



IMAGETEAM™ 4410/4710

2D Series Hand Held Imager



User's Guide

Statement of Agency Compliance

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, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Class B Compliance Statement

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.

Caution: Any changes or modifications made to this device that are not expressly approved by Hand Held Products, Inc. may void the user's authority to operate the equipment.

Note: To maintain compliance with FCC Rules and Regulations, cables connected to this device must be shielded cables, in which the cable shield wire(s) have been grounded (tied) to the connector shell.

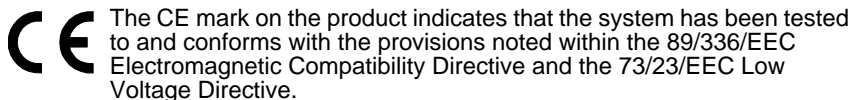
Canadian Notice

This equipment does not exceed the Class B limits for radio noise emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

LED Safety Statement

This device has been tested in accordance with EN60825-1 LED safety, and has been certified to be under the limits of a Class 1 LED device.



For further information please contact:

Hand Held Products, Inc.
Nijverheidsweg 9
5627 BT Eindhoven
The Netherlands

Hand Held Products 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.

Patents

Please refer to the product packaging for patent information.

Disclaimer

Hand Held Products, Inc. ("Hand Held Products") 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 Hand Held Products to determine whether any such changes have been made. The information in this publication does not represent a commitment on the part of Hand Held Products.

Hand Held Products 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.

This document contains proprietary information that is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced, or translated into another language without the prior written consent of Hand Held Products.

© 2005 Hand Held Products, Inc. All rights reserved.

Web Address: www.handheld.com



Table of Contents

Chapter 1 - Introduction and Installation

About the Hand-Held and Fixed Mount 2D Imager	1-1
Unpacking the Imager.....	1-2
IT4410 Imager Identification.....	1-4
IT4710 Imager Identification.....	1-5
Connecting the Scanner in Keyboard Wedge Mode.....	1-6
Connecting the Scanner to a Serial Port	1-7
Reading Techniques.....	1-8

Chapter 2 - Programming

Introduction.....	2-1
Reset Factory Settings	2-2
Status Check	2-2
All Symbologies	2-2
Revision Selections.....	2-3
Terminal Interface	2-4
Supported Terminals Chart.....	2-5
Keyboard Country	2-6
Keyboard Style	2-7
Keyboard Modifiers.....	2-8
Keyboard Function Relationships.....	2-9
Communication Settings.....	2-10
Parity	2-10
Baud Rate	2-11
Word Length Data Bits	2-12
Word Length Stop Bits.....	2-12
Hardware Flow Control.....	2-13
Software Flow Control	2-13
Serial Triggering	2-14
Trigger Timeout.....	2-15
Power Saving Mode.....	2-16
Power Hold Mode.....	2-17
LED Power Level	2-17
LED Flashing.....	2-18

Aimer Delay.....	2-18
Aimer Interval.....	2-19
Centering.....	2-20
AutoTrigger	2-23
Scan Stand	2-23
Scan Stand Symbol	2-24
Presentation Mode	2-24
Presentation Re-trigger Delay	2-24
Presentation Lights.....	2-25
Presentation Default.....	2-25
Fast Omni Mode	2-26
Beeper Volume	2-26
Power Up Beeper.....	2-27
Output Sequence Beeper.....	2-27
Beep On Decode.....	2-27
Beeper Default	2-27
Intercharacter, Interfunction, and Intermessage Delays.....	2-28
Intercharacter Delay	2-28
User Specified Intercharacter Delay	2-28
Interfunction Delay	2-29
Intermessage Delay	2-30
Prefix/Suffix Overview.....	2-31
Adding a Prefix or Suffix.....	2-32
Add a Carriage Return Suffix to All Symbolologies	2-33
Add a Code I.D. Prefix to All Symbolologies	2-33
Add an AIM I.D. Prefix to All Symbolologies	2-33
Prefix Entries.....	2-34
Suffix Entries	2-34
Symbology Chart.....	2-35
Decimal to Hex to ASCII Conversion Chart	2-36

Data Format Editor Overview	2-37
Format Editor Commands	2-38
Data Format Editor	2-40
Data Formatter.....	2-41
Require Data Format	2-41
Show Data Formats	2-41
Alternate Data Formats	2-42
Output Sequence Overview	2-43
Require Output Sequence	2-44
Output Sequence Editor.....	2-46
Multiple Symbols.....	2-47
No Read	2-47
Print Weight.....	2-48
Function Code Transmit	2-48
Video Reverse	2-49

Chapter 3 - Symbolologies

Introduction.....	3-1
Codabar	3-2
Start/Stop Characters.....	3-2
Message Length.....	3-2
Check Character	3-3
Code 39	3-4
Start/Stop Characters.....	3-4
Message Length.....	3-5
Full ASCII	3-5
Check Character	3-6
Code 11	3-7
Message Length.....	3-7
Check Digits Required	3-8
Interleaved 2 of 5	3-9
Message Length.....	3-9
Check Digit.....	3-10
IATA 2 of 5.....	3-11
Message Length.....	3-11

MSI	3-12
Message Length	3-12
Check Digit	3-13
Code 93.....	3-14
Message Length	3-14
Code 128.....	3-15
Message Length	3-15
ISBT.....	3-16
EAN/JAN 8.....	3-17
Check Digit	3-17
EAN/JAN 8 Addenda.....	3-18
EAN/JAN 8 Addenda Required	3-18
EAN/JAN 8 Addenda Separator	3-18
EAN/JAN 13.....	3-19
Check Digit	3-19
EAN/JAN 13 Addenda.....	3-20
EAN/JAN 13 Addenda Required	3-20
EAN/JAN 13 Addenda Separator	3-20
UPC A.....	3-21
Check Digit	3-21
Number System.....	3-21
UPC A Addenda.....	3-22
UPC A Addenda Required	3-22
UPC A Addenda Separator	3-22
UPC E0.....	3-23
Check Digit	3-23
Number System.....	3-23
Version E Expand	3-24
UPC E1	3-24
UPC E0/E1 Addenda.....	3-24
UPC E0/E1 Addenda Required	3-25
UPC E0/E1 Addenda Separator	3-25
RSS-14.....	3-26
RSS-14 Limited	3-26
RSS-14 Expanded	3-27
Message Length	3-27

Codablock	3-28
Message Length.....	3-28
PDF417	3-29
Message Length.....	3-29
MicroPDF417	3-30
Message Length.....	3-30
Code 49	3-31
Message Length.....	3-31
EAN•UCC Composite Codes	3-32
Message Length.....	3-32
TLC39	3-33
U.S. Postal Service POSTNET Code.....	3-34
Check Digit.....	3-34
Planet Code	3-34
Check Digit.....	3-34
British Post Office 4 State Code	3-35
Canadian 4 State Code	3-35
Dutch Postal Code.....	3-35
Australian 4 State Code	3-35
Japanese Postal Service.....	3-35
QR Code.....	3-36
Message Length.....	3-36
Data Matrix	3-37
Message Length.....	3-37
MaxiCode.....	3-38
Message Length.....	3-38
Structured Carrier Message Only	3-39
Aztec Code.....	3-40
Message Length.....	3-40
Test Menu	3-41
2D PQA (Print Quality Assessment)	3-41

Chapter 4 - OCR Programming

Introduction.....	4-1
OCR	4-2
OCR Direction.....	4-3

Creating OCR Templates.....	4-4
Creating an OCR Template.....	4-4
Stringing Together Multiple Formats (Creating “Or” Statements).....	4-6
Creating a User-Defined Variable.....	4-6
Adding an OCR Check Character	4-7
OCR Template Codes	4-9

Chapter 5 - Default Charts

Communication (RS-232) Selections.....	5-1
Imager Selections	5-1
Prefix/Suffix Selections.....	5-2
Data Formatter Selections.....	5-2
Output Sequence Selections	5-2
Linear Symbolologies	5-2
Postal Symbology Selections	5-4
2D Matrix Selections.....	5-4
OCR Selections	5-5

Chapter 6 - Software Development Kit

Software Development Kit (SDK).....	6-1
Features of the SDK.....	6-1

Chapter 7 - Quick*View

Quick*View Demonstration Software Instructions.....	7-1
Setting Up the Imager and the Quick*View Software...	7-1
Installing Quick*View from the Web.....	7-1
Using the Quick*View Software	7-3
Load New Imager Software	7-8
Serial Programming Commands	7-9
Query Commands	7-11
Trigger Commands	7-12
Serial Programming Commands	7-14

Imaging Commands	7-27
Image Commands Help File.....	7-27
Image Ship.....	7-27
Image Capture/Ship and Image Get Commands	7-28
Image Cropping/Shipping Example	7-29
Intelligent Signature Capture Commands	7-29

Chapter 8 - Visual Menu

Visual Menu Introduction	8-1
Installing Visual Menu from the Web.....	8-2

Chapter 9 - Interface Keys

Chapter 10 - Product Specifications & Pinouts

Product Specifications - IT4410	10-1
Product Specifications - IT4710	10-2
Depth of Field Charts.....	10-4
Cable Pinouts	10-6
Connector Part Numbers	10-7
IT4410 Dimensions.....	10-8
IT4710 Dimensions.....	10-9

Chapter 11 - Maintenance & Troubleshooting

Repairs	11-1
Maintenance.....	11-1
Replacing the Interface Cable	11-2
Troubleshooting	11-3

Chapter 12 - Customer Support

Product Service and Repair.....	12-1
Online Product Service and Repair Assistance	12-2
Technical Assistance.....	12-2
Online Technical Assistance	12-2
Limited Warranty.....	12-2



Introduction and Installation

About the Hand-Held and Fixed Mount 2D Imager

The hand-held and fixed mount 2D Imager is an economical, durable solution for a wide variety of data collection applications. The Imager features the following:

- A tough, ergonomic thermoplastic housing for comfort and durability.
- Omni-directional reading of a variety of printed symbols, including the most popular linear and 2D matrix symbologies.
- RS-232, keyboard wedge, and laser emulation communication outputs.
- The ability to capture and download images to a PC for signature capture software applications, and PC-based decoding.
- The ability to read OCR fonts.

About this Manual

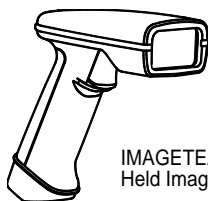
This user's guide provides installation instructions for the hand-held Imager. The chapters contain the following information:

- [Chapter 1](#) Unpacking and installing the Imager
- [Chapter 2](#) Programming selections
- [Chapter 3](#) Symbology programming selections
- [Chapter 4](#) OCR programming
- [Chapter 5](#) Default settings
- [Chapter 6](#) Software Developers Kit
- [Chapter 7](#) Quick*View software information and serial programming commands
- [Chapter 8](#) Visual Menu software
- [Chapter 9](#) Interface Keys
- [Chapter 10](#) [Product Specifications & Pinouts](#)
- [Chapter 11](#) Maintenance and troubleshooting
- [Chapter 12](#) Customer support, service information, and warranty

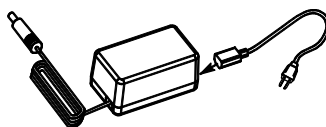
Unpacking the Imager

Open the carton. The shipping carton or container should contain:

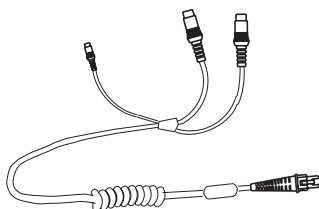
IMAGETEAM 4410 Convenience Kit:



IMAGETEAM 4410 Hand
Held Imager



Universal Power Supply
and Power Cable

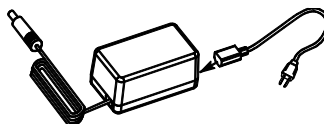


Cable

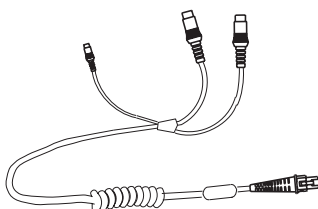
IMAGETEAM 4710 Convenience Kit:



IMAGETEAM 4710 Hand
Held/Fixed Mount Imager



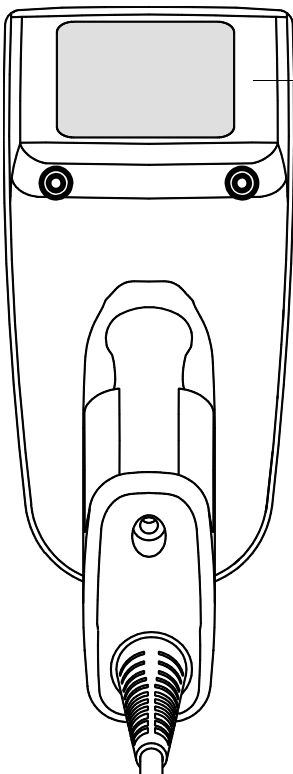
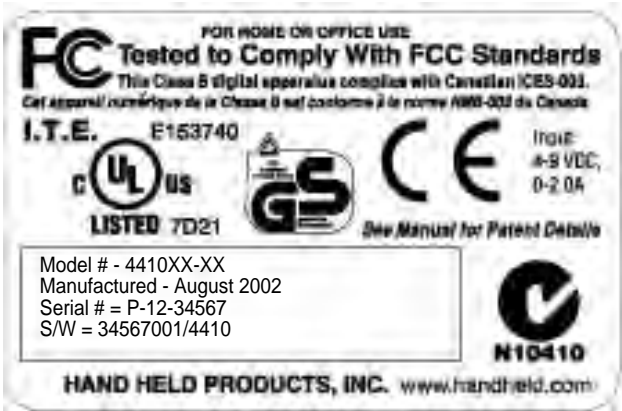
Universal Power Supply
and Power Cable



Cable

-
- Check to make sure everything you ordered is present.
 - Save the shipping container for later storage or shipping.
 - Check for damage during shipment. Report damage immediately to the carrier who delivered the carton.

IT4410 Imager Identification

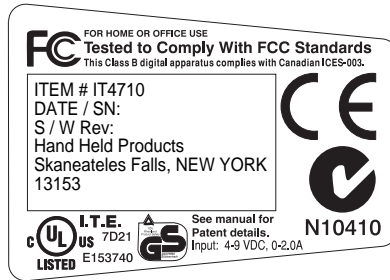
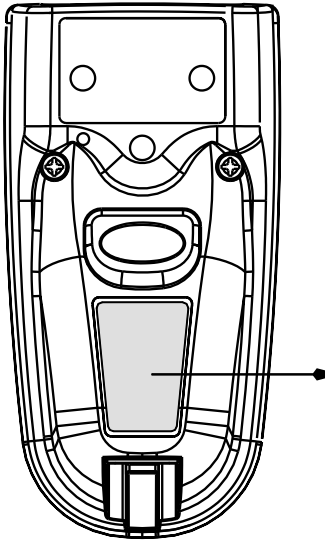


Enlarged View of Label

Hand Held IT4410 Imager
Bottom View

IT4710 Imager Identification

Hand Held IT4710 Imager Bottom View



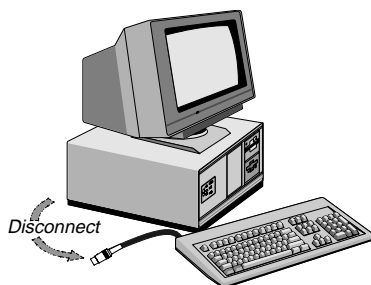
Connecting the Scanner in Keyboard Wedge Mode

A scanner can be connected between the keyboard and PC as a "keyboard wedge," plugged into the serial port, or connected to a portable data terminal in non decoded output mode.

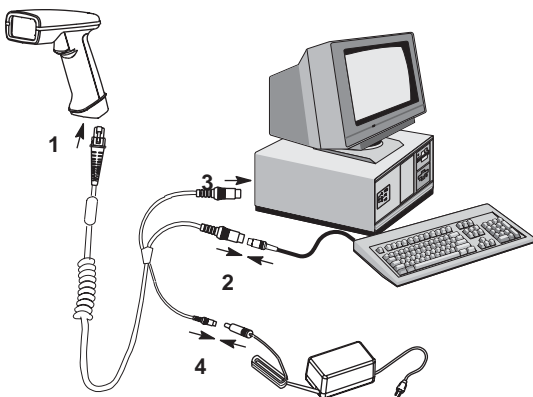
Note: Note: The IMAGETEAM 4410 and 4710 scanners are factory programmed for a keyboard wedge interface to an IBM PC AT with a USA keyboard.

The following is an example of a keyboard wedge connection:

1. Turn off power to the terminal/computer.
2. Disconnect the keyboard cable from the back of the terminal/computer.



3. Connect the appropriate interface cable to the scanner and to the terminal/computer. The scanner will beep twice.
4. Connect the power supply (4 to 9V).
5. Turn the terminal/computer power back on.
6. Verify the scanner operation by scanning a bar code. The scanner will beep once.

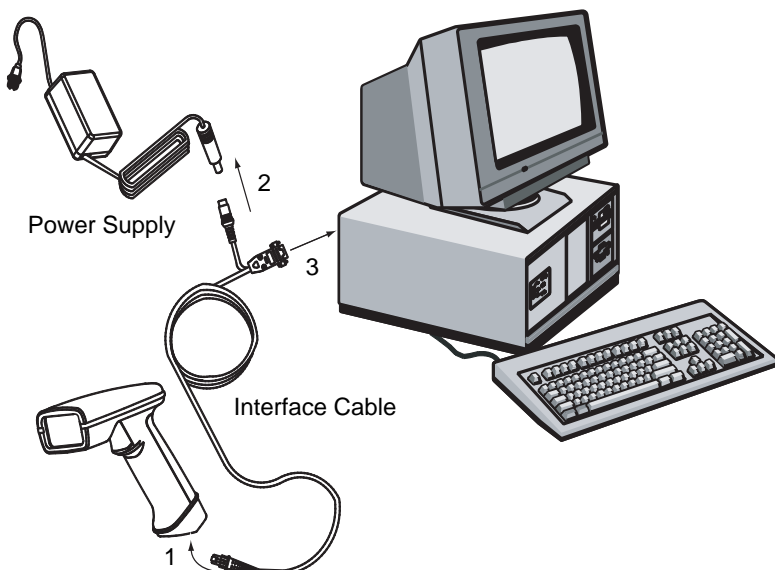


The scanner is now connected and ready to communicate with your terminal/PC. You must program the scanner for your interface before bar code data can be transmitted to your terminal/PC. If you are using the scanner as a keyboard wedge, see "Terminal Interface" on page 2-4. If the scanner is connected via a serial port, turn to "Connecting the Scanner to a Serial Port" on page 1-7.

Connecting the Scanner to a Serial Port

Turn off power to the terminal/computer.

1. Connect the interface cable to the scanner
2. Connect the interface cable to the 4 to 9 volt power supply and plug in the power supply. The scanner will beep twice.
3. Connect the interface cable to the terminal/computer.



4. Turn the terminal/computer power back on.
5. Verify the scanner operation by scanning a bar code from the sample bar code section in the back of this manual. The scanner will beep once.

The scanner is now connected and ready to communicate with your terminal/PC. Turn to "Communication Settings" on page 2-10 to program the communication parameters for a serial interface.

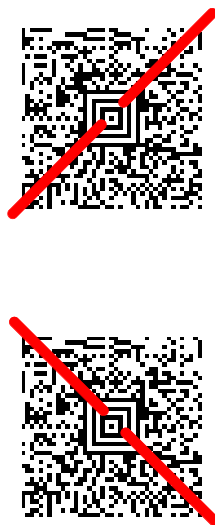
Reading Techniques

The hand-held Imager has a view finder that projects a bright red aiming beam that corresponds to the Imager's horizontal field of view. The aiming beam should be centered over the bar code, but it can be positioned in any direction for a good read.

