IDAutomation SC7USB 2D
Scanner Programming Manual

Online Support:
www.idautomation.com/support/

IDAutomation.com provides:
- Barcode Fonts
- Barcode Components
- Label Printing Software
- Barcode Readers

Plug 'n Play

CONTENTS

Introduction

This scanner will automatically scan a barcode at a distance of 3 to 8 inches from the symbol when the trigger is pulled. The scanner is programmed by scanning barcodes from the manual when viewed on the screen at 200% or more magnification from the PDF. Successful scanning shall be obtained by tilting the scanner with respect to the barcode to avoid direct reflections that impair reading performance.

Installation and Setup

1.Connect the USB cable between scanner and PC.

2.To enable USB keyboard emulation, scan the appropriate barcode below:

USB HID (PC)

USB HID (MAC)

3.If the scanner does not operate properly, remove the scanner from the USB port and plug it into another port after scanning one of the USB HID barcodes above.

4.If the scanner still does not operate properly, remove the cable from the PC and pull the cable out of the scanner. Reinsert the cable in the scanner.

Compliance Notice

These limits are designed to provide a reasonable protection against harmful interface when the equipment is operated under a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interface to radio communications. Operation of this equipment in a residential area may cause harmful interface, in which case the user will be required to correct the interface at his or her own expenses.

Limitation of Liability Notice

This limitation of hardware liability is necessary because IDAutomation is a reseller of hardware and does not directly manufacture any hardware devices. The entire limitation of liability (including attorney's fees, if any) under this policy and/or the limited hardware warranty, if any, is 3 times the original purchase price of the product (excluding any tax, shipping and additional charges) at the time of purchase from

IDAutomation or the authorized affiliate or reseller. This amount should be adequate to redirect any claims to the proper manufacturer, however, it should be understood that all intellectual property claims and all other claims relating to the hardware itself are not directly the responsibility of IDAutomation but rather only the manufacturer.

IDAUTOMATION, OUR RESELLERS AND AFFILIATES WILL NOT BE LIABLE FOR ANY INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO ANY LOSS OF PROFITS OR POTENTIAL PROFITS, LOSS OF SAVINGS OR ANTICIPATED SAVINGS, LOSS OF BUSINESS OR GOODWILL, LOSS OF DATA, LOSS OF OPPORTUNITIES, OR LOSS OF USE OF THE PRODUCT OR ANY EQUIPMENT, COST OF CAPITAL, COST OF SUBSTITUTE OR REPLACEMENT PRODUCT, EQUIPMENT, FACILITIES OR SERVICES, DOWN TIME, YOUR TIME, REGARDLESS OF THE FORM OF ACTION, ANY THIRD PARTY CLAIMS, AND ANY INJURY TO PROPERTY OR BODILY INJURY (INCLUDING DEATH) TO ANY PERSON, ARISING FROM OR RELATING TO THE USE OF OR THE INABILITY TO USE THE PRODUCT OR ARISING FROM BREACH OF THE WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, TORT, OR STRICT LIABILITY, WHETHER OR NOT SUCH LOSS OR DAMAGE WAS FORESEEABLE,

EVEN IF WE OR ANY OF OUR AFFILIATED COMPANIES
HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH
DAMAGES.

Other Notices:

- *All trademarks shall belong to their respective owners.*
- *Specifications subject to change without notice.*
- *Copyright 2010 IDAutomation.com.*

Verifying Barcodes with PQA

A unique feature of this scanner is the 2D PQA (Print Quality Assessment) feature, which verifies and grades several attributes of a barcode symbol. When enabled, PQA works on all 2D symbols including Data Matrix, PDF417, MaxiCode, Aztec, QR-Code and USPS Postnet and Intelligent Mail. The PQA report is transmitted as a second beep after the barcode data. Enable this feature by scanning the barcode below.

NOTE: When verifying symbols with PQA, be sure to carefully position the scanner directly over the barcode at an appropriate distance, such as 5 or 6 inches. Different angles and distances may falsely lower the grade with respect to height, width and gaps.

