code is disabled for reading and no tone is sounded.

# Data Formatter

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



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

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

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





## Data Format Non-Match Error Tone

When a bar code is encountered that doesn't match your required data format, the scan 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.*



## 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.





ALTFNM2.

Data Format 2



ALTFNM3.

Data Format 3

## Single Scan Data Format Change

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

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



VSAF\_0.

Single Scan-Primary  
Data Format



VSAF\_1.

Single Scan-Data Format 1



VSAF\_2.

Single Scan-Data Format 2



VSAF\_3.

Single Scan-Data Format 3



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

- All Symbolologies
- 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
- Digimarc Barcode™
- DotCode
- EAN/JAN-13
- EAN/JAN-8
- FEBRABAN Decode
- Grid Matrix
- GS1 Composite Codes
- GS1 DataBar Expanded
- GS1 DataBar Limited
- GS1 DataBar Omnidirectional
- GS1 Emulation
- GS1-128
- Interleaved 2 of 5
- Korea Post On/Off
- Codablock F
- Matrix 2 of 5
- MaxiCode
- MacroPDF417
- MicroPDF417
- MSI
- MSI Redundancy
- NEC 2 of 5
- PDF417
- Postal Codes - 2D
- Postal Codes - Linear
- 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 scanner, 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.

**Note:** *Scanner performance may reduce by scanning **All Symbologies On**. Only scan when needed.*



**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. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a mis-read.

**Example:** Decode only those bar codes with a count of 9-20 characters.

Min. length = 09Max. length = 20

**Example:** Decode only those bar codes with a count of 15 characters.

Min. length = 15Max. length = 15

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

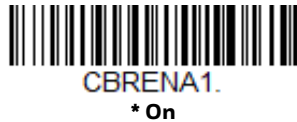


# Codabar

<Default All Codabar Settings>



## Codabar On/Off



## Codabar Start / Stop Characters

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



## Codabar Check Character

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

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

When Check Character is set to **Validate and Transmit**, the scanner 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.



## Codabar Concatenation

Codabar supports symbol concatenation. When you enable concatenation, the scanner 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.



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



## Codabar Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 2-60. Minimum Default = 4, Maximum Default = 60.



## Code 39

< Default All Code 39 Settings >



## Code 39 On/Off



If your are reading Code 39 bar codes, Codablock A should remain disabled. If you are enabling Codablock A (see page [137](#)), you should disable Code 39.

## 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.*



## Code 39 Check Character

**No Check Character** indicates that the scanner 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 scanner 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.*



## Code 39 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 0-48. Minimum Default = 0, Maximum Default = 48.



## Code 39 Redundancy

If you are encountering errors when reading Code 39 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the Code 39 Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#). Then scan the **Save** bar code. *Default = 0.*



## Code 39 Append

This function allows the scanner to append the data from several Code 39 bar codes together before transmitting them to the host computer. When the scanner encounters a Code 39 bar code with the append trigger character(s), it buffers Code 39 bar codes until it reads a Code 39 bar code that does not have the append trigger. The data is then transmitted in the order in which the bar codes were read (FIFO). *Default = 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 97) must be turned off while scanning Code 32 Pharmaceutical codes.*



## 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.





C39ASC0.  
\* 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 [ISO 2022/ISO 646 Character Replacements](#) on page 232), 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.



C39DCP.  
Code 39 Code Page

## Code 39 Unconventional Inter-Character Gaps

Use this setting to configure the scanner to read Code 39 bar codes with unconventional inter-character gaps. Default = Off.



C39UIC1.  
On



C39UIC0.  
\* Off

## Trioptic Code

**Note:** If you are going to scan Code 32 Pharmaceutical codes ([page 96](#)), Trioptic Code must be off.

Trioptic Code is used for labeling magnetic storage media.



TRIENA1.  
On



## Trioptic Redundancy

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



## Interleaved 2 of 5

< Default All Interleaved 2 of 5 Settings >



## Interleaved 2 of 5 On/Off



## Check Digit

**No Check Digit** indicates that the scanner 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 scanner 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.*



I25CK20.

**\* No Check Digit**



I25CK21.

**Validate, but Don't Transmit**



I25CK22.

**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 90) for additional information. Minimum and Maximum lengths = 2-80. *Minimum Default = 4, Maximum Default = 80.*



I25MIN.

**Minimum Message Length**



I25MAX.

**Maximum Message Length**

## FEBRABAN Decode

Febraban is an I 2 of 5 bar code that requires special check characters to be inserted in the transmitted data stream. It is used by the Brazilian Federation of Banks. Scan the bar codes below to turn FEBRABAN Boleto decoding on or off. *Default = Off.*



I25PAY1.

**FEBRABAN Decode On**



I25PAY0.

**FEBRABAN Decode Off**

# NEC 2 of 5

< Default All NEC 2 of 5 Settings >



## NEC 2 of 5 On/Off



## Check Digit

No Check Digit indicates that the scanner 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 scanner 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.*



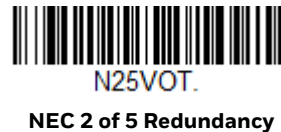
## NEC 2 of 5 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 80.



## NEC 2 of 5 Redundancy

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



## Code 93

< Default All Code 93 Settings >



## Code 93 On/Off



## Code 93 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 0-80. Minimum Default = 0, Maximum Default = 80.



C39MIN.

Minimum Message Length



C93MAX.

Maximum Message Length

## Code 93 Redundancy

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



C93VOT.

Code 93 Redundancy

## Code 93 Append

This function allows the scanner to append the data from several Code 93 bar codes together before transmitting them to the host computer. When this function is enabled, the scanner stores those Code 93 bar codes that start with a space (excluding the start and stop symbols), and does not immediately transmit the data. The scanner stores the data in the order in which the bar codes are read, deleting the first space from each. The scanner transmits the appended data when it reads a Code 93 bar code that starts with a character other than a space. *Default = Off.*



C93APP1.

On



C93APP0.

\* Off

## 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 [ISO 2022/ISO 646 Character Replacements](#) on page 232), 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 90) 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 Industrial Redundancy

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



N25VOT.

**Straight 2 of 5 Industrial  
Redundancy**

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

<Default All Straight 2 of 5 IATA Settings>



A25DFT.

## Straight 2 of 5 IATA On/Off



A25ENA1.

**On**



A25ENA0.

**\* Off**

## Straight 2 of 5 IATA Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-48. Minimum Default = 4, Maximum Default = 48.



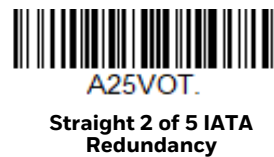
A25MIN.

**Minimum Message Length**



## Straight 2 of 5 IATA Redundancy

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



## Matrix 2 of 5

<Default All Matrix 2 of 5 Settings>



## Matrix 2 of 5 On/Off



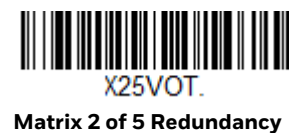
## Matrix 2 of 5 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 4, Maximum Default = 80.



## Matrix 2 of 5 Redundancy

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



## Code 11

<Default All Code 11 Settings>



## Code 11 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.*



## Code 11 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 4, Maximum Default = 80.



## Code 11 Redundancy

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



# Code 128

<Default All Code 128 Settings>



## Code 128 On/Off



If you are reading Code 128 bar codes, Codablock F should remain disabled. If you are enabling Codablock F (see page [138](#)), you should disable Code 128.

## 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.*



## ISBT 128 Concatenation Mode

Specifies the ISBT concatenation mode according to the ISBT specification recommendations. None = Concatenated read prohibited, Required = Concatenated read required, and Optional = Concatenated read permitted but not required. *Default = Required.*



## ISBT 128 Strict Concatenation

This setting specifies the rules for ISBT concatenation. When strict concatenation is on, only ISBT codes specified by the specification can be concatenated. When off, any ISBT code can be concatenated. *Default = On.*



## ISBT 128 Concatenation Alignment

This setting is used to define the alignment required for ISBT concatenation. Off = can concatenate codes from different images, whatever the relative position, On = only codes that are horizontally aligned in the same image can be concatenated. *Default = Off.*





## ISBT 128 Alternate ID

When on, ISBT codes have a specific code ID to differentiate them from regular Code 128 and they cannot be read as Code 128. *Default = Off.*



## Code 128 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 0-80. Minimum Default = 0, Maximum Default = 80.



## Code 128 Append

This function allows the scanner to append the data from several Code 128 bar codes together before transmitting them to the host computer. When the scanner encounters a Code 128 bar code with the append trigger character(s), it buffers Code 128 bar codes until it reads a Code 128 bar code that does not have the append trigger. The data is then transmitted in the order in which the bar codes were read (FIFO). *Default = On.*





## 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 [ISO 2022/ISO 646 Character Replacements](#) on page 232), 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 Redundancy

If you are encountering errors when reading Code 128 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the Code 128 Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#). Then scan the **Save** bar code. *Default = 0.*



## GS1-128

<Default All GS1-128 Settings>



## GS1-128 On/Off



## GS1-128 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 1, Maximum Default = 80.



## GS1-128 Redundancy

If you are encountering errors when reading GS1-128 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the GS1-128 Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#). Then scan the **Save** bar code. *Default = 0.*



## Telepen

<Default All Telepen Settings>



## Telepen On/Off



## Telepen Output

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



## Telepen Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-60. Minimum Default = 1, Maximum Default = 60.



## Telepen Redundancy

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

the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the Telepen Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#). Then scan the **Save** bar code. *Default = 0.*



## UPC-A

<Default All UPC-A Settings>



## UPC-A On/Off



**Note:** To convert UPC-A bar codes to EAN-13, see [Convert UPC-A to EAN-13](#) on page 121.

## 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.*





## 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.*



## UPC-A Redundancy

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



## 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.*





## UPC-A Addenda Required

When *Required* is scanned, the scanner will only read UPC-A bar codes that have addenda. You must then turn on a 2 or 5 digit addenda listed on [page 115](#). *Default = Not Required.*



## Addenda Timeout

You can set a time during which the scanner looks for an addenda. If an addenda is not found within this time period, the data can be either transmitted or discarded, based on the setting you are using for [UPC-A Addenda Required](#) (page 6-116). Set the length (in milliseconds) for this timeout by scanning the bar code below, then setting the timeout (from 0-500 milliseconds) by scanning digits from the [Programming Chart](#), then scanning Save. Default = 120.