Linear bar code



2D Matrix symbol



The aiming beam is smaller when the Imager is closer to the code and larger when it is farther from the code. Symbolologies with smaller bars or elements (mil size) should be read closer to the unit. Symbolologies with larger bars or elements (mil size) should be read farther from the unit. (see "Depth of Field Charts" on page 10-4.) To read single or multiple symbols (on a page or on an object), hold the Imager at an appropriate distance from the target, pull the trigger, and center the aiming beam on the symbol.

Introduction

Use this section to program the hand-held or fixed mount Imager.

This programming section contains the following menuing selections:

- General Selections
- Terminal Interface Selections
- Keyboard Selections
- Communication Settings
- Imager Selections
- Output Selections
- Prefix/Suffix Selections
- Data Formatter Selections
- Output Sequence Selections

Reset Factory Settings

All operating parameters are stored in nonvolatile memory resident in the Imager, where they are permanently retained in the event of a power interruption. When you receive your Imager, certain operating parameters have already been set. These are the factory defaults, indicated by the symbol “*” on the programming menu pages (beneath the default programming symbol). Default charts begin on page 5-1.



Default

Status Check

Read the **Show Software Revision** symbol to transmit the software revision level to the host terminal. The software revision will be printed out as “REV_SW:\$ProjectRevision:1.xx\$;REV_WA:31204960-xxx.”

Read the **Show Data Formats** symbol to transmit the existing Data Format Editor formats. One format per line will be printed out.



Show Software
Revision



Show Data Formats

All Symbolologies

If you want to decode all the symbolologies allowable for your scanner, scan the **All Symbolologies On** code.



All Symbolologies
On



All Symbolologies
Off

Revision Selections

Both the following programming codes would not normally be needed unless you have a problem with the unit. An Application Support Representative may request the boot code or power PC revision information in order to trouble shoot a problem.



Power PC Revision



Boot Code Revision

Terminal Interface

IMAGETEAM 4410 and IMAGETEAM 4710 scanners are factory programmed for a keyboard wedge interface to an IBM PC AT with a USA keyboard. If this is your interface and you do not need to modify the settings, skip to "Power Saving Mode" on page 2-16 to begin programming the scanner.

If your interface is not a standard PC AT, refer to the "Supported Terminals Chart" on page 2-5 and locate the Terminal ID number for your PC. Scan the **Terminal ID** bar code below, then scan the numeric bar code(s) on the inside back cover of this manual to program the scanner for your terminal ID> Scan **Save** to save your selection.

For example, an IBM PS/2 terminal has a Terminal ID of 002. You would scan the **Terminal ID** bar code, then **0, 0, 2** from the inside back cover, then **Save**. If you make an error while scanning the digits (before scanning Save), scan the **Discard** code on the back cover and scan the digits and the **Save** code again.

Note: Factory Default for Keyboard Wedge units = 003

Note: Factory Default for True RS-232 units = 000



Terminal ID



Save

Supported Terminals Chart

Terminal	Model(s)	Terminal I.D.
DEC	PC433 SE (Portable PC)	003
DELL	Latitude (Portable PC)	003
DTK	486 SLC (Portable PC)	003
Fujitsu	Stylistic (Portable PC)	003
HHLC (Code 128 Emulation)		089
IBM	PC XT	001
IBM	PS/2 25, 30, 77DX2	002
IBM	AT, PS/2 30-286, 50, 55SX, 60, 70, 70-061, 70-121, 80	003
IBM	AT Compatibles Keyboard Emulation (Non-wedge)	003
IBM	Thinkpad 360 CSE, 34, 750 (Portable PC)	097
IBM	Thinkpad 365, 755 CV (Portable PC)	003
IBM	AT Thinkpad	106
Midwest	Micro Elite TS 30 PS (Portable PC)	003
Mitak	4022 (Portable PC)	003
Olivetti	M19, M24, M28, M200	001
Olivetti	M240, M250, M290, M380, P500	003
Reliasys	TR 175	003
RS-232 TTL		000
Televideo	990, 995, 9060	002
Texas Instruments	Extensa 560CD (Portable PC)	003
Toshiba	2600 (Portable PC)	003
Toshiba	Satellite T1960, T2130, CS (Portable PC)	003
Zenith	Z-note (Portable PC)	003

Keyboard Country

Scan the **Program Keyboard Country** bar code below, then scan the numeric bar code(s) from the inside back cover, then the **Save** bar code to program the keyboard for your country. As a general rule, the following characters are not supported by the scanner for countries other than the United States:

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



Keyboard Country

Country Code	Scan	Country Code	Scan
Belgium.....	1	Latin America.....	14
Czechoslovakia	15	Norway.....	9
Denmark.....	8	Poland.....	20
Finland.....	2	Portugal	13
France	3	Romania	25
French Canadian	18	Russia.....	26
Germany/Austria.....	4	Slovakia	22
Great Britain	7	Spain.....	10
Greece.....	17	Sweden.....	23
Netherlands	11	Switzerland	6
Hungary	19	Turkey Q.....	24
Israel.....	12	Turkey F.....	27
Italy	5	USA (<i>Default</i>).....	0



Save

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.

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

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

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.



* Regular



Caps Lock



Shift Lock



Automatic
Caps Lock

Emulate External Keyboard should be scanned if you do not have an external keyboard (IBM AT or equivalent). To connect to a laptop, you must scan the Emulate External Keyboard bar code below, then scan "Automatic Direct Connect Mode On" on page 2-8. After scanning these codes, you must re-boot your laptop.



Emulate External
Keyboard

Keyboard Modifiers

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

Control + ASCII Mode On - The scanner sends key combinations for ASCII control characters for values 00-1F. Refer to "Keyboard Function Relationships" on page 2-9 for CTRL+ ASCII Values. *Default = Off*



Control + ASCII
Mode On



* Control + ASCII
Mode Off

Turbo Mode - The scanner sends characters to an IBM AT terminal faster. (For use with IBM AT only.) 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

Automatic Direct Connect - Use this selection if you are using a laptop whose keyboard is disabled when you plug in the scanner. This selection can also be used if you have an IBM AT style terminal and the system is dropping characters. After scanning these codes, you must re-boot your computer. *Default = Off*



Automatic Direct
Connect Mode On



* Automatic Direct
Connect Mode Off

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 scanner.

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	-

Communication Settings

<Default All RS-232 Communication Settings>



Parity

Parity provides a means of checking character bit patterns for validity. The Imager can be configured to operate under **Mark**, **Space**, **Odd**, **Even**, or No (**None**) parity options. The host terminal must be set up for the same parity as the Imager, to ensure reliable communication.



Mark



Space



Odd



Even



* None

Baud Rate

This sets the baud rate from 300 bits per second to 115,200 bits per second (see next page). Programming baud rate causes the data to be sent at the specified rate. The host terminal must be set to the same baud rate as the Imager to ensure reliable communication.



300



600



1200



2400



4800



9600



19200



* 38400

Baud Rate, continued



57600



115200

Word Length Data Bits

You can set the Word Length at 7 or 8 bits of data per character. If an application requires only ASCII Hex characters 0 through 7F decimal (text, digits, and punctuation), select 7 data bits. For applications requiring use of the full ASCII set, select 8 data bits per character.



7 Data Bits



* 8 Data Bits

Word Length Stop Bits

Word Length can be set to one or two stop bits.



* 1 Stop Bit



2 Stop Bits

Hardware Flow Control

When hardware flow control is **On**, the software checks for a CTS signal before sending data. This option is useful when your application supports the CTS signal.



On



* Off

Software Flow Control

This allows control of data transmission from the Imager using software commands from the host device. When this feature is turned **Off**, no data flow control is used. When Data Flow Control is turned **On**, the host device suspends transmission by sending the XOFF character (DC3, hex 13) to the Imager. To resume transmission, the host sends the XON character (DC1, hex 11). Data transmission continues where it left off when XOFF was sent.



On



* Off

Serial Triggering

This provides a means of sending a serial trigger command to start and stop decoding. When this feature is turned **Off**, the Imager will not respond to serial trigger commands. When serial triggering is turned **On**, the Imager requires a serial trigger character to activate scanning and decoding. The unit continues to scan and decode until the **Trigger Off** character turns off the scanner, a time out occurs, or a bar code is decoded.

On the "Decimal to Hex to ASCII Conversion Chart" on page 2-36, find the hex characters you want to use to turn the trigger on and off. Locate the decimal values for those characters and scan the 2 digits for each one from the Programming Chart in the back of this manual.

When Serial Triggering is On, the default Trigger On decimal character is 18 (hex 12, DC2), and the default Trigger Off decimal character is 20 (hex 14, DC4).



On



* Off



Trigger On ‡



Trigger Off ‡



* Trigger Defaults

Note: ‡ A one to three digit decimal number and Save are required after reading this programming symbol. See "Decimal to Hex to ASCII Conversion Chart" on page 2-36, and the Programming Chart (inside back cover).

Trigger Timeout

Use this selection to set a timeout (in quarter seconds) of the Imager's trigger. Once the imager has timed out, it must be triggered again either serially (see "Serial Triggering" on page 2-14), or manually. Set the Trigger Timeout to 00 if you don't want a Trigger Timeout. *Default setting = 120 seconds*



Set Timeout ‡

Note: ‡ A one- to three digit number and Save are required after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Power Saving Mode

This provides control of the Imager's power consumption, as follows:

Low Power draws low (50%) LED current during image capture, allowing one read attempt *only* for each trigger pull. The Imager is less tolerant of hand movement during the read attempt, and powers down after the image capture is complete.

Medium Power draws a normal LED current during image capture which enhances motion tolerance. **Medium Power** attempts to read as long as the trigger is pulled, going into a “doze” (low power) state after each read attempt. The Imager powers down ten seconds after the image capture is complete.

Normal Power draws a normal LED current, attempting to read as long as the trigger is pulled or a decode is in process. The Imager doesn't go into a “doze” state after each read attempt, but will power down after two minutes if Power Hold Mode is turned Off.



Low Power



Medium Power



* Normal Power

Power Hold Mode

Power Hold **On** keeps the Imager in a ready to read state. To conserve power, this selection may be turned **Off** and the unit will power down if not used within two minutes. When you are ready to use the Imager again, restore power by pressing the trigger.



On



* Off

LED Power Level

This selection allows you to adjust LED brightness.

Off is used when no illumination is needed. **Low** is used if low illumination is sufficient. **High** (the default) is the brightest setting.



Off



Low



* High

LED Flashing

When LED Flashing is **On**, the LEDs and aiming light alternately flash until a symbol is decoded or the trigger is released.

If LED Flashing is turned **Off**, the average current draw is increased and the aiming light won't illuminate while the scanner reads a bar code. The LEDs remain on while the scanner is reading.



Off



* On

Aimer Delay

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



200 milliseconds



400 milliseconds



* Off (no delay)

Aimer Interval

Aimer Interval turns off the aiming light, or programs the aimer to come on at certain intervals when reading symbols with the scanner. You may program the scanner to use the aimer **Every Read**, **Every Second Read**, or **Every Third Read**. You may also program the scanner to use the aimer every “x” reads, by entering a number from 0 to 999 to indicate “x.”



Off



* Every Read



Every Second Read



Every Third Read



Every “x” Reads ‡

Note: ‡ A one- to three digit number and Save are required after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Centering

Use the centering feature to narrow the imager's field of view to make sure that 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. When centering is turned on, the imager only reads codes that intersect the centering window set up by the user. The centering window must intersect the center of the image. If a bar code is not within the predefined window, it will not be decoded or output by the scanner.

If centering is turned on by scanning the On bar code below, the default centering window is a 60 pixel square area in the center of the imager's field of view. The position of the window may be changed by scanning the top, bottom, left, and right centering bar codes that follow and the appropriate pixel value, if other than the default, from the [Programming Chart](#) in the back of this manual. The defaults are listed in the table below.

Window Position	Default	Minimum	Maximum	Serial Command
Top of centering window	210	000	239	DECTPYxxx
Bottom of centering window	270	240	479	DECBTYxxx
Left of centering window	290	0	319	DECTPXxxx
Right of centering window	350	320	639	DECBTXxxx

The centering function can be used in conjunction with the Aimer Delay feature (page 2-18) for the most error-free operation in applications where multiple codes are spaced closely together. Using the Aimer Delay and Centering features, the imager can emulate the operation of older systems, such as linear laser bar code scanners.



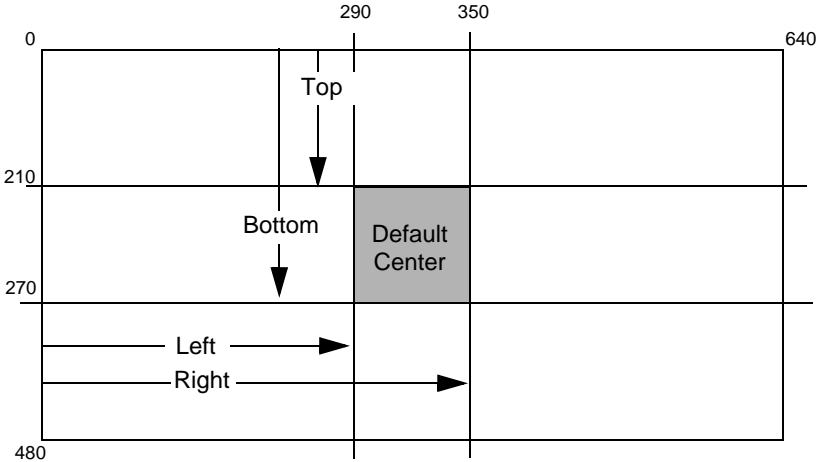
On



* Off

The figure below illustrates the default top, bottom, left, and right pixel positions. The position of the pixels is measured from the top and the left side of the

imager's field of view with the field of view being 640 by 480 pixels.





Top of Centering
Window



Top of Centering Window
Default (210)



Bottom of Centering
Window



Bottom of Centering
Window Default (270)



Left of Centering
Window



Left of Centering
Window Default (290)

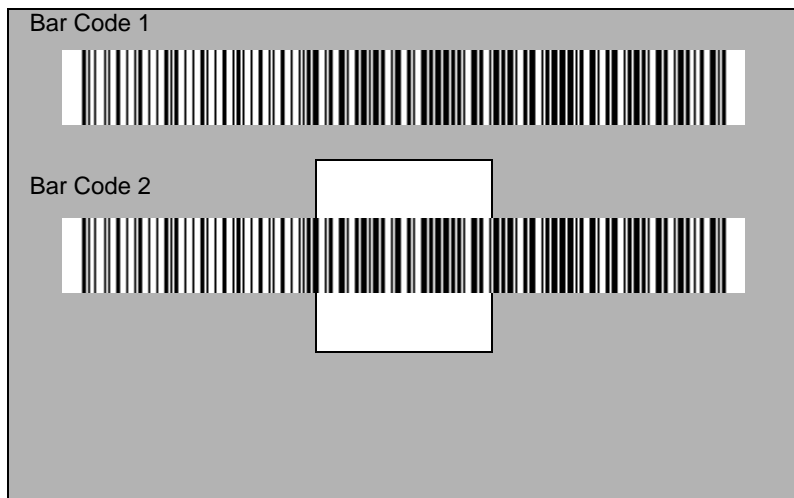


Right of Centering
Window



Right of Centering
Window Default (350)

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.



AutoTrigger

Two AutoTrigger Modes are available: Scan Stand and Presentation Mode.

When a unit is in Scan Stand mode, it remains idle as long as it sees the Scan Stand symbol. (See Scan Stand Symbol that follows.) When a different code is presented, the Imager is triggered to read the new code.

Note: The scanner automatically adjusts the illumination LEDs to the lowest light level possible to maintain a good lock on the Scan Stand symbol.

Presentation mode is for those applications where a scan stand will not work, i.e., when large packages must be scanned. To program the device for presentation mode, refer to "Presentation Mode" on page 2-24.

Scan Stand

This selection programs the Imager to work in a Scan Stand.



* Off



On

Scan Stand Symbol

Note: Scan Stand mode does not work when scanner is programmed for the HHLC interface.

When a unit is in Scan Stand mode, the LEDs shine at the Scan Stand symbol on the base of the stand which tells it to remain idle. When the Scan Stand symbol is covered, the imager turns the LEDs on at the configured power level (Default High) and attempts to find and decode bar codes in its field of view.



Scan Stand
Symbol

Presentation Mode

Note: Presentation Mode does not work when scanner is programmed for the HHLC interface.

This programs the scanner to work in Presentation Mode.



* Off



On

Presentation Re-trigger Delay

This sets the time period before the scanner can re-trigger for another read attempt. Setting a re-trigger delay protects against accidental rereads of the same bar code. Longer delays are effective in minimizing accidental rereads at POS (point of sale). Use shorter delays in applications where repetitive bar code scanning is required. Entries are in milliseconds, from 1 to 10,000. Scan the Presentation Re-trigger Delay bar code below, then scan the number of milliseconds and the Save bar code from the inside back cover.
Default = 200.



Presentation Re-trigger Delay

Presentation Lights

When using the scanner in presentation mode, the illuminating LEDs can be programmed on or off. If there is sufficient ambient light, the LEDs can be turned off by scanning the Lights Off bar code below. When a bar code is presented to the scanner, the illuminating LEDs turn on to scan the bar code and then turn off when the bar code has been read. *Default = Presentation Mode Lights On.*



* On



Off

Presentation Default

Defaults all presentation mode settings. *Defaults = Presentation Mode Off, Presentation Reread Delay 200 ms.*



Presentation Default

Fast Omni Mode

Normally, the imager searches throughout its whole field of view to determine if a bar code is present. Fast omni-directional mode provides a reduced search pattern that increases the scan rate of the imager. When fast omni mode is enabled, the imager only tries to locate bar codes in the center area of the image. Consequently, the user is required to center the aiming line over the bar code he wants to read. When a portion of the bar code is in the center area of the image, the imager locates and decodes the bar code. The entire bar code does not need to be in the center area, only a portion of it. Bar codes that are not in the center area of the image will not be found.

Note: Fast Omni Mode is not recommended when scanning Data Matrix codes.



* Normal, Full
Search Mode



Reduced Omni-
directional Mode

Beeper Volume



Off



Low



Medium



* High

Power Up Beeper



* On



Off

Output Sequence Beeper

If you are using an Output Sequence (see "Output Sequence Overview" on page 2-43), you may want to hear a beep after each bar code as it is read. Scan Output Sequence Beeper **On** to enable this feature, or **Off** to disable it.



* On



Off

Beep On Decode

If you want the scanner to beep each time it reads a bar code, leave this setting **On**. If you don't want it to beep on each read, but do want it to beep for other events, such as error conditions, set this selection to **Off**.



* On



Off

Beeper Default

Defaults all beeper settings. Defaults = Beeper Volume High, Power Up Beeper On, Output Sequence Beeper On, Beep On Read On.



Beeper Default

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.

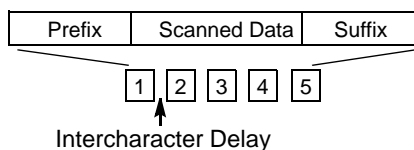
Each delay is composed of a 5 millisecond step. You can program up to 99 steps (of 5 ms each).

Intercharacter Delay

Note: This selection is valid for keyboard wedge interfaces only.

This is a delay of up to 495 milliseconds (in multiples of 5) placed between the transmission of each character of scanned data. You can program up to 99 steps (of 5 ms each). Scan the **Intercharacter Delay** bar code below, then scan the number of steps, and the **Save** bar code from the inside back cover.

