Honeywell

4800p

2D Imager

User's Guide

Disclaimer

Honeywell International Inc. ("HII") reserves the right to make changes in specifications and other information contained in this document without prior notice, and the reader should in all cases consult HII to determine whether any such changes have been made. The information in this publication does not represent a commitment on the part of HII.

HII shall not be liable for technical or editorial errors or omissions contained herein; nor for incidental or consequential damages resulting from the furnishing, performance, or use of this material.

Web Address: www.honeywellaidc.com

Other product names or marks mentioned in this document may be trademarks or registered trademarks of other companies and are the property of their respective owners.

Product Agency Compliance

USA

FCC Part 15 Subpart B Class B

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

If necessary, the user should consult the dealer or an experienced radio/ television technician for additional suggestions. The user may find the following booklet helpful: “Something About Interference.” This is available at FCC local regional offices. Honeywell is not responsible for any radio or television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Honeywell. The correction is the responsibility of the user.

Use only shielded data cables with this system.

Caution: Any changes or modifications made to this equipment not expressly approved by Honeywell may void the FCC authorization to operate this equipment.

UL Statement

UL listed: UL60950-1, 2nd Edition.

Canada

Industry Canada ICES-003

This Class B digital apparatus complies with Canadian ICES-003. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Conformité à la règlementation canadienne

Cet appareil numérique de la Classe B est conforme à la norme NMB-003 du Canada. Son fonctionnement est assujetti aux conditions suivantes :

1. Cet appareil ne doit pas causer de brouillage préjudiciable.
2. Cet appareil doit pouvoir accepter tout brouillage reçu, y compris le brouillage pouvant causer un fonctionnement indésirable.

C-UL Statement

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

Europe

The CE mark indicates compliance to 2004/108/EC EMC Directive with Standards EN55022 CLASS B, EN55024, EN61000-3-2, EN61000-3-3. In addition, complies to 2006/95/EC Low Voltage Directive, when shipped with recommended power supply. For further information, contact:

Honeywell Imaging & Mobility Europe BV
Nijverheidsweg 9-13
5627 BT Eindhoven
The Netherlands

Honeywell shall not be liable for use of our product with equipment (i.e., power supplies, personal computers, etc.) that is not CE marked and does not comply with the Low Voltage Directive.

Waste Electrical and Electronic Equipment Information

Honeywell complies with Directive 2002/96/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on waste electrical and electronic equipment (WEEE).

This product has required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment, if not properly disposed.

In order to avoid the dissemination of those substances in our environment and to diminish the pressure on the natural resources, we encourage you to use the appropriate take-back systems for product disposal. Those systems will reuse or recycle most of the materials of the product you are disposing in a sound way.

The crossed out wheeled bin symbol informs you that the product should not be disposed of along with municipal waste and invites you to use the appropriate separate take-back systems for product disposal.

If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration.

You may also contact your supplier for more information on the environmental performances of this product.

Germany

GS marked to EN60950-1, Second Edition.

International

LED Safety Statement

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

CB Scheme

Certified to CB Scheme IEC60950-1, Second Edition.

Patents

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

Table of Contents

Chapter 4 - Data Editing

Chapter 5 - Data Formatting

Chapter 6 - Symbologies

Chapter 10 - Utilities

Chapter 11 - Serial Programming Commands

Chapter 12 - Product Specifications

Chapter 13 - Maintenance

Chapter 14 - Customer Support

Appendix A - Appendix A

1 Getting Started

About This Manual

This User's Guide provides installation and programming instructions for the 4000 Series imagers. Product specifications, dimensions, warranty, and customer support information are also included.

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

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

Unpacking the Imager

After you open the shipping carton, take the following steps:

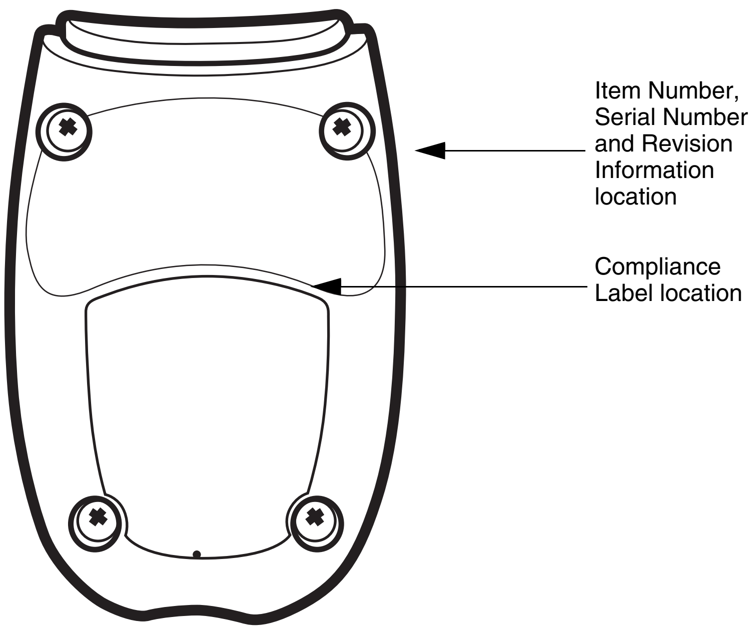
- Check for damage during shipment. Report damage immediately to the carrier who delivered the carton.
- Make sure the items in the carton match your order.
- Save the shipping container for later storage or shipping.

Imager Models

The chart below lists the interfaces that can be used with your imager.

Models	Primary
4800pSF151CE	USB keyboard, USB COM port emulation
4800oSF151C-0F00E	USB kit

Imager Identification

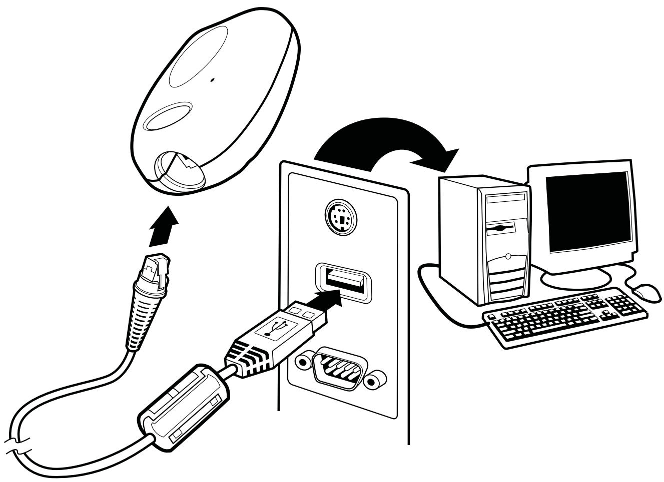


Connecting the Imager with USB

Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.

An imager can be connected to the USB port of a computer.

1. Connect the appropriate interface cable to the imager first, then to the computer.



2. Program the imager for a USB interface using the Plug and Play bar codes beginning on page 1-4.
3. The imager beeps.
4. Verify the imager operation by scanning a bar code from the Sample Symbols in the back of this manual.

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

Programming the Interface - Plug and Play

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

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

Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.

USB PC or Macintosh® Keyboard

Scan one of the following codes to program the imager for USB PC Keyboard or USB Macintosh Keyboard. Scanning these codes adds a CR and selects the terminal ID (USB PC Keyboard - 124, USB Macintosh Keyboard - 125, USB Japanese Keyboard - 134).

USB Keyboard (PC)

USB Keyboard (Mac)

USB Japanese Keyboard (PC)

USB HID

Scan the following code to program the imager for USB HID bar code imagers. Scanning this code changes the terminal ID to 131.

USB HID Bar Code Imager

USB COM Port Emulation

Scan the following code to program the imager to emulate a regular RS-232-based COM port. If you are using a Microsoft® Windows® PC, you will need to download a driver from the Honeywell website (www.honeywellaidc.com). The driver will use the next available COM port number. Apple® Macintosh computers recognize the imager as a USB CDC class device and automatically use a class driver. Scanning the code below changes the terminal ID to 130.

USB COM Port Emulation

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

CTS/RTS Emulation

On

* Off

ACK/NAK Mode

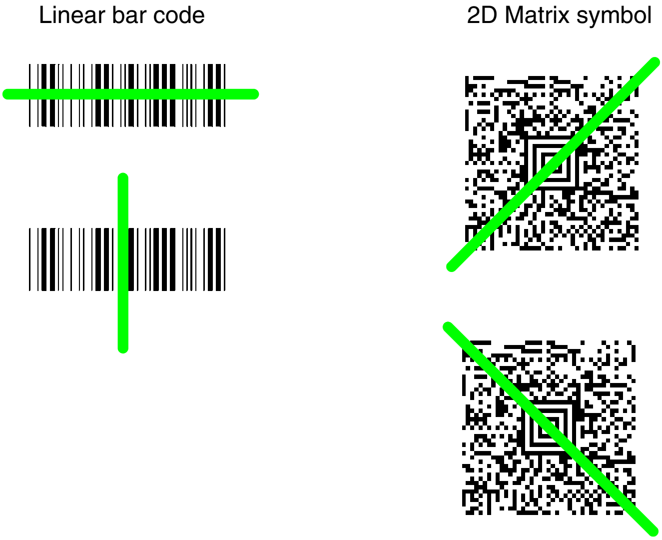
On

* Off

Reading Techniques

The 4800p scans bar codes and also captures images. It can be used with or without a stand.

The 4800p's viewfinder projects a green aiming beam that should be centered over the bar code, but can be positioned in any direction for a good read.



Hold the scanner with the aiming beam centered over the bar code. The 4800p beeps when it successfully reads a bar code. Do not move the 4800p over another bar code until it beeps. The optimum distance between the 4800p and the object being scanned is 2 to 5 inches (5.1 - 12.7 cm). The height from the 4800p to the stand's tray is the proper distance.

The aiming beam is smaller when the imager 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. If the code being scanned is highly reflective (e.g., laminated), it may be necessary to tilt the code $\pm 5°$ to prevent unwanted reflection.

4800p Stand

The stand holds the 4800p at a fixed distance for capturing images or reading bar codes on security/identification cards. The wedge insert supplied with the stand provides the optimum angle for scanning and capturing images in most lighting conditions. The card should be placed on the wedge with the bar code closest to the back of the stand.

2

Terminal Interfaces

Terminal ID

If your interface is not covered by a Plug and Play bar code from Chapter 1, then refer to Supported Terminals on page 2-2, and locate the Terminal ID number for your PC. Scan the ***Terminal ID*** bar code below, then scan the numeric bar code(s) from the Programming Chart inside the back cover of this manual to program the imager for your terminal ID. Scan ***Save*** to save your selection.

For example, an IBM AT terminal has a Terminal ID of 003. You would scan the ***Terminal ID*** bar code, then ***0, 0, 3*** from the Programming Chart inside the back cover of this manual, then ***Save***. If you make an error while scanning the digits (before scanning Save), scan the ***Discard*** code on the Programming Chart, scan the ***Terminal ID*** bar code, scan the digits, and the ***Save*** code again.

Terminal ID

Save

Note: After scanning one of these codes, you must power cycle your computer.

Supported Terminals

Note: See "Imager Models" on page 1-2 to determine which interfaces apply to your imager.

Terminal	Model(s)	Terminal ID
USB PC Keyboard		124
USB Mac Keyboard		125
USB HID POS		131
USB COM Port Emulation		130*
USB Japanese Keyboard		134

*Default for 4800p model

Keyboard Country

Scan the appropriate country code below to program the keyboard for your country. As a general rule, the following characters are supported, but need special care for countries other than the United States:
@ | $ # { } [ ] = / ‘ \ < > ~

* United States

Belgium

Brazil

Canada (French)

Czech Republic

Denmark

Finland (Sweden)

France

Germany/Austria

Greece

Hungary

Israel (Hebrew)

Keyboard Country (continued)

Italy

Latin America

Netherlands (Dutch)

Norway

Poland

Portugal

Romania

Russia

SCS

Slovakia

Spain

Sweden

Switzerland (German)

Keyboard Country (continued)

Turkey F

Turkey Q

U.K.

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

Program Keyboard Country

Keyboard Style

This programs keyboard styles, such as Caps Lock and Shift Lock. *Default = Regular.*

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

* Regular

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

Caps Lock

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

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 (AT and PS/2 only). This selection can only be used with systems that have an LED which notes the Caps Lock status.

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 Auotcaps, but uses the NumLock key to retrieve the current state of the Caps Lock.

Autocaps via NumLock

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

Emulate External Keyboard

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

Keyboard Modifiers

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

Control + ASCII Mode On: The imager sends key combinations for ASCII control characters for values 00-1F. Windows is the preferred mode. All keyboard country codes are supported. DOS mode is a legacy mode, and it does not support all keyboard country codes. New users should use the Windows mode. Refer to Keyboard Function Relationships, page 9-1 for CTRL+ ASCII Values. *Default = Off.*

Control + ASCII Mode On

* Control + ASCII Mode Off

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

Turbo Mode On

* Turbo Mode Off

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

Numeric Keypad Mode On

* Numeric Keypad Mode Off

3 Output

Good Read 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 = On.*

* On

Off

Beeper Volume – Good Read

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

Low

Medium

* High

Off

Beeper Pitch – Good Read

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

Low (1600 Hz)

* Medium (3250 Hz)

High (4200 Hz)

Beeper Duration – Good Read

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

* Normal Beep

Short Beep

Number of Beeps – Good Read

The number of beeps of a good read can be programmed from 1 - 9. 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 = One.*

Number of Pulses

Good Read Delay

This sets the minimum amount of time before the imager can read another bar code. *Default = No Delay.*

***** No Delay

Short Delay (500 ms)

Medium Delay (1,000 ms)

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***.

User-Specified Good Read Delay

Reread Delay

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

Short (500 ms)

* Medium (750 ms)

Long (1000 ms)

Extra Long (2000 ms)

User-Specified Reread Delay

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

User-Specified Reread Delay

LED Power Level

This selection allows you to adjust LED and aimer brightness. ***Off*** is used when no illumination is needed. ***Low*** is used if low illumination is sufficient. ***High*** (the default) is the brightest setting.

*Note: If you scan the **Off** bar code, both the aimer and illumination lights turn off, making it impossible to scan bar codes in low light. To turn the LED Power Level back on, move to a brightly lit area and scan either the **Low** or the **High** bar code below.*

Off

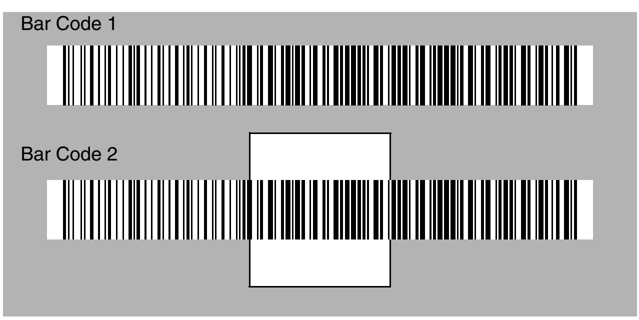
Low (50%)

***** High (100%)

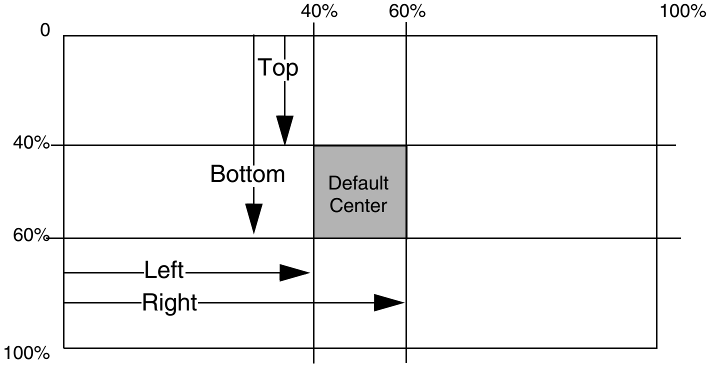
Centering

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

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



The default centering window is a 128x96 pixel area in the center of the imager's field of view. The following diagram illustrates the default top, bottom, left, and right pixel positions, measured from the top and the left side of the imager's field of view, which is 640 by 480 pixels.