## 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.*



# 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 scanner treats Coupon Codes and Extended Coupon Codes as single bar codes.

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

If you scan the **Require Concatenation** code, the scanner 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.*



## Coupon GS1 DataBar Output

If you scan coupons that have both UPC and GS1 DataBar codes, you may wish to scan and output only the data from the GS1 DataBar code. Scan the **GS1 Output On** code below to scan and output only the GS1 DataBar code data. *Default = GS1 Output Off.*



# 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 121). *Default = On.*



## UPC-E0 Expand

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



## UPC-E0 Redundancy

If you are encountering errors when reading UPC-E0 bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To

adjust the redundancy, scan the UPC-EO Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#). Then scan the **Save** bar code. *Default = 0.*



UPEVOT.

**UPC-EO Redundancy**

## UPC-EO Addenda Required

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



UPEARQ1.

**Required**



UPEARQ0.

**\* Not Required**

## UPC-EO 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.*



UPEADS1.

**\* On**



UPEADS0.

**Off**

## UPC-EO Check Digit

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



UPECKX1.

**\* On**



## UPC-E0 Leading Zero

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



## 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.*



# UPC-E1

Most U.P.C. bar codes lead with the 0 number system. For these codes, use [UPC-E0](#) (page 118). If you need to read codes that lead with the 1 number system, use the **UPC-E1** On selection. *Default = Off.*



# EAN/JAN-13

<Default All EAN/JAN Settings>



## EAN/JAN-13 On/Off



## Convert UPC-A to EAN-13

When **UPC-A Converted to EAN-13** is selected, UPC-A bar codes are converted to 13 digit EAN-13 codes by adding a zero to the front. When **Do not Convert UPC-A** is selected, UPC-A codes are read as UPC-A.



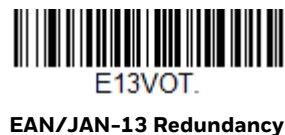
## EAN/JAN-13 Check Digit

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



## EAN/JAN-13 Redundancy

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



## 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.*







## EAN/JAN-13 Addenda Required

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



## EAN-13 Beginning with 290 Addenda Required

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

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

**Note:** *if you are using EAN-13 Beginning with 290 Addenda Required, this setting will take precedence.*

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

*Default = Don’t Require 5 Digit Addenda.*



## EAN-13 Beginning with 378/379 Addenda Required

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

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

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

*Default = Don’t Require Addenda.*



ARQ3780.

\* Don’t Require Addenda



ARQ3781.

Require 2 Digit Addenda



ARQ3782.

Require 5 Digit Addenda



ARQ3783.

Require 2 or 5 Digit Addenda

## EAN-13 Beginning with 414/419 Addenda Required

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

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

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

Default = Don't Require Addenda.



ARQ4140.

\* Don't Require Addenda



ARQ4142.

Require 5 Digit Addenda



ARQ4141.

Require 2 Digit Addenda



ARQ4143.

Require 2 or 5 Digit Addenda

## EAN-13 Beginning with 434/439 Addenda Required

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

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

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

Default = Don't Require Addenda.



ARQ4340.

\* Don't Require Addenda



ARQ4342.

Require 5 Digit Addenda



ARQ4341.

Require 2 Digit Addenda



ARQ4343.

Require 2 or 5 Digit Addenda

## EAN-13 Beginning with 491 Addenda Required

This setting programs the scanner to require any combination of a 2 digit addenda or a 5 digit addenda on EAN-13 bar codes that begin with a “491.” The following settings can be programmed:

**Require Addenda:** All EAN-13 bar codes that begin with a “491” must have a 2 digit addenda, a 5 digit addenda, or a combination of these addenda. The EAN-13 bar code with the addenda is then transmitted as a single, concatenated bar code. If the required addenda is not found within the [Addenda Timeout](#) period, the EAN-13 bar code is discarded.

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

*Default = Don’t Require Addenda.*



ARQ4910.

\* Don’t Require Addenda



ARQ4911.

Require 2 Digit Addenda



ARQ4912.

Require 5 Digit Addenda



ARQ4913.

Require 2 or 5 Digit Addenda

## EAN-13 Beginning with 977 Addenda Required

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

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

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

*Default = Don't Require 2 Digit Addenda.*



\* Don't Require 2 Digit Addenda



Require 2 Digit Addenda

## EAN-13 Beginning with 978 Addenda Required

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

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

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

*Default = Don't Require 5 Digit Addenda.*



\* Don't Require 5 Digit Addenda



Require 5 Digit Addenda

## EAN-13 Beginning with 979 Addenda Required

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

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

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

*Default = Don't Require 5 Digit Addenda.*



ARQ9790.

\* Don't Require 5 Digit Addenda



ARQ9791.

Require 5 Digit Addenda

## 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.*



E13ADS1.

\* On



E13ADS0.

Off

**Note:** If you want to enable or disable EAN13 with Extended Coupon Code, refer to [UPC-A/ EAN-13 with Extended Coupon Code](#) (page 117).

## ISBN Translate

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



E13ISB1.

On



E13ISB0.

\* Off

# ISSN Reformatting

When on, this will reformat an ISSN barcode.



# ISSN Conversion

When On is scanned, EAN-13 Bookland symbols are converted to an ISSN barcode.  
Default = Off.



# EAN/JAN-8

<Default All EAN/JAN-8 Settings>



# EAN/JAN-8 On/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 Redundancy

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



EA8VOT.

EAN/JAN-8 Redundancy

## 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 scanner 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>



MSIDFT.

## MSI On/Off



MSIENA1.  
On

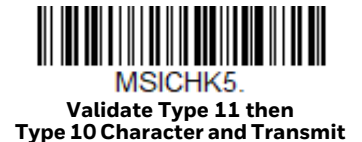


## MSI Check Character

Different types of check characters are used with MSI bar codes. You can program the scanner 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 scanner 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.



## MSI Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 4-48. Minimum Default = 4, Maximum Default = 48.



## MSI Redundancy

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



## GS1 DataBar Omnidirectional

< Default All GS1 DataBar Omnidirectional Settings >



## GS1 DataBar Omnidirectional On/Off



## GS1 DataBar Omnidirectional Redundancy

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



## GS1 DataBar Limited

< Default All GS1 DataBar Limited Settings >



## GS1 DataBar Limited On/Off



## GS1 DataBar Limited Redundancy

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

the bar code. To adjust the redundancy, scan the GS1 DataBar Limited Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#). Then scan the **Save** bar code. *Default = 0.*



## GS1 DataBar Expanded

< Default All GS1 DataBar Expanded Settings >



## GS1 DataBar Expanded On/Off



## GS1 DataBar Expanded Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 4-74. Minimum Default = 4, Maximum Default = 74.



## GS1 DataBar Expanded Redundancy

If you are encountering errors when reading GS1 DataBar Expanded bar codes, you may want to adjust the redundancy count. Redundancy adjusts the number of times a bar code is decoded before transmission, which may reduce the number of

errors. Note that the higher the redundancy count, the longer it will take to decode the bar code. To adjust the redundancy, scan the GS1 DataBar Expanded Redundancy bar code below, then scan a redundancy count between 0 and 10 on the [Programming Chart](#). Then scan the **Save** bar code. *Default = 0.*



RSEVOT.

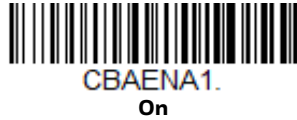
**GS1 DataBar Expanded  
Redundancy**

# Codablock A

<Default All Codablock A Settings>



## Codablock A On/Off



If you are reading Code 39 bar codes, Codablock A should remain disabled. If you are enabling Codablock A, you should disable Code 39 (see page 93).

## Codablock A Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) 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



If you are reading Code 128 bar codes, Codablock F should remain disabled. If you are enabling Codablock F, you should disable Code 128 (see page [108](#)).

## Codablock F Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-2048. Minimum Default = 1, Maximum Default = 2048.



## Label Code

The standard Label Code is used in libraries. *Default = Off.*





# PDF417

< Default All PDF417 Settings >



## PDF417 On/Off



## PDF417 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-2750. Minimum Default = 1, Maximum Default = 2750.



## PDF417 Code Page

PDF417 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 [ISO 2022/ISO 646 Character Replacements](#) on page 232), 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.



# MacroPDF417

MacroPDF417 is an implementation of PDF417 capable of encoding very large amounts of data into multiple PDF417 bar codes. When this selection is enabled, these multiple bar codes are assembled into a single data string. *Default = On.*



# MicroPDF417

< Default All MicroPDF417 Settings >



# MicroPDF417 On/Off



# MicroPDF417 Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-366. Minimum Default = 1, Maximum Default = 366.





## MicroPDF417 Code Page

MicroPDF417 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 [ISO 2022/ISO 646 Character Replacements](#) on page 232), 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.



MicroPDF417 Code Page

## 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. *Default = 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.) *Default = UPC/EAN Version Off.*



**Note:** *If you scan coupons that have both UPC and GS1 DataBar codes, you may wish to scan and output only the data from the GS1 DataBar code. See [Coupon GS1 DataBar Output](#) (page 117) for further information.*

## GS1 Composite Code Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-2435. Minimum Default = 1, Maximum Default = 2435.



## GS1 Composite Code Code Page

GS1 Composite Code 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 [ISO 2022/ISO 646 Character Replacements](#) on page 232), 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.