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



Intercharacter Delay

To remove this delay, scan the **Intercharacter Delay** bar code, then set the number of steps to 00. Scan the **Save** bar code from the inside back cover.

User Specified Intercharacter Delay

Note: This selection is valid for keyboard wedge interfaces only.

This is a delay of up to 495 milliseconds (in multiples of 5) placed after the transmission of a particular character of scanned data. You can program up to 99 steps (of 5 ms each) to follow the character you specify. Scan the **Delay Length** bar code below, then scan the number of steps for the delay, and the **Save** bar code from the inside back cover.

Next, scan the **Character to Trigger** bar code, then the 2 digit hex value for the ASCII character that trigger the delay (refer to the "Decimal to Hex to ASCII Conversion Chart" on page 2-36). *Note:* If you make an error while scanning the digits (before scanning Save), scan **Discard** on the back cover and scan the correct digits and **Save** again.



Delay Length



Character to Trigger Delay

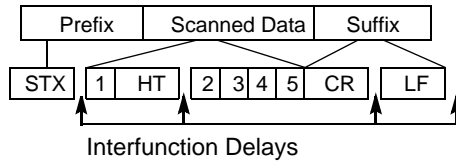
To remove this delay, scan the **Delay Length** bar code, then set the number of steps to 00. Scan the **Save** bar code from the inside back cover.

Interfunction Delay

Note: This selection is valid for keyboard wedge interfaces only.

This is a delay of up to 495 milliseconds (in multiples of 5) placed between the transmission of each segment of the message string. You can program up to 99 steps (of 5 ms each). Scan the **Interfunction Delay** bar code below, then scan the number of steps, and the **Save** bar code from the inside back cover.

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



Interfunction Delay

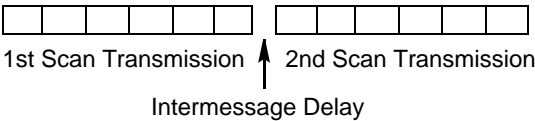
To remove this delay, scan the **Interfunction Delay** bar code, then set the number of steps to 00. Scan the **Save** bar code from the inside back cover.

Intermessage Delay

Note: This selection is valid for keyboard wedge interfaces only.

This is a delay of up to 495 milliseconds (in multiples of 5) placed between each scan transmission. You can program up to 99 steps (of 5 ms each). Scan the **Intermessage Delay** bar code below, then scan the number of steps, and the **Save** bar code from the inside back cover.

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



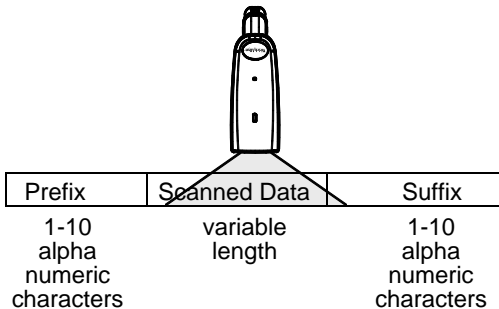
Intermessage Delay

To remove this delay, scan the **Intermessage Delay** bar code, then set the number of steps to 00. Scan the **Save** bar code from the inside back cover.

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 = CR/LF.*
- A prefix or suffix may be added or cleared from one symbology or all symbologies.
- You can add any prefix or suffix from the "Decimal to Hex to ASCII Conversion Chart" on page 2-36, 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.

Adding a Prefix or Suffix

1. Scan the **Add Prefix** (page 2-34) or **Add Suffix** symbol (page 2-34).
2. Determine the 2 digit Hex value from the "Symbology Chart" on page 2-35 for the symbology to which you want to apply the prefix or suffix.
3. Scan the 2 hex digits from the Programming Chart inside the back cover or scan **9, 9** for all symbologies.
4. Determine the hex value from the "Decimal to Hex to ASCII Conversion Chart" on page 2-36 for the prefix or suffix you wish to enter.
5. Scan the 2 digit hex value from the Programming Chart inside the back cover.

Note: Repeat Steps 4 and 5 for every prefix or suffix character.

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

6. 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 UPC only:

1. Scan **Add Suffix**.
2. Determine the 2 digit hex value from the "Symbology Chart" on page 2-35 for UPC.
3. Scan **6, 3** from the Programming Chart (inside back cover).
4. Determine the hex value from the "Decimal to Hex to ASCII Conversion Chart" on page 2-36 for the CR (carriage return).
5. Scan **0, D** from the Programming Chart (inside back cover).
6. Scan **Save**, or scan **Discard** to exit without saving.

Clearing 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.

1. Scan the **Clear One Prefix** symbol.
2. Determine the 2 digit Hex value from the "Symbology Chart" on page 2-35 for the symbology from which you want to clear the prefix or suffix.
3. Scan the 2 digit hex value from the Programming Chart inside the back cover or scan **9, 9** for all symbologies.

Your change is automatically saved.

Add a Carriage Return Suffix to All Symbolologies

Scan the following bar code if you wish to add a Carriage Return/Line Feed Suffix to all symbolologies at once. This action first clears all current suffixes, then programs a carriage return suffix for all symbolologies.



Add CR/LF Suffix
All Symbolologies

Add a Code I.D. Prefix to All Symbolologies

This selection allows you to turn on (or off) transmission of a Code I.D. before the decoded symbology. (See the "Symbology Chart" on page 2-35 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 symbolologies.



Add Code ID Prefix
All Symbolologies

Add an AIM I.D. Prefix to All Symbolologies

This selection allows you to turn on (or off) transmission of an AIM I.D. before the decoded symbology. (See the "Symbology Chart" on page 2-35 for the single character code that identifies each symbology.) This action first clears all current prefixes, then programs an AIM I.D. prefix for all symbolologies.



Add AIM ID Prefix
All Symbolologies

(See AIM Guidelines on Symbology Identifiers for more information on the AIM symbology ID characters.)

Prefix Entries



Add Prefix †



Clear One Prefix †



Clear All Prefixes

Suffix Entries



Add Suffix †



Clear One
Suffix †



Clear All Suffixes

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

Exit Selections



Save



Discard

Symbology Chart

Symbology	Code ID	AIM ID	Hex ID	Symbology	Code ID	AIM ID	Hex ID
Australian 4 State	A	JX	41	Interleaved 2 of 5	e	Jl	65
Aztec Code	z	Jz	7A	Japanese Postal	J	JX	4A
BC412**	g	JX	67	Kix (Dutch) Postal	K	JX	4B
BPO 4 State	B	JX	42	Maxicode	x	JU	78
Canadian 4 State	C	JX	43	Micro PDF417	R	JL	52
Codabar	a	JF	61	MSI	g	JM0	67
Codablock-F	q	JO	71	No Read			9C
Code 11	h	JH0	68	OCR	o	JY	6F
Code 39	b	JA	62	PDF417	r	JL	72
Code 49	l	JT	6C	Planet Code	L	JX	4C
Code 93	i	JG	69	Postnet	P	JX	50
Code 128	j	JC	6A	QR Code	s	JQ	73
Code Z**	u	JX	75	RSS/Composites	y	Je	79
Data Matrix	w	Jd	77	UPC	c	JE	63
EAN	d	JE	64	Vericode**	v	JV	76
IATA 2 of 5	f	JR	66	All Symbologies †			99

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

Note: † All Symbologies: Prefix/Suffix programming **only!**

Note: ** Not available in standard product. Only available when ordered in custom firmware

Decimal to Hex to ASCII Conversion Chart

Dec.	Hex	ASCII	Dec.	Hex	ASCII	Dec.	Hex	ASCII	Dec.	Hex	ASCII
0	00	NUL	32	20	SP	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	DEL

Data Format Editor Overview

The Data Format Editor selections are used to edit scanned data. For example, you can use the Data Format Editor to insert characters at certain points in bar code data as it is scanned.

It is not necessary to use the Data Format Editor. A set of defaults for the data format is already programmed in the scanner. The selections in the following pages are used only if you wish to alter the default settings. *Default Data Format setting = none.*

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

To Add a Data Format

1. Scan the **Enter Data Format** symbol (page 2-40).
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 scanner reverts to the primary data format. See "Alternate Data Formats" on page 2-42.) If you are programming the primary format, scan **0**. If you are programming an alternate format, scan **1**, **2**, or **3**, depending on the alternate format you are programming.
3. **Terminal Type**
Refer to the "Supported Terminals Chart" on page 2-5 and locate the Terminal ID number for your PC. Scan three numeric bar codes on the inside back cover to program the scanner 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.
4. **Code I.D.**
On page 2-35, 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.
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. (Note: 50 characters is entered as 0050. 9999 is a universal number, indicating all lengths.)
6. **Editor Commands**
Refer to the "Format Editor Commands" on page 2-38. Scan the symbols that represent the command you want to enter. 94 alphanumeric characters may be entered for each symbology data format.
7. Scan **Save** 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**. If you are clearing an alternate format, scan **1**, **2**, or **3**, depending on the alternate format you are clearing. Scan the Terminal Type (refer to the "Supported Terminals Chart" on page 2-5), Code I.D. and the length of the format you want to delete. That length data format for that symbology is deleted and all other formats are unaffected.

- **Save**

This exits, saving any Data Format changes.

- **Discard**

This exits without saving any Data Format changes.

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 "Decimal to Hex to ASCII Conversion Chart" on page 2-36.)
- 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 "Decimal to Hex to ASCII Conversion Chart" on page 2-36.)
- 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 "Decimal to Hex to ASCII Conversion Chart" on page 2-36.)
- 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 "Decimal to Hex to ASCII Conversion Chart" on page 2-36, 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 "Decimal to Hex to ASCII Conversion Chart" on page 2-36.)
- 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 "Decimal to Hex to ASCII Conversion Chart" on page 2-36.)
- 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 "Decimal to Hex to ASCII Conversion Chart" on page 2-36.)
- 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 "Decimal to Hex to ASCII Conversion Chart" on page 2-36.)

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 suppress 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 "Decimal to Hex to ASCII Conversion Chart" on page 2-36.)
- FC Disable 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 = E4nnxx₁xx₂yy₁yy₂...zz₁zz₂** where nn is the total count of both characters to be replaced plus replacement characters; xx₁ defines characters to be replaced and xx₂ defines replacement characters, continuing through zz₁ and zz₂.
- 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 "Decimal to Hex to ASCII Conversion Chart" on page 2-36.)
- 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

See page 2-37 through page 2-39 for a description of Data Format selections and commands.



Enter Data Format †



Default
Data Format
(none)



Clear One
Data Format †



Clear All
Data Formats

Exit Selections



Save Current
Data Format Changes



Discard Current
Data Format Changes

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

Data Formatter

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



* On/Not Required



Off

Require Data Format

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



Required

Show Data Formats

Read the ***Show Data Formats*** bar code to transmit the existing data formats. One format per line is printed out.



Show Data Formats

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 2-37), 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 scanner 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

Output Sequence Overview

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.

To Add an Output Sequence

1. Scan the **Enter Sequence** symbol (see "Output Sequence Editor" on page 2-46).
2. **Code I.D.**
On the "Symbology Chart" on page 2-35, 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.)
4. **Character Match Sequences**
On the "Decimal to Hex to ASCII Conversion Chart" on page 2-36, find the Hex value that represents the character(s) you want to match. Use the Programming Chart to read the alphanumeric combination that represents the ASCII characters. (99 is the Universal number, indicating all characters.)
5. **End Output Sequence Editor**
Scan **FF** to enter an Output Sequence for an additional symbology, or **Save Current Output Sequence Changes** to save your entries.

Other Programming Selections

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

Output Sequence Example

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

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



A - Code 39



B - Code 128



C - Code 93

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

SEQBLK62999941FF6A999942FF69999943FF

The breakdown of the command line is shown below:

SEQBLKsequence editor start command

62 code identifier for **Code 39**

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

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

FF termination string for first code

6A code identifier for **Code 128**

9999 code length that must match for Code 128, 9999 = all lengths

42 start character match for Code 128, 42h = "B"

FF termination string for second code

69 code identifier for **Code 93**

9999 code length that must match for Code 93, 9999 = all lengths

43 start character match for Code 93, 43h = "C"

FF termination string for third code

Require Output Sequence

When an output sequence is **Required**, all output data must conform to an edited sequence or the scanner will not transmit the output data to the host device.

When it's **On/Not Required**, the scanner will attempt to get the output data to conform to an edited sequence, but if it cannot, the scanner 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 scanner decodes it.

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



Required



On/Not Required



Off

Output Sequence Editor



Enter Sequence †



Default Sequence

Exit Selections



Save Current
Output Sequence Changes



Discard Current
Output Sequence Changes

Note: If you want the scanner to beep after each bar code is read, please see "Output Sequence Beeper" on page 2-27.

† One or more two digit numbers and Save are required after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Multiple Symbols

Note: This feature does not work when the Imager is in Low Power mode.

When this programming selection is turned **On**, it allows you to read multiple symbols with a single pull of the Imager's trigger. If you press and hold the trigger, aiming the Imager at a series of symbols, it reads unique symbols once, beeping (if turned on) for each read. Data is output as the imager finds and decodes the symbols. The imager attempts to find and decode new symbols as long as the trigger is pulled. When this programming selection is turned **Off**, the Imager will only read the symbol closest to the aiming beam.



On



* Off

No Read

With No Read turned **On**, the Imager notifies you if a code cannot be read. In the Quick*View Scan Data Window (see "Scan Data Window" on page 7-4), an "NR" appears when a code cannot be read. If No Read is turned **Off**, the "NR" will not appear.



On



* Off

If you want a different notation than "NR," for example, "Error," or "Bad Code," you can edit the output message using the Data Formatter (see page 2-37). The hex code for the No Read symbol is 9C.

Print Weight

Print Weight is used to adjust the way the scanner reads Matrix symbols. If a scanner 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. A value from 0 to 7 may be used to adjust the print weight. The default print weight is 4.



† Set Print Weight



* Default

† A one digit number from 1 to 7 is required after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Function Code Transmit

When this selection is enabled and function codes are contained within the scanned data, the scanner transmits the function code to the terminal. Charts of these function codes are provided in [Chapter 9](#), Supported Interface Keys. When the scanner is in keyboard wedge mode, the scan code is converted to a key code before it is transmitted.



* On



Off

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



Introduction

Use this section to program the hand-held Imager.

This programming section contains the following menuing selections:

- Linear Symbology Selections
- Stacked Symbology Selections
- Postal Symbology Selections
- 2D Matrix Symbology Selections
- Diagnostics

Linear Symbolologies

Codabar

<Default All Codabar Settings>



Codabar



* On



Off

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.



Start/Stop Transmit



* Don't Transmit
Start/Stop

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a misread.

Linear Symbolgies

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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Codabar, continued

Check Character

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

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

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



* No Check Character



Validate,
But Don't Transmit



Validate,
And Transmit

Linear Symbolologies

Code 39

< Default All Code 39 Settings >



Code 39



* On



Off

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.



Transmit



* Don't Transmit

Linear Symbolologies

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Code 39, continued

Full ASCII

If Full ASCII Code 39 decoding is turned on, 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 #.

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

Linear Symbolologies

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, continued

Check Character

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

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

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



* No Check Character



Validate,
But Don't Transmit



Validate,
And Transmit

Linear Symbolologies

Code 11

< Default All Code 11 Settings >



Code 11



On



* Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Linear Symbolologies

Code 11, continued

Check Digits Required

This option sets whether 1 or 2 check digits are required with Code 11 bar codes.



One Check Digit



* Two Check Digits

Linear Symbolologies

Interleaved 2 of 5

< Default All Interleaved 2 of 5 Settings >



Interleaved 2 of 5



* On



Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Linear Symbolologies

Interleaved 2 of 5, continued

Check Digit

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

When Check Digit is set to **Validate, And Transmit**, the scanner will only read Interleaved 2 of 5 bar codes printed with a check digit, and will transmit this digit at the end of the scanned data.



* No Check Digit



Validate,
But Don't Transmit



Validate,
And Transmit

Linear Symbolologies

IATA 2 of 5

< Default All IATA 2 of 5 Settings >



IATA 2 of 5



On



* Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Linear Symbolologies

MSI

< Default All MSI Settings >



MSI



On



* Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Linear Symbolologies

MSI, continued

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

Linear Symbolologies

Code 93

< Default All Code 93 Settings >



Code 93



On



* Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Linear Symbolologies

Code 128

< Default All Code 128 Settings >



Code 128



* On



Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Linear Symbolologies

ISBT

Scan the **On** code below if you wish to decode ISBT bar codes. (ISBT codes are a combination of multiple linear symbols used to mark blood bags.)



On



* Off

Linear Symbolologies

EAN/JAN 8

< Default All EAN/JAN 8 Settings >



EAN/JAN 8



On



* Off

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

Linear Symbolologies

EAN/JAN 8 Addenda

You can add 2 or 5 digits to the end of all scanned EAN/JAN 8 data.



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 used, the scanner will only read EAN/JAN 8 bar codes that have addenda.



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.



Space



* No Space

Linear Symbolologies

EAN/JAN 13

< Default all EAN/JAN 13 Settings >



EAN/JAN 13



* On



Off

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

Linear Symbolologies

EAN/JAN 13 Addenda

You can add 2 or 5 digits to the end of all scanned EAN/JAN 13 data.



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 used, the scanner will only read EAN/JAN 13 bar codes that have addenda.



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.



Space



* No Space

Linear Symbolologies

UPC A

< Default All UPC A Settings >



UPC A



* On



Off

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

Number System

The numeric system digit of a UPC symbol is normally transmitted, but the unit can be programmed so it will not transmit it.



* Transmit
Number System



Don't Transmit
Number System

Linear Symbolologies

UPC A Addenda

You can add 2 or 5 digits to the end of all scanned UPC A data.



2 Digit Addenda On



* 2 Digit
Addenda Off



5 Digit Addenda On



* 5 Digit
Addenda Off

UPC A Addenda Required

When **Addenda Required** is used, the scanner will only read UPC A bar codes that have addenda.



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.



Space



* No Space

Linear Symbolologies

UPC E0

< Default All UPC E0 Settings >



UPC E0

Most UPC 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 the UPC E1 selection (see "UPC E1" on page 3-24).



UPC E0
On



* UPC E0
Off

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

Number System

The numeric system digit of a UPC symbol is normally transmitted, but the unit can be programmed so it will not transmit it.



Transmit
Number System



* Don't Transmit
Number System

Linear Symbolologies

UPC E0, continued

Version E Expand

Version E Expand, expands the UPC-E code to the 12 digit, UPC-A format.



Expand



* Don't Expand

UPC E1

Most UPC bar codes lead with the 0 number system. For these codes, use the UPC E0 selection (see "UPC E0" on page 3-23). If you need to read codes that lead with the 1 number system, use the UPC E1 selection.



UPC E1
On



* UPC E1
Off

UPC E0/E1 Addenda

You can add 2 or 5 digits to the end of all scanned UPC E0 and E1 data.



2 Digit Addenda On



* 2 Digit
Addenda Off



5 Digit Addenda On



* 5 Digit
Addenda Off

Linear Symbolologies

UPC E0/E1 Addenda Required

When **Addenda Required** is used, the scanner will only read UPC E0 and E1 bar codes that have addenda.



Required



* Not Required

UPC E0/E1 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.



Space



* No Space

Linear Symbologies

RSS-14

< Default All RSS-14 Settings >



RSS-14

Reduced Space Symbology (RSS) is a family of linear bar codes which meets restricted space requirements, while still providing full product identification.