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

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

Centering On

* Centering Off

Top of Centering Window

Bottom of Centering Window

Left of Centering Window

Right of Centering Window

Decode Search Mode

There are three selectable decode (scanning) modes:

Full Omnidirectional - Searches for bar code features beginning at the center of an image, and searches to the image's limits. This mode reads all symbologies (including OCR), in any orientation. The Full Omnidirectional search is very thorough which may slow performance time.

Note: This search mode is the default setting.

*Full Omnidirectional

Quick Omnidirectional - This is an abbreviated search for bar code features around the center region of an image. This mode quickly reads all symbologies in any orientation. The Quick Omnidirectional mode may miss some off-center symbols, as well as larger Data Matrix and QR Code symbols.

Quick Omnidirectional

Advanced Linear Decoding - Performs quick horizontal linear scans in a center band of the image. This mode is *not* omnidirectional, but does quickly read linear and stacked bar codes. Advanced Linear Decoding cannot read 2D, OCR, or Postal symbols.

Advanced Linear Decoding

Output Sequence Overview

Require Output Sequence

When turned off, the bar code data will be output to the host as the Imager decodes it. When turned on, all output data must conform to an edited sequence or the imager will not transmit the output data to the host device.

Note: This selection is unavailable when Print Weight (page 3-11) is enabled.

Output Sequence Editor

This programming selection allows you to program the imager 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 imager 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 scan each bar code in the sequence.

To Add an Output Sequence

1. Scan the ***Enter Sequence*** symbol (see Require Output Sequence, page 3-10).
2. **Code I.D.**
   On the Symbology Chart on page A-1, find the symbology to which you want to apply the output sequence format. Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart (inside back cover).
3. **Length**
   Specify what length (up to 9999 characters) of data output will be acceptable for this symbology. Scan the four digit data length from the Programming Chart. (Note: 50 characters is entered as 0050. 9999 is a universal number, indicating all lengths.) When calculating the length, you must count any programmed prefixes, suffixes, or formatted characters as part of the length (unless using 9999).
4. **Character Match Sequences**
   On the ASCII Conversion Chart (Code Page 1252), page A-4, find the Hex value that represents the character(s) you want to match. Use the Programming Chart to read the alphanumeric combination that represents the ASCII characters. (99 is the Universal number, indicating all characters.)
5. **End Output Sequence Editor**
   Scan ***F F*** to enter an Output Sequence for an additional symbology, or ***Save*** to save your entries.

Other Programming Selections

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

Output Sequence Examples

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

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

A - Code 39

B - Code 128

C - Code 93

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

SEQBLK62999941FF6A999942FF69999943FF

The breakdown of the command line is shown below:

SEQBLK	sequence editor start command
62	code identifier for **Code 39**
9999	code length that must match for Code 39, 9999 = all lengths
41	start character match for Code 39, 41h = “A”
FF	termination string for first code
6A	code identifier for **Code 128**
9999	code length that must match for Code 128, 9999 = all lengths
42	start character match for Code 128, 42h = “B”
FF	termination string for second code
69	code identifier for **Code 93**
9999	code length that must match for Code 93, 9999 = all lengths
43	start character match for Code 93, 43h = “C”
FF	termination string for third code

To program the previous example using specific lengths, you would have to count any programmed prefixes, suffixes, or formatted characters as part of the length. If you use the example on page 3-9, but assume a <CR> suffix and specific code lengths, you would use the following command line:

SEQBLK62001241FF6A001342FF69001243FF

The breakdown of the command line is shown below:

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

Output Sequence Editor

Enter Sequence

Default Sequence

Require Output Sequence

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

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

Required

On/Not Required

*Off

Print Weight

Print Weight is used to adjust the way the imager reads Matrix symbols. If an imager will be seeing consistently heavily printed matrix symbols, then a print weight of 6 may improve the reading performance. For consistently light printing, a print weight of 2 may help. After scanning the ***Set Print Weight*** bar code, set the print weight (from 1-7) by scanning digits from the inside back cover, then scanning ***Save***. *Default = 4*.

Set Print Weight

* Default

Video Reverse

Video Reverse is used to allow the imager to read bar codes that are inverted. The “Off” bar code below is an example of this type of bar code. If additional menuing is required, Video Reverse must be disabled to read the menu bar codes and then re-enabled after menuing is completed.

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

On

* Off

Working Orientation

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

Upright:

Rotate Code Clockwise 90°:

Upside Down:

Rotate Code Counterclockwise 90°:

* Upright

Upside Down

Rotate Code Clockwise 90°
(Rotate Imager
Counterclockwise)

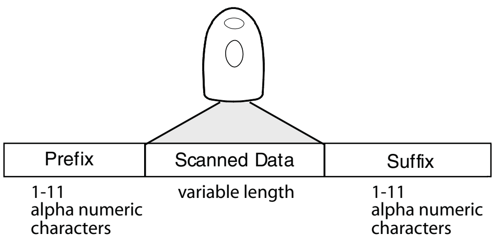
Rotate Code
Counterclockwise 90°
(Rotate Imager Clockwise)

4 Data Editing

Prefix/Suffix Overview

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

Prefix and Suffix characters are data characters that can be sent before and after scanned data. You can specify if they should be sent with all symbologies, or only with specific symbologies. The following illustration shows the 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), page A-4, plus Code I.D. and AIM I.D.
- You can string together several entries for several symbologies at one time.
- Enter prefixes and suffixes in the order in which you want them to appear on the output.
- When setting up for specific symbologies, instead of All Symbologies, the symbology ID value counts as an added prefix or suffix character.

To Add a Prefix or Suffix:

Step 1. Scan the **Add Prefix** or **Add Suffix** symbol (page 4-4).

Step 2. Determine the 2 digit Hex value from the Symbology Chart (included in Appendix A) 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), page A-4, for the prefix or suffix you wish to enter.

Step 5. Scan the 2 digit hex value from the Programming Chart inside the back cover of this manual.

Step 6. Repeat Steps 4 and 5 for every prefix or suffix character.

Step 7. To add the Code I.D., scan **5**, **C**, **8**, **0**.
To add AIM I.D., scan **5**, **C**, **8**, **1**.
To add a backslash (\), scan **5**, **C**, **5**, **C**.

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

Step 8. Scan **Save** to exit and save, or scan **Discard** to exit without saving.

Repeat Steps 1-6 to add a prefix or suffix for another symbology.

Example: Add a Suffix to a specific symbology

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

Step 1. Scan **Add Suffix**.

Step 2. Determine the 2 digit hex value from the Symbology Chart (included in Appendix A) for U.P.C.

Step 3. Scan **6**, **3** from the Programming Chart inside the back cover of this manual.

Step 4. Determine the hex value from the ASCII Conversion Chart (Code Page 1252), page A-4, for the CR (carriage return).

Step 5. Scan **0**, **D** from the Programming Chart inside the back cover of this manual.

Step 6. Scan **Save**, or scan **Discard** to exit without saving.

To Clear One or All Prefixes or Suffixes:

You can clear a single prefix or suffix, or clear all prefixes/suffixes for a symbology. When you Clear One Prefix (Suffix), the specific character you select is deleted from the symbology you want. 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 Appendix A) for the symbology from which you want to clear the prefix or suffix.

Step 3. Scan the 2 digit hex value from the Programming Chart inside the back cover of this manual or scan **9**, **9** for all symbologies.

Your change is automatically saved.

To Add a Carriage Return Suffix to all Symbologies

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

Add CR Suffix
All Symbologies

Prefix Selections

Add Prefix

Clear One Prefix

Clear All Prefixes

Suffix Selections

Add Suffix

Clear One Suffix

Clear All Suffixes

Function Code Transmit

When this selection is enabled and function codes are contained within the scanned data, the imager transmits the function code to the terminal. Charts of these function codes are provided in Supported Interface Keys starting on page 9-3. When the imager is in keyboard wedge mode, the scan code is converted to a key code before it is transmitted. *Default = Enable.*

* Enable

Disable

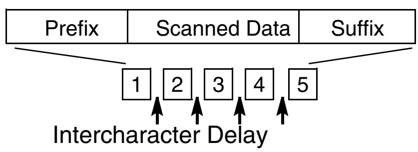
Intercharacter, Interfunction, and Intermessage Delays

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

Each delay is composed of a 5 millisecond step. You can program up to 99 steps (of 5 ms each) for a range of 0-495 ms.

Intercharacter Delay

An intercharacter delay of up to 495 milliseconds (in 5 ms steps) may be placed between the transmission of each character of scanned data. Scan the ***Intercharacter Delay*** bar code below, then scan the number of 5 millisecond steps (0-99), and the ***Save*** bar code using the Programming Chart inside the back cover of this manual.



Intercharacter Delay

To remove this delay, scan the ***Intercharacter Delay*** bar code, then set the number of steps 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 495 milliseconds (in 5 ms steps) 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 5 millisecond steps (0-99), 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), page A-4.

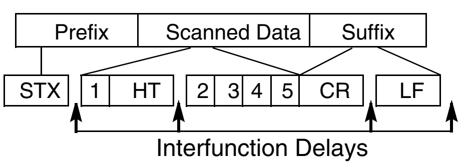
Delay Length

Character to Trigger Delay

To remove this delay, scan the ***Delay Length*** bar code, and set the number of steps 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 495 milliseconds (in 5 ms steps) may be placed between the transmission of each segment of the message string. Scan the ***Interfunction Delay*** bar code below, then scan the number of 5 millisecond steps (0-99), and the ***Save*** bar code using the Programming Chart inside the back cover of this manual.

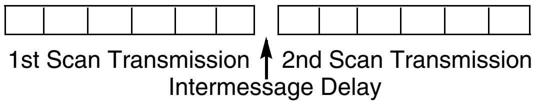


Interfunction Delay

To remove this delay, scan the ***Interfunction Delay*** bar code, then set the number of steps 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 495 milliseconds (in 5 ms steps) may be placed between each scan transmission. Scan the ***Intermessage Delay*** bar code below, then scan the number of 5 millisecond steps (0-99), and the ***Save*** bar code using the Programming Chart inside the back cover of this manual.



Intermessage Delay

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

5 Data Formatting

Data Format Editor Introduction

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

Normally, when you scan a bar code, it gets outputted automatically; however when you do a format, you must use a "send" command (see Send Commands on page 5-2) within the format program to output data.

Multiple formats may be programmed into the imager. 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 Term ID, Actual Code ID, Actual Length
2. Specific Term ID, Actual Code ID, Universal Length
3. Specific Term ID, Universal Code ID, Actual Length
4. Specific Term ID, Universal Code ID, Universal Length
5. Universal Term ID, Actual Code ID, Actual Length
6. Universal Term ID, Actual Code ID, Universal Length
7. Universal Term ID, Universal Code ID, Actual Length
8. Universal Term ID, Universal Code ID, Universal Length

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 on page 5-4.

To Add a Data Format

Step 1. Scan the **Enter Data Format** symbol (page 5-4).

Step 2. Primary/Alternate Format
Determine if this will be your primary data format, or one of 3 alternate formats. (Alternate formats allow you "single shot" capability to scan one bar code using a different data format. After the one bar code has been read, the imager reverts to the primary data format. See page 5-5.) If you are programming the 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 the alternate format you are programming.

Step 3. Terminal Type
Refer to Supported Terminals (page 2-2) and locate the Terminal ID number for your PC. Scan three numeric bar codes on the inside back cover to program the imager for your terminal ID (you must enter 3 digits). For example, scan **0 0 3** for an AT wedge.

Note: The wildcard for all terminal types is 099.

Step 4. Code I.D.

In Appendix A, find the symbology to which you want to apply the data format. Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart inside the back cover of this manual.

Step 5. Length

Specify what length (up to 9999 characters) of data will be acceptable for this symbology. Scan the four digit data length from the Programming Chart inside the back cover of this manual. (Note: 50 characters is entered as 0050. 9999 is a universal number, indicating all lengths.)

Step 6. Editor Commands

Refer to Data Format Editor Commands (page 5-2). Scan the symbols that represent the command you want to enter. 94 alphanumeric characters may be entered for each symbology data format.

Step 7. Scan **Save** from the Programming Chart inside the back cover of this manual to save your entries.

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 alternate format you are clearing. Scan the Terminal Type and Code I.D. (see Supported Terminals on page 2-2), and the bar code data length for the specific data format that you want to delete. All other formats remain unaffected.
- **Save** from the Programming Chart inside the back cover of this manual
  This exits, saving any Data Format changes.
- **Discard** from the Programming Chart inside the back cover of this manual
  This exits without saving any Data Format changes.

Data Format Editor Commands

Send Commands

F1 Send all characters followed by “xx” key or function code, starting from current cursor position. ***Syntax = F1xx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

F2 Send “nn” characters followed by “xx” key or function code, starting from current cursor position. ***Syntax = F2nnxx*** (nn stands for the numeric value (00-99) for the number of characters and xx stands for the hex value for an ASCII code. See ASCII Conversion Chart (Code Page 1252), page A-4.)

F3 Send up to but not including “ss” character (Search and Send) starting from current cursor position, leaving cursor pointing to “ss” character followed by “xx” key or function code. ***Syntax = F3ssxx*** (ss and xx both stand for the hex values for ASCII codes, see ASCII Conversion Chart (Code Page 1252), page A-4.)

F4 Send “xx” character “nn” times (Insert) leaving cursor in current cursor position. ***Syntax = F4xxnn*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4, and nn is the numeric value (00-99) for the number of times it should be sent.)

E9 Send all but the last “nn” characters, starting from the current cursor position. ***Syntax = E9nn*** (nn is the numeric value (00-99) for the number of characters that will not be sent at the end of the message.)

Move Commands

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

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

F7 Move the cursor to the beginning of the data string. ***Syntax = F7.***

EA Move the cursor to the end of the data string. ***Syntax = EA***

Search Commands

F8 Search ahead for “xx” character from current cursor position, leaving cursor pointing to “xx” character. ***Syntax = F8xx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

F9 Search back for “xx” character from current cursor position, leaving cursor pointing to “xx” character. ***Syntax = F9xx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

E6 Search ahead for the first non “xx” character from the current cursor position, leaving cursor pointing to non “xx” character. ***Syntax = E6xx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.

E7 Search back for the first non “xx” character from the current cursor position, leaving cursor pointing to non “xx” character. ***Syntax = E7xx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

Miscellaneous Commands

FB Suppress all occurrences of up to 15 different characters, starting at the current cursor position, as the cursor is advanced by other commands. When the FC command is encountered, the suppress function is terminated. The cursor is not moved by the FB command. **Syntax = FBnnxxyy . .zz** where nn is a count of the number of suppressed characters in the list and xxyy .. zz is the list of characters to be suppressed. (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

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

E4 Replaces up to 15 characters in the data string with user specified characters. Replacement continues until the E5 command is encountered. ***Syntax = E4nnxx$_1$xx$_2$yy$_1$yy$_2$...zz$_1$zz$_2$*** where nn is the total count of both characters to be replaced plus replacement characters; xx$_1$ defines characters to be replaced and xx_2 defines replacement characters, continuing through zz_1 and zz_2.

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

FE Compare character in current cursor position to the character "xx." If characters are equal, increment cursor. If characters are not equal, no format match. ***Syntax = FExx*** (xx stands for the hex value for an ASCII code, see ASCII Conversion Chart (Code Page 1252), page A-4.)

EC Check to make sure there is an ASCII number at the current cursor position. If character is not numeric, format is aborted. ***Syntax = EC***.

ED Check to make sure there is a non-numeric ASCII character at the current cursor position. If character is numeric, format is aborted. ***Syntax = ED***.