# GS1 Emulation

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

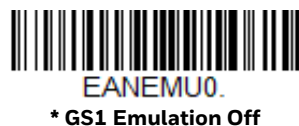
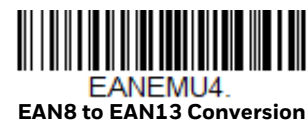
If **GS1-128 Emulation** is scanned, all retail codes (U.P.C., UPC-E, EAN8, EAN13) are expanded out to 16 digits. If the AIM ID is enabled, the value will be the GS1-128 AIM ID, ]C1 (see [Symbology Charts](#) on page 223).

If **GS1 DataBar Emulation** is scanned, all retail codes (U.P.C., UPC-E, EAN8, EAN13) are expanded out to 16 digits. If the AIM ID is enabled, the value will be the GS1-DataBar AIM ID, ]em (see [Symbology Charts](#) on page 223).

If **GS1 Code Expansion Off** is scanned, retail code expansion is disabled, and UPC-E expansion is controlled by the [UPC-E0 Expand](#) (page 118) setting. If the AIM ID is enabled, the value will be the GS1-128 AIM ID, ]C1 (see [Symbology Charts](#) on page 223).

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

*Default = 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.*



## QR Code

< Default All QR Code Settings >



## QR Code On/Off

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



## QR Code Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-7089. Minimum Default = 1, Maximum Default = 7089.





## 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.*



## QR Code Page

QR 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 [ISO 2022/ISO 646 Character Replacements](#) on page 232), 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.



## QR Code No Quiet Zone

Activate QR Code No Quiet Zone to be able to decode bar codes with no quiet zone around the patterns.





## DotCode

< Default All DotCode Settings >



## DotCode On/Off



## Poor Quality DotCodes

This setting improves the scanner's ability to read damaged or badly printed DotCodes. *Default = Poor Quality DotCodes Off.*

**Note:** *When enabled decoding may be longer.*





## DotCode Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-2400. Minimum Default = 1, Maximum Default = 2400.



DOTMIN.

Minimum Message Length



DOTMAX.

Maximum Message Length

## Digimarc Barcode™

### Digimarc Decoder Attempts

Set the number of attempts by scanning the bar code below, then setting the number of attempts (0-10) by scanning digits from the [Programming Chart](#) beginning on page 237 of this manual, the **Save**. *Minimum to Maximum attempts = 0-10. Default = 3.*



DIGSTR.

Digimarc Decoder Attempts

### Digimarc Barcode

This setting programs the scanner to decode Digimarc Barcode using Digimarc and ID decoders. When Digimarc Barcode is set to **On**, the Digimarc decoder is used on most frames and the Honeywell decoder will read every fifth frame.

When Digimarc Barcode is set to **Use Honeywell Decoder then Both Decoders**, the Honeywell decoder will read the number of attempts set by the Digimarc Decoder Attempts and then will use both Honeywell and Digimarc decoders. When Digimarc Barcode is set to **Use Digimarc Decoder then Both Decoders**, the Digimarc decoder will read the number of attempts set by the Digimarc Decoder Attempts and then will use both Honeywell and Digimarc decoders.

When Digimarc Barcode is set to **Use Honeywell Decoder then Alternates Decoders**, the Honeywell decoder will read the number of attempts set by the Digimarc Decoder Attempts and then will alternate between Honeywell and Digimarc decoders. When Digimarc Barcode is set to **Uses Digimarc Decoder then Alternates Decoders**, the Digimarc decoder will read the number of attempts set by the Digimarc Decoder Attempts and then will alternate between Honeywell and Digimarc decoders.

Default = Off.



DIGENA0.

\* Off



DIGENA1.

On



DIGENA2.

Use Honeywell Decoder then  
Both Decoders



DIGENA3.

Use Digimarc Decoder then  
Both Decoders



DIGENA4.

Use Honeywell Decoder then  
Alternates Decoders



DIGENA5.

Use Digimarc Decoder then  
Alternates Decoders

## Data Matrix

< Default All Data Matrix Settings >



IDMDFT.

## Data Matrix On/Off



IDMENA1.

\* On



IDMENA0.

Off

## Low Contrast Data Matrix Enhancements

Use this setting if you are reading low contrast Data Matrix and dot peened direct part mark bar codes. If you are having trouble reading non-dot peen Data Matrix bar codes, it may be helpful to turn this setting off by scanning the **Low Contrast Data Matrix Enhancements Off**. Default = Low Contrast Data Matrix Enhancements On.



DPMENA1.  
\*Low Contrast Data Matrix  
Enhancements On



DPMENA0.  
Low Contrast Data Matrix  
Enhancements Off



DPMENA2.  
Reflective Low Contrast Data  
Matrix Enhancements On

## Data Matrix Small Reflective Barcodes

Use this setting if Reflective Low Contrast Data Matrix Enhancements are on (DPMENA2). This setting improves decoding of small reflective DPM symbols. *Default = Off.*



DPMRSZ0.  
\*Data Matrix Small  
Reflective Codes Off



DPMRSZ1.  
Data Matrix Small Reflective  
Codes On

## Data Matrix Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-3116. Minimum Default = 1, Maximum Default = 3116.



IDMMIN.  
Minimum Message Length



## Data Matrix Append

This function allows the scanner to append the data from several Data Matrix bar codes together before transmitting them to the host computer. When the scanner encounters an Data Matrix bar code with the append trigger character(s), it buffers the number of Data Matrix 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.*



## 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 [ISO 2022/ISO 646 Character Replacements](#) on page 232), 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.



## Grid Matrix

<Default All Grid Matrix Settings>



## Grid Matrix On/Off



## Grid Matrix Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-2751. Minimum Default = 1, Maximum Default = 2751.



## MaxiCode

< Default All MaxiCode Settings >



## MaxiCode On/Off



## MaxiCode Message Format

Use this setting to specify whether the secondary message of a MaxiCode bar code is decoded or not. Default = Primary Required, Secondary if Available.



MAXFMT0.

**Primary Message Only**



MAXFMT1.

**\*Primary Required, Secondary if Available**



MAXFMT2.

**Both Primary and Secondary Required**

## MaxiCode Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-150. Minimum Default = 1, Maximum Default = 150.



MAXMIN.

**Minimum Message Length**



MAXMAX.

**Maximum Message Length**

## Aztec Code

< Default All Aztec Code Settings >



AZTDFT.

## Aztec Code On/Off



AZTENA1.

**\* On**



## Aztec Code Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-3832. Minimum Default = 1, Maximum Default = 3832.



## Aztec Append

This function allows the scanner to append the data from several Aztec bar codes together before transmitting them to the host computer. When the scanner encounters an Aztec bar code with the append trigger character(s), it buffers the number of Aztec 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.*



## 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 [ISO 2022/ISO 646](#)

[Character Replacements](#) on page 232), 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.

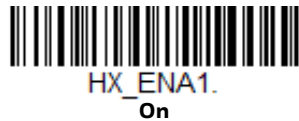


## Chinese Sensible (Han Xin) Code

< Default All Han Xin Settings >



## Han Xin Code On/Off



## Han Xin Code Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 1-7833. Minimum Default = 1, Maximum Default = 7833.





# 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.*



## Single 2D Postal Codes:





POSTAL6.

Postnet On

Also see [Postnet](#)



POSTAL11.

Postnet with B and B' Fields On



POSTAL2.

InfoMail On

## Combination 2D Postal Codes:



POSTAL8.

InfoMail and British  
Post On



POSTAL20.

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



POSTAL14.

Postnet and  
Postal-4i On



POSTAL16.

Postnet and  
Intelligent Mail Bar Code On



POSTAL17.

Postal-4i and  
Intelligent Mail Bar Code On



POSTAL19.

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



**POSTAL12.**  
Planet Code and  
Postnet On



**POSTAL13.**  
Planet Code and  
Postal-4i On



**POSTAL21.**  
Planet Code,  
Postnet, and  
Postal-4i On



**POSTAL23.**  
Planet Code,  
Postal-4i, and  
Intelligent Mail Bar Code On



**POSTAL25.**  
Planet Code,  
Postal-4i, and  
Postnet with B and B' Fields On



**POSTAL18.**  
Planet Code and  
Postnet with B and B' Fields On



**POSTAL15.**  
Planet Code and  
Intelligent Mail Bar Code



**POSTAL22.**  
Planet Code,  
Postnet, and  
Intelligent Mail Bar Code On



**POSTAL24.**  
Postnet,  
Postal-4i, and  
Intelligent Mail Bar Code 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

# Australian Post Interpretation

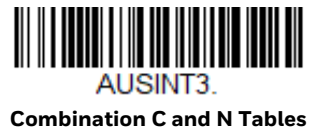
This option controls what interpretation is applied to customer fields in Australian 4-State symbols.

**Bar Output** lists the bar patterns in “0123” format.

**Numeric N Table** causes that field to be interpreted as numeric data using the N Table.

**Alphanumeric C Table** causes the field to be interpreted as alphanumeric data using the C Table. Refer to the Australian Post Specification Tables.

**Combination C and N Tables** causes the field to be interpreted using either the C or N Tables.



# 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>



## China Post (Hong Kong 2 of 5) 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 90) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 80.



## China Post Redundancy

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



## Korea Post

<Default All Korea Post Settings>



## Korea Post On/Off



## Korea Post Message Length

Scan the bar codes below to change the message length. Refer to [Message Length Description](#) (page 90) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 48.



## Korea Post Check Digit

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







The scan 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 scan engine performs these functions.

## Single-Use Basis

Imaging Commands with their modifiers send instructions to the scan engine on a single-use basis, and take effect for a single image capture. Once that capture is complete, the scan engine reverts to its imaging default settings. If you want to permanently change a setting, you must use the serial default commands (see [Chapter 9](#)). When the serial default command is used, that selection becomes the new, permanent setting for the scan 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 `IMG SNP1P1T`.