RSS-14 On



* RSS-14
Off

RSS-14 Limited

< Default All RSS-14 Limited Settings >



RSS-14 Limited



RSS-14 Limited On



* RSS-14 Limited
Off

Linear Symbolologies

RSS-14 Expanded

< Default All RSS-14 Expanded Settings >



RSS-14 Expanded



RSS Expanded On



* RSS Expanded
Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Stacked Symbolologies

Codablock

< Default All Codablock Settings >



Codablock



On



* Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Stacked Symbolologies

PDF417

< Default All PDF417 Settings >



PDF417



* On



Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Stacked Symbolologies

MicroPDF417

< Default All MicroPDF417 Settings >



MicroPDF417



* On



Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Stacked Symbolologies

Code 49

< Default All Code 49 Settings >



Code 49



On



* Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum

Message Length



Maximum

Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Stacked Symbolologies

EAN•UCC Composite Codes

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



On



* Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Stacked Symbolologies

TLC39

TLC39 stands for TCIF Linked Code 39 (where TCIF stands for Telecommunications Industry Forum). 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. In fact, the linear component may be decoded as Code 39 even if TLC39 is disabled. The MicroPDF417 component can only be decoded if TLC39 is enabled.



On



* Off

Postal Symbolologies

Note: *Note:*

For best performance when reading a postal symbology, all other postal symbologies should be turned off.

U.S. Postal Service POSTNET Code



On



* Off

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

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

Postal Symbolologies

British Post Office 4 State Code



On



* Off

Canadian 4 State Code



On



* Off

Dutch Postal Code



On



* Off

Australian 4 State Code



On



* Off

Japanese Postal Service



On



* Off

2D Matrix Symbologies

QR Code

< Default All QR Code Settings >



QR Code



On



* Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

2D Matrix Symbolologies

Data Matrix

< Default All Data Matrix Settings >



Data Matrix



* On



Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

2D Matrix Symbologies

MaxiCode

< Default All MaxiCode Settings >



MaxiCode



On



* Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

The desired message length and **Save** must be input after reading this programming symbol. Refer to the Programming Chart (inside back cover).

2D Matrix Symbolologies

MaxiCode, continued

Structured Carrier Message Only

A MaxiCode is made up of a primary and secondary message. The primary portion, also known as the “structured carrier message,” contains information of primary importance, such as package destination. The secondary portion contains less important data, such as package weight. If your application requires only the primary data from MaxiCodes, turn Structured Carrier Message Only **On**. Turn this feature on if you are trying to read a damaged Maxicode. The scanner may be able to extract just the structured carrier message if the center portion of the code is intact.



On



* Off

2D Matrix Symbologies

Aztec Code

< Default All Aztec Code Settings >



Aztec Code



* On



Off

Message Length

The message length selection is used to set the valid reading length of the bar code. If the data length of the scanned bar code doesn't match the valid reading length, the scanner will not read the symbol. You may wish to set the same value for minimum and maximum length to force the scanner to read fixed length bar code data. This helps reduce the chances of a 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



Minimum
Message Length



Maximum
Message Length

A one- to two-digit number and **Save** are required after reading this programming symbol. Refer to the Programming Chart (inside back cover).

Diagnostics

Test Menu

When you scan the Test Menu **On** code then scan a programming code in this manual, the scanner 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. You may wish to use this feature in conjunction with Quick*View (see page 7-1).

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

Note:



On



* Off

2D PQA (Print Quality Assessment)

Two-dimensional Print Quality Assessment (2D PQA) is a feature of Hand Held Products's image readers where the data from the successful read of a 2D bar code symbol is augmented with lines of text both identifying the symbol and also reporting graded measurement parameters obtained from it.

To utilize 2D PQA, you need to have an IT4410/4710 with revision 1.91.2.18 or higher. To see displayed results, Microsoft® Notepad, a word processor/editing program, or Quick*View (see page 7-1) is recommended.

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



Introduction

Use this section to program the hand-held Imager to read machine readable fonts used in optical character recognition (OCR). The IT4410 reads 6 to 60 point OCR typeface.

The IT4410/4710 will read the following fonts:

- OCR-A

```
0123456789ABCDEF GHIJ KLMNOP QRSTUVW XYZ
() <> /\ + - * $
```

- OCR-B

```
0123456789 ABCDEF GHIJ KLMNOP QRSTUVW XYZ
() <> ^ + - * $
```

- U.S. Currency Serial Number (Money)

```
I 07700277 F
*
```

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 4-2 for programming codes that will enable your scanner to read OCR-A, OCR-B or U.S. Currency fonts. See "Creating OCR Templates" on page 4-4 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 scanner.

OCR

Default All OCR Settings turns off all OCR capability in the scanner, so the scanner 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 8 digit default templates are reinstated for any future use of the **OCR On** codes listed below.

< Default All OCR Settings >



OCR

OCR-A On allows you to scan characters in the OCR-A font. The default setting allows you to scan any 8 digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see "Creating an OCR Template" on page 4-4).



OCR-A On

OCR-B On allows you to scan characters in the OCR-B font. The default setting allows you to scan any 8 digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see "Creating an OCR Template" on page 4-4).



OCR-B On

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 8 digit combination. If you have created an OCR template, character combinations that fit the template can be scanned (see "Creating an OCR Template" on page 4-4).



U.S. Currency On

All OCR Off turns off all OCR capability in the scanner, so the scanner 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.



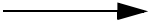
* All OCR Off

OCR Direction

This setting can be used to prevent misreads of character strings that could be interpreted differently in different orientations when you know the orientation of the characters that are being read in relation to the scanner (e.g., 80086996 could read as 80086996 or 96698008) This feature is generally used with a fixed mount scanner. Scan the appropriate bar code to set the direction. *Default = Left-to-Right.*



* Left-to-Right



Top-to-Bottom



Right-to-Left



Bottom-to-Top



Creating 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 scanner. 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 scanner 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 a check character position
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”
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.	

To Add an OCR Template

1. Begin building the template.
Scan the **Enter OCR Template** symbol (page 4-9).
2. 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 A: You need to read any combination of 8 digits. The template would be:

dddddddd

To create this template, you would scan the **Enter OCR Template** symbol (page 4-9), then scan the **d** from the OCR Programming Chart after the Sample Codes in the back of this manual 8 times. Scan **Save OCR Template** (page 4-9). This would let you read any string of 8 digits, for example:

37680981

3. Character Match Sequences

On the "Decimal to Hex to ASCII Conversion Chart" on page 2-36, 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 B: You need to read 3 digits, 3 specific characters (ABC), 3 digits. The template would be:

ddd414243ddd
 └───┘
 hex codes for
 letters A, B, and C

To create this template, you would scan the **Enter OCR Template** symbol (page 4-9), scan the **d** from the OCR Programming Chart after the Sample Codes in the back of this manual 3 times, scan **414243** from the Programming Chart inside back cover (the hex characters for "A," "B," and "C"), then scan the **d** from the inside back cover 3 more times. Scan **Save OCR Template** (page 4-9). This would let you read any string of 3 digits, "ABC," then any string of 3 digits, for example:

551ABC983

4. Adding Spaces

You may also need to put spaces in your template.

Example C: You need to read 3 digits, space, 3 specific characters (ABC), space, 3 digits. The template would be:

ddd2041424320ddd
 ↓ ↓
 hex code for a space

To create this template, you would scan the **Enter OCR Template** symbol (page 4-9), scan the **d** from the OCR Programming Chart after the Sample Codes in the back of this manual 3 times, scan **2041424320** from the Programming Chart inside back cover (the hex characters for "space," "A," "B," "C," "space"), then scan the **d** from the inside back cover 3 more times. Scan **Save OCR Template** (page 4-9). This would let you read any string of 3 digits, space, "ABC," space, then any string of 3 digits, for example:

551 ABC 983

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

5. 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 scanner to accept many OCR formats. To do this, you would string together each format with a “t.” This tells the scanner to read optical characters that match any one of the formats in the template.

Example D: You need to read any combination of 8 digits, or a combination of 4 digits, 2 uppercase letters, and 2 digits. The template would be:

dddddddtdddlldd

To create this template, you would scan the **Enter OCR Template** symbol (page 4-9), scan the **d** from the OCR Programming Chart after the Sample Codes in the back of this manual 8 times, then scan the **t** to create the “or” statement. Then you would scan the characters for the 2nd template. Scan the **d** 4 times, scan **l** 2 times, then scan **d** 2 more times. Scan **Save OCR Template** (page 4-9). This would let you read either type of format, for example:

99028650

or

9902XZ50

You can string together as many templates as you need.

Creating a User-Defined Variable

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 4-9). The letters g and h can then be used in an OCR template to define the variable you specified.

Example E: 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 scan the **Enter User-Defined Variable g** symbol (page 4-9). Scan **414243** from the inside back cover (the hex characters for “A,” “B,” and “C”). Scan **Save OCR Template** (page 4-9). 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 6 digits, and had an A, B, or C trailing. So you would be able to read:

654321ABC

or

654321BAC

or

654321CCC

Adding an OCR Check Character

You may want to program the scanner to read OCR strings that have a check character. The IT4410/4710 reads and strips out the OCR check character created using a modulo 10 or modulo 36 table. (Modulo 10 being digits 0-9, modulo 36 being digits 0-9 and characters A-Z.)

Scan the **Modulo 10** or **Modulo 36 Check Character** bar code to specify the type of check character used in the OCR strings you’re scanning. The scanner will then only read OCR character strings with a valid check character. The IT4410/4710 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 F: You need to read any combination of 6 digits, with a modulo 10 check character in the 7th position. The template would be:

ddddddc

To create this template, you would scan the **Modulo 10 Check Character** symbol (page 4-9). Then scan the **Enter OCR Template** symbol, scan the **d** from the inside back cover 6 times, and scan the **c** once. Scan **Save OCR Template** (page 4-9). This template will let you read any combination of 6 digits with a correct check character after. (If the check character is invalid, the scanner will issue an error beep.) For example, the following string could be scanned:

0123455

and the output would be:012345

Reading Multi-Row OCR

The IT4410/4710 is capable of decoding multi-row OCR text. Consider the following example. This example shows serial commands as would be entered using Quick*View.

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

12345678
A B C D E F G H

To read the first row of OCR data, you would menu 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"|||||||".

To read both lines of OCR at one time, use the variable *r* to indicate the start of a new row. All of 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"dddddddr|||||||".

To read the three rows below, you would use the template command "OCRTMP"dddddddr|||||||rlll|dddd".

12345678
A B C D E F G H
A B C D 1234

Note: Note: Reading more than three rows of OCR is not recommended. Contact the factory if you have an application that requires reading 4 or more rows of OCR.

OCR Template Codes



Enter OCR Template †



Enter User-
Defined Variable
"g" †



Enter User-
Defined Variable
"h" †



OCR Modulo 10
Check
Character



OCR Modulo 36
Check
Character

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

Exit Selections



Save OCR Template



Discard OCR Template



Default Charts

The following chart lists the factory default settings (indicated by a “*” on the programming menu pages).

Parameter	Default Setting	Page
Terminal ID - Keyboard Wedge	003	page 2-4
Terminal ID - True RS-232	000	page 2-4
Keyboard Country	0	page 2-6
Keyboard Style	Regular	page 2-7
Keyboard Modifiers	Control + ASCII Off	page 2-8
	Turbo Mode Off	page 2-8
	Numeric Keypad Off	page 2-8
	Auto Direct Connect Off	page 2-8
<i>Communication (RS-232) Selections</i>		
Parity	None	page 2-10
Baud Rate	38400	page 2-11
Word Length Data Bits	8	page 2-12
Word Length Stop Bits	1	page 2-12
Hardware Flow Control	Off	page 2-13
Software Flow Control	Off	page 2-13
Serial Triggering	On = 18, Off = 20	page 2-14
Trigger Timeout	60 seconds	page 2-15
<i>Imager Selections</i>		
Power Saving Mode	Normal Power	page 2-16
Power Hold Mode	Off	page 2-17
LED Power Level	High	page 2-17
LED Flashing	On	page 2-18
Aimer Delay	Off (no delay)	page 2-18
Aimer Interval	Every Read	page 2-19
Centering	Off	page 2-20
	Top of Centering Window = 210	page 2-22
	Bottom of Centering Window = 270	page 2-22
	Left of Centering Window = 290	page 2-22
	Right of Centering Window = 350	page 2-22
Scan Stand	Off	page 2-23
Presentation Mode	Off	page 2-24

Parameter	Default Setting	Page
Presentation Re-Trigger Delay	200 ms	page 2-24
Presentation Lights	On	page 2-25
Beeper Volume	High	page 2-26
Power Up Beeper	On	page 2-27
Output Sequence Beeper	On	page 2-27
Beep On Decode	On	page 2-27
Intercharacter Delay	0	page 2-28
User Specified Intercharacter Delay	0	page 2-28
Interfunction Delay	0	page 2-29
Intermessage Delay	0	page 2-30
<i>Prefix/Suffix Selections</i>		
Prefix	None	page 2-34
Suffix	CR/LF	page 2-34
<i>Data Formatter Selections</i>		
Data Format	None	page 2-40
Data Formatter	On	page 2-41
Require Data Format	Not Required	page 2-41
<i>Output Sequence Selections</i>		
Multiple Symbols	Off	page 2-47
Require Output Sequence	Don't Require	page 2-45
No Read	Off	page 2-47
Print Weight	4	page 2-48
Video Reverse	Off	page 2-49
Function Code Transmit	On	page 2-48
<i>Linear Symbologies</i>		
Codabar	On	page 3-2
Start/Stop Characters	Don't Transmit	page 3-2
Message Length	Min = 2, Max = 60	page 3-2
Check Character	No Check Character	page 3-3
Code 39	On	page 3-4
Start/Stop Characters	Don't Transmit	page 3-4
Message Length	Min = 2, Max = 48	page 3-5
Full ASCII	Off	page 3-5
Check Character	No Check Character	page 3-6

Parameter	Default Setting	Page
Code 11	Off	page 3-7
Message Length	Min = 1, Max = 80	page 3-7
Check Digits Required	Two Check Digits	page 3-8
Interleaved 2 of 5	On	page 3-9
Message Length	Min = 4, Max = 80	page 3-9
Check Digit	No Check Character	page 3-10
IATA 2 of 5	Off	page 3-11
Message Length	Min = 4, Max = 80	page 3-11
MSI	Off	page 3-12
Message Length	Min = 4, Max = 48	page 3-12
Check Digit	Don't Transmit	page 3-13
Code 93	Off	page 3-14
Message Length	Min = 0, Max = 80	page 3-14
Code 128	On	page 3-15
Message Length	Min = 0, Max = 80	page 3-15
ISBT	Off	page 3-16
EAN/JAN 8	Off	page 3-17
Check Digit	Don't Transmit	page 3-17
EAN/JAN 8 Addenda	Off	page 3-18
EAN/JAN 8 Addenda Required	Off	page 3-18
EAN/JAN 8 Addenda Separator	No Space	page 3-18
EAN/JAN 13	On	page 3-19
Check Digit	Don't Transmit	page 3-19
EAN/JAN 13 Addenda	Off	page 3-20
EAN/JAN 13 Addenda Required	Off	page 3-20
EAN/JAN 13 Addenda Separator	No Space	page 3-20
UPC A	On	page 3-21
Check Digit	Don't Transmit	page 3-21
Number System	Transmit	page 3-21
UPC A Addenda	Off	page 3-22
UPC A Addenda Required	Off	page 3-22
UPC A Addenda Separator	No Space	page 3-22
UPC E0	Off	page 3-23
Check Digit	Don't Transmit	page 3-23
Number System	Don't Transmit	page 3-23

Parameter	Default Setting	Page
Version E Expand	Don't Expand	page 3-24
UPC E1	Off	page 3-24
UPC E0/E1 Addenda	Off	page 3-24
UPC E0/E1 Addenda Required	Off	page 3-25
UPC E0/E1 Addenda Separator	No Space	page 3-25
RSS-14	Off	page 3-26
RSS-14 Limited	Off	page 3-26
RSS-14 Expanded	Off	page 3-27
RSS-14 Expanded Message Length	Min = 1, Max = 80	page 3-27
Codablock	Off	page 3-28
Message Length	Min = 0, Max = 2048	page 3-28
PDF417	On	page 3-29
Message Length	Min = 1, Max = 2750	page 3-29
MicroPDF417	On	page 3-30
Message Length	Min = 1, Max = 2750	page 3-30
Code 49	Off	page 3-31
Message Length	Min = 1, Max = 81	page 3-31
EAN•UCC Composite Codes	Off	page 3-32
Message Length	Min = 1, Max = 300	page 3-32
<i>Postal Symbology Selections</i>		
POSTNET Code (USPS)	Off	page 3-34
Planet Code	Off	page 3-34
BPO 4 State Code	Off	page 3-35
Canadian 4 State Code	Off	page 3-35
Dutch Code	Off	page 3-35
Australian 4 State Code	Off	page 3-35
Japanese Postal Service	Off	page 3-35
<i>2D Matrix Selections</i>		
QR Code	Off	page 3-36
Message Length	Min = 1, Max = 3500	page 3-36
Data Matrix	On	page 3-37
Message Length	Min = 1, Max = 1500	page 3-37
MaxiCode	Off	page 3-38

Parameter	Default Setting	Page
Message Length	Min = 1, Max = 150	page 3-38
SCM Only	Off	page 3-39
Aztec Code	On	page 3-40
Message Length	Min = 1, Max = 3750	page 3-40
<i>OCR Selections</i>		
OCR-A	Off	page 4-2
OCR-B	Off	page 4-2
U.S. Currency	Off	page 4-2



Software Development Kit (SDK)

The IMAGETEAM™ Software Development Kit (SDK) provides a set of libraries, tools, and sample source code to help software developers create an interface between their host system and a Hand Held Products image/data capture device. The SDK consists of:

- The API Definition and Documentation
- API Libraries
- Sample Code

Features of the SDK

- The SDK contains software libraries that interact with image/data capture engines using a documented API (Application Programmers Interface).
- The image/data capture engine is easily integrated into a variety of host platforms.
- The SDK captures images and saves them to standard .bmp file format. Captured images can then be easily imported into a variety of common tools and applications.
- Libraries are available for MS-DOS and 32-bit MS Windows®. This includes Windows CE 2.x, Windows 95, 98, NT 4.0, and Win 2000. Additional libraries can be created for custom embedded platforms upon request.

Refer to the Software Development Kit User's Guide for complete information on using the SDK.



Quick*View Demonstration Software Instructions

Quick*View is a Microsoft Windows® program that displays decoded symbol messages and captures images (for instance, ID photographs) from the IMAGETEAM 4410/4710 Imager. Bar code information and images are displayed in the Quick*View window.

Setting Up the Imager and the Quick*View Software

1. Connect the Imager to the PC's com port (com port 1 or com port 2) via the appropriate interface cable (see "Unpacking the Imager" on page 1-2). Connect the appropriate power supply to the Imager. (The Imager cannot get its power from the PC's com port.)

For Microsoft Windows 95 or NT 4.0

2. Insert the Quick*View diskette labelled "32 Bit Release" into Drive A or B.
3. From the Start Menu, click on Run. Type "x:\setup" in the command line box, where "x" represents a drive letter, typically "A" for the 3.5" floppy drive on most PCs. Click on OK.
4. Follow the instructions in the setup screens.
5. To start the Quick*View program, from the Start Menu click on Programs, Quickview, QuickView (32 Bit).

Installing Quick*View from the Web

1. Access the Hand Held Products web site at www.handheld.com.
2. Click in the **Quick Search** text box and enter **Quick*View**.
3. Click on **Search Now**.
4. Click on the entry for Quick*View.
5. When prompted, select **Save File**, and save the files to the **c:\windows\temp** directory.
6. Once you have finished downloading the file, exit the web site.
7. Using Explorer, go to the **c:\windows\temp** file.
8. Double click on the **Quickview.exe** file. Follow the screen prompts to install the Quick*View program.
9. To start Quick*View, from the Start Menu click on **Programs, Quick*View, Quick*View**.