Data Format Editor

Enter Data Format

* Default Data Format

Clear One Data Format

Clear All Data Formats

Save

Discard

Data Formatter

When Data Formatter is turned off, the bar code data is output to the host as read (including prefixes and suffixes). Choose one of the following options. *Default = Data Formatter On, but Not Required.*

* Data Formatter On,
but Not Required

Data Formatter Off

When Data Formatter is required, all input data must conform to an edited format or the imager does not transmit the input data to the host device.

Data Format On, Format Required

Alternate Data Formats

Alternate formats allow you “single shot” capability to scan one bar code using a different data format than your primary format. When data formats are programmed (see page 5-1), you must input whether you are programming the primary format, or an alternate format numbered 1, 2, or 3.

An alternate format is initiated by scanning one of the 3 alternate format bar codes below. The imager will scan the next bar code, formatting the data with the selected alternate format, then revert immediately to the primary format.

Alternate Data Format 1

Alternate Data Format 2

Alternate Data Format 3

6 Symbologies

This programming section contains the following menu selections. Refer to Chapter 11 for settings and defaults.

- All Symbologies
- Australian Post
- Aztec Code
- British Post
- Canadian Post
- China Post
- Codabar
- Codablock F
- Code 11
- Code 128
- Code 16K
- Code 39
- Code 49
- Code 93
- Data Matrix
- EAN/JAN-13
- EAN/JAN-8
- GS1 Composite Codes
- GS1 DataBar Expanded
- GS1 DataBar Limited
- GS1 DataBar Omnidirectional
- Intelligent Mail Bar Code
- Interleaved 2 of 5
- Interleaved 2 of 5
- Japanese Post
- Kix (Netherlands) Post
- Korea Post
- Matrix 2 of 5
- MaxiCode
- MicroPDF417
- MSI
- PDF417
- Planet Code
- Plessey Code
- PosiCode A and B
- Postal-4i (UPU 4-State)
- Postnet
- QR Code
- Straight 2 of 5 IATA
- Straight 2 of 5 Industrial
- TCIF Linked Code 39 (TLC39)
- Telepen
- UPC-A
- UPC-A/EAN-13 with Extended Coupon Code

All Symbologies

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

All Symbologies On

All Symbologies Off

Message Length Description

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

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

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

Transmit

* Don't Transmit

Codabar Check Character

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

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

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

* No Check Character

Validate Modulo 16, but Don't Transmit

Validate Modulo 16 and Transmit

Codabar Concatenation

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

Character Start Stop Start Stop

Codabar

A12D D34A

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

On

* Off

Require

Codabar Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 2-60. Minimum Default = 4, Maximum Default = 60.

Minimum Message Length

Maximum Message Length

Code 39

< Default All Code 39 Settings >

Code 39

* On

Off

Code 39 Start/Stop Characters

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

Transmit

* Don't Transmit

Code 39 Check Character

No Check Character indicates that the imager 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 imager only reads Code 39 bar codes printed with a check character, and will transmit this character at the end of the scanned data. *Default = No Check Character.*

* No Check Character

Validate, but Don't Transmit

Validate and Transmit

Code 39 Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 0-48. Minimum Default = 0, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

Code 39 Append

This function allows the imager to append the data from several Code 39 bar codes together before transmitting them to the host computer. When this function is enabled, the imager stores those Code 39 bar codes that start with a space (excluding the start and stop symbols), and does not immediately transmit the data. The imager stores the data in the order in which the bar codes are read, deleting the first space from each. The imager transmits the appended data when it reads a Code 39 bar code that starts with a character other than a space. *Default = Off.*

On

* Off

Code 32 Pharmaceutical (PARAF)

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

Note: Trioptic Code (page 6-33) must be turned off while scanning Code 32 Pharmaceutical codes.

On

* Off

Full ASCII

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

NUL	%U	DLE	$P	SP	SPACE	0	0	@	%V	P	P	‘	%W	p	+P
SOH	$A	DC1	$Q	!	/A	1	1	A	A	Q	Q	a	+A	q	+Q
STX	$B	DC2	$R	“	/B	2	2	B	B	R	R	b	+B	r	+R
ETX	$C	DC3	$S	#	/C	3	3	C	C	S	S	c	+C	s	+S
EOT	$D	DC4	$T	$	/D	4	4	D	D	T	T	d	+D	t	+T
ENQ	$E	NAK	$U	%	/E	5	5	E	E	U	U	e	+E	u	+U
ACK	$F	SYN	$V	&	/F	6	6	F	F	V	V	f	+F	v	+V
BEL	$G	ETB	$W	‘	/G	7	7	G	G	W	W	g	+G	w	+W
BS	$H	CAN	$X	(	/H	8	8	H	H	X	X	h	+H	x	+X
HT	$I	EM	$Y	)	/I	9	9	I	I	Y	Y	i	+I	y	+Y
LF	$J	SUB	$Z	*	/J	:	/Z	J	J	Z	Z	j	+J	z	+Z
VT	$K	ESC	%A	+	/K	;	%F	K	K	[	%K	k	+K	{	%P
FF	$L	FS	%B	,	/L	<	%G	L	L	\	%L	l	+L	l	%Q
CR	$M	GS	%C	-	-	=	%H	M	M	]	%M	m	+M	}	%R
SO	$N	RS	%D	.	.	>	%I	N	N	^	%N	n	+N	~	%S
SI	$O	US	%E	/	/O	?	%J	O	O	_	%O	o	+O	DEL	%T

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

Full ASCII On

* Full ASCII Off

Code 39 Code Page

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

Code 39 Code Page

Interleaved 2 of 5

< Default All Interleaved 2 of 5 Settings >

Interleaved 2 of 5

* On

Off

Check Digit

No Check Digit indicates that the imager 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 imager only reads Interleaved 2 of 5 bar codes printed with a check digit, and will transmit this digit at the end of the scanned data. *Default = No Check Digit.*

* No Check Digit

Validate, but Don't Transmit

Validate and Transmit

Interleaved 2 of 5 Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

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 6-2) for additional information. Minimum and Maximum lengths = 0-80. Minimum Default = 0, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

Code 93 Code Page

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

Code 93 Code Page

Straight 2 of 5 Industrial

<Default All Straight 2 of 5 Industrial Settings>

Straight 2 of 5 Industrial

On

* Off

Straight 2 of 5 Industrial Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-48. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

Straight 2 of 5 IATA (Two-Bar Start/Stop)

<Default All Straight 2 of 5 IATA Settings>

Straight 2 of 5 IATA

On

* Off

Straight 2 of 5 IATA Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-48. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

Matrix 2 of 5

<Default All Matrix 2 of 5 Settings>

Matrix 2 of 5

On

* Off

Matrix 2 of 5 Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 4, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

Code 11

<Default All Code 11 Settings>

Code 11

On

* Off

Check Digits Required

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

One Check Digit

* Two Check Digits

Code 11 Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-80. Minimum Default = 4, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

Code 128

<Default All Code 128 Settings>

Code 128

* On

Off

ISBT 128 Concatenation

In 1994 the International Society of Blood Transfusion (ISBT) ratified a standard for communicating critical blood information in a uniform manner. The use of ISBT formats requires a paid license. The ISBT 128 Application Specification describes 1) the critical data elements for labeling blood products, 2) the current recommendation to use Code 128 due to its high degree of security and its space-efficient design, 3) a variation of Code 128 that supports concatenation of neighboring symbols, and 4) the standard layout for bar codes on a blood product label. Use the bar codes below to turn concatenation on or off. *Default =Off.*

On

* Off

Code 128 Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 0-80. Minimum Default = 0, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

Code 128 Code Page

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

Code 128 Code Page

Telepen

<Default All Telepen Settings>

Telepen

On

* Off

Telepen Output

Using AIM Telepen Output, the imager 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 imager 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.*

* AIM Telepen Output

Original Telepen Output

Telepen Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-60. Minimum Default = 1, Maximum Default = 60.

Minimum Message Length

Maximum Message Length

UPC-A

<Default All UPC-A Settings>

UPC-A

* On

Off

UPC-A Check Digit

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

* On

Off

UPC-A Number System

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

* On

Off

UPC-A Addenda

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

2 Digit Addenda On

* 2 Digit Addenda Off

5 Digit Addenda On

* 5 Digit Addenda Off

UPC-A Addenda Required

When ***Required*** is scanned, the imager will only read UPC-A bar codes that have addenda. You must then turn on a 2 or 5 digit addenda listed on page 6-20. *Default = Not Required.*

Required

* Not Required

UPC-A Addenda Separator

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

* On

Off

UPC-A/EAN-13 with Extended Coupon Code

Use the following codes to enable or disable UPC-A **and** EAN-13 with Extended Coupon Code. *Default = On.*

* On

Off

UPC-E0

<Default All UPC-E Settings>

UPC-E0

Most U.P.C. bar codes lead with the 0 number system. For these codes, use the UPC-E0 selection. If you need to read codes that lead with the 1 number system, use UPC-E1 (page 6-23). *Default = On.*

* UPC-E0 On

UPC-E0 Off

UPC-E0 Expand

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

On

* Off

UPC-E0 Addenda Required

When Addenda Required is set to on, the imager will only read UPC-E bar codes that have addenda. *Default = Not Required.*

Required

* Not Required

UPC-E0 Addenda Separator

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

* On

Off

UPC-E0 Check Digit

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

* On

Off

UPC-E0 Number System

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

* On

Off

UPC-E0 Addenda

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

2 Digit Addenda On

* 2 Digit Addenda Off

5 Digit Addenda On

* 5 Digit Addenda Off

UPC-E1

Most U.P.C. bar codes lead with the 0 number system. For these codes, use UPC-E0 (page 6-21). If you need to read codes that lead with the 1 number system, use the UPC-E1 selection. *Default = Off.*

UPC-E1 On

* UPC-E1 Off

EAN/JAN-13

<Default All EAN/JAN Settings>

EAN/JAN-13

* On

Off

EAN/JAN-13 Check Digit

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

* On

Off

EAN/JAN-13 Addenda

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

2 Digit Addenda On

* 2 Digit Addenda Off

5 Digit Addenda On

* 5 Digit Addenda Off

EAN/JAN-13 Addenda Required

When Addenda Required is set to on, the imager will only read EAN/JAN-13 bar codes that have addenda. *Default = Not Required.*

Required

* Not Required

EAN/JAN-13 Addenda Separator

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

* On

Off

Note: If you want to enable or disable EAN13 with Extended Coupon Code, refer to *UPC-A/EAN-13 with Extended Coupon Code (page 6-21).*

ISBN Translate

This selection causes EAN-13 Bookland symbols to be translated into their equivalent ISBN number format. *Default = Off.*

On

* 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.*

* On

Off

EAN/JAN-8 Addenda

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

2 Digit Addenda On

* 2 Digit Addenda Off

5 Digit Addenda On

* 5 Digit Addenda Off

EAN/JAN-8 Addenda Required

When Addenda Required is set to on, the imager will only read EAN/JAN-8 bar codes that have addenda. *Default = Not Required.*

Required

* 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.

* On

Off

MSI

<Default All MSI Settings>

MSI

On

* Off

MSI Check Character

Different types of check characters are used with MSI bar codes. You can program the imager 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 and Transmit***, the imager will only read MSI bar codes printed with the specified type 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 MSI bar codes printed with the specified type check character, but will not transmit the check character with the scanned data.

* Validate Type 10, but Don't Transmit

Validate Type 10 and Transmit

MSI Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 4-48. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

Plessey Code

<Default All Plessey Code Settings>

Plessey Code

On

* Off

Plessey Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 4-48. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

GS1 DataBar Omnidirectional

< Default All GS1 DataBar Omnidirectional Settings >

GS1 DataBar Omnidirectional

* On

Off

GS1 DataBar Limited

< Default All GS1 DataBar Limited Settings >

GS1 DataBar Limited

* On

Off

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 6-2) for additional information. Minimum and Maximum lengths = 4-74. Minimum Default = 4, Maximum Default = 74.

Minimum Message Length

Maximum Message Length

PosiCode

<Default All PosiCode Settings>

PosiCode A and B

* On

Off

You have to have PosiCode A and B on to read any of the PosiCode symbologies.

A and B On
(No Limited)

A and B and Limited A On
(Limited B Off)

* A and B and Limited B On
(Limited A Off)

PosiCode Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

Trioptic Code

Note: If you are going to scan Code 32 Pharmaceutical codes (page 6-7), Trioptic Code must be off.

Trioptic Code is used for labeling magnetic storage media.

On

* Off

Codablock F

<Default All Codablock F Settings>

Codablock F

On

* Off

Codablock F Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-2048. Minimum Default = 1, Maximum Default = 2048.

Minimum Message Length

Maximum Message Length

Code 16K

<Default All Code 16K Settings>

Code 16K

On

* Off

Code 16K Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 0-160. Minimum Default = 1, Maximum Default = 160.

Minimum Message Length

Maximum Message Length

Code 49

<Default All Code 49 Settings>

Code 49

* On

Off

Code 49 Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-81. Minimum Default = 1, Maximum Default = 81.

Minimum Message Length

Maximum Message Length

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 6-2) for additional information. Minimum and Maximum lengths = 1-2750. Minimum Default = 1, Maximum Default = 2750.

Minimum Message Length

Maximum Message Length

MicroPDF417

< Default All MicroPDF417 Settings >

MicroPDF417

On

* Off

MicroPDF417 Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-366. Minimum Default = 1, Maximum Default = 366.

Minimum Message Length

Maximum Message Length

GS1 Composite Codes

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

On

* Off

UPC/EAN Version

Scan the ***UPC/EAN Version On*** bar code to decode G1 Composite symbols that have a U.P.C. or EAN linear component. (This does not affect GS1 Composite symbols with a GS1-128 or GS1 linear component. If either of these codes are the linear component, either Code 128 or the correct GS1 code must be enabled.)

UPC/EAN Version On

* UPC/EAN Version Off

G1 Composite Code Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-2435. Minimum Default = 1, Maximum Default = 2435.

Minimum Message Length

Maximum Message Length

GS1 Emulation

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

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

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

Default = GS1 Emulation Off.

GS1 Emulation

GS1-128 Emulation

* 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.

On

* Off

Postal Codes

Note: For best performance when reading a postal symbology, all other postal symbologies should be turned off. The following postal codes can only be read by a 2D Imager.

Intelligent Mail Bar Code

Note: You may enable the Intelligent Mail Bar Code if you have firmware with a base number of 31205480. *Refer to the Show Software Revision on page 10-2 for information on determining the firmware revision in your unit.*

On

* Off

Postal-4i (UPU 4-State)

Note: You may enable the Postal-4i (UPU 4-State) if you have firmware with a base number of 31205480. Refer to the Show Software Revision on page 10-2 for information on determining the firmware revision in your unit.

On

* Off

Postnet

On

* Off

Postnet Check Digit

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data.

Transmit Check Digit

* Don't Transmit Check Digit

Planet Code

On

* Off

Planet Code Check Digit

This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data.

Transmit Check Digit

* Don’t Transmit Check Digit

British Post

On

* Off

Canadian Post

On

* Off

Kix (Netherlands) Post

Note: Kix code can misread when scanned sideways or upside down. Use Working Orientation, page 3-12, if your Kix codes will not usually be presented upright to the imager.

On

* Off

Australian Post

On

* Off

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.

Note: You may enable the Australian Post Interpretation option if you have firmware with a base number of 31205480. Refer to the Show Software Revision on page 10-2 for information on determining the firmware revision in your unit.

* Bar Output

Numeric N Table

Alphanumeric C Table

Japanese Post

On

* Off

China Post

<Default All China Post Settings>

China Post

On

* Off

China Post Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 80.

Minimum Message Length

Maximum Message Length

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 6-2) for additional information. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 48.

Minimum Message Length

Maximum Message Length

QR Code

Note: QR Code can only be read by a 2D imager.

< Default All QR Code Settings >

QR Code

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

* On

Off

Note: The default applies to firmware with a base number of 31205480. Refer to the Show Software Revision on page 10-2 for information on determining the firmware revision in your unit

QR Code Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-3500. Minimum Default = 1, Maximum Default = 3500.