**Note:** *After processing an image capture command (IMG SNP or IMG BOX), you must follow it with an IMG SHP 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 `IMG SNP1P1T;IMG SHP`.

The imaging commands are:

[Image Snap - IMG SNP](#) (page 164)

[Image Ship - IMG SHP](#) (page 167)

[Intelligent Signature Capture - IMG BOX](#) (page 176)

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 scan engine from the image/object. To achieve a high quality image, it is recommended that you position your scan 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. 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 scan 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 scan engine is in a stand. LED illumination (1L) is preferred when the scanner is handheld. LED State is not available when using Decoding Style (0P).

- 0L LEDs off (*default*)
- 1L LEDs on

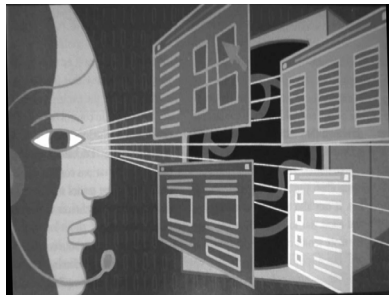
## E - Exposure

Exposure is used in Manual Style only (1P|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 scanner 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 = 1 000 000.*

- nE Range: 1-1 000 000

### Example:

**Exposure at 7874E with fluorescent lighting:**



**Exposure at 100E with fluorescent lighting:**



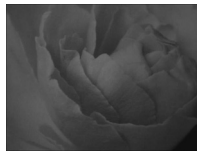
## G - Gain

Gain is used in Manual Style only (2P). Like a volume control, the gain modifier boosts the signal and multiplies the pixel value. As you increase the gain, the noise in an image is also amplified. *Default = 6.*

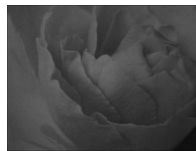
40G	Medium gain
64G	Heavy gain ( <i>default</i> )
96G	Maximum gain

### Example:

**Gain at 1G:**



**Gain at 4G:**



**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 = 90*)

nW      Range: 0 - 255

### Example:

**White Value at 75W:**



**White Value at 125W:**



**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*)

nD      Range: 0 - 255

## U - Update Tries

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

nU      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: 0 - 99

### Example:

**Target Set Point Percentage at 97%:**

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Curabitur massa. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec interdum volutpat arcu. Proin sed turpis. Donec

**Target Set Point Percentage at 50%:**

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Curabitur massa. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec interdum volutpat arcu. Proin sed turpis. Donec

**Target Set Point Percentage at 40%:**

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Curabitur massa. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec interdum volutpat arcu. Proin sed turpis. Donec

# Step 2 - Ship a Picture Using IMGSHIP

## Image Ship - IMGSHIP

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 **IMGSHIP** 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. Any number of modifiers may be appended to the **IMGSHIP** command.

**Example:** You can use the following command to snap and ship a bitmap image with gamma correction and document image filtering: **IMGSNP;IMGSHIP8F75K26U**

# IMGSHHP Modifiers

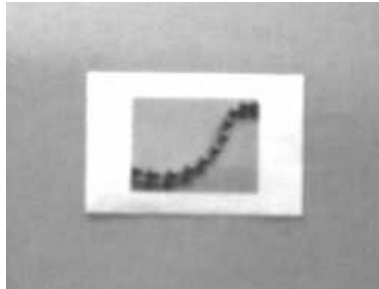
## A - Infinity Filter

Enhances pictures taken from very long distances (greater than 10 feet or 3m). The Infinity Filter should not be used with [IMGSNP Modifiers](#) (page 164).

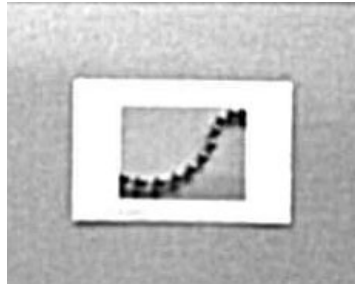
- 0A Infinity filter off (*default*)
- 1A Infinity filter on

### Example:

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



**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:

**Compensation at 0C:**



**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

## 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
- ne Apply edge sharpen using strength  $n$  ( $n = 1-24$ )

### Example:

**Edge Sharpen at 0E:**



**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)
- 15F BMP Uncompressed raw image

## H - Histogram Stretch

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

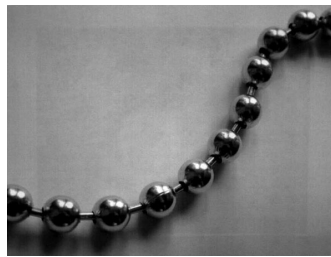
- 0H No stretch (*default*)
- 1H Histogram stretch

### Example:

**Histogram Stretch at 0H:**



**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:

**Image not inverted:**



**Image with Invert Image set to 1ix:**



**Image with Invert Image set to 1iy:**





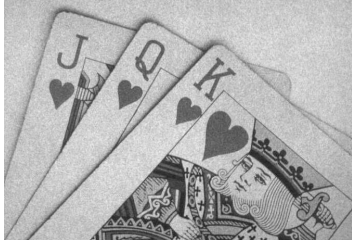
## IF- Noise Reduction

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

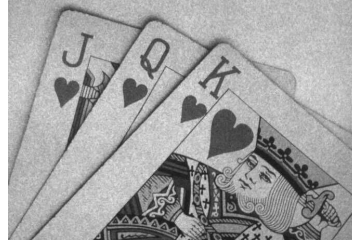
- 0if No salt and pepper noise reduction (default)
- 1if Salt and pepper noise reduction

### Example:

**Noise Reduction Off (0if):**



**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:

**Image Rotate set to 0ir:**



**Image Rotate set to 2ir:**



**Image Rotate set to 1ir:**



**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)

$nJ$	Image is compressed as much as possible while preserving quality factor of $n$ ( $n = 0 - 100$ )
0J	Worst quality (smallest file)
100J	Best 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
$nK$	Apply gamma correction factor $n$ ( $n = 0-1,000$ )

### Example:

**Gamma Correction set to 0K:**



**Gamma Correction set to 50K:**



**Gamma Correction set to 255K:**



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

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.

- nL* The left edge of the shipped image corresponds to column *n* of the image in memory. Range: 000 - 1279. (Default = 0)
- nR* The right edge of the shipped image corresponds to column *n* - 1 of the image in memory. Range: 000 - 1279. (Default = all columns)
- nT* The top edge of the shipped image corresponds to row *n* of the image in memory. Range: 000 - 799. (Default = 0)
- nB* The bottom edge of the shipped image corresponds to row *n* - 1 of the image in memory. Range: 000 - 799. (Default = all rows)

### Example:

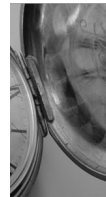
**Uncropped Image:**



**Image Crop set to 300R:**



**Image Crop set to 300L:**



**Image Crop set to 200B:**



**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.

- nM* 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:

**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.

- OP 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:

**Pixel Ship set to 1S:**



**Pixel Ship set to 2S:**



**Pixel Ship set to 3S:**



**Pixel Ship set to 4S:**



## 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 172](#)), with the scan engine in a stand, and the image captured using the command:

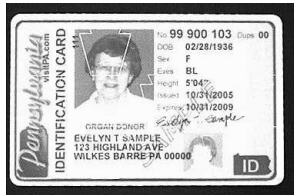
**IMG SNP1POL168W90%32D**

This filter typically provides better JPEG compression than the standard E - Edge Sharpen command (see [page 175](#)). This filter also works well when shipping pure black and white images (1 bit per pixel). The optimal setting is 26U.

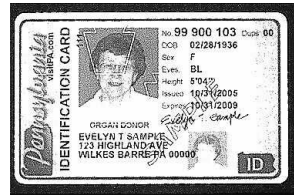
- 0U Document image filter off (*default*)
- 26U Apply document image filter for typical document image
- nU Apply document image filter using grayscale threshold n. Use lower numbers when the image contrast is lower. 1U will have a similar effect to setting [E - Edge Sharpen](#) (page 169) to 22e. Range: 0-255

**Example:**

**Document Image Filter set to 0U:**



**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**



**Example of Blur Image On**



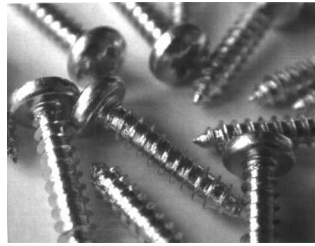
**W - Histogram Ship**

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.

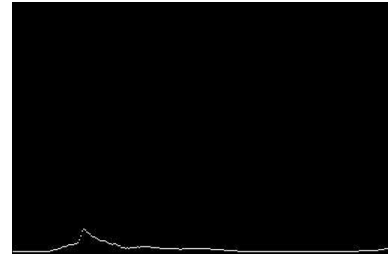
- 0W Don't ship histogram (*default*)

- 1WShip 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.*



## 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 scan 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.*



Below is an example of a signature capture application. In this example, the aimer is centered over the signature capture area and the trigger is pressed. A single beep is emitted, indicating that the scan engine has read a Code 128 bar code and the data has been transferred to the host. If using a Granit scan engine, the scan engine also vibrates. 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 aimer with the signature area (not with the bar code), 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 scan engine. Modifiers affect the image that is transmitted, but do not affect the image in memory. Any number of modifiers may be appended to the IMGBOX command.

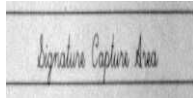
**Note:** The IMGBOX command will return a NAK unless a window size (width and height) are specified. See [H - Height of Signature Capture Area](#) (page 179) and [W - Width of Signature Capture Area](#) (page 180).