*Note: If you wish, you can create a shortcut to the Quick*View executable on your desktop.*

Temporary Quick*View Configuration

For a quick download communication configuration, scan the Quick*View bar code and the scanner will be temporarily configured for Quick*View settings.

*Note: If you have a unit capable of keyboard wedge mode, scan the bar code below and the unit will communicate in RS-232 mode, allowing it to work with Quick*View. To convert the scanner back to keyboard wedge communication, cycle the power.*



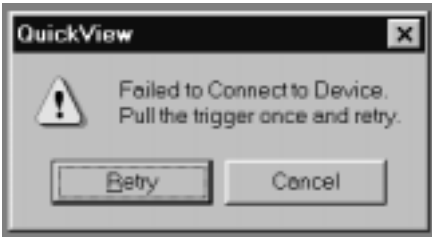
Quick*View

Using the Quick*View Software

Upon startup, the Quick*View splash screen appears for approximately three seconds. Quick*View will then attempt to establish communications with the Imager.

If Communication Cannot Be Established

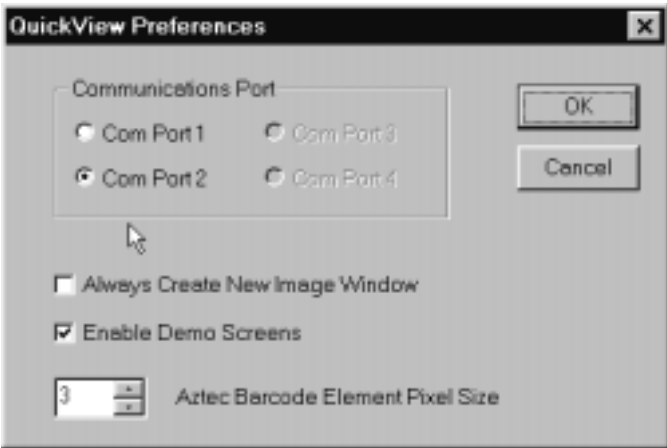
This message appears if communication cannot be established:



Quick*View defaults to com 1 as the communications port. If you have plugged the Imager into another com port, you must Cancel out of this message.

Click on **File - Preferences**. This popup appears:

Click on the radio button for the appropriate com port, then click on **OK**. Quick*View should now be able to locate the Imager.



You may also need to pull the Imager's trigger to establish communications between the PC and the Imager.

If you want Quick*View to search for the Imager and establish communication, click on **Device - Auto Baud Detect**.

Scan Data Window

Once successful communication has been established, you can scan codes and display the bar code data in a window. Select **View - Scan Data Window**.



As you scan bar codes, the data appears in the Serial Scan Data Window.



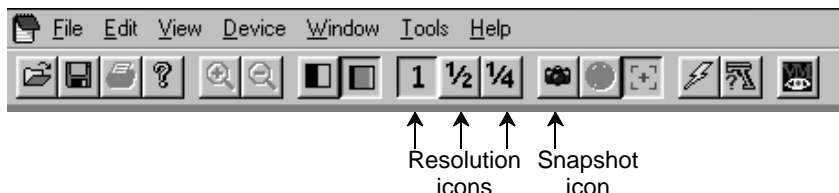
You can alter the font in this window by using the **Font** button, or clear all data in the window with the **Clear** button.

If you wish to see the mnemonic for any embedded control characters, you should put a check in the checkbox for **Expand Control Chars** (the default setting). If you wish to see the ASCII control character rather than the mnemonic, turn off this checkbox.

Note: The ASCII control character that is displayed is dependent on the font you are using.

Snapshot

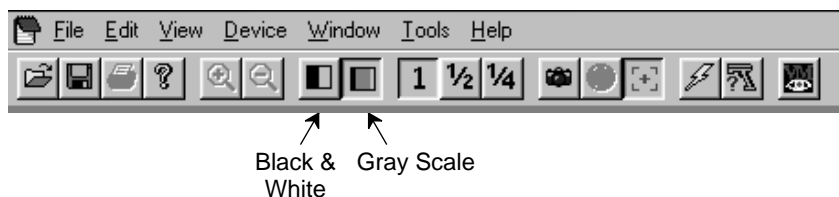
You may also use the IMAGETEAM 4410/4710 to capture an image. Click on **Device - Snapshot**, or click on the camera icon in the button bar to activate this feature.



Select the resolution you wish to use for this image, either Full, Half or Quarter Resolution. (These can also be selected by clicking on the **1**, **1/2**, or **1/4** buttons in the button bar.)

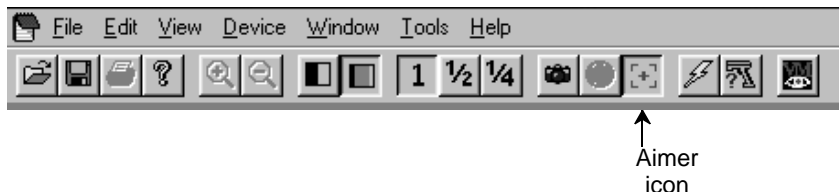
Note: The higher resolution, the sharper the image, and the larger the size of the resulting file. Higher resolution images also take longer to process.

You must also select whether you wish to capture the image in **Gray Scale** or in **Black & White**.



*Note: If you need to see exactly what the Imager sees (for example, if you are diagnosing a bar code), you should set the image to **Black & White**.*

If you want the Imager to display illuminated aiming brackets, click on **Device - Snapshot Properties - Use Aimer During Image Capture**, or click on the aimer icon in the button bar.



Snapshot, continued

Pull the Imager's trigger to capture an image. Captured images appear in the Quick*View window.



As you move the mouse over the image, the cursor changes to a magnifying glass. Left click to zoom in to the image, right click to zoom out.

Saving an Image File

If you wish to save the file as a bitmap, click on **File - Save As**. Enter the location and file name you wish to use for this file. Click on **Save** and a bitmap file will be saved.

Open Com Port

If you wish to open a com port which does *not* have a device attached, you can do so by selecting **File - Open Com Port**.

This dialog box appears:

Click on the arrows to select the Baud Rate, Parity, and Data Bits for the com port you wish to open. Click on Open Port and Quick*View opens the com port whether or not there is a device attached. This feature may be beneficial when troubleshooting a device.



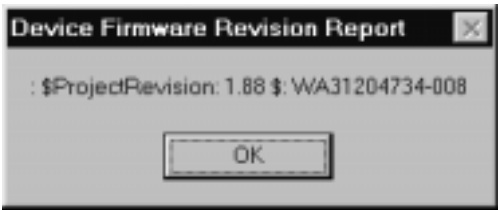
Reporting Firmware Revision

To find out what software version the Imager is using, click on **Device - Report Device Firmware Revision**, or click on the Imager icon in the button bar.



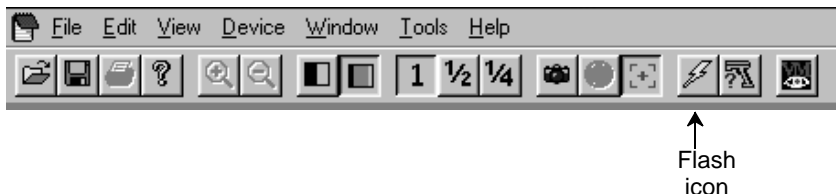
Imager icon

This popup lists the firmware information:



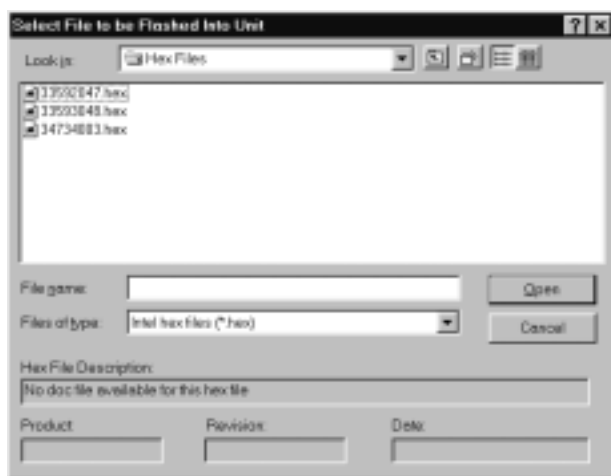
Load New Imager Software

If you need to upgrade the Imager's software, you can load a new software file into the Imager's ROM. Click on **Device - Load Firmware File into ROM** or click on the lightning flash icon in the button bar.



You will be prompted for the name of the hex file:

Select the hex file and click on Open. Quick*View will flash the new software into your Imager's ROM.



Imager Power Settings

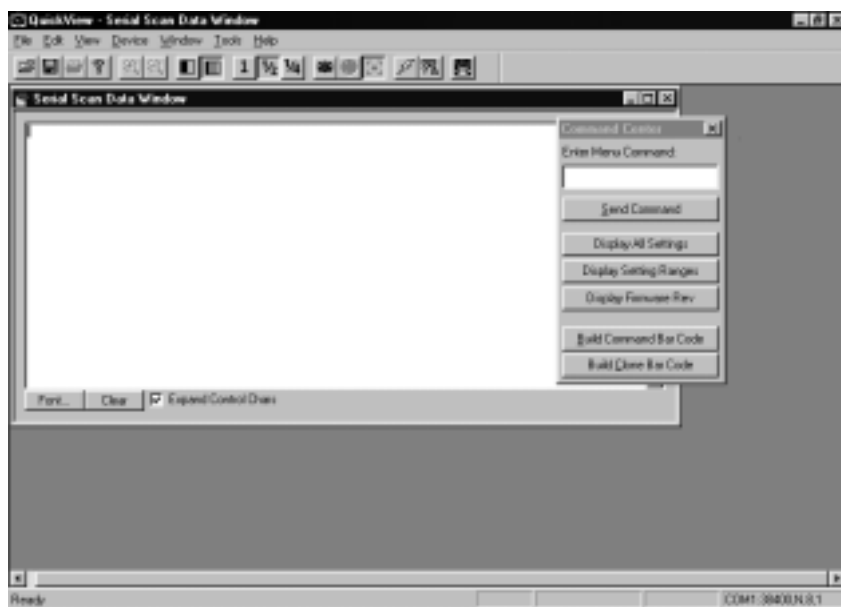
By default, the Imager will power down after 2 minutes of inactivity. If you wish to keep the Imager powered up indefinitely, click on **Device - Hold Power**. To reset the Imager to the default power setting, click on **Device - Remove Power Hold**.

Trigger Settings

If you wish to control the Imager's trigger with the software, you can select **Device - Trigger On**, or **Device - Trigger Off**. These settings turn the trigger on and off just as if you were holding the trigger or releasing it manually. This feature may be necessary when working with a fixed device that has no trigger.

RS-232 Serial Commands

Click on **View - Serial Command Window** to display the Command Center window which allows you to enter serial commands to the Imager. Click on **View - Scan Data Window** to open a window which displays serial data in a text format.



Serial commands are used to program the Imager and to query the Imager about programming parameters. The serial programming commands are listed beginning on page 7-14. Information about performing queries is listed on page 7-11.

Serial Programming Commands

The serial programming commands can be used in place of the programming bar codes listed in [Chapter 3](#). Both the serial commands and the programming bar codes will program the Imager. For complete descriptions and examples of each programming command, refer to [Chapter 3](#).

To enter a serial command, click in the **Enter Menu Command** text box and type in the command(s) you wish to use. If you are typing in more than one command, separate the commands with a semicolon (;). Click on **Send Command** to send the command(s) to the Imager.

Responses

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

ACK Indicates a good command which has been processed.

ENQ Indicates a bad command.

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

Command Center Buttons

Display All Settings displays the settings currently saved for the Imager.

Display Setting Ranges displays all the possible serial commands and the allowable data field parameters.

Display Firmware Rev displays the software version being used by the Imager.

Build Command Bar Code is used to create an Aztec code from a command or set of commands entered in the Serial Window. (The size of the Aztec code can be altered using the **File - Preferences** selection.) This bar code can then be printed out and used to program other Imagers.

Build Clone Bar Code is used to capture the settings from one Imager, and input them to another Imager. When the Build Clone Bar Code button is clicked, Quick*View captures the settings from the attached Imager and creates an Aztec code which can be printed. (The size of the Aztec code can be altered using the **File - Preferences** selection.) Any Imager that scans the resulting clone bar code will be programmed to the same settings as the original Imager.



Query Commands

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

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

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

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

Examples of Query Commands

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 Imager's current setting for Codabar Coding Enable?

Enter: **cbrena?.**

Response: **CBRENA1[ACK]**

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

Example #4: What are the Imager's settings for all Codabar selections?

Enter: **cbr?.**

Response: **CBRENA1[ACK],**
 CHK0[ACK],
 CKX0[ACK],
 SSX0[ACK],
 MIN2[ACK],
 MAX60[ACK],
 DFT[ACK].

This response indicates that the Imager's Codabar Coding Enable (CBRENA) is set to 1, or on;
the Check Character (CHK and CKX) is set to 0, or No Check Character;
the Start/Stop Character is set to 0, or Don't Transmit;
the Minimum Message Length (MIN) is 2 characters;
the Maximum Message Length (MAX) is 60 characters;
and the Default setting (DFT) has no value.

Trigger Commands

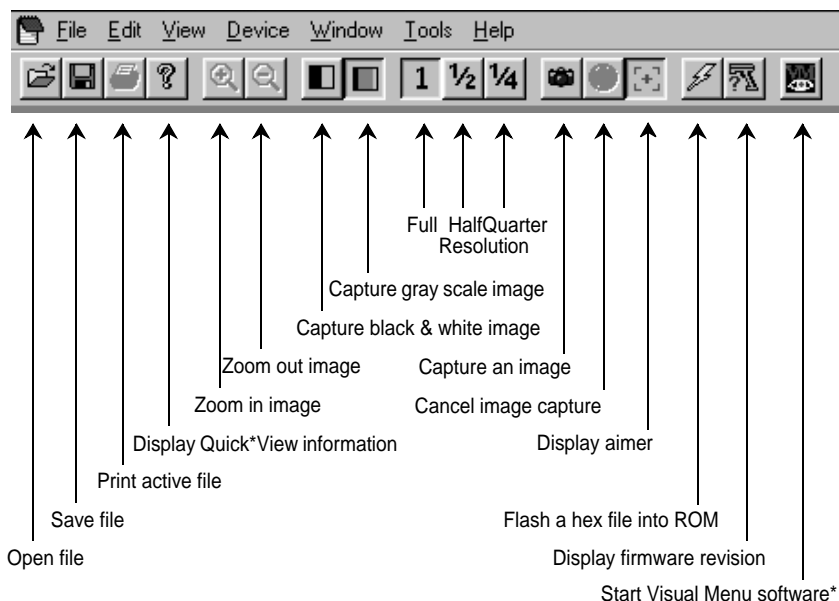
You can activate and deactivate the scanner with the serial trigger commands. First, the scanner must be programmed for accepting serial commands by scanning the Serial Triggering On bar code on page 2-14, or by sending the serial command (TRGSER1.) on page 7-15. When the serial trigger factory default settings are used and serial triggering is enabled, the trigger is activated and deactivated by sending the following commands:

Activate SYN T CR
Deactivate SYN U CR

The scanner scans until a bar code has been read, until the deactivate command is sent, or until the serial timeout has been reached. See "Trigger Timeout" on page 2-15 for a description and the serial command on page 7-15.

Button Bar

The Quick*View button bar and the button functions are shown below.



*Note: *This icon only appears if you have Visual Menu software installed. Visual Menu is available free of charge from the Hand Held Products website at www.handheld.com.*