Minimum Message Length

Maximum Message Length

Data Matrix

Note: Data Matrix can only be read by a 2D imager.

< Default All Data Matrix Settings >

Data Matrix

* On

Off

Data Matrix Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-1500. Minimum Default = 1, Maximum Default = 1500.

Minimum Message Length

Maximum Message Length

MaxiCode

Note: MaxiCode can only be read by a 2D imager.

< Default All MaxiCode Settings >

MaxiCode

* On

Off

MaxiCode Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-150. Minimum Default = 1, Maximum Default = 150.

Minimum Message Length

Maximum Message Length

Aztec Code

Note: Aztec Code can only be read by a 2D imager.

< Default All Aztec Code Settings >

Aztec Code

* On

Off

Aztec Code Message Length

Scan the bar codes below to change the message length. Refer to Message Length Description (page 6-2) for additional information. Minimum and Maximum lengths = 1-3750. Minimum Default = 1, Maximum Default = 3750.

Minimum Message Length

Maximum Message Length

Aztec Runes

Select ***Enable Runes*** if you are scanning Aztec runes, which are the smallest type of Aztec Code symbol with the ability to encode a very short license plate message.

Enable Runes

* Disable Runes

7 Imaging Commands

The imager can be used as a digital camera for capturing, manipulating, and transferring images.

Imaging Commands with their modifiers send imaging commands to the imager on a single-use basis, and take effect for the next subsequent image capture. Once that capture is complete, the imager reverts to its imaging default settings. If you wish to change a default setting, you must use the serial default command (see Imaging Default Commands on page 11-18). When the serial default command is used, that selection becomes the new default setting for the imager.

Image Snap - IMGSNP

An image is taken when the Image Snap (IMGSNP) command is processed. Image Snap is the command processor for image capture, or taking a picture.

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

IMGSNP2G1B

IMGSNP Modifiers

P - Imaging Style: Sets the Image Snap style.

- 0P **Decoding Style**. This is similar to the current format for decoding, however, this processing allows a few frames to be taken until the exposure parameters are met. Then the last frame is available for further use.
- 1P **Photo Style** ***(default)***. This attempts to mimic a simple digital camera, and results in a visually optimized image.
- 2P **Manual Style**. This is an advanced style, and should not normally be used. It allows you the most freedom to set up the imager, 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, notifying the user that the imager can be moved.

E - Exposure: This allows you to set the exposure time. Units are 127 microseconds. Exposure is used in Manual Style only. *(Default = 7874)*

- *n*E Range: 1 - 7874

G - Gain: This modifier boosts the signal and multiplies the pixel value.

1G	No gain *(default)*
2G	Medium gain
4G	Heavy gain
8G	Maximum gain

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. *(Default = 25)*

*n*D	Range: 0 - 255

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 imager is in a stand. LED illumination (1L) is preferred when the imager is hand held. LED State is not available when using Decoding Style.

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

U - Update Tries: The maximum number of frames the imager should take to reach the Delta for Acceptance. Update Tries is only available when using Photo Style. *(Default = 6)*

*n*U	Range: 0 - 10

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. *(Default = 125)*

*n*W	Range: 0 - 255

% - 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, Target White Value should be used. *(Default = 50)*

n%	Range: 1 - 99

Image Ship - IMGSHP

An image is taken when the Image Snap (IMGSNP) command is processed. The last image is always stored in memory. You may “ship” the image by using the IMGSHP command.

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

IMGSHP8F75K26U

IMGSHP Modifiers

A - Infinity Filter: Enhances pictures taken from very long distances (greater than 10 feet or 3 m).

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

C - Compensation: Flattens the image to account for variations in illumination across the image.

0C	Compensation disabled *(default)*
1C	Compensation enabled

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: Causes the transmitted image to be convolved with an edge sharpening filter. Entering a 23E gives the sharpest edges, but also increases noise in the image.

0E	Don't sharpen image *(default)*
14E	Apply edge sharpen for typical image
*n*e	Apply edge sharpen using strength *n* (*n* = 1-24)

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)

H - Histogram Stretch: Increases the contrast of the transmitted image. Not available with some image formats.

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

I - Invert Image: Used to rotate the image around the X or Y axis in fixed mount applications where the imager is mounted upside down.

1IX	Invert around the X axis (flips picture upside down)
1IY	Invert around the Y axis (flips picture left to right)

IF- Noise Reduction: Used to reduce the salt and pepper noise.

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

Note: You may enable the Salt and Pepper Noise Reduction option if you have firmware with a base number of 31205122-064 or greater. Refer to the *Show Software Revision on page 10-2* *for information on determining the firmware revision in your unit.*

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

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

*n*J	Image is compressed as much as possible while preserving quality factor of *n* (*n* = 0 - 100)
0J	worst quality (smallest file)
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. A setting of 100 results in no adjustment to the image. The optimal setting for text images is 50K.

0K	Gamma correction off *(default)*
50K	Apply gamma correction for brightening typical document image
*n*K	Apply gamma correction factor *n* (*n* = 1-255)

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 640, and device rows are numbered 0 through 480.

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

*n*R The right edge of the shipped image corresponds to column *n* - 1 of the image in memory. Range: 000 - 640. *(Default = all columns, or 639 for VGA imager)*

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

*n*B The bottom edge of the shipped image corresponds to row *n* - 1 of the image in memory. Range: 000 - 480. *(Default = all rows, or 479 for VGA imager)*

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

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

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

0P None (raw data)

2P None *(default for USB)*

3P Hmodem compressed

4P Hmodem

S - Pixel Ship: Can be used to decimate 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 *(default)*

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

U - Document Image Filter: Sharpens the edges and smooths the area between the edges of the transmitted text image. The Document Image Filter enhances images of documents such as ID cards and prescriptions. This filter should be used with gamma correction (see page 7-4), with the imager in a stand, and the image captured using the command:

IMGSNP1P0L168W90%32D

This filter typically provides better JPEG compression than the standard E - Edge Sharpen command (see page 7-6). This filter also works well when shipping pure black and white images (1 bit per pixel). The optimal setting is 26U.

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

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

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

0W	Don't ship histogram *(default)*
1W	Ship histogram

Image Size Compatibility

If you prefer that an image ship returns images at the sensor's native resolution (752x480 pixels for the 5X00 engine, 640x480 pixels for the 4X00 engine), scan the Native Resolution code. If you have an 4X00 image engine and have designed applications that expect an image ship to return exactly 640x480 pixels, scan the Force VGA Resolution bar code. Refer to *"Show Engine Revision"* on page 10-1 for information on determining the engine in your unit.
Default = Force VGA Resolution

* Force VGA Resolution

Native Resolution

Intelligent Signature Capture - IMGBOX

Note: IMGBOX commands can only be used with PDF417, Code 39, Code 128, Aztec, Codabar, and Interleaved 2 of 5 symbologies.

Intelligent signature capture ships only part of an image to the host application. This method reduces transfer time and file size, while simplifying signature capture.

Below is an example of an intelligent signature capture application. In this example, the operator reads the bar code, which is then transmitted to the host application. Upon the receipt of the bar code data, the host application sends the IMGBOX command, which tells the imager to output only the area of the image corresponding to the signature capture box. The imager also automatically adjusts for aspect ratio and distortion, issues that arise due to imager skew with respect to the bar code.

Align the aimers with the signature area (not with the bar code). Send the IMGBOX command string after you hear the good read beep.

An important aspect of intelligent signature capture is that all dimensions used in the application are measured as multiples of the minimum element size of the bar code. Using this method, intelligent signature capture always outputs the correct image size and resolution, no matter the distance at which the imager is held from the bar code, assuming that the entire signature capture area is within the imager's field of view.

The intelligent signature capture command string for this application is:

IMGBOX40S0X70Y190W100H1R0F

IMGBOX Modifiers

A - Output Image Width: This option is used to output an image of a particular width. If using this option, set the resolution to zero.

B - Output Image Height This option is used to output an image of a particular height. If using this option, set the resolution to zero.

D - Pixel Depth: Indicates the number of bits per pixel in the transmitted image.

8D	8 bits per pixel, grayscale image
1D	1 bit per pixel, black and white image

F - File Format: Indicates the type of file format in which to save the image.

0F	KIM format *(default)*
1F	TIFF binary
2F	TIFF binary group 4, compressed
3F	TIFF grayscale
4F	Uncompressed Binary
5F	Uncompressed grayscale
6F	JPEG image
7F	Outlined image
8F	BMP format

H - Height of Signature Capture Area: In the example, the height of the area to be captured is 1 inch, resulting in a value of H = 1/0.01 = 100. The value for H is slightly larger, to accommodate some extra image capture area outside of the signature capture box.

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. A setting of 100 results in no adjustment to the image. *(Default = 50K)*

0K	Gamma correction off
50K	Apply gamma correction for brightening typical document image
*n*K	Apply gamma correction factor *n* (*n* = 1-255)

R - Resolution of Signature Capture Area: The number of pixels that the imager 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. To specify a non-integer value for the resolution, use a number greater than or equal to 1000. For example, use 2500 to specify a resolution of 2.500. The imager automatically inserts a decimal point between the first and second digit. Set to zero when using the A and B modifiers.

S - Bar Code Aspect Ratio: 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: In the example, the width of the area to be captured is 1.90 inches, resulting in a value of W = 1.9/0.01 = 190. The value for W is slightly larger, to accommodate some extra image capture area outside of the signature capture box.

X - Horizontal Bar Code Offset: The horizontal ratio offset of the center of the signature capture area, in multiples of the minimum bar width. In the example, the horizontal offset is 0.

Y - Vertical Bar Code Offset: The vertical offset of the center of the signature capture area, in multiples of the minimum bar width. Negative numbers indicate that the signature capture is above the bar code, and positive numbers indicate that the area is below the bar code. In the example, the horizontal offset is 0.70 inches, resulting in a value for Y = 0.7/0.01 = 70.

8 OCR Programming

Use this section to program the Imager for optical character recognition (OCR). The 2D imager reads 6 to 60 point OCR typeface.

Note: OCR is not as secure as bar codes. To enhance security in OCR applications, create an OCR template to match the data, and print an OCR check character.

The 2D imager will read OCR-A, OCR-B, U.S. Currency Serial Number (Money), MICR E-13B, and SEMI Font.

You can either select an OCR default, or create your own custom template for the type of OCR format you intend to read. See "OCR" on page 8-1 for programming codes that will enable your imager to read OCR-A, OCR-B, U.S. Currency, MICR E 13 B, or SEMI fonts. See "OCR Templates" on page 8-3 if you want to create a custom "template," or character string that defines the length and content of OCR strings that will be read with your imager.

Note: Setting the template and check character options are essential for OCR reading.

OCR Fonts

Default All OCR Settings turns off all OCR capability in the imager, so the imager will be able to scan linear, stacked, matrix, and composite bar codes, but not OCR fonts. In addition, any OCR templates you have created are erased. The eight digit default templates are reinstated for any future use of the ***OCR On*** codes listed below.

< Default All OCR Settings >

OCR

Note: OCR symbols can misread when scanned sideways or upside down. Use Working Orientation, page 3-12, if your OCR symbols will not usually be presented upright to the imager.

Only one OCR symbology can be read at a time.

OCR-A On allows you to scan characters in the OCR-A font. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see Creating an OCR Template, page 8-3).

OCR-A On

OCR-B On allows you to scan characters in the OCR-B font. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see Creating an OCR Template, page 8-3).

OCR-B On

U.S. Currency Font

U.S. Currency On allows you to scan characters in the font used on U.S. currency. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see Creating an OCR Template, page 8-3).

U.S. Currency On

MICR E13 B Font

MICR E13 B On allows you to scan MICR characters on a bank check. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see Creating an OCR Template, page 8-3).

MICR E 13 B On

Note: TOAD characters (Transit, On Us, Amount and Dash) are output in the following manner:

the transit character is output as **T**

the amount character is output as **A**

the on us character is output as **O**

the dash character is output as **D**

SEMI Font

SEMI Font On allows you to scan the SEMI font used in the semiconductor industry.

SEMI Font On

All OCR Off turns off all OCR capability in the imager, so the imager will be able to scan linear, stacked, matrix, and composite bar codes, but not OCR fonts. However, any OCR templates you have created will be retained in memory.

* All OCR Off

OCR Templates

You can create a custom "template," or character string that defines the length and content of OCR strings that will be read with your imager. There are several choices when creating a custom template for your application. You can create a template for a single format, you can string together several formats, and you can create a template for a user-defined variable. These choices are described in detail below.

Creating an OCR Template

A single template allows you to program the imager to read any combination of characters in the order you specify. Refer to examples that follow the Template Characters table below.

Template Characters

a	represents any alphanumeric character (digit or letter)
c	represents that a check character is verified but not transmitted
d	represents any digit
e	represents any available OCR character
g	represents character from user-defined variable “g”
h	represents character from user-defined variable “h”
i	represents character from user-defined variable “g” or “h”
k	represents that a check character is verified but transmitted
l	represents any uppercase letter
t	marks the start of a new template
r	multi row indicator
All other characters represent themselves. Spaces can be used. Note: In MICR E13 B templates, TOAD characters (capital letters T, O, A, and D), represent Transit, On Us, Amount, and Dash.	

Note: OCR templates default to eight digits, no check character.

To Add an OCR Template

1. Turn on the OCR font you want to read (page 8-1).
2. Begin building the template.
   Scan the ***Enter OCR Template*** symbol (page 8-13).
3. Scan the characters for the string.
   Use the Template Characters chart above to determine what characters you need to create your format. Use the OCR Programming Chart (after the Sample Codes in the back of this manual) to scan the characters for your template.

Example: You need to read any combination of eight digits. The template would be:

dddddddd

To create this template, you would enable the OCR-A font. Scan the ***Enter OCR Template*** symbol (page 8-13), then scan the ***d*** from the OCR Programming Chart in the back of this manual eight times. Scan ***Save OCR Template*** (page 8-13). This would let you read any string of eight digits, for example:

37680981

Character Match Sequences

On the ASCII Conversion Chart (Code Page 1252), page A-4, find the Hex value that represents the character(s) you want to match. Use the Programming Chart (inside the back cover) to scan the numbers that represent these characters.

Example: You need to read three digits, three specific characters (ABC), three digits. The template would be:

$$\text{ddd}\underbrace{414243}_{\substack{\text{hex codes for}\\ \text{letters A, B, and C}}}\text{ddd}$$

To create this template, you would enable the OCR-A font. Scan the ***Enter OCR Template*** symbol (page 8-13). Scan the ***d*** from the OCR Programming Chart in the back of this manual three times. Then scan ***414243*** from the inside back cover (the hex characters for “A,” “B,” and “C”), and scan the ***d*** three more times. Scan ***Save OCR Template,*** page 8-13. This would let you read any string of three digits, “ABC,” then any string of three digits, for example:

551ABC983

Adding Spaces

You may also need to put spaces in your template.

Example: You need to read three digits, space, three specific characters (ABC), space, three digits. The template would be:

ddd2041424320ddd

hex code for a space

To create this template, you would enable the OCR-A font. Scan the ***Enter OCR Template*** symbol (page 8-13). Scan the ***d*** from the OCR Programming Chart in the back of this manual three times, then scan ***2041424320*** from the Programming Chart on the inside back cover (the hex characters for “space,” “A,” “B,” “C,” “space”). Scan the ***d*** three more times, then scan ***Save OCR Template*** (page 8-13). This would let you read any string of three digits, space, “ABC,” space, then any string of three digits. For example:

551 ABC 983

*Note: If using Quick*View to program, use the space bar to designate a space and not the hex value of 20.*

4. Exit OCR Template Editor
   Scan ***Save OCR Template*** to save your entries. ***Discard OCR Template*** exits without saving any OCR Template changes.