## IMGBOX Modifiers

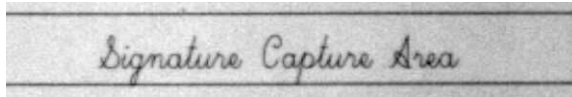
### A - Output Image Width

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



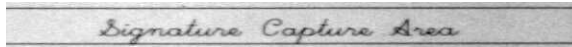
#### Example of Image Width set to



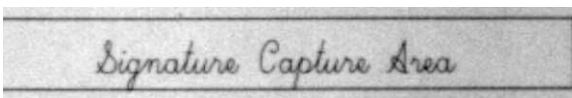
### B - Output Image Height

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.

- 8D8 bits per pixel, grayscale image (*default*)
- 1D1 bit per pixel, black and white image

### F - File Format

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

- OFKIM format



- 1FTIFF binary
- 2FTIFF binary group 4, compressed
- 3FTIFF grayscale
- 4FUncompressed Binary
- 5FUncompressed grayscale
- 6FJPEG image (*default*)
- 7FOutlined image
- 8FBMP 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: *IMGBOX245w37h55y*.

#### 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.

- 0KGamma correction off (*default*)
- 50KApply gamma correction for brightening typical document image
- *n*KApply gamma correction factor *n* ( $n = 1-255$ )

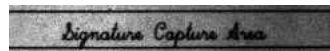
##### Example of Gamma Correction set to 0K:



##### Example of Gamma Correction set to 50K:



##### Example of Gamma Correction set to 255K:

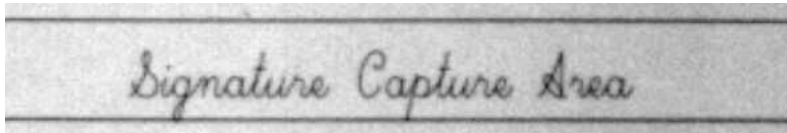


#### R - Resolution of Signature Capture Area

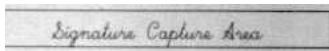
The resolution is the number of pixels that the scan engine outputs per each minimum bar width. The higher the value for R, the higher the quality of the image, but also the larger the file size. Values begin at 1000. The scan engine automatically

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 178).

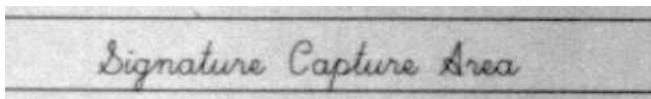
**Example of Resolution set to OR:**



**Example of Resolution set to**



**Example of Resolution set to**



**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**

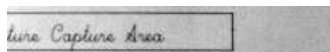
The width of the signature capture area must be measured in inches divided by .01. In the example, the width of the area to be captured is 2.4 inches, resulting in a value of  $W = 2.4/0.01 = 240$ . (A value of 245 was used in the example to accommodate a slightly wider image area.)

Example: *IMGBOX245w37h55y.*

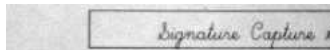
**X - Horizontal Bar Code Offset**

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**



**Example of Horizontal Offset set to -**



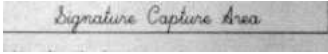
**Y - Vertical Bar Code Offset**

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:**



## RF Default Imaging Device

The scan engine supports imaging command processing (IMGSH, IMGSNP, IMG-BOX) so that EZConfig-Scanning (see page 185) and other applications are able to perform imaging functions as if they were communicating directly with a scanner. To accomplish this, the scanner uses a menu command called RF\_DID (RF Default Imaging Device). RF\_DID is the name of the scanner (BT\_NAM) that is to receive imaging commands. The default for RF\_DID is "\*" indicating that imaging commands are to be sent to all associated scanners. Change this setting to RF\_DID-*scanner\_name* to ensure that they are sent to a particular scanner.



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

This selection allows you to turn on transmission of a Code I.D. before the decoded symbology. (See the [Symbology Charts](#), beginning on page 223) for the single character code that identifies each symbology.) This action first clears all current prefixes, then programs a Code I.D. prefix for all symbologies. This is a temporary setting that will be removed when the unit is power cycled.



PRECA2,BK2995C80!

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

## Show Software Revision

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



REVINF.

**Show Software Revision**

## Show Data Format

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



DFMBK3?.

DFMBK3?.

**Data Format Settings**

## Test Menu

When you scan the **Test Menu On** code, then scan a programming code in this manual, the scan 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 scan engine operation.*



## TotalFreedom

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



PLGDCE1.

\* Decoding Apps On



PLGDCE0.

Decoding Apps Off



PLGFOE1.

\* Formatting Apps On



PLGFOE0.

Formatting Apps Off



PLGINF.

List Apps

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

## EZConfig-Scanning Introduction

EZConfig-Scanning provides a wide range of PC-based programming functions that can be performed on a scan engine connected to your PC's COM port. EZConfig-Scanning allows you to download upgrades to the scan engine's firmware, change programmed parameters, and create and print programming bar codes. Using EZConfig-Scanning, you can even save/open the programming parameters for a scan 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 a scan engine, EZConfig-Scanning requires that the PC have at least one available serial communication port, or a serial port emulation using a physical USB port. If you are using the serial port and RS232 cable, an external power supply is required. When using a USB serial port emulation, only a USB cable is required.

# EZConfig-Scanning Operations

The EZConfig-Scanning software performs the following operations:

## Scan Data

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

## Configure

Configure displays the programming and configuration data of the scan engine. The scan 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 a scan engine. You can set or modify these parameters as required. You can later write the modified settings to the scan engine, or save them to a dcf file.

## Imaging

Imaging provides all the image-related functions that a 2D scan 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 scan 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 scan engine.

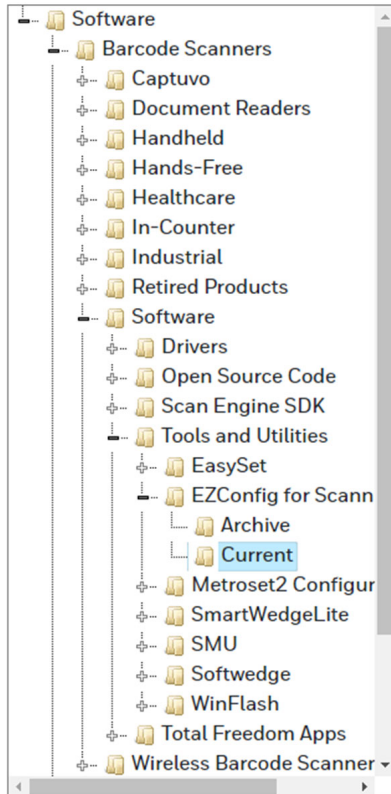
## Install the EZConfig for Scanning Tool

To download and install EZConfig:

1. Access the Honeywell Technical Support Downloads Portal at <https://hsmftp.honeywell.com/>.
2. Register (if you haven't already), then login.



3. Browse to **Software/Barcode Scanners/Software/Tools and Utilities/EZConfig for Scanning > Current** and download the tool.



4. Double click on the Setup.exe file. Follow the screen prompts to install the EZConfig for Scanning Tool.
5. Open EZConfig to configure your scanner.

# Resetting the Factory Defaults



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

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



DEFOVR.

Remove Custom Defaults



DEFAULT.

Activate Defaults

The [Menu Commands](#), beginning on page 194 list the factory default settings for each of the commands (indicated by an asterisk (\*) on the programming pages).

## Reset

Use this barcode to do a hard reset of the scan engine. A hard reset cycles power as if the engine was turned off then on. Software configuration is not reset.



RESET\_.

Reset

# 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 scan 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 7](#)). 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:

<i>parameter</i>	A label representing the actual value you should send as part of a command.
[ <i>option</i> ]	An optional part of a command.
{Data}	Alternatives in a command.
<b>bold</b>	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: <b>SYN M CR</b> (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 <b>232</b> .
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 <b>BAD</b> .
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: <b>!</b> (exclamation point) => performs the command's operation on the device's volatile menu configuration table. <b>.</b> (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.

**Note: IMPORTANT:** *The scan engine's flash has a limited number of write cycles. When sending commands frequently Honeywell recommends using the volatile (! exclamation point) memory as often as possible.*

## Serial Command Example

Set the RS232 baud rate to 115,200: *SYN M CR 232BAD9. or \x16M\x0D232BAD9.*

Prefix	Tag	SubTag	Data	Storage
SYN M CR	232	BAD	9	.

## 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 scan 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:**            **cbrena?.**  
**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
- Default setting (DFT) has no value.

# Trigger Commands

You can activate and deactivate the scan engine with serial trigger commands. First, the scan engine must be put in Manual Trigger Mode by scanning a Manual Trigger Mode bar code (page 36), or by sending a serial menu command for triggering (page 200). Once the scan 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 scan 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 3-39 for a description, and the serial command on page 200).

## Setting the Custom Defaults

You can set the custom defaults by sending serial commands. Use the following concatenated command format to store custom defaults in your product:

`MNUCDF;DEFOVR;<CMD1>;<CMD2>; ... <CMDX>;MNUCDS@`

Set Custom Defaults	Remove Custom Default List	Menu Command List	Save Custom Defaults (@ = save to custom default table)
MNUCDF	DEFOVR	<CMD1>;<CMD2>; ... <CMDX>	MNUCDS@

The custom defaults are not applied immediately, to activate send the Activate Defaults command or read the **DEFAULT** bar code below.