Serial Programming Commands

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
Factory Default Settings	Default	DEFAULT.
Status Check		
Show Software Revision		REV?.
Show Data Formats		DFMBK3?.
Enable All Symbologies		ALLENA1.
Disable All Symbologies		ALLENA0.
Output Selections		
Power PC Revision		REVMPC.
Boot Code Revision		REV_BT.
Terminal ID		TERMID.
Keyboard Country		KBDCTY.
Keyboard Style	Regular	KBDSTY0.
	Caps Lock	KBDSTY1.
	Shift Lock	KBDSTY2.
	Emulate External Keyboard	KBDSTY5.
	Automatic Caps Lock	KBDSTY6.
Keyboard Modifiers	*Control + ASCII Off	KBDCAS0.
	Control + ASCII On	KBDCAS1.
	*Turbo Mode Off	KBDTMD0.
	Turbo Mode On	KBDTMD1.
	*Numeric Keypad Off	KBDNPS0.
	Numeric Keypad On	KBDNPS1.
	*Auto Direct Conn. Off	KBDADC0.
	Auto Direct Conn. On	KBDADC1.
Communication Settings		
*Default All RS-232 Communication Settings		232DFT.
Parity	*None	232PARN.
	Mark	232PARM.
	Space	232PARS.
	Odd	232PARO.
	Even	232PARE.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
Baud Rate	*38400 BPS	232BDR38400.
	300 BPS	232BDR300.
	600 BPS	232BDR600.
	1200 BPS	232BDR1200.
	2400 BPS	232BDR2400.
	4800 BPS	232BDR4800.
	9600 BPS	232BDR9600.
	19200 BPS	232BDR19200.
	57600 BPS	232BDR57600.
	115200 BPS	232BDR115200.
Word Length Data Bits	*8 Data Bits	232LEN8.
	7 Data Bits	232LEN7.
Word Length Stop Bits	*1 Stop Bit	232STP1.
	2 Stop Bits	232STP2.
Hardware Flow Control	*Off	232CTS0.
	On	232CTS1.
Software Flow Control	*Off	232SFL0.
	On	232SFL1.
Serial Triggering	*Off	TRGSER0.
	On	TRGSER1.
	*Trigger Defaults	TRGDFT.
	Set Trigger On value ¹	TRG_ONXX.
	Set Trigger Off value ¹	TRGOFFXX.
Trigger Timeout	Set Timeout	TRGSTO.
Hardware Triggering ²	Trigger Mode	HWTRIG1.
	Power Hold Mode	HWTRIG0.
Imager Selections		
Power Saving Mode	*Normal Power	PWRDFT; SCNLEDHIGH; HSTSSS0.
	Low Power	PWRTIM0; SCNLEDLOW; HSTSSS1.
	Medium Power	PWRTIM10000; SCNLEDHIGH; HSTSSS0.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
Power Hold Mode	On	PWR_ON1.
	*Off	PWR_ON0.
LED Power	*High	SCNLEDHIGH.
	Off	SCNLEDOFF.
	Low	SCNLEDLOW.
LED Flashing	*On	HSTLED0.
	Off	HSTLED1.
Aimer Delay	*Off (no delay)	HSTAIM0.
	200 milliseconds	HSTAIM200.
	400 milliseconds	HSTAIM400.
Aimer Interval	*Every Read	HSTINT1.
	Every 2nd Read	HSTINT2.
	Every 3rd Read	HSTINT3.
	Every "x" Read	HSTINT.
	Off	HSTINT0.
Centering	On	DECWIN1.
	*Off	DECWIN0.
	Top of Centering Window	DECTPY.
	Bottom of Centering Window	DECBTY.
	Left of Centering Window	DECTPX.
	Right of Centering Window	DECBTX.
Scan Stand	*Off	SSTMOD0.
	On	SSTMOD1.
Presentation Mode	On	PRSMOD1.
	*Off	PRSMOD0.
Presentation Re-Trigger Delay	*200 ms	PRSTIM.
Presentation Lights	*On	PRSLON1.
	Off	PRSLON0.
Presentation Default		PRSDFT.
<i>Output Selections</i>		
Beeper Volume	*High	BEPVOL50.
	Medium	BEPVOL25.
	Low	BEPVOL5.
	Off	BEPVOL0.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
Power Up Beeper	*Enable	BEPRST1.
	Disable	BEPRST0.
Output Sequence Beeper	*On	BEPCLK1.
	Off	BEPCLK0.
Beep On Decode	*On	BEPDEC1.
Beeper Volume	Off	BEPDEC0.
Beeper Default		BEPDFT.
Intercharacter Delay		DLYCHR.
User Specified Intercharacter Delay	Character to Trigger Delay	DLY_XX.
	Delay Length	DLYCRX.
Interfunction Delay		DLYFNC.
Intermessage Delay		DLYMSG.
<i>Prefix/Suffix Selections</i>		
Add CR Suffix to All Symbolologies		SUFBK2990D.
Add Code I.D. Prefix to All Symbolologies		PREBK2995C80.
Add AIM I.D. Prefix to All Symbolologies		PREBK2995C81.
Prefix	Add Prefix	PREBK2.
	Clear One Prefix	PRECL2.
	Clear All Prefixes	PRECA2.
Save Current Prefix Changes		MNUSAV.
Discard Current Prefix Changes		MNUABT.
Suffix	Add Suffix	SUFBK2.
	Clear One Suffix	SUFCL2.
	Clear All Suffixes	SUFCA2.
Save Current Suffix Changes		MNUSAV.
Discard Current Suffix Changes		MNUABT.
<i>Data Formatter Selections</i>		
Data Format Editor	*No Format	DFMDF3.
	Enter Format	DFMBK3.
	Clear One Format	DFMCL3.
	Clear All Formats	DFMCA3.
Save Current Data Format Changes		MNUSAV.
Discard Current Data Format Changes		MNUABT.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
Data Formatter	*On	DFM_EN1.
	Off	DFM_EN0.
Require Data Format	Require	DFM_EN2.
Show Data Formats		DFMBK3?.
Alternate Data Formats	1	VSAF_1.
	2	VSAF_2.
	3	VSAF_3.
<i>Output Sequence Selections</i>		
Require Output Sequence	Require	SEQ_EN2.
	On/Not Required	SEQ_EN1.
	Off	SEQ_EN0.
Output Sequence Editor	*Default Sequence	SEQDFT.
	Enter Sequence	SEQBLK.
Save Current Sequence Changes		MNUSAV.
Discard Current Sequence Changes		MNUABT.
Multiple Symbols	*Off	SHOTGN0.
	On	SHOTGN1.
No Read	*Off	SHWNRD0.
	On	SHWNRD1.
Print Weight	Default	PRTWGT4.
Set Print Weight		PRTWGT.
Video Reverse	*Off	VIDREV0.
	On	VIDREV1.
Function Code Transmit	Off	RMVFNC0.
	*On	RMVFNC1.
<i>Linear Symbolgy Selections</i>		
Codabar	*Default All Codabar Settings*	CBRDFT.
Codabar	*On	CBRENA1.
	Off	CBRENA0.
Codabar Start/Stop Char.	*Don't Transmit	CBRSSX0.
	Transmit	CBRSSX1.
Codabar Message Length	Minimum	CBRMIN.
	Maximum	CBRMAX.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
Codabar Check Char.	*No Check Char.	CBRCK20.
	Validate, But Don't Transmit	CBRCK21.
	Validate, and Transmit	CBRCK22.
Code 39	*Default All Code 39 Settings*	C39DFT.
Code 39	*On	C39ENA1.
	Off	C39ENA0.
Code 39 Start/Stop Char.	*Don't Transmit	C39SSX0.
	Transmit	C39SSX1.
Code 39 Full ASCII	*Off	C39ASC0.
	On	C39ASC1.
Code 39 Message Length	Minimum	C39MIN.
	Maximum	C39MAX.
Code 39 Check Char.	*No Check Char.	C39CK20.
	Validate, But Don't Transmit	C39CK21.
	Validate, and Transmit	C39CK22.
Code 39 Mesa Composite	On	3MSENA1.
	*Off	3MSENA0.
Code 11	*Default All Code 11 Settings*	C11DFT.
Code 11	On	C11ENA1.
	*Off	C11ENA0.
Code 11 Message Length	Minimum	C11MIN.
	Maximum	C11MAX.
Code 11 Check Digits Required	1 Check Digit	C11CK20.
	*2 Check Digits	C11CK21.
Interleaved 2 of 5	*Default All Interleaved 2 of 5 Settings*	I25DFT.
Interleaved 2 of 5	*On	I25ENA1.
	Off	I25ENA0.
Interleaved 2 of 5 Message Length	Minimum	I25MIN.
	Maximum	I25MAX.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
Interleaved 2 of 5 Check Digit	*No Check Char.	I25CK20.
	Validate, But Don't Transmit	I25CK21.
	Validate, and Transmit	I25CK22.
Interleaved 2 of 5 Mesa Composite	On	IMSENA1.
	*Off	IMSENA0.
IATA 2 of 5	*Default All IATA 2 of 5 Settings*	A25DFT.
IATA 2 of 5	On	A25ENA1.
	*Off	A25ENA0.
IATA 2 of 5 Message Length	Minimum	A25MIN.
	Maximum	A25MAX.
MSI	*Default All MSI Settings*	MSIDFT.
MSI	On	MSIENA1.
	*Off	MSIENA0.
MSI	Minimum	MSIMIN.
	Maximum	MSIMAX.
MSI Check Digit	Transmit	MSICKX1.
	*Don't Transmit	MSICKX0.
Code 93	*Default All Code 93 Settings*	C93DFT.
Code 93	On	C93ENA1.
	*Off	C93ENA0.
Code 93 Message Length	Minimum	C93MIN.
	Maximum	C93MAX.
Code 93 Mesa Composite	On	9MSENA1.
	*Off	9MSENA0.
Code 128	*Default All Code 128 Settings*	128DFT.
Code 128	*On	128ENA1.
	Off	128ENA0.
Code 128 Message Length	Minimum	128MIN.
	Maximum	128MAX.
Code 128 ISBT	*Off	ISBENA0.
	On	ISBENA1.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
Code 128 Mesa Composite	On	1MSENA1.
	*Off	1MSENA0.
EAN/JAN 8	*Default All EAN/ JAN 8 Settings*	EA8DFT.
EAN/JAN 8	On	EA8ENA1.
	*Off	EA8ENA0.
EAN/JAN 8 Check Digit	*Don't Transmit	EA8CKX0.
	Transmit	EA8CKX1.
EAN/JAN 8 2 Digit Addenda	*Off	EA8AD20.
	On	EA8AD21.
EAN/JAN 8 5 Digit Addenda	*Off	EA8AD50.
	On	EA8AD51.
EAN/JAN 8 Addenda Required	*Not Required	EA8ARQ0.
	Required	EA8ARQ1.
EAN/JAN 8 Addenda Separator	*No Space	EA8ADS0.
	Space	EA8ADS1.
EAN/JAN 13	*Default All EAN/ JAN 13 Settings*	E13DFT.
EAN/JAN 13	*On	E13ENA1.
	Off	E13ENA0.
EAN/JAN 13 Check Digit	*Don't Transmit	E13CKX0.
	Transmit	E13CKX1.
EAN/JAN 13 2 Digit Addenda	*Off	E13AD20.
	On	E13AD21.
EAN/JAN 13 5 Digit Addenda	*Off	E13AD50.
	On	E13AD51.
EAN/JAN 13 Addenda Required	*Not Required	E13ARQ0.
	Required	E13ARQ1.
EAN/JAN 13 Addenda Separator	*No Space	E13ADS0.
	Space	E13ADS1.
EAN Mesa Composite	On	EMSENA1.
	*Off	EMSENA0.
UPC A	*Default All UPC A Settings*	UPADFT.
UPC A	*On	UPAENA1.
	Off	UPAENA0.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
UPC A Check Digit	*Don't Transmit	UPACKX0.
	Transmit	UPACKX1.
UPC A Number System	Don't Transmit	UPANSX0.
	*Transmit	UPANSX1.
UPC A 2 Digit Addenda	*Off	UPAAD20.
	On	UPAAD21.
UPC A 5 Digit Addenda	*Off	UPAAD50.
	On	UPAAD51.
UPC A Addenda Required	*Not Required	UPAARQ0.
	Required	UPAARQ1.
UPC A Addenda Separator	*No Space	UPAADS0.
	Space	UPAADS1.
UPC E0	*Default All UPC E0 Settings*	UE0DFT.
UPC E0	On	UE0ENA1.
	*Off	UE0ENA0.
UPC E0 Check Digit	*Don't Transmit	UE0CKX0.
	Transmit	UE0CKX1.
UPC E0 Number System	*Don't Transmit	UE0NSX0.
	Transmit	UE0NSX1.
UPC E0 Version E Expand	*Don't Expand	UE0EXP0.
	Expand	UE0EXP1.
UPC E1	On	UE1ENA1.
	*Off	UE1ENA0.
UPC E0/E1 2 Digit Addenda	*Off	UPEAD20.
	On	UPEAD21.
UPC E0/E1 5 Digit Addenda	*Off	UPEAD50.
	On	UPEAD51.
UPC E0/E1 Addenda Required	*Not Required	UPEARQ0.
	Required	UPEARQ1.
UPC E0/E1 Addenda Separator	*No Space	UPEADS0.
	Space	UPEADS1.
UPC Mesa Composite	On	UMSENA1.
	*Off	UMSENA0.
RSS-14	*Default All RSS-14 Settings*	RSSDFT.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
RSS-14	On	RSENA1.
	*Off	RSENA0.
RSS-14 Limited	*Default All RSS-14 Limited Settings*	RSLDFT.
RSS-14 Limited	On	RSENA1.
	*Off	RSENA0.
RSS-14 Limited	*Default All RSS-14 Expanded Settings*	RSEDFT.
RSS Expanded	On	RSEENA1.
	*Off	RSEENA0.
RSS Expanded Msg. Length	Minimum	RSEMIN.
	Maximum	RSEMAX.
<i>Stacked Symbolgy Selections</i>		
Codablock	*Default All Codablock Settings*	CBFDFT.
Codablock	On	CBFENA1.
	*Off	CBFENA0.
Codablock Msg. Length	Minimum	CBFMIN.
	Maximum	CBFMAX.
PDF417	*Default All PDF417 Settings*	PDFDFT.
PDF417	*On	PDFENA1.
	Off	PDFENA0.
PDF417 Message Length	Minimum	PDFMIN.
	Maximum	PDFMAX.
MicroPDF417	*Default All Micro PDF Settings*	MPDDFT.
MicroPDF417	*On	MPDENA1.
	Off	MPDENA0.
MicroPDF417 Message Length	Minimum	MPDMIN.
	Maximum	MPDMAX.
Code 49	*Default All Code 49 Settings*	C49DFT.
Code 49	On	C49ENA1.
	*Off	C49ENA0.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
Code 49 Msg. Length	Minimum	C49MIN.
	Maximum	C49MAX.
EAN•UCC Composite Codes	On	COMENA1.
	*Off	COMENA0.
EAN•UCC Composite Msg. Length	Minimum	COMMIN.
	Maximum	COMMAX.
TLC39	On	T39ENA1.
	*Off	T39ENA0.
<i>Postal Symbology Selections</i>		
POSTNET Code (USPS)	On	NETENA1.
	*Off	NETENA0.
POSTNET Check Digit	*Don't Transmit	NETCKX0.
	Transmit	NETCKX1.
BPO 4 State Code (BPO)	On	BPOENA1.
	*Off	BPOENA0.
Canadian 4 State Code	On	CANENA1.
	*Off	CANENA0.
Dutch Code	*Off	KIXENA0.
	On	KIXENA1.
Australian 4 State Code	On	AUSENA1.
	*Off	AUSENA0.
Japanese Postal Code	On	JAPENA1.
	*Off	JAPENA0.
Planet Code	On	PLNENA1.
	*Off	PLNENA0.
Planet Check Digit	*Don't Transmit	PLNCKX0.
	Transmit	PLNCKX1.
<i>2D Matrix Symbology Selections</i>		
QR Code Settings	*Default All QR Code Settings*	QRCDFT.
QR Code	On	QRCENA1.
	*Off	QRCENA0.
QR Code Message Length	Minimum	QRCMIN.
	Maximum	QRCMAX.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
Data Matrix Settings	*Default All Data Matrix Settings*	IDMDFT.
Data Matrix	*On	IDMENA1.
	Off	IDMENA0.
Data Matrix Msg. Length	Minimum	IDMMIN.
	Maximum	IDMMAX.
MaxiCode Settings	*Default All MaxiCode Settings*	MAXDFT.
MaxiCode	On	MAXENA1.
	*Off	MAXENA0.
MaxiCode Msg. Length	Minimum	MAXMIN.
	Maximum	MAXMAX.
SCM Only	*Off	MAXSCM0.
	On	MAXSCM1.
Aztec Code Settings	*Default All Aztec Code Settings*	
		AZTDFT.
Aztec Code	*On	AZTENA1.
	Off	AZTENA0.
Aztec Code Msg. Length	Minimum	AZTMIN.
	Maximum	AZTMAX.
Test Menu	*Off	TSTMNU0.
	On	TSTMNU1.
Print Quality Assessment	*Off	2D_PQA0.
	On	2D_PQA1.

Selection	Setting <i>* Indicates Default Setting</i>	Serial Command
OCR	*Default All OCR Settings*	OCRDFT.
	*All OCR Off	OCRENA0.
	OCR-A On	OCRENA1.
	OCR-B On	OCRENA2.
	U.S. Currency On	OCRENA3.
	Enter OCR Template	OCRTMP.
	Enter User-Defined Variable "g"	OCRGPG.
	Enter User-Defined Variable "h"	OCRGPH.
	OCR Modulo 10 Check Character	OCRCHK"0123456789".
	OCR Modulo 36 Check Character	OCRCHK"0123456789A BCDEFGHIJKLM NOPQRSTUVWXYZ".
	*Direction – left-to-right	ORCDIR0.
	Direction – top-to-bottom	ORCDIR1.
	Direction – right-to-left	ORCDIR2.
	Direction – bottom-to-top	ORCDIR3.
	Save OCR Template	MNUSAV.
	Discard OCR Template	MNUABT.

1. XX = decimal value. Trigger on is defaulted to 18 and trigger off is defaulted to 20.
2. See the SDK User's Guide for the commands needed to utilize Hardware Triggering.

Imaging Commands

Image Commands Help File

If you send the IMGCMD command to the imager, the imager sends out an ASCII "help file" that describes the available imager capture commands. Explanations of the most commonly used imager capture commands follow.

Image Ship

An image is taken whenever the trigger of the IT4410/4710 is depressed. The last image is always stored in memory. You may "ship" the image by using the IMGSHIP command. The image ship command has many different modifiers that can be used to change the look of the image that is output by the scanner. The default image file format used by IMGSHIP is a gray scale KIM.

IMGSHIP Modifiers

Compensation: flattens the image to account for variations in illumination across the image.

0C - compensation disabled

1C - compensation enable, default

Pixel Ship: can be used to decimate the image by shipping only certain regularly spaced pixels. There is no limit to the number of pixels that can be skipped; although after a certain point, the image becomes unusable.

1S - ship every pixel

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

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

Image Cropping: Ship a window of the image

xxxT - top of image with xxx indicating the pixel row at which to start shipping. Range: 000 - 480.

xxxB - bottom of image with xxx indicating the pixel row at which to stop shipping. Range: 000 - 480.

xxxL - left of image with xxx indicating the pixel column at which to start shipping. Range: 000 - 640.

xxxR - right of image with xxx indicating the pixel column at which to stop shipping. Range: 000 - 640.

Image 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 Gray scale

4F - Uncompressed Binary

5F - Uncompressed Gray scale

6F - JPEG image

7F - Outlined image

JPEG Image Quality

xJ (x = 1 - 100)

1J = worst quality

100J = best quality

Pixel Depth: Indicates the number of bits.

8D - 8 bit, gray scale image

1D - 1 bit, black and white image

Image Inversion: Used to invert the image in fix mount applications where the imager is mounted upside down.

0I - no inversion, default

1I - inversion

Image Capture/Ship and Image Get Commands

Close Image Capture - IMGCAP

The imager command, IMGCAP, sets up the imager to capture and ship an image the next time the imager's trigger is pulled. All of the modifiers available for the IMGSHIP command (page 7-27) also are available for the IMGCAP command to change the look of the image that is output by the scanner. When using the IMGCAP command, the imager is optimized to capture images of close objects (e.g., signatures, address labels). The default image file format used by IMGCAP is a gray scale KIM.

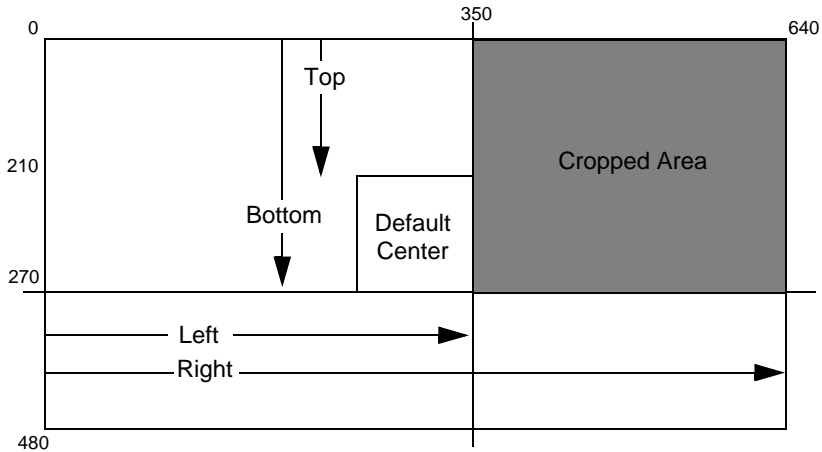
Far Away Image Capture - IMGGET

The imager command, IMGGET, works the same way as the IMGCAP command, except the imager is set up for capturing images of scenes, similar to a digital camera. The allowable exposure times that the imager uses are longer than those for IMGCAP to account for the fact that the imager's LEDs have little effect at longer distances. The default image file format used by IMGGET is JPEG.

Image Cropping/Shipping Example

The figure below illustrates the cropping of an area (shaded) of the image. The cropped area is shipped and stored as a one bit, black and white JPEG. The cropped area would be 270 pixels by 290 pixels with the following designations: Top = 000; Bottom = 270; Left = 350; Right = 640.

The command string would be IMGSHPO00T270B350L640R6F1D.



Intelligent Signature Capture Commands

Intelligent signature capture is a method to ship only the part of an image to the host application. This method reduces transfer time and file size while making signature capture easy.

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 scanner to output only the area of the image corresponding to the signature capture box. The scanner also automatically adjusts for aspect ratio and distortion issues that arise due to scanner skew with respect to the bar code.

An important aspect of the intelligent signature capture functionality 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 scanner is held from the bar code, assuming that the entire signature capture area is within the scanner's field of view.



The intelligent signature capture for this application is:

IMGBOX40S0X70Y190W100H1R0F

IMGBOX Modifiers

S - Bar Code Aspect Ratio: This is the ratio of the bar code height to the narrow element width. In the above example, the narrow element width is 10 mil (0.010") and the bar code height is 0.400 inches, resulting in a value of $S = 0.400/0.010$ 0 = 40.

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

Y - Vertical Bar Code Offset: This is 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 above example, the horizontal offset is 0.70," resulting in a value for $Y = 0.70/0.010 = 70$.

H - Height of Signature Capture Area: In the above example, the height of the area to be captured is 1.00," resulting in a value of $H = 1.00"/0.010 = 100$. The value for H is slightly larger to have some extra image capture area outside of the signature capture box.