Stringing Together Multiple Formats (Creating "Or" Statements)

You may want to program the imager to accept many OCR formats. To do this, you would string together each format with a "t." This tells the imager to read optical characters that match any one of the formats in the template.

Example: You need to read any combination of eight digits, *or* a combination of four digits, two uppercase letters, and two digits. The template would be:

ddddddddtddddlldd

To create this template, you would enable the OCR-A font. Scan the ***Enter OCR Template*** symbol (page 8-13). Scan the ***d*** from the OCR Programming Chart in the back of this manual eight times, then scan the ***t*** to create the "or" statement. Then you would scan the characters for the second template. Scan ***d*** four times, scan ***l*** two times, then scan ***d*** two more times. Scan ***Save OCR Template*** (page 8-13). This would let you read either type of format, for example:

99028650

or

9902XZ50

You can string together as many templates as you need.

OCR User-Defined Variables

You can create up to two of your own user variables for an OCR template. These variables will represent any OCR readable characters. The user-defined variables are stored under the letters "g" and "h." Creating a user variable follows the same steps as creating a template, but instead of scanning the ***Enter OCR Template*** symbol, you scan the ***Enter User-Defined Variable*** symbol (page 8-13). The letters g and h can then be used in an OCR template to define the variable you specified.

Example: You need a variable to represent the letters "A," "B," or "C." The template for this variable would be:

414243

To create this template, you would enable the OCR-A font. Scan the ***Enter User-Defined Variable g*** symbol (page 8-13). Scan ***414243*** from the Programming Chart (the hex characters for "A," "B," and "C"). Scan ***Save OCR Template*** (page 8-13). This will let you read either A or B or C in any position where you place the g. For example, you could create the following template:

ddddddggg

This template would then let you read data that began with six digits, and had an A, B, or C trailing. So you would be able to read:

654321ABC

or

654321BAC

or

654321CCC

Reading Multi-Row OCR

The imager is capable of decoding multi-row OCR text.

Note: Reading rows longer than sixteen characters is not recommended.

Consider the following example. This example shows serial commands as they would be entered using Quick*View.

Example: You need to read multiple rows of OCR-A data as shown below:

12345678

ABCDEFGH

First, enable the OCR-A font. To read the first row of OCR data, you would program the following template:

OCRTMP"dddddddd".

This template is the default OCR template. If you wanted to read the second line of data, you would use the following template:

OCRTMP"llllllll".

To read both lines of OCR at one time, use the variable ***r*** to indicate the start of a new row. All the other templating variables for the individual rows work the same as previously described. For instance, in the above example, you would use the following template to read both rows:

OCRTMP"ddddddddrllllllll".

To read the three rows below, you would use the template command "OCRTMP"ddddddddrllllllllrlllldddd".

12345678

ABCDEFGH

ABCD1234.

OCR Check Character

You may want to print and verify a check character in order to enhance the security of your OCR application. The imager can be programmed for almost any type of check character. A number of presets are provided for common check character uses (e.g., modulo 10 and modulo 36).

Scan the ***OCR Modulo 10*** or ***OCR Modulo 36 Check Character*** bar code to specify the type of check character used in the OCR strings you're scanning. The imager will then only read OCR character strings with a valid check character. The imager transmits the OCR data without the check character data. You must specify the location of the check character in the template with a ***c***.

Example: You need to read any combination of seven digits, with a modulo 10 check character in the eighth position. The template would be:

ddddddddc

To create this template, you would enable the OCR-A font. Scan the ***Modulo 10 Check Character*** symbol. Then scan the ***Enter OCR Template*** symbol, and scan the ***d*** from the OCR Programming Chart seven times, and scan the ***c*** once. Scan ***Save OCR Template*** (page 8-13). This template will let you read any combination of six digits with a correct check character after. (If the check character is invalid, the data is discarded.) For example, the following string could be scanned:

01234569

and the output would be: 0123456

OCR Modulo 10 Check Character

Scan this symbol to program the OCR template for a simple modulo 10 checksum of the digits 0 through 9.

OCR Modulo 10 Check Character

OCR Modulo 36 Check Character

Scan this symbol to program the OCR template for a simple modulo 36 checksum of the digits 0 through 9 and the letters A through Z.

OCR Modulo 36 Check Character

OCR User-Defined Check Character

You can customize the check character calculation to suit your application. Each character of the check character alphabet can be programmed in its proper order. The number of characters you enter determines the modulo value for the calculation. By default, the check character computation is unweighted, but the imager also supports two weighted modulo 10 checking schemes.

Example: To program a modulo 11 check character, you would enter the following 11 characters in order:

0123456789X

Also enter the OCR template:

ddddddddc

Enable the OCR-A font, then scan the following string:

6512351X

The imager performs the following check character computation:

(6 + 5 + 1 + 2 +3 + 5 + 1 + X) modulo 11 = 0

Since the result is zero, the message is considered to be valid, so the reader outputs the message: 6512351

Programming a User-Defined Check Character

1. Scan the **Enter OCR Check Character** bar code, below.

Enter OCR Check Character

2. Enter the characters in order. For each character, look up the corresponding hex value from the ASCII Conversion Chart (Code Page 1252), page A-4. Use the Programming Chart on the inside the back cover of this manual to scan the two symbols for each hex value.
3. Scan the **Save** bar code on the inside back cover.

Example: To program the modulo 11 check character from example #8 on page 8-9, enable the OCR-A font. Scan the **Enter OCR Check Character** bar code on page 8-9, then scan the following hex values in order:

303132333435363738395 8

After you enter all the desired hex values, scan the **Save** bar code on the inside back cover of this manual.

Weighting Options

By default, the check character computation is unweighted. It is possible to use one of two weighted modulo 10 schemes. Weighting is often used to detect if two neighboring characters are transposed, a common error when an operator keys in data.

3-1-3-1 Weighted Modulo 10 Check Character

Starting with the check character and working backward through the message, the imager applies a multiplier of 1, then 3, then 1, then 3, and so on. This is the checking scheme used in many EAN•UCC symbologies, including U.P.C. and Interleaved 2 of 5 (when a check digit is invoked). To apply this weighting scheme, set the OCR check character to **"0123456789x3x1"** or scan the following symbol:

3-1-3-1 Weighted Modulo 10
Check Character

Example: Scan the 3-1-3-1 Weighted Modulo 10 Check Character symbol. Also enter the OCR template:

dddddddc

Then scan the string below:

01234565

The reader performs the check character computation below:

(0 x 3 + 1 x 1 + 2 x 3 + 3 x 1 + 4 x 3 + 5 x 1 + 6 x 3 + 5 x 1) modulo 10 = 0

Since the result is zero, the message is considered to be valid, so the reader outputs the message: 0123456

2-1-2-1 Weighted Modulo 10 Check Character

Starting with the check character and working backward through the message, the imager applies a multiplier of 1, then 2, then 1, then 2, and so on. When the result of the multiplication is greater than 9, add both digits to the running sum. This is often referred to as the LUHN formula. One common application of the

LUHN formula is validate credit card numbers. This is the modulo 10 checking scheme used in MSI Code and in Code 32 Pharmaceutical (PARAF). To apply this weighting scheme, set the OCR check character to **"0123456789x2x1"** or scan the following symbol:

2-1-2-1 Weighted Modulo 10
Check Character

Example: Scan the 2-1-2-1 Weighted Modulo 10 Check Character symbol. Also enter the OCR template:

dddddddc

Then scan the string below:

0128454

The reader performs the check character computation below:

$$(0 \underline{x} 1 + 1 \underline{x} 2 + 2 \underline{x} 1 + 8 \underline{x} 2 + 4 \underline{x} 1 + 5 \underline{x} 2 + 4 \underline{x} 1) \text{ modulo } 10$$

$$= (0 + 2 + 2 + (1 + 6) + 4 + (1 + 0) + 4) \text{ modulo } 10$$

$$= 0$$

Since the result is zero, the message is considered to be valid, so the reader outputs the message: 012845

OCR ISBN Application Example

One application of OCR is to read the ISBN characters typically encoded using the OCR-A or OCR-B font. This is especially useful when the ISBN number is not encoded in an EAN-13 bar code. The following example shows how to configure the imager to read the ISBN strings on books in Japan. After you have followed the steps below, you will be able to scan the following ISBN number or the additional data below it, depending on the line of text at which the imager is aimed.

ISBN4-594-03019-X

C0097 ¥838E

1. Scan the OCR-B On bar code on page 8-2.

2. Program the user-defined variable “g” to comprise the ten digits plus the dash:

0123456789-

3. In Japan, it is common for two fields to follow the ISBN number, the three digit price field, and the four digit price field. The first field typically starts with a “C” (uppercase c), followed by four digits. The second field typically starts with a “P” or a yen symbol, followed by three or four digits, followed by an “E.” Program the user-defined variable “h” to comprise the “P” and the yen symbol (represented by a backslash).

P\

4. Scan the symbol below to set up three templates to handle the ISBN number, the three digit price field, and the four digit price field.

5. Finally, set up the ISBN check digit, which is a special position-weighted modulo 11 checksum. The imager automatically invokes the ISBN checksum for template rows that are:
   1.) at least fourteen characters long,
   2.) whose first four characters are the letters “ISBN,”
   3.) whose last character is a check character, and
   4.) when the modulo 11 check character “0123456789X” is programmed.

Note that all these commands can be combined into a single serial programming command:

OCRENA2,TMP”ISBNgggggggggggctCdddd hdddEtCdddd hddddE”,GPG”0123456789-”,GPH”P\”,CHK”0123456789X”.

These commands can be encoded into the following Aztec Code symbol:

OCR Template Codes

Note: Reading more than three rows of OCR is not recommended. Contact the factory if you have an application that requires reading four or more rows of OCR.

Enter OCR Template †

Enter User-Defined Variable “g”†

Enter User-Defined Variable “h”†

† One or more two-digit numbers and ***Save*** are required after reading this programming symbol. Refer to the Programming Chart on the inside the back cover of this manual.

Exit Selections

Save OCR Template

Discard OCR Template

9 Interface Keys

Keyboard Function Relationships

The following Keyboard Function Code, Hex/ASCII Value, and Full ASCII "CTRL"+ relationships apply to all terminals that can be used with the imager. Refer to page 2-7 enable Control + ASCII mode.

Function Code	HEX/ASCII Value	Full ASCII "CTRL" +
NUL	00	2
SOH	01	A
STX	02	B
ETX	03	C
EOT	04	D
ENQ	05	E
ACK	06	F
BEL	07	G
BS	08	H
HT	09	I
LF	0A	J
VT	0B	K
FF	0C	L
CR	0D	M
SO	0E	N
SI	0F	O
DLE	10	P
DC1	11	Q
DC2	12	R
DC3	13	S
DC4	14	T
NAK	15	U
SYN	16	V
ETB	17	W
CAN	18	X
EM	19	Y
SUB	1A	Z
ESC	1B	[
FS	1C	\
GS	1D	]
RS	1E	6
US	1F	-

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

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

Supported Interface Keys

ASCII	HEX	IBM AT/XT and PS/2 Compatibles, WYSE PC/AT Supported Keys	IBM XTs and Compatibles Supported Keys	IBM, DDC, Memorex Telex, Harris* Supported Keys
NUL	00	Reserved	Reserved	Reserved
SOH	01	Enter (KP)	CR/Enter	Enter
STX	02	Cap Lock	Caps Lock	F11
ETX	03	ALT make	Reserved	F12
EOT	04	ALT break	Reserved	F13
ENQ	05	CTRL make	Reserved	F14
ACK	06	CTRL break	Reserved	F15
BEL	07	CR/Enter	CR/Enter	New Line
BS	08	Reserved	Reserved	F16
HT	09	Tab	Tab	F17
LF	0A	Reserved	Reserved	F18
VT	0B	Tab	Tab	Tab/Field Forward
FF	0C	Delete	Delete	Delete
CR	0D	CR/Enter	CR/Enter	Field Exit/New Line
SO	0E	Insert	Insert	Insert
SI	0F	Escape	Escape	F19
DLE	10	F11	Reserved	Error Reset
DC1	11	Home	Home	Home
DC2	12	Print	Print	F20
DC3	13	Back Space	Back Space	Back Space
DC4	14	Back Tab	Back Tab	Backfield/Back Tab
NAK	15	F12	Reserved	F21
SYN	16	F1	F1	F1
ETB	17	F2	F2	F2
CAN	18	F3	F3	F3
EM	19	F4	F4	F4
SUB	1A	F5	F5	F5
ESC	1B	F6	F6	F6
FS	1C	F7	F7	F7
GS	1D	F8	F8	F8
RS	1E	F9	F9	F9
US	1F	F10	F10	F10

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

Supported Interface Keys

ASCII	HEX	IBM, Memorex Telex (102)* Supported Keys	Memorex Telex (88)** Supported Keys
NUL	00	Reserved	Reserved
SOH	01	Enter	Enter
STX	02	F11	PF10
ETX	03	F12	PF11
EOT	04	F13	PF12
ENQ	05	F14	Reserved
ACK	06	F15	Reserved
BEL	07	New Line	New Line
BS	08	F16	Field Forward
HT	09	F17	Field Forward
LF	0A	F18	Reserved
VT	0B	Tab/Field Forward	Field Forward
FF	0C	Delete	Delete
CR	0D	Field Exit	New Line
SO	0E	Insert	Insert
SI	0F	Clear	Erase
DLE	10	Error Reset	Error Reset
DC1	11	Home	Reserved
DC2	12	Print	Print
DC3	13	Back Space	Back Space
DC4	14	Back Tab	Back Field
NAK	15	F19	Reserved
SYN	16	F1	PF1
ETB	17	F2	PF2
CAN	18	F3	PF3
EM	19	F4	PF4
SUB	1A	F5	PF5
ESC	1B	F6	PF6
FS	1C	F7	PF7
GS	1D	F8	PF8
RS	1E	F9	PF9
US	1F	F10	Home

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

Supported Interface Keys

ASCII	HEX	Esprit 200, 400 ANSI Supported Keys	Esprit 200, 400 ASCII Supported Keys	Esprit 200, 400 PC Supported Keys
NUL	00	Reserved	Reserved	Reserved
SOH	01	New Line	New Line	New Line
STX	02	N/A	N/A	N/A
ETX	03	N/A	N/A	N/A
EOT	04	N/A	N/A	N/A
ENQ	05	N/A	N/A	N/A
ACK	06	N/A	N/A	N/A
BEL	07	New Line	New Line	New Line
BS	08	N/A	N/A	N/A
HT	09	Tab	Tab	Tab
LF	0A	N/A	N/A	N/A
VT	0B	Tab	Tab	Tab
FF	0C	N/A	N/A	Delete
CR	0D	New Line	New Line	New Line
SO	0E	N/A	N/A	Insert
SI	0F	Escape	Escape	Escape
DLE	10	F11	F11	F11
DC1	11	Insert	Insert	Home
DC2	12	F13	F13	Print
DC3	13	Back Space	Back Space	Back Space
DC4	14	Back Tab	Back Tab	Back Tab
NAK	15	F12	F12	F12
SYN	16	F1	F1	F1
ETB	17	F2	F2	F2
CAN	18	F3	F3	F3
EM	19	F4	F4	F4
SUB	1A	F5	F5	F5
ESC	1B	F6	F6	F6
FS	1C	F7	F7	F7
GS	1D	F8	F8	F8
RS	1E	F9	F9	F9
US	1F	F10	F10	F10

Supported Interface Keys

ASCII	HEX	Apple Mac/iMac Supported Keys
NUL	00	Reserved
SOH	01	Enter/Numpad Enter
STX	02	CAPS
ETX	03	ALT make
EOT	04	ALT break
ENQ	05	CNTRL make
ACK	06	CNTRL break
BEL	07	RETURN
BS	08	APPLE make
HT	09	TAB
LF	0A	APPLE break
VT	0B	TAB
FF	0C	Del
CR	0D	RETURN
SO	0E	Ins Help
SI	0F	ESC
DLE	10	F11
DC1	11	Home
DC2	12	Prnt Scrn
DC3	13	BACKSPACE
DC4	14	LSHIFT TAB
NAK	15	F12
SYN	16	F1
ETB	17	F2
CAN	18	F3
EM	19	F4
SUB	1A	F5
ESC	1B	F6
FS	1C	F7
GS	1D	F8
RS	1E	F9
US	1F	F10
DEL	7F	BACKSPACE

10 Utilities

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

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

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

Show Decoder Revision

Scan the bar code below to output the decoder revision.