## Resetting the Custom Defaults

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



**DEFAULT.**

**Activate Custom Defaults**

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

**Note:** To remove custom defaults, see [Resetting the Factory Defaults](#) on page 188.

# Menu Commands

Selection	Setting * Indicates default	Serial Command # Indicates a numeric entry	Page
<b>Product Default Settings</b>			
Setting Custom Defaults	Set Custom Defaults	MNUCDP	6
	Save Custom Defaults	MNUCDS	6
Resetting the Custom Defaults	Activate Custom Defaults	DEFAULT	6
Resetting the Factory Defaults	Remove Custom Defaults	DEFOVR	188
<b>Programming the Interface</b>			
RS232 Interface (not supported by CM5780)	RS232 Serial Port	TERMID0;232BAD9;232WRD2	7
Plug and Play Codes: USB	USB Keyboard (PC)	PAP124	8
	USB Keyboard (Mac)	PAP125	8
	USB Japanese Keyboard (PC)	TERMUSB134	8
	USB HID	TERMID131	9
	USB Serial*	TERMID130	9
	CTS/RTS Emulation On	USBCTS1	9
	CTS/RTS Emulation Off*	USBCTS0	9
	ACK/NAK Mode On	USBACK1	9
	ACK/NAK Mode Off*	USBACK0	9
Remote MasterMind for USB	*ReM Off	REMIFC0	10
	ReM On	REMIFC1	10
Program Keyboard Country	*U.S.A.	KBDCTY0	11
	Albania	KBDCTY35	11
	Azeri (Cyrillic)	KBDCTY81	11
	Azeri (Latin)	KBDCTY80	11
	Belarus	KBDCTY82	11
	Belgium	KBDCTY1	11
	Bosnia	KBDCTY33	11
	Brazil	KBDCTY16	11
	Brazil (MS)	KBDCTY59	11
	Bulgaria (Cyrillic)	KBDCTY52	12
	Bulgaria (Latin)	KBDCTY53	12
	Canada (French legacy)	KBDCTY54	12
	Canada (French)	KBDCTY18	12
	Canada (Multilingual)	KBDCTY55	12
	Croatia	KBDCTY32	12
	Czech	KBDCTY15	12



Selection	Setting * Indicates default	Serial Command # Indicates a numeric entry	Page
	Czech (Programmers)	KBDCTY40	12
	Czech (QWERTY)	KBDCTY39	12
	Czech (QWERTZ)	KBDCTY38	12
	Denmark	KBDCTY8	12
	Dutch (Netherlands)	KBDCTY11	12
	Estonia	KBDCTY41	13
	Faeroese	KBDCTY83	13
	Finland	KBDCTY2	13
	France	KBDCTY3	13
	Gaelic	KBDCTY84	13
	Germany	KBDCTY4	13
	Greek	KBDCTY17	13
	Greek (220 Latin)	KBDCTY64	13
	Greek (220)	KBDCTY61	13
	Greek (319 Latin)	KBDCTY65	13
	Greek (319)	KBDCTY62	13
	Greek (Latin)	KBDCTY63	13
	Greek (MS)	KBDCTY66	14
	Greek (Polytonic)	KBDCTY60	14
	Hebrew	KBDCTY12	14
	Hungarian (101 key)	KBDCTY50	14
	Hungary	KBDCTY19	14
	Iceland	KBDCTY75	14
	Irish	KBDCTY73	14
	Italian (142)	KBDCTY56	14
	Italy	KBDCTY5	14
	Japan ASCII	KBDCTY28	14
	Kazakh	KBDCTY78	14
	Kyrgyz (Cyrillic)	KBDCTY79	14
	Latin America	KBDCTY14	15
	Latvia	KBDCTY42	15
	Latvia (QWERTY)	KBDCTY43	15
	Lithuania	KBDCTY44	15
	Lithuania (IBM)	KBDCTY45	15
	Macedonia	KBDCTY34	15
	Malta	KBDCTY74	15
	Mongolian (Cyrillic)	KBDCTY86	15

Selection	Setting * Indicates default	Serial Command # Indicates a numeric entry	Page
	Norway	KBDCTY9	15
	Poland	KBDCTY20	15
	Polish (214)	KBDCTY57	15
	Polish (Programmers)	KBDCTY58	15
	Portugal	KBDCTY13	16
	Romania	KBDCTY25	16
	Russia	KBDCTY26	16
	Russian (MS)	KBDCTY67	16
	Russian (Typewriter)	KBDCTY68	16
	SCS	KBDCTY21	16
	Serbia (Cyrillic)	KBDCTY37	16
	Serbia (Latin)	KBDCTY36	16
	Slovakia	KBDCTY22	16
	Slovakia (QWERTY)	KBDCTY49	16
	Slovakia (QWERTZ)	KBDCTY48	16
	Slovenia	KBDCTY31	16
	Spain	KBDCTY10	17
	Spanish variation	KBDCTY51	17
	Sweden	KBDCTY23	17
	Switzerland (French)	KBDCTY29	17
	Switzerland (German)	KBDCTY6	17
	Tatar	KBDCTY85	17
	Turkey F	KBDCTY27	17
	Turkey Q	KBDCTY24	17
	Ukrainian	KBDCTY76	17
	United Kingdom	KBDCTY7	17
	United States (Dvorak right)	KBDCTY89	18
	United States (Dvorak left)	KBDCTY88	17
	United States (Dvorak)	KBDCTY87	17
	United States (International)	KBDCTY30	18
	Uzbek (Cyrillic)	KBDCTY77	18

<b>Selection</b>	<b>Setting * Indicates default</b>	<b>Serial Command # Indicates a numeric entry</b>	<b>Page</b>
Keyboard Wedge Modifiers, ALT Mode	*Off	KBDALT0	18
	Windows	KBDALT1	18
	DOS	KBDALT2	18
	Unicode	KBDALT3	18
	Windows System CP	KBDALT4	18
	DOS System CP	KBDALT5	18
	3 Characters	KBDALT6	18
	4 Characters	KBDALT7	18
Keyboard Style	*Regular	KBDSTY0	19
	Caps Lock	KBDSTY1	19
	Shift Lock	KBDSTY2	19
	Automatic Caps Lock	KBDSTY6	20
	Automatic Caps via Num Lock	KBDSTY7	20
	Emulate External Keyboard	KBDSTY5	20
Keyboard Conversion	*Keyboard Conversion Off	KBDCNV0	20
	Convert all Characters to Upper Case	KBDCNV1	20
	Convert all Characters to Lower Case	KBDCNV2	21
Control Character Output	*Control Character Output Off	KBDNPE0	21
	*Control Character Output On	KBDNPE1	21
Keyboard Modifiers	*Control + X Off	KBDCAS0	22
	DOS Mode Control + X	KBDCAS1	22
	Windows Mode Control + X	KBDCAS2	22
	Windows Mode Prefix/Suffix Off	KBDCAS3	22
	DOS Mode Control +X Mode On with Windows Mode Prefix/Suffix	KBDCAS4	22
	Control + ASCII Notepad	KBDCAS5	22
	*Turbo Mode Off	KBDTMD0	22
	Turbo Mode On	KBDTMD1	22
	*Numeric Keypad Off	KBDNPS0	22
	Numeric Keypad On	KBDNPS1	22
	*Auto Direct Connect Off	KBDADC0	23
	Auto Direct Connect On	KBDADC1	23
Baud Rate (not supported by CM5780)	300 BPS	232BAD0	23
	600 BPS	232BAD1	23
	1200 BPS	232BAD2	23
	2400 BPS	232BAD3	23
	4800 BPS	232BAD4	23

<b>Selection</b>	<b>Setting * Indicates default</b>	<b>Serial Command # Indicates a numeric entry</b>	<b>Page</b>
	9600 BPS	232BAD5	23
	19200 BPS	232BAD6	24
	38400 BPS	232BAD7	24
	57600 BPS	232BAD8	24
	*115200 BPS	232BAD9	24
Word Length: Data Bits, Stop Bits, and Parity	7 Data, 1 Stop, Parity Even	232WRD3	24
	7 Data, 1 Stop, Parity None	232WRD0	24
	7 Data, 1 Stop, Parity Odd	232WRD6	24
	7 Data, 2 Stop, Parity Even	232WRD4	24
	7 Data, 2 Stop, Parity None	232WRD1	24
	7 Data, 2 Stop, Parity Odd	232WRD7	25
	8 Data, 1 Stop, Parity Even	232WRD5	25
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	*5 Digit Addenda Off	EA8AD50	<a href="#">131</a>



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	Validate 2 Type 10 Chars and Transmit	MSICHK3	<a href="#">132</a>
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MSI Redundancy	Maximum (4 - 48) *48	MSIMAX##	<a href="#">133</a>
	Range (0-10) *0	MSIVOT##	<a href="#">133</a>
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GS1 DataBar Limited	Default All GS1 DataBar Limited Settings	RSLDFT	<a href="#">134</a>
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	*On	RSLENA1	<a href="#">134</a>
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	Off	RSEENA0	<a href="#">135</a>
	*On	RSEENA1	<a href="#">135</a>
GS1 DataBar Expanded Msg. Length	Minimum (4 - 74) *4	RSEMIN##	<a href="#">135</a>
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<b>Selection</b>	<b>Setting * Indicates default</b>	<b>Serial Command # Indicates a numeric entry</b>	<b>Page</b>
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	*Off	CBFENAO	<a href="#">138</a>
	On	CBFENA1	<a href="#">138</a>
Codablock F Msg. Length	Minimum (1 - 2048) *1	CBFMIN####	<a href="#">138</a>
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	* Off	LBLENA0	<a href="#">137</a>
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	Maximum (1-7089) *7089	QRCMAX	144
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<b>Selection</b>	<b>Setting * Indicates default</b>	<b>Serial Command # Indicates a numeric entry</b>	<b>Page</b>
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<b>Selection</b>	<b>Setting * Indicates default</b>	<b>Serial Command # Indicates a numeric entry</b>	<b>Page</b>
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<b>Selection</b>	<b>Setting * Indicates default</b>	<b>Serial Command # Indicates a numeric entry</b>	<b>Page</b>
Reset	Reset	RESET_	<a href="#">188</a>



# MAINTENANCE AND TROUBLESHOOTING

## 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 and Technical Assistance"](#) on page xvii for further information.

## Inspecting Cords and Connectors

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

## Troubleshooting

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

***Is the power on? Is the red or green aiming illumination line on?***

***If the aiming line doesn't appear, check that:***

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

***Is the scan engine having trouble reading your symbols?***

If the scan 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 scan engine or in the decoder to which the scan 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 scan 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 4-63 for further information.