W - Width of Signature Capture Area: In the above example, the width of the area to be captured is 1.90," resulting in a value of $W = 1.90"/0.010" = 190$. The value for W is slightly larger to have some extra image capture area outside of the signature capture box.

R - Resolution of Signature Capture Area: This is 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.

D - Pixel Depth:

1D - binarized image

8D - gray scale image

F - File Format:

- 0F - KIM format, default
- 1F - TIFF Binary
- 2F - TIFF Binary Group 4 Compressed
- 3F - TIFF Gray scale
- 4F - Uncompressed Binary
- 5F - Uncompressed Gray scale
- 6F - JPEG image
- 7F - Outlined image





Visual Menu Introduction

Visual Menu provides the ability to configure a scanning device by connecting the scanner to the com port of a PC. Visual Menu allows you to download upgrades to a scanner's firmware, change programmed parameters, and create and print programming bar codes. Using Visual Menu, you can even set up the configuration for a scanner which is not attached to your PC. This enables one expert user to establish the configuration settings for all the devices your company uses, then save these configuration files for others. A configuration file can be e-mailed or, if you prefer, an expert user can create a bar code (or series of bar codes) which contains all the customized programming parameters, and mail or fax the bar code(s) to any location. Users in other locations can scan the bar code(s) to load in the customized parameters.

To communicate with a scanner, Visual Menu requires that the PC have at least one available serial communication port and an RS-232 cable to connect the port to the device. A power supply, which plugs into the cable, is also required.

Visual Menu Operations

The Visual Menu program performs the following operations:

- Displays all configuration data, and saves the information to a file on your PC.
- Configures the device to meet your specific requirements. Visual Menu has all the programming parameters which are available via programming bar codes in this User's Guide.
- Creates and prints a clone bar code which contains the program and configuration data from one device. This bar code can then be used to program additional devices with the same parameters.
- Selects a device from a list, then performs offline or online file configuration for that device.

Temporary Visual Menu Configuration

For quick download communication configuration, scan the **Visual Menu** bar code to temporarily configure the scanner for Visual Menu settings.

Note: If you have a unit capable of keyboard wedge mode, scan the bar code below and the unit will communicate in RS-232 mode, allowing it to work with Visual Menu. To convert the scanner back to keyboard wedge communication, cycle the power.



Visual Menu

Installing Visual Menu from the Web

1. Access the Hand Held Products web site at www.handheld.com.
2. Click on the **Quick Search** text box and enter **Visual Menu**.
3. Click on **Search Now**.
4. Click on the entry for Visual Menu.
5. When prompted, select **Save File**, and save the files to the **c:\windows\temp** directory.
6. Once you have finished downloading the file, exit the web site.
7. Using Explorer, go to the **c:\windows\temp** file.
8. Double click on the **Visualmenu.exe** file. Follow the screen prompts to install the Visual Menu program.
9. To start Visual Menu, from the Start Menu click on **Programs, Visual Menu, Visual Menu**.

Note: If you wish, you can create a shortcut to the Visual Menu executable on your desktop.

Interface Keys

Supported Interface Keys		IBM AT/XT and PS/2 Compatibles, WYSE PC/AT	IBM XTs and Compatibles	IBM, DDC, Memorex Telex, Harris *
NUL	00	Reserved	Reserved	Reserved
SOH	01	Enter (KP)	CR/Enter	Enter
STX	02	Caps 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

Supported Interface Keys		IBM AT/XT and PS/2 Compatibles, WYSE PC/AT	IBM XTs and Compatibles	IBM, DDC, Memorex Telex, Harris*
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		IBM, Memorex Telex (102)*	Memorex Telex (88)**
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

Supported Interface Keys		IBM, Memorex Telex (102) *	Memorex Telex (88) **
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

Supported Interface Keys		IBM, Memorex Telex (102)*	Memorex Telex (88)**
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		Esprit 200, 400 ANSI	Esprit 200, 400 ASCII	Esprit 200, 400 PC
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

Supported Interface Keys		Esprit 200, 400 ANSI	Esprit 200, 400 ASCII	Esprit 200, 400 PC
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



Product Specifications & Pinouts

Product Specifications - IT4410

<i>Parameter</i>	<i>Specification</i>
Dimensions	
Length	6.1 inches (15.4 cm)
Height	5.6 inches (14.2 cm)
Width	2.5 inches (6.4 cm)
Weight	Less than 7 ounces (198 g), without cable
Illumination Source	660 nm illumination LEDs
Aiming Pattern Source	660 nm illumination LEDs
Focal Point (focus)	
LX	7 inches (17.8 cm) from Imager's nose
Long Range	5 inches (12.7 cm) from Imager's nose
High Density	2 inches (5.1 cm) from Imager's nose
High Density10	3 inches (7.62 cm) from Imager's nose
Field of View	
LX	4.3 inches (10.92 cm) by 3.25 inches (8.26 cm) @ 7.0"
Long Range	3 inches (7.6 cm) by 2.25 inches (5.7 cm) @ 5.0"
High Density	1.35 inches (3.4 cm) by 1.0 inches (2.5 cm) @ 2.0"
High Density10	1.9 inches (4.8 cm) by 1.5 inches (3.8 cm) @ 3.0"
Rotational Sensitivity	360° around optical axis
Viewing Angle	±45° at the nominal operating distance
Motion Sensitivity	approx. 2 inches (5 cm) per second of lateral motion
Ambient Light	Total darkness to 100,000 Lux (sunlight)
Video Image	8-bits per pixel
Operating Voltage	4.0 VDC - 9.0 VDC
Power Supply	5 VDC input
Peak Current	550 mA (when illumination LEDs are on)
Current Draw - 4410	
Low Power Mode	Average @ 5 VDC - 40mA
Medium Power Mode	Average @ 5 VDC - 125mA
Normal Power Mode	Average @ 5 VDC - 175mA
Temperature Ranges	
	Operating 32° F to +122° F (-0C to +50C)
	Storage -40° F to +158° F (-40C to +70C)
Humidity	95% RH non-condensing, at +50° C
Mechanical Shock	10 drops from 5 feet (1.5 m) to concrete

<i>Parameter</i>	<i>Specification</i>
ESD Sensitivity	15 kV to any external surface
Agency Compliance	FCC Class B Canadian Class B CE 55022 Class B UL/CUL Listed to UL1950 CSA 22.2 950 TUV Certified to EN60950 and EN 60825-1 Class 1 CTick N10410 GS

Product Specifications - IT4710

<i>Parameter</i>	<i>Specification</i>
Dimensions	
Length	4.85 inches (12.3 cm)
Height	1.85 inches (4.7 cm)
Width	2.5 inches (6.4 cm)
Weight	Less than 5.5 ounces 198 g), without cable
Illumination Source	660 nm illumination LEDs
Aiming Pattern Source	660 nm illumination LEDs
Focal Point (focus)	
LX	7 inches (17.8 cm) from Imager's nose
Long Range	5 inches (12.7 cm) from Imager's nose
High Density	2 inches (5.1 cm) from Imager's nose
High Density10	3 inches (7.62 cm) from Imager's nose
Field of View	
LX	4.3 inches (10.92 cm) by 3.25 inches (8.26 cm) @ 7.0"
Long Range	3 inches (7.6 cm) by 2.25 inches (5.7 cm) @ 5.0"
High Density	1.35 inches (3.4 cm) by 1.0 inches (2.5 cm) @ 2.0"
High Density10	1.9 inches (4.8 cm) by 1.5 inches (3.8 cm) @ 3.0"
Rotational Sensitivity	360° around optical axis
Viewing Angle	±45° at the nominal operating distance
Motion Sensitivity	approx. 2 inches (5 cm) per second of lateral motion
Ambient Light	Total darkness to 100,000 Lux (sunlight)
Video Image	8-bits per pixel
Operating Voltage	4.0 VDC - 9.0 VDC
Power Supply	5 VDC input
Peak Current	550 mA (when illumination LEDs are on)

<i>Parameter</i>	<i>Specification</i>
Current Draw Low Power Mode Medium Power Mode High Power Mode	Average @ 5 VDC - 40mA Average @ 5 VDC - 125mA Average @ 5 VDC - 175mA
Temperature Ranges	Operating 32° F to +122° F (-0C to +50C) Storage -40° F to +158° F (-40C to +70C)
Humidity	95% RH non-condensing, at +50° C
Mechanical Shock	10 drops from 5 feet (1.5 m) to concrete
ESD Sensitivity	15 kV to any external surface
Agency Compliance	FCC Class B Canadian Class B CE 55022 Class B UL/CUL Listed to UL1950 CSA 22.2 950 TUV Certified to EN60950 and EN 60825-1 Class 1 CTick GS

Depth of Field Charts

All depth of field measurements are made from the IT4410/4710 lens plate, which is .100" (.25 cm) from the front surface of the IT4410/4710 window.

Depth of Field for High Density Imager (2" Nominal Focus)

Code Size	Near Distance	Far Distance
QR 6.6 mil (0.017 cm)	1.7 inches (4.3 cm)	2.4 inches (6.1 cm)
Data Matrix 6.6 mil (0.017 cm)	1.7 inches (4.3 cm)	2.4 inches (6.1 cm)
Linear 4 mil (0.01 cm)	1.7 inches (4.3 cm)	2.9 inches (7.4 cm)
OCR 6 pt. (20 cpi)	2 inches (5.1 cm)	3.5 inches (8.9 cm)

Depth of Field for High Density10 Imager (3" Nominal Focus)

Code Size	Near Distance	Far Distance
QR 10 mil (0.025 cm)	2.0 inches (5.1 cm)	4.0 inches (10.2 cm)
Data Matrix 10 mil (0.025 cm)	2.2 inches (5.6 cm)	3.8 inches (9.7 cm)
Linear 5 mil (0.013 cm)	2.75 inches (7.0 cm)	3.75 inches (9.5 cm)
OCR 12 pt. (12 cpi)	2 inches (5.1 cm)	5 inches (12.7 cm)

Depth of Field for Long Range Imager (5" Nominal Focus)

Code Size	Near Distance	Far Distance
Linear 5 mil (.0127 cm)	3.0 inches (7.6 cm)	4.3 inches (10.9 cm)
Linear 10 mil (0.025 cm)	2.4 inches (6.1 cm)	8 inches (20.3 cm)
Data Matrix 15 mil (0.038 cm)	2.0 inches (5.1 cm)	5.8 inches (14.7 cm)
UPC 13 mil (0.033 cm)	1.9 inches (4.8 cm)	9.4 inches (23.9 cm)
QR 15 mil (0.038 cm)	1.7 inches (4.3 cm)	6 inches (15.2 cm)
MaxiCode 35 mil (0.089 cm)	2 inches (5.1 cm)	10.5 inches (26.7 cm)
12 pt. OCR-A	1.9 inches (4.8 cm)	8.7 inches (22.1 cm)
16 pt. OCR-A	2.3 inches (5.8 cm)	9.3 inches (23.6 cm)
Linear 15 mil (0.038 cm)	2.2 inches (5.6 cm)	9.9 inches (25.2 cm)
PDF 6.6 mil (0.017 cm)	2.7 inches (6.9 cm)	5.2 inches (13.2 cm)
PDF 10 mil (0.025 cm)	2.4 inches (6.1 cm)	7.7 inches (19.6 cm)

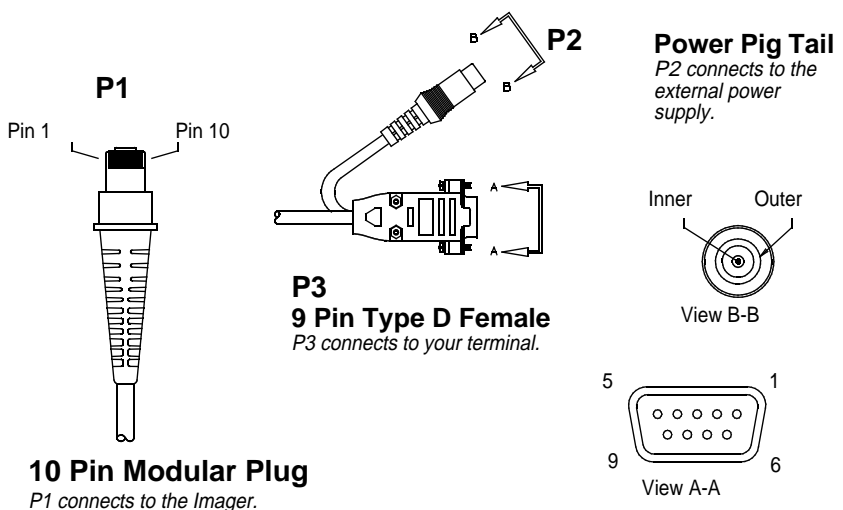
Depth of Field for LX Imager (7" Nominal Focus)

Code Size	Near Distance	Far Distance
MaxiCode 35 mil (0.089 cm)	2 inches (5.1 cm)	15 inches (38.1 cm)
Data Matrix 15 mil (0.038 cm)	3.7 inches (9.4 cm)	5.9 inches (15 cm)
PDF 10 mil (0.025 cm)	2.7 inches (6.9 cm)	9.8 inches ((24.9 cm)
PDF 8 mil (0.020 cm)	3.0 inches (7.6 cm)	8.3 inches (21.1 cm)
PDF 6.6 mil (0.017 cm)	4.0 inches (10.2 cm)	6.3 inches (16.0 cm)
Code 39 15 mil (0.038 cm)	2.1 inches (5.3 cm)	13.8 inches (35.1 cm)
Code 39 10 mil (0.025 cm)	2.8 inches (7.1 cm)	9.5 inches (24.1 cm)
Code 39 8 mil (0.020 cm)	3.5 inches (8.9 cm)	8.0 inches (20.3 cm)
UPC 13 mil (0.033 cm)	2.3 inches (5.8 cm)	13 inches (33.0 cm)
Postnet	3.7 inches (9.4 cm)	6.0 inches (15.2 cm)
12 pt. OCR-A	1.6 inches (4.1 cm)	12.3 inches (31.2 cm)
12 pt. OCR-B	1.5 inches (3.8 cm)	11.2 inches (28.5 cm)

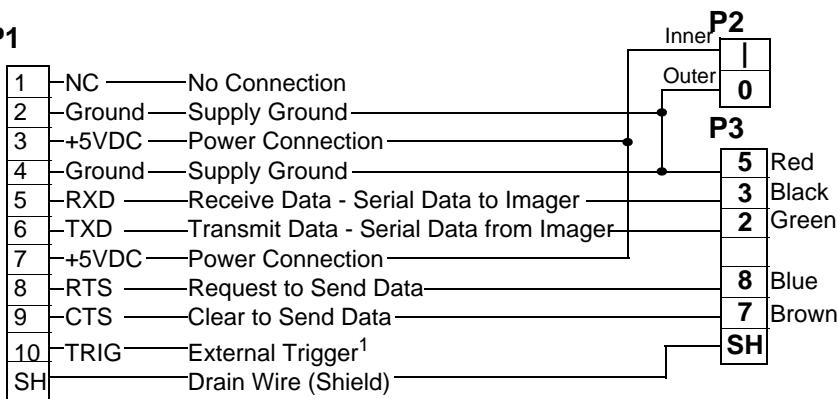
Cable Pinouts

RS-232 Output, External Power

Decoded output data format is provided at the modular connector in the Imager. Interface cables normally supplied with the Imager are terminated with a 10 pin modular plug (P1) and a 9 pin Type D connector (P3) that is compatible with all Hand Held Products decoders and terminals. See chart below. (The power pigtail applies to serial wedge cable, which is not shown.)



1



1. The voltage requirements for external trigger signal are Logic Low $\leq .3$ VDC and Logic High ≥ 1.8 VDC.

Connector Part Numbers

Listed below are the connector descriptions and part numbers. The suggested supplier for all of the connectors is Molex, Inc. (www.molex.com).

TTL RS-232 and Laser Emulation Connector

P/N: 52559-0890 (straight)

or

P/N: 52746-0890 (right angle)

Decoder Board Output Flex Strip

P/N: 21020-0075 (2" length specified. Various lengths available.)

Optics Connector

P/N: 52559-2290 (straight)

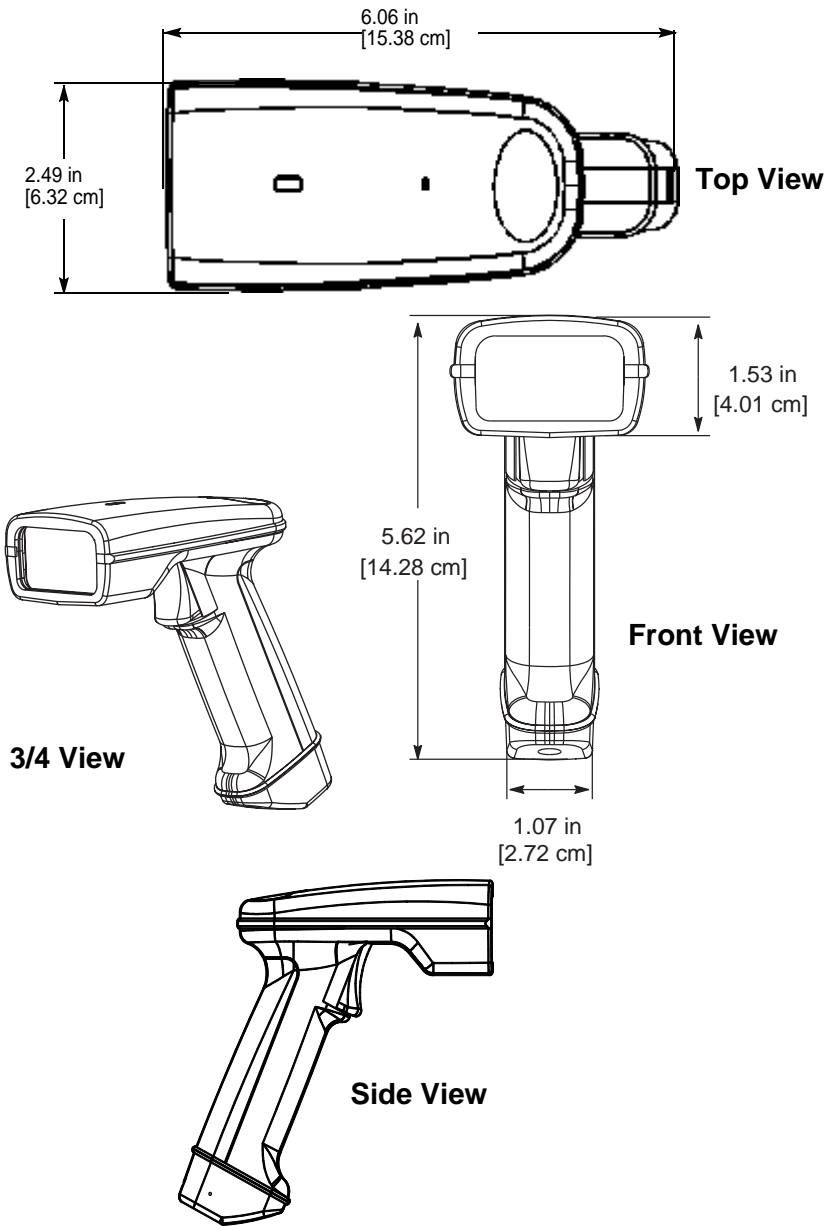
or

P/N: 52437-2291 (right angle)