Note: You may use the Show Decoder Revision option if you have firmware with a base number of 31205480. Refer to Show Software Revision on page 10-2 for information on determining the firmware revision in your unit.

Show Decoder Revision

Show Engine Revision

Note: You may use the Show Engine Revision option if you have firmware with a base number of 31205480.

Scan the bar code below to output the engine revision. If your imager has an 4X00 engine, it will return an [ACK] with no data in the string. If your imager has an 5X00 engine, it will return the engine type, revision number, and status character [ACK]. For example, an imager with an 5100, version 26 would return:

```
ENGREVType:  1  Revision: 26[ACK]
```

Show Engine Revision

Show Scan Driver Revision

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

You may use the Show Scan Driver Revision option if you have firmware with a base number of 31205480. Refer to the Show Software Revision below for information on determining the firmware revision in your unit.

Show Scan Driver Revision

Show Software Revision

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

Show Software Revision

Show Data Format

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

Data Format Settings

Resetting the Standard Product Defaults

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

Standard Product Default Settings

The Menu Commands starting on page 11-4 lists the standard product default settings for each of the commands (indicated by an asterisk (*) on the programming pages).

Test Menu

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

On

* Off

2D PQA (Print Quality Assessment)

Two-dimensional Print Quality Assessment (2D PQA) is a feature of Honeywell image readers where the data from the successful read of a 2D bar code symbol is augmented with lines of text that both identify the symbol, and also report graded measurement parameters obtained from it.

2D PQA Reporting

Honeywell 2D PQA reporting can be enabled in two different modes: Full Report or Screening. (To see displayed results, Microsoft® Notepad or a word processor/editing program is recommended.)

If you are using Visual Xpress, you can enable Full Report, a listing of all of a symbol's identifying information, measurements, and corresponding grades, by typing the following menu command:

```
2D_PQA1
```

or by scanning the following bar code:

Full Report

Note: The PQA report is sent out as a second data/beep sequence after the bar code data. The report has its own Honeywell code ID of >(0X3E) so it can be uniquely identified.

You can exit Full Report mode by either typing the menu command, 2D_PQA0, if you are using Visual Xpress, or by scanning the following bar code:

Exit

Note: For additional information on interpreting your read results, refer to Honeywell Quick Check 2D Print Assessment User's Guide.

Visual Xpress™ Introduction

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

To communicate with an imager, Visual Xpress requires that the PC have a serial port emulation using a physical USB port.

Visual Xpress Operations

The Visual Xpress 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 imager and receive imager 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 imager. The imager's programming and configuration data is grouped into different categories. Each category is displayed as a tree item under the "Configure" tree node in the application explorer. When one of these tree nodes is clicked, the right-hand side is loaded with the parameters' form belonging to that particular category. The "Configure" tree option has all the programming and configuration parameters specified for an imager. You can set or modify these parameters as required. You can later write the modified settings to the imager, or save them to a dcf file.

Imaging

Imaging provides all the image-related functions that a 2D Imager 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 imager 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 imager.

Installing Visual Xpress from the Web

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

1. Access the Honeywell web site at www.honeywellaidc.com.
2. Click on **Downloads**.
3. Click on **Software**.
4. Select your model number from the list of product numbers.
5. Click on the entry for **Visual Xpress**.
6. When prompted, select **Save File**, and save the files to the **c:\windows\temp** directory.
7. Once you have finished downloading the file, exit the web site.
8. Using Explorer, go to the **c:\windows\temp** file and unzip the file you saved.
9. Double click on **Setup.exe** and follow the screen prompts to install the Visual Xpress program.
10. If you've selected the defaults during installation, you can click on **Start Menu-Programs**-**Honeywell-Visual Xpress**.

Temporary USB Com Port Configuration

For a quick download communication configuration, scan the Visual Xpress bar code and the imager will be temporarily configured for USB Com Port Emulation.

USB Com Port Emulation
(temporary)

11 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 your imager. 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 USB Com Port Emulation interface (see page 1-5). The following commands can be sent via a PC COM port using terminal emulation software.

Conventions

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

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

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

{Data} Alternatives in a command.

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

Menu Command Syntax

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

Prefix Tag SubTag {Data} [, SubTag {Data}] [; Tag SubTag {Data}] […] Storage

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

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

SubTag A 3 character case-insensitive field that identifies the desired menu command within the tag group. For example, the SubTag for the Beeper Volume is **LVL**.

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

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

Query Commands

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

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

? What is the device's current value for the setting(s).

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

Tag Field Usage

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

SubTag Field Usage

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

Data Field Usage

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

Concatenation of Multiple Commands

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

Responses

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

ACK Indicates a good command which has been processed.

ENQ Indicates an invalid Tag or SubTag command.

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

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

Examples of Query Commands

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

Example #1: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 #2: 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 #3: 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 #4: What are the device's settings for all Codabar selections?

Enter: **cbr?.**

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

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

Resetting the Standard Product Defaults

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

Standard Product Default Settings

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

Menu Commands

Note: Not all menu commands apply to all imager models.

Selection	**Setting** **** Indicates default***	**Serial Command** ***# Indicates a numeric entry***	**Page**
Factory Default Settings	Default	DEFALT	11-4
Terminal Interfaces			
Terminal ID	*130	TERMID###	2-1
Output Selections			
Beeper - Good Read	Off	BEPBEP0	3-1
	*On	BEPBEP1	3-1
Beeper Volume - Good Read	Off	BEPLVL0	3-1
	Low	BEPLVL1	3-1
	Medium	BEPLVL2	3-1
	*High	BEPLVL3	3-1
Beeper Pitch - Good Read (Frequency)	Low (1600) (min 400Hz)	BEPFQ11600	3-2
	*Medium (3250)	BEPFQ13250	3-2
	High (4200) (max 9000Hz)	BEPFQ14200	3-2
Beeper Duration - Good Read	*Normal Beep	BEPBIP0	3-2
	Short Beep	BEPBIP1	3-2

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
Number of Beeps - Good Read	*1	BEPRPT1	3-2
	Range 1 - 9	BEPRPT#	3-2
Good Read Delay	*No Delay	DLYGRD0	3-3
	Short Delay (500 ms)	DLYGRD500	3-3
	Medium Delay (1000 ms)	DLYGRD1000	3-3
	Long Delay (1500 ms)	DLYGRD1500	3-3
User-Specified Good Read Delay	Range 0 - 30,000 ms	DLYGRD#####	3-3
Reread Delay	Short (500 ms)	DLYRRD500	3-4
	*Medium (750 ms)	DLYRR750	3-4
	Long (1000 ms)	DLYRRD1000	3-4
	Extra Long (2000 ms)	DLYRRD2000	3-4
User-Specified Reread Delay	Range 0 - 30,000 ms	DLYRRD#####	3-4
LED Power Level	Off	PWRLDC0	3-5
	Low (50%)	PWRLDC50	3-5
	*High (100%)	PWRLDC100	3-5
Centering Window	Centering On	DECWIN1	3-6
	*Centering Off	DECWIN0	3-6
	Left of Centering Window (*40%)	DECLFT	3-6
	Right of Centering Window (*60%)	DECRGT	3-6
	Top of Centering Window (*40%)	DECTOP	3-6
	Bottom of Centering Window (*60%)	DECBOT	3-6
Decode Search Mode	*Full Omnidirectional (Default for 2D imagers)	DECMOD0	3-7
	Quick Omnidirectional	DECMOD1	3-7
	Advanced Linear Decoding (Default for PDF imagers)	DECMOD2	3-7

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
Output Sequence Editor	Enter Sequence	SEQBLK	3-10
	Default Sequence	SEQDFT	3-10
Require Output Sequence	Required	SEQ_EN2	3-11
	On/Not Required	SEQ_EN1	3-11
	*Off	SEQ_EN0	3-11
Print Weight	Set Print Weight (1-7)	PRTWGT	3-11
	*Default (4)	PRTWGT4	3-11
Video Reverse	On	VIDREV1	3-12
	*Off	VIDREV0	3-12
Working Orientation	*Upright	ROTATN0	3-13
	Rotate Code Clockwise 90°	ROTATN1	3-13
	Upside Down	ROTATN2	3-13
	Rotate Code Counterclockwise 90°	ROTATN3	3-13
Prefix/Suffix Selections			
Add CR Suffix to All Symbologies		VSUFCR	4-3
Prefix	Add Prefix	PREBK2##	4-4
	Clear One Prefix	PRECL2	4-4
	Clear All Prefixes	PRECA2	4-4
Suffix	Add Suffix	SUFBK2##	4-4
	Clear One Suffix	SUFCL2	4-4
	Clear All Suffixes	SUFCA2	4-4
Function Code Transmit	*Enable	RMVFNC0	4-4
	Disable	RMVFNC1	4-4
Intercharacter Delay	Range 0 - 495 ms	DLYCHR##	4-5
User Specified Intercharacter Delay	Delay Length (0 - 495 ms)	DLYCRX##	4-6
	Character to Trigger Delay	DLY_XX###	4-6
Interfunction Delay	Range 0 - 495 ms	DLYFNC##	4-6
Intermessage Delay	Range 0 - 495 ms	DLYMSG##	4-7

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
Data Formatter Selections			
Data Format Editor	*Default Data Format (None)	DFMDF3	5-4
	Enter Data Format	DFMBK3##	5-4
	Clear One Data Format	DFMCL3	5-4
	Clear All Data Formats	DFMCA3	5-4
Data Formatter	Off	DFM_EN0	5-5
	*On, but Not Required	DFM_EN1	5-5
	On, Required	DFM_EN2	5-5
Alternate Data Formats	1	VSAF_1	5-5
	2	VSAF_2	5-5
	3	VSAF_3	5-5
Symbologies			
All Symbologies	All Symbologies Off	ALLENA0	6-2
	All Symbologies On	ALLENA1	6-2
Codabar	Default All Codabar Settings	CBRDFT	6-3
Codabar	Off	CBRENA0	6-3
	*On	CBRENA1	6-3
Codabar Start/Stop Char.	*Don't Transmit	CBRSSX0	6-3
	Transmit	CBRSSX1	6-3
Codabar Check Char.	*No Check Char.	CBRCK20	6-4
	Validate, But Don't Transmit	CBRCK21	6-4
	Validate, and Transmit	CBRCK22	6-4
Codabar Concatenation	*Off	CBRCCT0	6-4
	On	CBRCCT1	6-4
	Require	CBRCCT2	6-4
Codabar Message Length	Minimum (2 - 60) *4	CBRMIN##	6-5
	Maximum (2 - 60) *60	CBRMAX##	6-5

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
Code 39	Default All Code 39 Settings	C39DFT	6-5
Code 39	Off	C39ENA0	6-5
	*On	C39ENA1	6-5
Code 39 Start/Stop Char.	*Don’t Transmit	C39SSX0	6-5
	Transmit	C39SSX1	6-5
Code 39 Check Char.	*No Check Char.	C39CK20	6-6
	Validate, But Don’t Transmit	C39CK21	6-6
	Validate, and Transmit	C39CK22	6-6
Code 39 Message Length	Minimum (0 - 48) *0	C39MIN##	6-6
	Maximum (0 - 48) *48	C39MAX##	6-6
Code 39 Append	*Off	C39APP0	6-7
	On	C39APP1	6-7
Code 32 Pharmaceu-tical (PARAF)	*Off	C39B320	6-7
	On	C39B321	6-7
Code 39 Full ASCII	*Off	C39ASC0	6-8
	On	C39ASC1	6-8
	Code 39 Code Page	C39DCP	6-9
Interleaved 2 of 5	Default All Interleaved 2 of 5 Settings	I25DFT	6-9
Interleaved 2 of 5	Off	I25ENA0	6-9
	*On	I25ENA1	6-9
Interleaved 2 of 5 Check Digit	*No Check Char.	I25CK20	6-10
	Validate, But Don’t Transmit	I25CK21	6-10
	Validate, and Transmit	I25CK22	6-10
Interleaved 2 of 5 Message Length	Minimum (2 - 80) *4	I25MIN##	6-10
	Maximum (2 - 80) *80	I25MAX##	6-10
Code 93	Default All Code 93 Settings	C93DFT	6-11

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
Code 93	Off	C93ENA0	6-11
	*On	C93ENA1	6-12
Code 93 Message Length	Minimum (0 - 80) *0	C93MIN##	6-11
	Maximum (0 - 80) *80	C93MAX##	6-11
	Code 93 Code Page	C93DCP	6-11
Straight 2 of 5 Industrial	Default All Straight 2 of 5 Industrial Settings	R25DFT	6-12
Straight 2 of 5 Industrial	*Off	R25ENA0	6-12
	On	R25ENA1	6-12
Straight 2 of 5 Industrial Message Length	Minimum (1 - 48) *4	R25MIN##	6-12
	Maximum (1 - 48) *48	R25MAX##	6-12
Straight 2 of 5 IATA	Default All Straight 2 of 5 IATA Settings	A25DFT	6-13
Straight 2 of 5 IATA	*Off	A25ENA0	6-13
	On	A25ENA1	6-13
Straight 2 of 5 IATA Message Length	Minimum (1 - 48) *4	A25MIN##	6-13
	Maximum (1 - 48) *48	A25MAX##	6-13
Matrix 2 of 5	Default All Matrix 2 of 5 Settings	X25DFT	6-14
Matrix 2 of 5	*Off	X25ENA0	6-14
	On	X25ENA1	6-14
Matrix 2 of 5 Message Length	Minimum (1 - 80) *4	X25MIN##	6-14
	Maximum (1 - 80) *80	X25MAX##	6-14
Code 11	Default All Code 11 Settings	C11DFT	6-14
Code 11	*Off	C11ENA0	6-15
	On	C11ENA1	6-15
Code 11 Check Digits Required	1 Check Digit	C11CK20	6-15
	*2 Check Digits	C11CK21	6-15

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
Code 11 Message Length	Minimum (1 - 80) *4	C11MIN##	6-15
	Maximum (1 - 80) *80	C11MAX##	6-15
Code 128	Default All Code 128 Settings	128DFT	6-16
Code 128	Off	128ENA0	6-16
	*On	128ENA1	6-16
ISBT Concatenation	*Off	ISBENA0	6-16
	On	ISBENA1	6-16
Code 128 Message Length	Minimum (0 - 80) *0	128MIN##	6-17
	Maximum (0 - 80) *80	128MAX##	6-17
Code 128 Code Page	Code 128 Code Page (*2)	128DCP##	6-17
Telepen	Default All Telepen Settings	TELDFT	6-17
Telepen	*Off	TELENA0	6-17
	On	TELENA1	6-17
Telepen Output	*AIM Telepen Output	TELOLD0	6-18
	Original Telepen Output	TELOLD1	6-18
Telepen Message Length	Minimum (1 - 60) *1	TELMIN##	6-18
	Maximum (1 - 60) *60	TELMAX##	6-18
UPC-A	Default All UPC-A Settings	UPADFT	6-19
UPC-A	Off	UPAENA0	6-19
	*On	UPAENA1	6-19
UPC-A Check Digit	Off	UPACKX0	6-19
	*On	UPACKX1	6-19
UPC-A Number System	Off	UPANSX0	6-19
	*On	UPANSX1	6-19
UPC-A 2 Digit Addenda	*Off	UPAAD20	6-20
	On	UPAAD21	6-20
UPC-A 5 Digit Addenda	*Off	UPAAD50	6-20
	On	UPAAD51	6-20