### ***Does the scan engine read the bar code incorrectly?***

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

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

Reprogram the scan engine with the correct Plug and Play or Terminal selection bar code. See [Chapter 2](#) and [Chapter 3](#).

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

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

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

1. Scan the sample bar codes in the back of this manual. If the scan 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 scan engine still can't read the sample bar codes, scan "[All Symbologies](#)" on page 6-90.

If you aren't sure what programming options have been set in the scan engine, or if you want the factory default settings restored, scan [Resetting the Factory Defaults](#) on page 188.

## Symbology Charts

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

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

Refer to [Data Editing](#) beginning on page 63 and [Data Formatting](#) beginning on page 69 for information about using Code ID and AIM ID.

## Linear Symbologies

Symbology	AIM		Honeywell	
	ID	Possible modifiers (m)	ID	Hex
All Symbologies				99
Codabar	JFm	0-1	a	61
Code 11	JH3		h	68
Code 128	JCm	0, 1, 2, 4	j	6A
Code 32 Pharmaceutical (PARAF)	JX0		<	3C
Code 39 (supports Full ASCII mode)	JAm	0, 1, 3, 4, 5, 7	b	62
TCIF Linked Code 39 (TLC39)	JL2		T	54
Code 93 and 93i	JGm	0-9, A-Z, a-m	i	69
EAN	JEm	0, 1, 3, 4	d	64
EAN-13 (including Bookland EAN)	JX0		d	64
EAN-13 with Add-On	JE3		d	64
EAN-13 with Extended Coupon Code	JE3		d	64
EAN-8	JE4		D	44
EAN-8 with Add-On	JE3		D	44

Symbology	AIM		Honeywell	
	ID	Possible modifiers (m)	ID	Hex
GS1				
GS1 DataBar	Jem	0	y	79
GS1 DataBar Limited	Jem		{	7B
GS1 DataBar Expanded	Jem		}	7D
GS1-128	JC1		l	49
2 of 5				
China Post (Hong Kong 2 of 5)	JX0		Q	51
Interleaved 2 of 5	Jlm	0, 1, 3	e	65
Matrix 2 of 5	JX0		m	6D
NEC 2 of 5	JX0		Y	59
Straight 2 of 5 IATA	JRm	0, 1, 3	f	66
Straight 2 of 5 Industrial	JSO		f	66
MSI	JMm	0, 1	g	67
Telepen	JBm		t	74
UPC		0, 1, 2, 3, 8, 9, A, B, C		
UPC-A	JE0		c	63
UPC-A with Add-On	JE3		c	63
UPC-A with Extended Coupon Code	JE3		c	63
UPC-E	JE0		E	45
UPC-E with Add-On	JE3		E	45
UPC-E1	JX0		E	45

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

## 2D Symbologies

Symbology	AIM		Honeywell	
	ID	Possible modifiers (m)	ID	Hex
All Symbologies				99
Aztec Code	]zm	0-9, A-C	z	7A
Chinese Sensible Code (Han Xin Code)	]X0		H	48
Codablock A	]O6	0, 1, 4, 5, 6	V	56
Codablock F	]Om	0, 1, 4, 5, 6	q	71
Code 49	]Tm	0, 1, 2, 4	l	6C
Data Matrix	]dm	0-6	w	77
GS1	]em	0-3	y	79
GS1 Composite	]em	0-3	y	79
GS1 DataBar Omnidirectional	]em		y	79
MaxiCode	]Um	0-3	x	78
PDF417	]Lm	0-2	r	72
MicroPDF417	]Lm	0-5	R	52
QR Code	]Qm	0-6	s	73
Micro QR Code	]Qm		s	73

## Postal Symbologies

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

# ASCII Conversion Chart (Code Page 1252)

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

Non-printable ASCII control characters			Keyboard Control + ASCII (CTRL+X) Mode		
DEC	HEX	Char	Control + X Mode Off (KBDCAS0)	Windows Mode Control + X Mode On (KBDCAS2)	
				CTRL + X	CTRL + X function
0	00	NUL	Reserved	CTRL+ @	
1	01	SOH	NP Enter	CTRL+ A	Select all
2	02	STX	Caps Lock	CTRL+ B	Bold
3	03	ETX	ALT Make	CTRL+ C	Copy
4	04	EOT	ALT Break	CTRL+ D	Bookmark
5	05	ENQ	CTRL Make	CTRL+ E	Center
6	06	ACK	CTRL Break	CTRL+ F	Find
7	07	BEL	Enter / Ret	CTRL+ G	
8	08	BS	<i>(Apple Make)</i>	CTRL+ H	History
9	09	HT	Tab	CTRL+ I	Italic
10	0A	LF	<i>(Apple Break)</i>	CTRL+ J	Justify
11	0B	VT	Tab	CTRL+ K	hyperlink
12	0C	FF	Delete	CTRL+ L	list, left align
13	0D	CR	Enter / Ret	CTRL+ M	
14	0E	SO	Insert	CTRL+ N	New
15	0F	SI	ESC	CTRL+ O	Open
16	10	DLE	F11	CTRL+ P	Print
17	11	DC1	Home	CTRL+ Q	Quit
18	12	DC2	PrtScn	CTRL+ R	
19	13	DC3	Backspace	CTRL+ S	Save
20	14	DC4	Back Tab	CTRL+ T	
21	15	NAK	F12	CTRL+ U	
22	16	SYN	F1	CTRL+ V	Paste
23	17	ETB	F2	CTRL+ W	
24	18	CAN	F3	CTRL+ X	
25	19	EM	F4	CTRL+ Y	



Non-printable ASCII control characters			Keyboard Control + ASCII (CTRL+X) Mode		
DEC	HEX	Char	Control + X Mode Off (KBDCAS0)	Windows Mode Control + X Mode On (KBDCAS2)	
				CTRL + X	CTRL + X function
26	1A	SUB	F5	CTRL+Z	
27	1B	ESC	F6	CTRL+[	
28	1C	FS	F7	CTRL+\	
29	1D	GS	F8	CTRL+]	
30	1E	RS	F9	CTRL+^	
31	1F	US	F10	CTRL+-	
127	7F	?	NP Enter		

## Lower ASCII Reference Table

**Note:** Windows Code page 1252 and lower ASCII use the same characters.

Printable Characters								
DEC	HEX	Character	DEC	HEX	Character	DEC	HEX	Character
32	20	<SPACE>	64	40	@	96	60	`
33	21	!	65	41	A	97	61	a
34	22	"	66	42	B	98	62	b
35	23	#	67	43	C	99	63	c
36	24	\$	68	44	D	100	64	d
37	25	%	69	45	E	101	65	e
38	26	&	70	46	F	102	66	f
39	27	'	71	47	G	103	67	g
40	28	(	72	48	H	104	68	h
41	29	)	73	49	I	105	69	i
42	2A	*	74	4A	J	106	6A	j
43	2B	+	75	4B	K	107	6B	k
44	2C	,	76	4C	L	108	6C	l
45?	2D	-	77	4D	M	109	6D	m
46	2E	.	78	4E	N	110	6E	n
47	2F	/	79	4F	O	111	6F	o
48	30	0	80	50	P	112	70	p
49	31	1	81	51	Q	113	71	q
50	32	2	82	52	R	114	72	r

Printable Characters (Continued)								
DEC	HEX	Character	DEC	HEX	Character	DEC	HEX	Character
51	33	3	83	53	S	115	73	s
52	34	4	84	54	T	116	74	t
53	35	5	85	55	U	117	75	u
54	36	6	86	56	V	118	76	v
55	37	7	87	57	W	119	77	w
56	38	8	88	58	X	120	78	x
57	39	9	89	59	Y	121	79	y
58	3A	:	90	5A	Z	122	7A	z
59	3B	;	91	5B	[	123	7B	{
60	3C	<	92	5C	\	124	7C	
61	3D	=	93	5D	]	125	7D	}
62	3E	>	94	5E	^	126	7E	~
63	3F	?	95	5F	_	127	7F	?

Extended ASCII Characters					
DEC	HEX	CP 1252	ASCII	Alternate Extended	PS2 Scan Code
128	80	€	Ç	up arrow ↑	0x48
129	81		ü	down arrow ↓	0x50
130	82	,	é	right arrow →	0x4B
131	83	f	â	left arrow ←	0x4D
132	84	„	ä	Insert	0x52
133	85	...	à	Delete	0x53
134	86	†	å	Home	0x47
135	87	‡	ç	End	0x4F
136	88	^	ê	Page Up	0x49
137	89	%	ë	Page Down	0x51
138	8A	Š	è	Right ALT	0x38
139	8B	‹	ï	Right CTRL	0x1D
140	8C	Œ	î	Reserved	n/a
141	8D		ì	Reserved	n/a
142	8E	Ž	Ä	Numeric Keypad Enter	0x1C
143	8F		Å	Numeric Keypad /	0x35
144	90		É	F1	0x3B
145	91	‘	æ	F2	0x3C

Extended ASCII Characters (Continued)					
DEC	HEX	CP 1252	ASCII	Alternate Extended	PS2 Scan Code
146	92	'	Æ	F3	0x3D
147	93	“	ô	F4	0x3E
148	94	”	ö	F5	0x3F
149	95	•	ò	F6	0x40
150	96	–	û	F7	0x41
151	97	—	ù	F8	0x42
152	98	~	ÿ	F9	0x43
153	99	™	Ö	F10	0x44
154	9A	š	Ü	F11	0x57
155	9B	›	φ	F12	0x58
156	9C	œ	£	Numeric Keypad +	0x4E
157	9D		¥	Numeric Keypad -	0x4A
158	9E	ž	Pts	Numeric Keypad *	0x37
159	9F	ÿ	f	Caps Lock	0x3A
160	A0		á	Num Lock	0x45
161	A1	ı	í	Left Alt	0x38
162	A2	φ	ó	Left Ctrl	0x1D
163	A3	£	ú	Left Shift	0x2A
164	A4	¤	ñ	Right Shift	0x36
165	A5	¥	Ñ	Print Screen	n/a
166	A6	ı	ª	Tab	0x0F
167	A7	§	º	Shift Tab	0x8F
168	A8	¨	¿	Enter	0x1C
169	A9	©	ƒ	Esc	0x01
170	AA	ª	¬	Alt Make	0x36
171	AB	«	½	Alt Break	0xB6
172	AC	¬	¼	Control Make	0x1D
173	AD		ı	Control Break	0x9D
174	AE	®	«	Alt Sequence with 1 Character	0x36
175	AF	–	»	Ctrl Sequence with 1 Character	0x1D
176	B0	°	⠈		
177	B1	±	⠈		
178	B2	²	⠈		
179	B3	³			
180	B4	´	†		