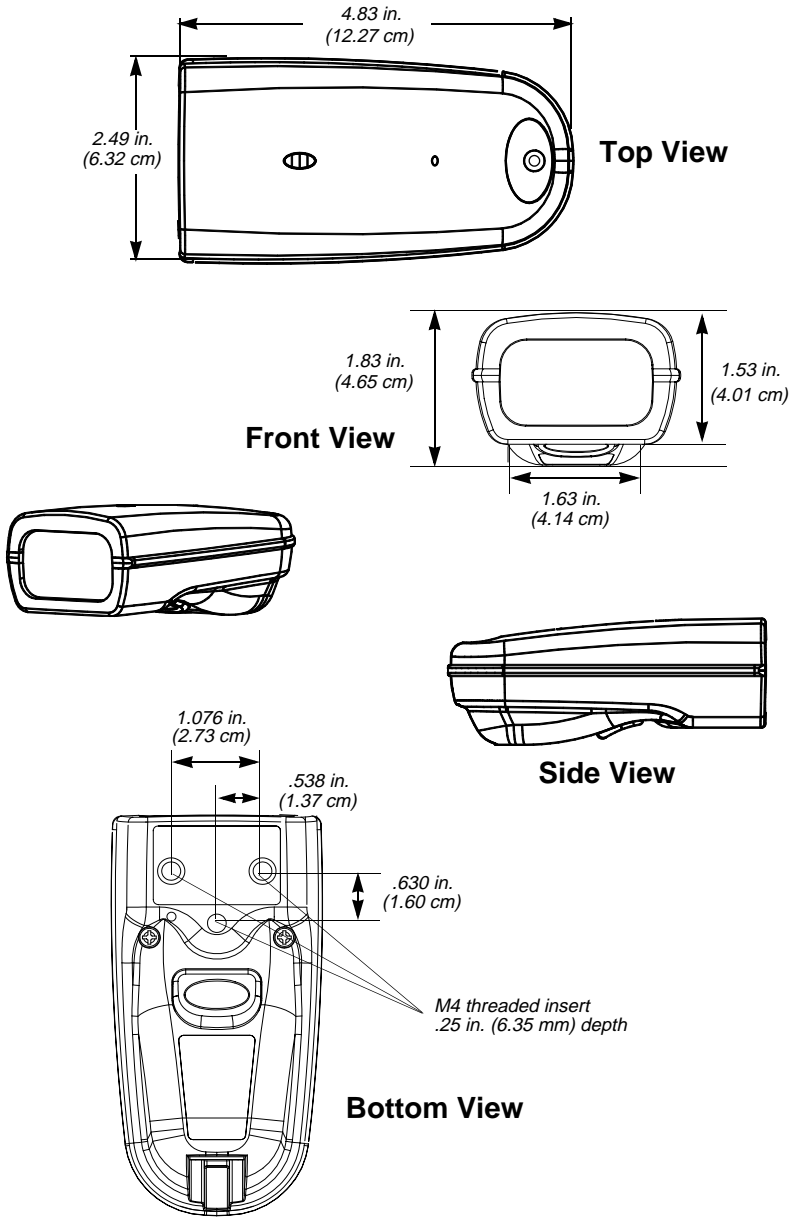
Optics-to-Decoder Board Flex Strip

P/N: 21020-0229 (2" length specified. Contact Hand Held Products if other lengths are needed)

IT4410 Dimensions



IT4710 Dimensions





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 page 12-1 for further information.

Maintenance

The IMAGETEAM 4410/IT4710 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 Imager's Window

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 facial tissue dampened with water (or a mild detergent- water solution). If a detergent solution is used, rinse with a clean tissue dampened with water only.

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



Caution:

Do not submerge the Imager in water. The Imager's housing is not water-tight.

Do not use abrasive wipers or tissues on the Imager's window - abrasive wipers may scratch the window.

Never use solvents (alcohol or acetone) 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 distributor for information about cable replacement. Cable replacement instructions are on the next page.

Examining the Imager's Housing

Routinely examine the Imager's housing for signs of damage. A damaged housing may cause the internal components to move and may result in a malfunctioning Imager.

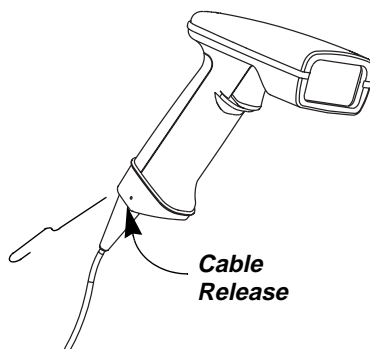
Replacing the Interface Cable

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 cable is designed to be field replaceable.

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

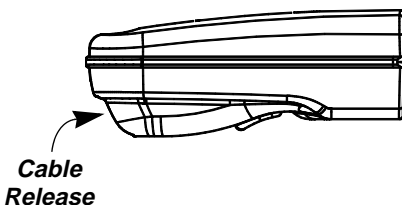
To Replace the IT4410 Interface Cable:

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 side of the Imager's handle near the base (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 of the Imager's handle while maintaining pressure on the paper clip.
6. Replace with the new cable. Insert the connector into the opening at the base of the Imager's handle. Press firmly. The connector is "keyed" to go in only one way, and will click into place.



To Replace the IT4710 Interface Cable:

1. Turn the power to the host system OFF.
2. Disconnect the Imager's cable from the terminal or computer.
3. Insert a small, flat head screwdriver into the slot between the cable and the back end of the housing.
4. Press the screwdriver tip down to depress the retention tab, releasing the connector.
5. Pull the connector out of the Imager while maintaining pressure on the screwdriver.
6. Replace with the new cable. Insert the connector into the opening at the base of the Imager. 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.

Troubleshooting Guide

Is the power on? Are the illumination LEDs on?

If the illumination LEDs in the Imager aren't illuminated, check that:

1. The cable is connected properly.
2. 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:

1. Aren't smeared, rough, scratched, or exhibiting voids.
2. Aren't coated with frost or water droplets on the surface.
3. Are enabled in the Imager or in the decoder the Imager connects to.



Product Service and Repair

Hand Held Products provides service for all its products through service centers throughout the world. To obtain warranty or non-warranty service, return the unit to Hand Held Products (postage paid) with a copy of the dated purchase record attached. Contact the appropriate location below to obtain a Return Material Authorization number (RMA #) before returning the product.

North America

Hand Held Products Corporate Offices
Telephone: (800) 782-4263, Option 3
Fax: (704) 566-6015
E-mail: naservice@handheld.com

America Latina

Hand Held Products America Latina
Teléfono: (239) 263-7600
Fax: (239) 263-9689
E-mail: laservice@handheld.com

Brazil

Hand Held Products Brazil
Telephone: +55 (21) 2176-0250
Fax: +55 (21) 2176-0249
E-mail: suporte@handheld.com

Europe, Middle East, and Africa

Hand Held Products Europe
Telephone: +31 (0) 40 29 01 633
Fax: +31 (0) 40 2901631
E-mail: euservice@handheld.com

Asia Pacific

Hand Held Products Asia/Pacific
Telephone: +852-2511-3050
Fax: +852-2511-3557
E-mail: apservice@handheld.com

Japan

Hand Held Products Japan
Telephone: +81-3-5770-6312
Fax: +81-3-5770-6313
E-mail: apservice@handheld.com

Online Product Service and Repair Assistance

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

Technical Assistance

If you need assistance installing or troubleshooting your imager, please call your Distributor or the nearest Hand Held Products technical support office:

North America/Canada:

Telephone: (800) 782-4263, option 4 (8 a.m. to 6 p.m. EST)

Fax number: (315) 685-4960

E-mail: natechsupport@handheld.com

Europe, Middle East, and Africa:

Telephone-

European Ofc: Int+31 (0) 40 29 01 600

U.K. Ofc: Int+44 1925 240055

E-mail: eutechsupport@handheld.com

Asia Pacific:

Telephone: Int+852-3188-3485 or 2511-3050

E-mail: aptechsupport@handheld.com

America Latina:

Teléfono: (704) 998-3998, opción 8

E-mail: latechsupport@handheld.com

Online Technical Assistance

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

Limited Warranty

Hand Held Products, Inc. ("Hand Held Products") warrants its products to be free from defects in materials and workmanship and to conform to Hand Held Products' published specifications applicable to the products purchased at the time of shipment. This warranty does not cover any Hand Held Products 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 Hand Held Products or its authorized representatives.

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

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.

Hand Held Products' RESPONSIBILITY AND PURCHASER'S EXCLUSIVE REMEDY UNDER THIS WARRANTY IS LIMITED TO THE REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT. IN NO EVENT SHALL Hand Held Products BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, AND, IN NO EVENT, SHALL ANY LIABILITY OF Hand Held Products 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 Hand Held Products FOR THE PRODUCT. THESE LIMITATIONS ON LIABILITY SHALL REMAIN IN FULL FORCE AND EFFECT EVEN WHEN Hand Held Products 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 manufactured/sold by Hand Held Products voids the warranty. This includes but is not limited to: cables, power supplies, cradles, and docking stations. Hand Held Products, Inc. extends these warranties only to the first end-users of the products. These warranties are nontransferable.

The limited duration of the warranty for the IT4410/4710 is for 3 years.





Index

A

- Add AIM I.D. Prefix to All Symbologies 2-33
 - Serial Command 7-17
- Add Code I.D. Prefix to All Symbologies 2-33
 - Serial Command 7-17
- Add CR Suffix to All Symbologies 2-33
 - Serial Command 7-17
- AIM I.D. Prefix
 - Add to all Symbologies 2-33
- Aimer Delay 2-18
 - Serial Command 7-16
- Aimer Interval 2-19
 - Serial Command 7-16
- Aimer Timeout
 - Serial Command 7-15
- Alternate Data Formats 2-42
 - Serial Command 7-18
- ASCII Conversion Chart 2-36
- AutoTrigger Selections
 - Presentation Mode 2-24
- Aztec Code Selections 3-40
 - Serial Commands 7-25

B

- Baud Rate 2-11
 - Serial Command 7-15
- Beeper
 - Power Up 2-27
 - Volume
 - Serial Command 7-16
- Boot Code Revision 2-3
 - Serial Command 7-14

C

- Cable
 - Replacing 11-2
- Carriage Return Suffix
 - Add to all Symbologies 2-33
- Centering 2-20
- Codabar Selections
 - Serial Commands 7-18, 7-19
- Codablock Selections 4-2
 - Serial Commands 7-23
- Code 128 Selections 3-15
 - Serial Commands 7-20
- Code 39 Selections 3-4
 - Serial Commands 7-19
- Code 49 Selections 3-31
 - Serial Commands 7-23
- Code 93 Selections 3-14
 - Serial Commands 7-20
- Code I.D. Prefix
 - Add to all Symbologies 2-33
- Communication Settings 2-10
- Connecting the scanner
 - Keyboard wedge 1-6
 - Serial port 1-7
- Conversion Chart
 - Decimal to Hex to ASCII 2-36

D

- Data Format
 - Require 2-41
 - Serial Command 7-18
- Data Format Editor 2-40
 - Commands 2-38
 - Overview 2-37
 - Programming codes 2-40
 - Serial Command 7-17

Data Formats
 Show 2-2, 2-41
 Serial Command 7-18
Data Formatter 2-41
 Serial Command 7-18
Data Matrix Selections 3-37
 Serial Commands 7-25
Decimal to Hex to ASCII Conversion
Chart 2-36
Default Settings 5-1
Dimensions 10-8
Disable All Symbolologies 2-2
 Serial Command 7-14

E

EAN/JAN 13 Selections 3-19
 Serial Commands 7-21
EAN/JAN 8 Selections 3-17
 Serial Commands 7-21
EAN•UCC Composite Codes 3-32
Enable All Symbolologies 2-2
 Serial Command 7-14

F

Flow Control
 Hardware 2-13
 Serial Command 7-15
 Software 2-13
 Serial Command 7-15

H

Hardware Flow Control 2-13
 Serial Command 7-15
Hex Chart 2-36

I

Iata 2 of 5 Selections 3-11

Installation
 Keyboard Wedge 1-6
 Serial Port 1-7
Intercharacter Delay 2-28
 Serial Command 7-17
Interface Keys 9-1
Interfunction Delay 2-29
 Serial Command 7-17
Interleaved 2 of 5 Selections 3-9
 Serial Commands 7-19, 7-20
Intermessage Delay 2-30
 Serial Command 7-17
ISBT Symbology 3-16
 Serial Command 7-20

K

Keyboard Country
 Serial Command 7-14
Keyboard Modifiers
 Serial Command 7-14
Keyboard Style
 Serial Command 7-14

L

Labels
 Safety and Identification 1-4
LED
 Flashing 2-18
 Serial Command 7-16
 Power Levels 2-17
 Serial Command 7-16
Load New Imager Software
 Using Quick*View 7-8

M

Maintenance 11-1
MaxiCode Selections 3-38
 Serial Commands 7-25

Micro PDF Selections

Serial Commands 7-23

MicroPDF Selections 3-30

Money

reading serial numbers 4-1

Multiple Symbols

Serial Command 7-18

N

No Read 2-47

Serial Command 7-18

O

OCR Programming 4-1

Online Programming 8-1

Open Com Port 7-7

Output Sequence

Descriptions and Examples 4-4

Require 2-44

Serial Command 7-18

Output Sequence Editor 2-46, 4-9

Serial Command 7-18

Overview 1-1

P

Parity 2-10

Serial Command 7-14

PDF 417 Selections 3-29

Serial Commands 7-23

Postal Code Selections

Serial Commands 7-24

Power Hold Mode 2-17

Serial Command 7-16

Power PC Revision 2-3

Serial Command 7-14

Power Saving Mode

Serial Command 7-15

Power Settings

Using Quick*View 7-8

Power Up Beeper 2-27

Serial Command 7-17

Prefix

Programming codes 2-34

Serial Command 7-17

Prefix/Suffix

Adding or removing 2-32

Prefix/Suffix Overview 2-31

Presentation Default

Serial Command 7-16

Presentation Mode

Default 2-25, 2-27

Presentation Lights 2-25

Presentation Reread Delay 2-24

Serial Command 7-16

Print Weight 2-48

Serial Command 7-18

Q

QR Code Selections

Serial Commands 7-24

Query Commands 7-11

Quick*View 7-1

Button Bar 7-13

Imager Power Settings 7-8

Installation 7-1

Load New Imager Software 7-8

Open Com Port 7-7

Query Commands 7-11

Reporting Firmware Revision 7-7

RS-232 Serial Commands 7-9

Scan Data Window 7-4

Serial Programming Commands 7-9

Snapshot 7-5, 7-6

Trigger Settings 7-8

R

- Reporting Firmware Revision
 - Using Quick*View 7-7
- Require Data Format 2-41
 - Serial Command 7-18
- Require Output Sequence 2-44
 - Serial Command 7-18
- Reset Factory Settings 2-2
- Revision Selections 2-3
 - Serial Commands 7-14
- RS-232 Communication
 - Serial Command 7-14
- RSS-14 Selections 3-26
 - Serial Commands 7-22

S

- Scan Data Window 7-4
- Scan Stand Selections 2-23
 - Serial Command 7-16
- SCM Selections
 - Serial Commands 7-25
- Serial Programming Commands 7-9
 - Add AIM I.D. Prefix to All Symbologies 7-17
 - Add Code I.D. Prefix to All Symbologies 7-17
 - Add CR Suffix to All Symbologies 7-17
 - Aimer Delay 7-16
 - Aimer Interval 7-16
 - Aimer Timeout 7-15
 - Alternate Data Formats 7-18
 - Aztec Code Selections 7-25
 - Baud Rate 7-15
 - Beeper Volume 7-16
 - Boot Code Revision 7-14
 - Codabar Selections 7-18, 7-19
 - Codablock Selections 7-23
 - Code 128 Selections 7-20

- Code 39 Selections 7-19
- Code 49 Selections 7-23
- Code 93 Selections 7-20
- Data Format Editor 7-17
- Data Formatter 7-18
- Data Matrix Selections 7-25
- Disable All Symbologies 7-14
- EAN/JAN 13 Selections 7-21
- EAN/JAN 8 Selections 7-21
- Enable All Symbologies 7-14
- Hardware Flow Control 7-15
- Intercharacter Delay 7-17
- Interfunction Delay 7-17
- Interleaved 2 of 5 Selections 7-19, 7-20
- Intermessage Delay 7-17
- ISBT 7-20
- Keyboard Country 7-14
- Keyboard Modifiers 7-14
- Keyboard Style 7-14
- LED Flashing 7-16
- LED Power Levels 7-16
- MaxiCode Selections 7-25
- Micro PDF Selections 7-23
- Multiple Symbols 7-18
- No Read 7-18
- Output Sequence Editor 7-18
- Parity 7-14
- PDF 417 Selections 7-23
- Postal Code Selections 7-24
- Power Hold Mode 7-16
- Power PC Revision 7-14
- Power Saving Mode 7-15
- Power Up Beeper 7-17
- Prefix 7-17
- Presentation Default 7-16
- Presentation Mode 7-16
- Presentation Reread Delay 7-16
- Print Weight 7-18
- QR Code Selections 7-24

Require Data Format 7-18
Require Output Sequence 7-18
RS-232 Communication 7-14
RSS-14 7-22
Scan Stand 7-16
SCM Selections 7-25
Serial Triggering 7-15
Set Print Weight 7-18
Show Data Formats 7-14, 7-18
Show Software Revision 7-14
Software Flow Control 7-15
Suffix 7-17
Terminal ID 7-14
UPC A Selections 7-21
UPC E0 Selections 7-22
UPC E1 Selections 7-22
Word Length Data Bits 7-15
Word Length Stop Bits 7-15
Serial Triggering 2-14
 Serial Command 7-15
Service 12-1
Show Data Formats 2-2, 2-41
 Serial Command 7-14, 7-18
Show Software Revision 2-2
 Serial Command 7-14
Snapshot 7-5, 7-6
Software Flow Control 2-13
 Serial Command 7-15
Software Revision
 Show 2-2
 Serial Command 7-14
Specifications 10-1, 10-2
Status Check 2-2
Suffix
 Programming codes 2-34
 Serial Command 7-17
Symbology
 Enable/Disable All 2-2
Symbology Chart 2-35

T

Terminal ID
 Serial Command 7-14
Trigger Settings
 Using Quick*View 7-8
Troubleshooting 11-3

U

Unpacking Imager 1-2
UPC A Selections 3-21
 Serial Commands 7-21
UPC E0 Selections 3-23
 Serial Commands 7-22
UPC E1 Selections 3-24
 Serial Commands 7-22
User Specified Intercharacter Delay
2-28

V

Video Reverse 2-49
Visual Menu 8-1

W

Word Length
 Data Bits 2-12
 Serial Command 7-15
 Stop Bits 2-12
 Serial Command 7-15



Sample Symbols

UPC A



0 123456 7890

Interleaved 2 of 5



1234567890

Code 128



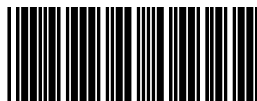
Code 128

EAN 13



9 780330 290951

Code 39



BC321

Codabar



A13579B

Sample Symbols

PDF417



Car Registration

Postnet



Zip Code

Code 49



1234567890

Data Matrix



Test Symbol

OCR-A Sample

55836540

QR Code



Numbers

OCR-B Sample

55836540

Sample Symbols

Aztec



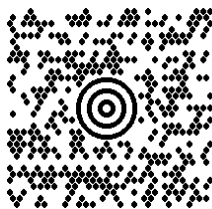
Package Label

Aztec Mesa Code



Test Message

MaxiCode



Test Message

Micro PDF417



Test Message

Programming Chart (OCR)



a



c



d



e



g



h

Programming Chart (OCR)



l



r



t



Save



Discard

Programming Chart



0



1



2



3



4



5



6



7

Programming Chart



8



9



A



B



C



D



E



F



Save



Discard

Hand Held Products, Inc.

700 Visions Drive

P.O. Box 208

Skaneateles Falls, NY 13153-0208