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
UPC-A Addenda Required	*Not Required	UPAARQ0	6-20
	Required	UPAARQ1	6-20
UPC-A Addenda Separator	Off	UPAADS0	6-20
	*On	UPAADS1	6-20
UPC-A/EAN-13 with Extended Coupon Code	*On	CPNENA1	6-21
	Off	CPNENA0	6-21
UPC-E0	Default All UPC-E Settings	UPEDFT	6-21
UPC-E0	Off	UPEEN00	6-21
	*On	UPEEN01	6-21
UPC-E0 Expand	*Off	UPEEXP0	6-21
	On	UPEEXP1	6-21
UPC-E0 Addenda Required	Required	UPEARQ1	6-22
	*Not Required	UPEARQ0	6-22
UPC-E0 Addenda Separator	*On	UPEADS1	6-22
	Off	UPEADS0	6-22
UPC-E0 Check Digit	Off	UPECKX0	6-22
	*On	UPECKX1	6-22
UPC-E0 Number System	Off	UPENSX0	6-23
	*On	UPENSX1	6-23
UPC-E0 Addenda	2 Digit Addenda On	UPEAD21	6-23
	*2 Digit Addenda Off	UPEAD20	6-23
	5 Digit Addenda On	UPEAD51	6-23
	*5 Digit Addenda Off	UPEAD50	6-23
UPC-E1	*Off	UPEEN10	6-23
	On	UPEEN11	6-23
EAN/JAN-13	Default All EAN/ JAN Settings	E13DFT	6-24
EAN/JAN-13	Off	E13ENA0	6-24
	*On	E13ENA1	6-24

Selection	**Setting** ** Indicates default*	**Serial Command** *# Indicates a numeric entry*	**Page**
EAN/JAN-13 Check Digit	Off	E13CKX0	6-24
	*On	E13CKX1	6-24
EAN/JAN-13 2 Digit Addenda	2 Digit Addenda On	E13AD21	6-25
	*2 Digit Addenda Off	E13AD20	6-25
	5 Digit Addenda On	E13AD51	6-25
	*5 Digit Addenda Off	E13AD50	6-25
EAN/JAN-13 Addenda Required	*Not Required	E13ARQ0	6-25
	Required	E13ARQ1	6-25
EAN/JAN-13 Addenda Separator	Off	E13ADS0	6-25
	*On	E13ADS1	6-25
ISBN Translate	*Off	E13ISB0	6-26
	On	E13ISB1	6-26
EAN/JAN-8	Default All EAN/ JAN 8 Settings	EA8DFT	6-26
EAN/JAN-8	Off	EA8ENA0	6-26
	*On	EA8ENA1	6-26
EAN/JAN-8 Check Digit	Off	EA8CKX0	6-26
	*On	EA8CKX1	6-26
EAN/JAN-8 Addenda	*2 Digit Addenda Off	EA8AD20	6-27
	2 Digit Addenda On	EA8AD21	6-27
	*5 Digit Addenda Off	EA8AD50	6-27
	5 Digit Addenda On	EA8AD51	6-27
EAN/JAN-8 Addenda Required	*Not Required	EA8ARQ0	6-27
	Required	EA8ARQ1	6-27
EAN/JAN-8 Addenda Separator	Off	EA8ADS0	6-27
	*On	EA8ADS1	6-27
MSI	Default All MSI Settings	MSIDFT	6-28
MSI	*Off	MSIENA0	6-28
	On	MSIENA1	6-28

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
MSI Check Character	*Validate Type 10, but Don't Transmit	MSICHK0	6-28
	Validate Type 10 and Transmit	MSICHK1	6-28
MSI Message Length	Minimum (4 - 48) *4	MSIMIN##	6-29
	Maximum (4 - 48) *48	MSIMAX##	6-29
Plessey Code	Default All Plessey Settings	PLSDFT	6-29
Plessey Code	*Off	PLSENA0	6-29
	On	PLSENA1	6-29
Plessey Message Length	Minimum (4 - 48) *4	PLSMIN##	6-29
	Maximum (4 - 48) *48	PLSMAX##	6-29
GS1 DataBar Omnidirectional	Default All GS1 DataBar Omnidirectional Settings	RSSDFT	6-30
GS1 DataBar Omnidirectional	Off	RSSENA0	6-30
	*On	RSSENA1	6-30
GS1 DataBar Limited	Default All GS1 DataBar Limited Settings	RSLDFT	6-30
GS1 DataBar Limited	Off	RSLENA0	6-30
	*On	RSLENA1	6-30
GS1 DataBar Expanded	Default All GS1 DataBar Expanded Settings	RSEDFT	6-30
GS1 DataBar Expanded	Off	RSEENA0	6-31
	*On	RSEENA1	6-31
GS1 DataBar Expanded Msg. Length	Minimum (4 - 74) *4	RSEMIN##	6-31
	Maximum (4 - 74) *74	RSEMAX##	6-31
PosiCode	Default All PosiCode Settings	POSDFT	6-33

Selection	Setting *** Indicates default**	Serial Command *# Indicates a numeric entry*	Page
PosiCode	Off	POSENA0	6-32
	*On	POSENA1	6-32
	A and B On	POSLIM0	6-32
	A and B and Limited A On	POSLIM1	6-32
	*A and B and Limited B On	POSLIM2	6-32
PosiCode Msg. Length	Minimum (2 - 80) *4	POSMIN##	6-32
	Maximum (2 - 80) *48	POSMAX##	6-32
Trioptic Code	*Off	TRIENA0	6-33
	On	TRIENA1	6-33
Codablock F	Default All Codablock F Settings	CBFDFT	6-33
Codablock F	*Off	CBFENA0	6-33
	On	CBFENA1	6-33
Codablock F Msg. Length	Minimum (1 - 2048) *1	CBFMIN####	6-33
	Maximum (1 - 2048) *2048	CBFMAX####	6-33
Code 16K	Default All Code 16K Settings	16KDFT	6-34
Code 16K	*Off	16KENA0	6-34
	On	16KENA1	6-34
Code 16K Msg. Length	Minimum (0 - 160) *1	16KMIN###	6-34
	Maximum (0 - 160) *160	16KMAX###	6-34
Code 49	Default All Code 49 Settings	C49DFT	6-35
Code 49	Off	C49ENA0	6-35
	*On	C49ENA1	6-35
Code 49 Msg. Length	Minimum (1 - 81) *1	C49MIN##	6-35
	Maximum (1 - 81) *81	C49MAX##	6-35
PDF417	Default All PDF417 Settings	PDFDFT	6-36

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
PDF417	*On	PDFENA1	6-36
	Off	PDFENA0	6-36
PDF417 Msg. Length	Minimum (1-2750) *1	PDFMIN	6-36
	Maximum (1-2750) *2750	PDFMAX	6-36
MicroPDF417	Default All Micro PDF417 Settings	MPDDFT	6-37
MicroPDF417	On	MPDENA1	6-37
	*Off	MPDENA0	6-37
MicroPDF417 Msg. Length	Minimum (1-366) *1	MPDMIN	6-37
	Maximum (1-366) *366	MPDMAX	6-37
GS1 Composite Codes	On	COMENA1	6-37
	*Off	COMENA0	6-37
UPC/EAN Version	On	COMUPC1	6-38
	*Off	COMUPC0	6-38
GS1 Composite Codes Msg. Length	Minimum (1-2435) *1	COMMIN	6-38
	Maximum (1-2435) *2435	COMMAX	6-38
GS1 Emulation	GS1 Databar Emulation	EANEMU2	6-38
	GS1-128 Emulation	EANEMU1	6-39
	*GS1 Emulation Off	EANEMU0	6-39
TCIF Linked Code 39 (TLC39)	On	T39ENA1	6-39
	*Off	T39ENA0	6-39
Intelligent Mail Bar Code (4-State Customer Bar Code)	On	4CBENA1	6-39
	*Off	4CBENA0	6-39
Posal-4i (UPU 4-State)	On	TAGENA1	6-40
	*Off	TAGENA0	6-40
Postnet	On	NETENA1	6-40
	*Off	NETENA0	6-40
Postnet Check Digit	Transmit	NETCKX1	6-40
	*Don’t Transmit	NETCKX0	6-40

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
Planet Code	On	PLNENA1	6-40
	*Off	PLNENA0	6-41
Planet Code Check Digit	Transmit	PLNCKX1	6-41
	*Don't Transmit	PLNCKX0	6-41
British Post	On	BPOENA1	6-41
	*Off	BPOENA0	6-41
Canadian Post	On	CANENA1	6-41
	*Off	CANENA0	6-40
Kix (Netherlands) Post	On	KIXENA1	6-43
	*Off	KIXENA0	6-42
Australian Post	On	AUSENA1	6-42
	*Off	AUSENA0	6-43
Australian Post Interpretation	*Bar Output	AUSINT0	6-42
	Numeric N Table	AUSINT1	6-42
	Alphanumeric C Table	AUSINT2	6-42
Japanese Post	On	JAPENA1	6-42
	*Off	JAPENA0	6-42
China Post	Default All China Post Settings	CPCDFT	6-43
China Post	*Off	CPCENA0	6-43
	On	CPCENA1	6-43
China Post Msg. Length	Minimum (2 - 80) *4	CPCMIN##	6-43
	Maximum (2 - 80) *80	CPCMAX##	6-43
Korea Post	Default All Korea Post Settings	KPCDFT	6-43
Korea Post	*Off	KPCENA0	6-44
	On	KPCENA1	6-44
Korea Post Msg. Length	Minimum (2 - 80) *4	KPCMIN##	6-44
	Maximum (2 - 80) *48	KPCMAX##	6-44
QR Code	Default All QR Code Settings	QRCDFT	6-44

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
QR Code	*On	QRCENA1	6-44
	Off	QRCENA0	6-44
QR Code Msg. Length	Minimum (1-3500) *1	QRCMIN	6-45
	Maximum (1-3500) *3500	QRCMAX	6-45
Data Matrix	Default All Data Matrix Settings	IDMDFT	6-45
Data Matrix	*On	IDMENA1	6-45
	Off	IDMENA0	6-45
Data Matrix Msg. Length	Minimum (1-1500) *1	IDMMIN	6-45
	Maximum (1-1500) *1500	IDMMAX	6-45
MaxiCode	Default All MaxiCode Settings	MAXDFT	6-46
MaxiCode	*On	MAXENA1	6-46
	Off	MAXENA0	6-46
MaxiCode Msg. Length	Minimum (1-150) *1	MAXMIN	6-46
	Maximum (1-150) *150	MAXMAX	6-46
Aztec Code	Default All Aztec Code Settings	AZTDFT	6-47
Aztec Code	*On	AZTENA1	6-47
	Off	AZTENA0	6-47
Aztec Code Msg. Length	Minimum (1-3750) *1	AZTMIN	6-47
	Maximum (1-3750) *3750	AZTMAX	6-47
Aztec Runes	Enable Runes	AZTRUN1	6-47
	*Disable Runes	AZTRUN0	6-47

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

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
Image Ship	*Infinity Filter - Off	IMGINF0	7-3
	Infinity Filter - On	IMGINF1	7-3
	*Compensation Off	IMGCOR0	7-3
	Compensation On	IMGCOR1	7-3
	*Pixel Depth - 8 bits/pixel (grayscale)	IMGBPP8	7-3
	Pixel Depth - 1 bit/pixel (B&W)	IMGBPP1	7-3
	*Don't Sharpen Edges	IMGEDG0	7-3
	Sharpen Edges (0-23)	IMGEDG##	7-3
	*File Format - JPEG	IMGFMT6	7-3
	File Format - KIM	IMGFMT0	7-3
	File Format - TIFF binary	IMGFMT1	7-3
	File Format - TIFF binary group 4, compressed	IMGFMT2	7-3
	File Format - TIFF gray-scale	IMGFMT3	7-3
	File Format - Uncom-pressed binary	IMGFMT4	7-3
	File Format - Uncom-pressed grayscale	IMGFMT5	7-3
	File Format - BMP	IMGFMT8	7-3
	*Histogram Stretch Off	IMGHIS0	7-4
	Histogram Stretch On	IMGHIS1	7-4
	Invert Image around X axis	IMGNVX1	7-4
	Invert Image around Y axis	IMGNVY1	7-4
	*Noise Reduction Off	IMGFSP0	7-4
	Noise Reduction On	IMGFSP1	7-4
	Rotate Image 90° left	IMGROT3	7-4
	JPEG Image Quality (0-100) *50	IMGJQF###	7-4
	*Gamma Correction Off	IMGGAM0	7-4

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
Image Ship (continued)	Image Crop - Bottom (0-480) *479	IMGWNB###	7-5
	Image Crop - Margin (1-238) *0	IMGMAR###	7-5
	Protocol - None (raw)	IMGXFR0	7-5
	Protocol - None (default USB)	IMGXFR2	7-5
	Protocol - Hmodem Compressed	IMGXFR3	7-5
	Protocol - Hmodem	IMGXFR4	7-5
	Ship Every Pixel	IMGSUB1	7-5
	Ship Every 2nd Pixel	IMGSUB2	7-5
	Ship Every 3rd Pixel	IMGSUB3	7-5
	*Document Image Filter Off	IMGUSH0	7-6
	Document Image Filter On (0-255)	IMGUSH###	7-6
	*Don't Ship Histogram	IMGHST0	7-6
	Ship Histogram	IMGHST1	7-6
	*Force VGA Resolution	IMGVGA1	7-6
	Native Resolution	IMGVGA0	7-6
OCR Selections			
OCR	Default All OCR Settings	OCRDFT	8-1
	OCR-A On	OCRENA1	8-1
	OCR-B On	OCRENA2	8-2
	U.S. Currency On	OCRENA3	8-2
	MICR E 13 B On	OCRENA4	8-2
	SEMI Font	OCRENA5	8-3
	* All OCR Off	OCRENA0	8-3

Selection	Setting ** Indicates default*	Serial Command *# Indicates a numeric entry*	Page
OCR Check Character	OCR Mod. 10 Check Char.	"OCRCHK0123456789"	8-8
	OCR Mod. 36 Check Char.	"OCRCHK0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ"	8-8
	OCR User-Defined Check Char.	OCRCHK	8-9
	3-1-3-1 Weighted Mod. 10 Check Char.	OCRCHK3-1-3-1	8-10
	2-1-2-1 Weighted Mod. 10 Check Char.	OCRCHK2-1-2-1	8-11
OCR Templates	Enter OCR Template	OCRTMP	8-13
	Enter User-Defined Variable g	OCRGPG	8-13
	Enter User-Defined Variable h	OCRGPH	8-13

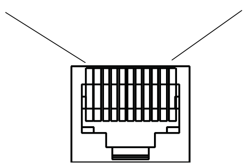
12 Product Specifications

4800p Specifications

Parameter	***Specification***
Dimensions (Typical): Height Length Width Weight	 1.4 inches (3.5 cm) 3.4 inches (8.5 cm) 2.3 inches (5.9 cm) 3 ounces (85.1 g)
Illumination: Scan LEDs Aiming LEDs	 626nm ±30nm 526nm ±30nm
Image	VGA, 640x480 (4X00); 752x480 (5X00). Binary, TIFF, or JPEG output.
Skew Angle	±40 degrees
Pitch Angle	±40 degrees
Motion Tolerance	4 inches (10 cm) per second
Symbol Contrast	Grade 1.0 (20% or greater)
Voltage Requirements	4.5 - 5.5 VDC at imager
Current Draw (Typical):	Input / Inrush / Scanning / Idle / Standby / Power Off 5V / 550mA / 350mA / 75mA / 10mA / 0.500 mA
Power Supply Noise Rejection	Maximum 100mV peak to peak, 10 to 100 kHz
Temperature Ranges: Operating Storage	 +22°F to +104°F (-30°C to +40°C) -40°F to +158°F (-40°C to +70°C)
Humidity	0 to 95% non-condensing
Mechanical Drop	Operational after 50 drops from 6 feet (1.8 m) to concrete
Vibration	Withstands 5G peak from 22 to 300 Hz
ESD Tolerance	15 kV to any external surface

Connector Pinouts

10 Pin Modular RJ45 Jack



1
2 Data +
3
4 Supply ground
5
6
7 5 volt power connection
8
9
10 Data -

Note: Pins 1, 3, 5, 6, 8, and 9 should not be connected externally.