Extended ASCII Characters (Continued)					
DEC	HEX	CP 1252	ASCII	Alternate Extended	PS2 Scan Code
181	B5	μ	≡		
182	B6	¶	≡		
183	B7	·	π		
184	B8	¸	ϣ		
185	B9	¹	≡		
186	BA	º	∥		
187	BB	»	ϣ		
188	BC	¼	¼		
189	BD	½	½		
190	BE	¾	¾		
191	BF	¿	⌋		
192	C0	À	Ⓐ		
193	C1	Á	Ⓐ		
194	C2	Â	Ⓐ		
195	C3	Ã	Ⓐ		
196	C4	Ä	—		
197	C5	Å	í		
198	C6	Æ	Ⓐ		
199	C7	Ç	Ⓐ		
200	C8	È	Ⓐ		
201	C9	É	Ⓐ		
202	CA	Ê	Ⓐ		
203	CB	Ë	Ⓐ		
204	CC	Ì	Ⓐ		
205	CD	Í	=		
206	CE	Î	Ⓐ		
207	CF	Ï	±		
208	D0	Ð	Ⓐ		
209	D1	Ñ	Ⓐ		
210	D2	Ò	π		
211	D3	Ó	Ⓐ		
212	D4	Ô	Ⓐ		
213	D5	Õ	Ⓐ		
214	D6	Ö	π		

Extended ASCII Characters (Continued)					
DEC	HEX	CP 1252	ASCII	Alternate Extended	PS2 Scan Code
215	D7	×	‡		
216	D8	∅	‡		
217	D9	Ù	Ɔ		
218	DA	Ú	Г		
219	DB	Û	■		
220	DC	Ü	■		
221	DD	Ý	■		
222	DE	Þ	■		
223	DF	ß	■		
224	E0	à	α		
225	E1	á	β		
226	E2	â	Г		
227	E3	ã	π		
228	E4	ä	Σ		
229	E5	å	σ		
230	E6	æ	μ		
231	E7	ç	τ		
232	E8	è	Φ		
233	E9	é	Θ		
234	EA	ê	Ω		
235	EB	ë	δ		
236	EC	ì	∞		
237	ED	í	φ		
238	EE	î	ε		
239	EF	ï	∩		
240	F0	ð	≡		
241	F1	ñ	±		
242	F2	ò	≥		
243	F3	ó	≤		
244	F4	ô	∫		
245	F5	õ	∫		
246	F6	ö	÷		
247	F7	÷	≈		
248	F8	ø	°		
249	F9	ù	·		

Extended ASCII Characters (Continued)					
DEC	HEX	CP 1252	ASCII	Alternate Extended	PS2 Scan Code
250	FA	ú	.		
251	FB	û	√		
252	FC	ü	ñ		
253	FD	ý	²		
254	FE	þ	■		
255	FF	ÿ			

## ISO 2022/ISO 646 Character Replacements

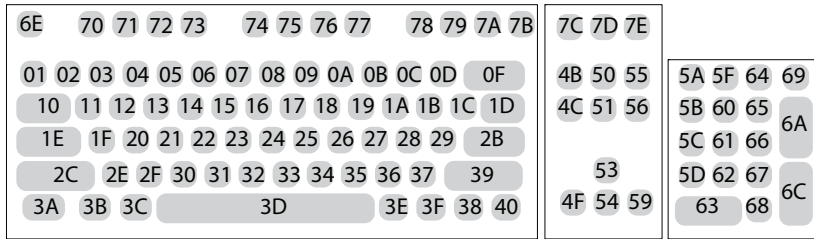
Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the bar code being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, select the code page with which the bar codes were created. The data characters should then appear properly.

Code Page Selection Method/ Country	Standard	Keyboard Country	Honeywell Code Page Option
United States (standard ASCII)	ISO/IEC 646-IRV	?n/a	1
Automatic National Character Replacement	ISO/IEC 2022	?n/a	2 (default)
Binary Code page	?n/a	?n/a	3
<b>Default "Automatic National Character replacement" will select the below Honeywell Code Page options for Code128, Code 39 and Code 93.</b>			
United States	ISO/IEC 646-06	0	1
Canada	ISO /IEC 646-121	54	95
Canada	ISO /IEC 646-122	18	96
Japan	ISO/IEC 646-14	28	98
China	ISO/IEC 646-57	92	99
Great Britain (UK)	ISO /IEC 646-04	7	87
France	ISO /IEC 646-69	3	83
Germany	ISO/IEC646-21	4	84
Switzerland	ISO /IEC 646-CH	6	86
Sweden / Finland (extended Annex C)	ISO/IEC 646-11	2	82
Ireland	ISO /IEC 646-207	73	97
Denmark	ISO/IEC 646-08	8	88
Norway	ISO/IEC 646-60	9	94
Italy	ISO/IEC 646-15	5	85
Portugal	ISO/IEC 646-16	13	92

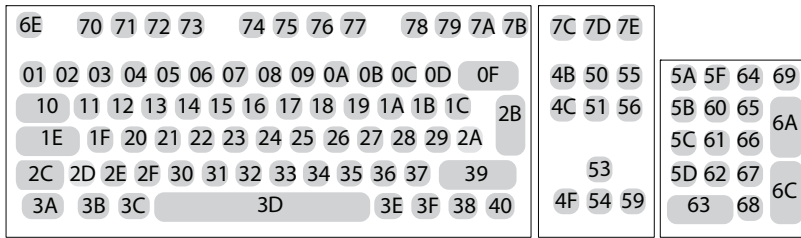
Code Page Selection Method/ Country	Standard	Keyboard Country	Honeywell Code Page Option
Spain	ISO/IEC 646-17	10	90
Spain	ISO/IEC 646-85	51	91

Dec			35	36	64	91	92	93	94	96	123	124	125	126
Hex			23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
US	0	1	#	\$	@	[	\	]	^	`	{		}	~
CA	54	95	#	\$	à	â	ç	ê	î	ô	é	ù	è	û
CA	18	96	#	\$	à	â	ç	ê	É	ô	é	ù	è	û
JP	28	98	#	\$	@	[	¥	]	^	`	{		}	-
CN	92	99	#	¥	@	[	\	]	^	`	{		}	-
GB	7	87	£	\$	@	[	\	]	^	`	{		}	~
FR	3	83	£	\$	à	°	ç	§	^	μ	é	ù	è	..
DE	4	84	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
CH	6	86	ù	\$	à	é	ç	ê	î	ô	ä	ö	ü	û
SE/FI	2	82	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
DK	8	88	#	\$	@	Æ	Ø	Å	^	`	æ	ø	å	~
NO	9	94	#	\$	@	Æ	Ø	Å	^	`	æ	ø	å	-
IE	73	97	£	\$	Ó	É	Í	Ú	Á	ó	é	í	ú	á
IT	5	85	£	\$	§	°	ç	é	^	ù	à	ò	è	ì
PT	13	92	#	\$	§	Ã	Ç	Õ	^	`	ã	ç	õ	°
ES	10	90	#	\$	§	i	Ñ	¿	^	`	°	ñ	ç	~
ES	51	91	#	\$	·	i	Ñ	Ç	¿	`	´	ñ	ç	..
COUNTRY	Country Keyboard	Honeywell CodePage	ISO / IEC 646 National Character Replacements											

# Keyboard Key References



**104 Key U.S. Style Keyboard**

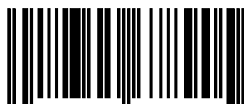


**105 Key European Style**



# Sample Symbols

**UPC-A**



0 123456 7890

**Interleaved 2 of 5**



1234567890

**EAN-13**



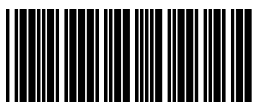
9 780330 290951

**Code 128**



Code 128

**Code 39**



BC321

**Codabar**



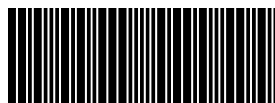
A13579B

**Code 93**



123456-9\$

**Straight 2 of 5 Industrial**



123456

**Matrix 2 of 5**



6543210

**RSS-14**



(01)00123456789012

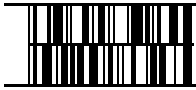
# Sample Symbols

**PDF417**



*Car Registration*

**Code 49**



*1234567890*

**Postnet**



*Zip Code*

**Data Matrix**



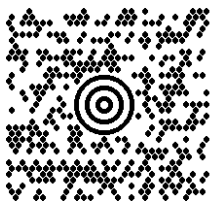
*Test Symbol*

**QR Code**



*Numbers*

**MaxiCode**



*Test Message*

**Aztec**



*Package Label*

**Micro PDF417**



*Test Message*

# Programming Chart



K0K  
0



K2K  
2



K4K  
4



K6K  
6



K8K  
8



K1K  
1



K3K  
3



K5K  
5



K7K  
7



K9K  
9



# Programming Chart



KAK  
A



KCK  
C



KEK  
E



MNUSAV.  
Save



RESET\_  
Reset



KBK  
B



KDK  
D



KFK  
F



MNUABT.  
Discard

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

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