13 Maintenance

Repairs

Repairs and/or upgrades are not to be performed on this product. These services are to be performed only by an authorized service center. See "Customer Support" on page 14-1 for further information.

Maintenance

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

Cleaning the Device

Reading performance may degrade if the imager's window is not clean. If the window is visibly dirty, or if the imager isn't operating well, clean the window with a soft cloth or lens tissue dampened with water (or a mild detergent- water solution). If a detergent solution is used, rinse with a clean lens tissue dampened with water only.

The imager's housing may also be cleaned the same way.

⚠ **Caution:**

Do not submerge the imager in water. Do not use abrasive wipes or tissues on the imager's window – abrasive wipes may scratch the window.

Never use solvents (e.g., acetone, benzene, ether, or phenol-based agents) on the housing or window – solvents may damage the finish or the window.

Inspecting Cords and Connectors

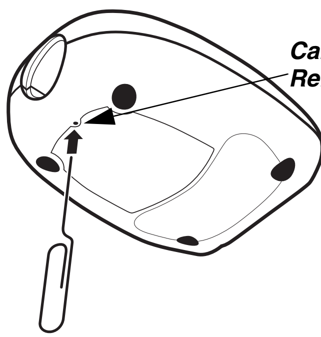
Inspect the imager's interface cable and connector for wear or other signs of damage. A badly worn cable or damaged connector may interfere with imager operation. Contact your Honeywell distributor for information about cable replacement. Cable replacement instructions are on page 13-2.

Replacing the Interface Cable

The standard interface cable is attached to the imager with an 10-pin modular connector. When properly seated, the connector is held in the imager's handle by a flexible retention tab. The interface cable is designed to be field replaceable.

- Order replacement cables from Honeywell or from an authorized distributor.
- When ordering a replacement cable, specify the cable part number of the original interface cable.

To Replace the 4800p Interface Cable:



1. Turn the power to the host system OFF.
2. Disconnect the imager's cable from the terminal or computer.
3. Locate the small hole on the bottom of the imager's handle. This is the cable release.
4. Straighten one end of a paper clip.
5. Insert the end of the paper clip into the small hole and press in. This depresses the retention tab, releasing the connector. Pull the connector out while maintaining pressure on the paper clip, then remove the paper clip.
6. Replace with the new cable. Insert the connector into the opening and press firmly. The connector is keyed to go in only one way, and will click into place.

Troubleshooting

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

Is the power on? Is the red aiming illumination line on?

If the red aiming illumination line isn't illuminated, check that:

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

Is the imager having trouble reading your symbols?

If the imager 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 imager or in the decoder to which the imager 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 imager to output the bar code data plus the key you need (such as “CR”) to enter the data into your application. Refer to "Prefix/Suffix Overview" on page 4-1 for further information.

Does the imager read the bar code incorrectly?

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

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

  Reprogram the imager with the correct Plug and Play or Terminal selection bar code. See Chapter 1 and Chapter 2.
- The imager may not be programmed to output your bar code data properly. For example, you scan “12345” and the host displays “A12345B.”

  Reprogram the imager with the proper symbology selections. See Chapter 6.

The imager won’t read your bar code at all.

1. Scan the sample bar codes in the back of this manual. If the imager 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 imager still can’t read the sample bar codes, scan "All Symbologies" on page 6-2.

If you aren’t sure what programming options have been set in the imager, or if you want the factory default settings restored, scan Standard Product Default Settings on page 11-4.

14 Customer Support

Technical Assistance

If you need assistance installing or troubleshooting your device, please call your distributor or the nearest technical support office:

North America/Canada

Telephone: (800) 782-4263
E-mail: hsmnasupport@honeywell.com

Latin America

Telephone: (803) 835-8000
Telephone: (800) 782-4263
E-mail: hsmlasupport@honeywell.com

Brazil

Telephone: +55 (11) 5185-8222
Fax: +55 (11) 5185-8225
E-mail: brsuporte@honeywell.com

Mexico

Telephone: 01-800-HONEYWELL (01-800-466-3993)
E-mail: soporte.hsm@honeywell.com

Europe, Middle East, and Africa

Telephone: +31 (0) 40 7999 393
Fax: +31 (0) 40 2425 672
E-mail: hsmeurosupport@honeywell.com

Hong Kong

Telephone: +852-29536436
Fax: +852-2511-3557
E-mail: aptechsupport@honeywell.com

Singapore

Telephone: +65-6842-7155
Fax: +65-6842-7166
E-mail: aptechsupport@honeywell.com

China

Telephone: +86 800 828 2803
Fax: +86-512-6762-2560
E-mail: aptechsupport@honeywell.com

Japan

Telephone: +81-3-6730-7344
Fax: +81-3-6730-7222
E-mail: aptechsupport@honeywell.com

Online Technical Assistance

You can also access technical assistance online at www.honeywellaidc.com.

Product Service and Repair

Honeywell International Inc. provides service for all its products through service centers throughout the world. To obtain warranty or non-warranty service, contact the appropriate location below to obtain a Return Material Authorization number (RMA #) before returning the product.

North America

Telephone: (800) 782-4263
E-mail: hsmnaservice@honeywell.com

Latin America

Telephone: (803) 835-8000
Telephone: (800) 782-4263
Fax: (239) 263-9689
E-mail: laservice@honeywell.com

Brazil

Telephone: +55 (11) 5185-8222
Fax: +55 (11) 5185-8225
E-mail: brservice@honeywell.com

Mexico

Telephone: 01-800-HONEYWELL (01-800-466-3993)
Fax: +52 (55) 5531-3672
E-mail: mxservice@honeywell.com

Europe, Middle East, and Africa

Telephone: +31 (0) 40 2901 633
Fax: +31 (0) 40 2901 631
E-mail: euroservice@honeywell.com

Hong Kong

Telephone: +852-29536436
Fax: +852-2511-3557
E-mail: apservice@honeywell.com

Singapore

Telephone: +65-6842-7155
Fax: +65-6842-7166
E-mail: apservice@honeywell.com

China

Telephone: +86 800 828 2803
Fax: +86-512-6762-2560
E-mail: apservice@honeywell.com

Japan

Telephone: +81-3-6730-7344
Fax: +81-3-6730-7222
E-mail: apservice@honeywell.com

Online Product Service and Repair Assistance

You can also access product service and repair assistance online at www.honeywellaidc.com.

Limited Warranty

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

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

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

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

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

The limited duration of the warranty for the 4800p is for five (5) years.

Appendix A

Symbology Chart

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

Symbology	AIM ID	Possible AIM ID Modifiers (*m*)	Code ID (hex)
GS1 Composite	]e*m*	0-3	y (0x79)
GS1 DataBar	]e*m*	0	y (0x79)
GS1 DataBar Limited	]e*m*		{ (0x7B)
GS1 DataBar Omnidirectional	]e*m*		y (0x79)
GS1 DataBar Expanded	]e*m*		} (0x7D)
InfoMail	]X0		, (0x2c)
Intelligent Mail Bar Code	]X0		M (0x4D)
Interleaved 2 of 5	]I*m*	0, 1, 3	e (0x65)
Japanese Post	]X0		J (0x4A)
KIX (Netherlands) Post	]X0		K (0x4B)
Korea Post	]X0		? (0x3F)
Matrix 2 of 5	]X0		m (0x6D)
MaxiCode	]U*m*	0-3	x (0x7 8)
MicroPDF417	]L*m*	3-5	R (0x52)
MSI	]M*m*	0	g (0x67)
NEC 2 of 5	]X0		Y (0x59)
OCR MICR (E 13 B)	]o3		O (0x4F)
OCR SEMI Font	]o3		O (0x4F)
OCR-A	]o1		O (0x4F)
OCR-B	]o2		O (0x4F)
PDF417	]L*m*	0-2	r (0x72)
Planet Code	]X0		L (0x4C)
Postal-4i	]X0		N (0x4E)
Postnet	]X0		P (0x50)
QR Code and Micro QR Code	]Q*m*	0-6	s (0x73)
Straight 2 of 5 IATA	]R*m*	0, 1, 3	f (0x66)
Straight 2 of 5 Industrial	]S0		f (0x66)
TCIF Linked Code 39 (TLC39)	]L2		T (0x54)

Symbology	AIM ID	Possible AIM ID Modifiers (*m*)	Code ID (hex)
Telepen	]B*m*		t (0x54)
UPC-A	]E0		c (0x63)
UPC-A with Add-On	]E3		c (0x63)
UPC-A with Extended Coupon Code	]E3		c (0x63)
UPC-E	]E0		E (0x45)
UPC-E with Add-On	]E3		E (0x45)
UPC-E1	]X0		E (0x45)

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

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

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

ASCII Conversion Chart (Code Page 1252)

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

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
0	00	NUL	32	20		64	40	@	96	60	‘
1	01	SOH	33	21	!	65	41	A	97	61	a
2	02	STX	34	22	“	66	42	B	98	62	b
3	03	ETX	35	23	#	67	43	C	99	63	c
4	04	EOT	36	24	$	68	44	D	100	64	d
5	05	ENQ	37	25	%	69	45	E	101	65	e
6	06	ACK	38	26	&	70	46	F	102	66	f
7	07	BEL	39	27	‘	71	47	G	103	67	g
8	08	BS	40	28	(	72	48	H	104	68	h
9	09	HT	41	29	)	73	49	I	105	69	i
10	0A	LF	42	2A	*	74	4A	J	106	6A	j
11	0B	VT	43	2B	+	75	4B	K	107	6B	k
12	0C	FF	44	2C	,	76	4C	L	108	6C	l
13	0D	CR	45	2D	-	77	4D	M	109	6D	m
14	0E	SO	46	2E	.	78	4E	N	110	6E	n
15	0F	SI	47	2F	/	79	4F	O	111	6F	o
16	10	DLE	48	30	0	80	50	P	112	70	p
17	11	DC1	49	31	1	81	51	Q	113	71	q
18	12	DC2	50	32	2	82	52	R	114	72	r
19	13	DC3	51	33	3	83	53	S	115	73	s
20	14	DC4	52	34	4	84	54	T	116	74	t
21	15	NAK	53	35	5	85	55	U	117	75	u
22	16	SYN	54	36	6	86	56	V	118	76	v
23	17	ETB	55	37	7	87	57	W	119	77	w
24	18	CAN	56	38	8	88	58	X	120	78	x
25	19	EM	57	39	9	89	59	Y	121	79	y
26	1A	SUB	58	3A	:	90	5A	Z	122	7A	z
27	1B	ESC	59	3B	;	91	5B	[	123	7B	{
28	1C	FS	60	3C	<	92	5C	\	124	7C	|
29	1D	GS	61	3D	=	93	5D	]	125	7D	}
30	1E	RS	62	3E	>	94	5E	^	126	7E	~
31	1F	US	63	3F	?	95	5F	_	127	7F	

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
128	80	€	160	A0		192	C0	À	224	E0	à
129	81	□	161	A1	¡	193	C1	Á	225	E1	á
130	82	‚	162	A2	¢	194	C2	Â	226	E2	â
131	83	ƒ	163	A3	£	195	C3	Ã	227	E3	ã
132	84	„	164	A4	¤	196	C4	Ä	228	E4	ä
133	85	…	165	A5	¥	197	C5	Å	229	E5	å
134	86	†	166	A6	¦	198	C6	Æ	230	E6	æ
135	87	‡	167	A7	§	199	C7	Ç	231	E7	ç
136	88	ˆ	168	A8	¨	200	C8	È	232	E8	è
137	89	‰	169	A9	©	201	C9	É	233	E9	é
138	8A	Š	170	AA	ª	202	CA	Ê	234	EA	ê
139	8B	‹	171	AB	«	203	CB	Ë	235	EB	ë
140	8C	Œ	172	AC	¬	204	CC	Ì	236	EC	ì
141	8D	□	173	AD	-	205	CD	Í	237	ED	í
142	8E	Ž	174	AE	®	206	CE	Î	238	EE	î
143	8F	□	175	AF	¯	207	CF	Ï	239	EF	ï
144	90	□	176	B0	°	208	D0	Ð	240	F0	ð
145	91	‘	177	B1	±	209	D1	Ñ	241	F1	ñ
146	92	’	178	B2	²	210	D2	Ò	242	F2	ò
147	93	“	179	B3	³	211	D3	Ó	243	F3	ó
148	94	”	180	B4	´	212	D4	Ô	244	F4	ô
149	95	•	181	B5	µ	213	D5	Õ	245	F5	õ
150	96	–	182	B6	¶	214	D6	Ö	246	F6	ö
151	97	—	183	B7	·	215	D7	×	247	F7	÷
152	98	˜	184	B8	¸	216	D8	Ø	248	F8	ø
153	99	™	185	B9	¹	217	D9	Ù	249	F9	ù
154	9A	š	186	BA	º	218	DA	Ú	250	FA	ú
155	9B	›	187	BB	»	219	DB	Û	251	FB	û
156	9C	œ	188	BC	¼	220	DC	Ü	252	FC	ü
157	9D	□	189	BD	½	221	DD	Ý	253	FD	ý
158	9E	ž	190	BE	¾	222	DE	Þ	254	FE	þ
159	9F	Ÿ	191	BF	¿	223	DF	ß	255	FF	ÿ

Code Page Mapping of Printed Bar Codes

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the 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.

Note: The Code Page option is available for Code 39, Code 93, and Code 128.

Code Page	**Standard**	**Description**
1	CP ISO646	
2 (Default)	ISO 2022	Automatic National Replacement Characters
3	CP Binary	
82	ISO 2022 11 Swe	Swedish Replacement Characters
83	ISO 2022 69 Fra	French/Belgian Replacement Characters
81	ISO 2022 25 Fra	French/Belgian Replacement Characters
84	ISO 2022 11 Ger	German Replacement Characters
85	ISO 2022 11 Ita	Italian Replacement Characters
86	ISO 2022 11 Swi	Swiss Replacement Characters
87	ISO 2022 11 UK	British Replacement Characters
88	ISO 2022 11 Dan	Danish Replacement Characters
89	ISO 2022 11 Nor	Norwegian Replacement Characters
90	ISO 2022 11 Spa	Spanish Replacement Characters

Sample Symbols

UPC-A

0 123456 7890

Interleaved 2 of 5

1234567890

Code 128

Code 128

EAN-13

9 780330 290951

Code 39

BC321

Codabar

A13579B

Code 93

123456-9$

Straight 2 of 5 Industrial

123456

Sample Symbols

Matrix 2 of 5

6543210

RSS-14

(01)00123456789012

PDF417

Car Registration

Postnet

Zip Code

Code 49

1234567890

Data Matrix

Test Symbol

QR Code

Numbers

4-CB (4-State Customer Bar Code)

01,234,567094,987654321,01234567891

Postal-4i (UPU 4-State)

J18CUSA8E6N062315014880T

Sample Symbols

Aztec

Package Label

Micro PDF417

Test Message

MaxiCode

Test Message

OCR-B with Modulo 10 check character

5324277

OCR-A with Modulo 36 check character

532427D

OCR Programming Chart

a

c

d

e

g

h

l

r

t

OCR Programming Chart

T

O

A

D

Discard

Save

Programming Chart

A

B

C

D

E

F

0

1

2

3

Programming Chart

4

5

6

7

8

9

Save

Discard

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

Honeywell Scanning & Mobility
9680 Old Bailes Road
Fort Mill, SC 29707

www.honeywellaidc.com

4800P-UG Rev B
4/11