Default Settings

For each barcode shown as below:

V = Enabled as default setting

- = Not supported

Empty space = Not enabled at default setting

Code Type	Read Enable	Checksum Verification Enable	Checksum Transmission Enable	Code ID
UPC-A	V	V	V	c
UPC-E0	V	V	V	E
UPC-E1				E
EAN-13	V	V	V	d
EAN-8	V	V	V	D
Code-32				<
Code-39	V			b
TCIF Linked Code 39				T
Code-49				I
Interleaved 2 of 5	V			e
Industrial 2 of 5		-	-	e
Straight 2 of 5 IATA				f
Straight 2 of 5 Industrial				f
Matrix 2 of 5				m
Codabar	V			a
Code-128	V			j

Code-93	V			i
Code-11		V two digits		h
Telepen				t
MSI				g
Plessey				n
GS1 DataBar Omnidirectional	V	-	-	y
GS1 DataBar Limited	V	-	-	y
GS1 DataBar Expanded	V	-	-	y
PosiCode A&B	V			W
Codablock F				q
Code 16K				o
Code 49	V			I
PDF 417	V			r
MicroPDF 417	V			R
EAN UCC Composite				y
Postnet				P
Planet Code				L
British Post				B
Canadia Post				C
Kix Post (Netherlands)				K
Australian Post				A
Japanese Post				J
China Post				Q
Korea Post				?
QR Code	V			O
Data Matrix	V			w
MaxiCode	V			x
Aztec Code	V			z
Aztec Runes				z

Specifications

Operational	
Light Source	626 nm ± 30 nm Visible Red LED
Aiming Source	526 nm ± 30 nm Visible Green LED
Optical System	752 x 480 CMOS sensor
Motion Tolerance	4 inches / sec
Depth of Scan Field	1D : 37 ~ 175 mm (CODE 39,)
(PCS=90%,10 mils)	2D : 62 ~ 137 mm (QR code)
Resolution (min)	1D : 0.127 mm (5 mils)
	2D : 0.21 mm (8 mils)
Print Contrast	30% or more
Focal Point	114 mm (4.5 inches) from lens plate
Scanning Angle	Pitch: ± 40° Skew: ±40°
Rotational Sensitivity	360˚
Decode Capability	Auto-discriminates all standard barcodes;
	Other symbologies can be ordered optionally
Beeper Operation	Volume x 3 and Frequency x 3 or
	no beep
Indicator	Blue led and adjustable beeper
Mechanical	
Length	165.1 mm
Width-handle	32 mm
Width-head	72.8 mm
Depth-handle	54.7 mm
Depth-head	82.5 mm
Weight	146 g

Cable	Straight 2.0 m	
Connector type	RJ-45 phone jack connector	
Case material	ABS and Rubber	
Electrical		
Input Voltage	3.5 ~ 5.5 VDC	
Power	RS232	USB HID
Operating	Max 300mA @ 5V	
Standby	Max 55mA@ 5V	Max 50mA@ 5V
Low Power Mode	Max 30mA@5V	*
Agency listing	EMI: FCC, CE, BSMI Safety: UL, BSMI, CB	
Environmental		
Operating Temperature	0℃ to 50℃ (32°F to 122°F)	
Storage Temperature	-20℃ to 60℃ (-4°F to 140°F)	
Humidity	Up to 95% relative humidity, non-condensing @ 50℃	
Light Level	Dark to 100,000 Lux.	
Shock	24 drops from 1.5 m to concrete	
Resistance	IP 42	
Contaminants	Seals to resist airborne particulate contaminants	
Ventilation	None required	

Reading Characteristics

The engine has a view finder that projects a bright red or green aiming beam that corresponds to the engine's horizontal field of view. The aiming beam should be centered over the barcode, but it can be positioned in any direction for a good read.

Linear bar code
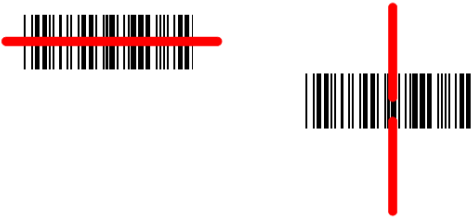
2D Matrix symbol
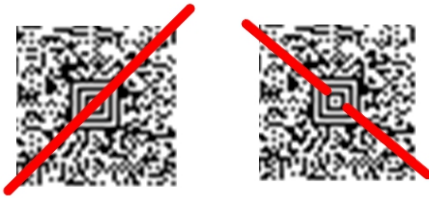
The aiming beam is smaller when the engine is closer to the code and larger when it is farther from the code. Symbologies with smaller bars or elements (mil size) should be read closer to the unit. Symbologies with larger bars or elements (mil size) should be read farther from the unit. To read symbols, hold the engine at an appropriate distance from the target, send a trigger command, and center the aiming beam on the symbol. If the code being scanned is highly reflective (e.g., laminated), it may be necessary to tilt the code +5° to prevent unwanted reflection.

Programming

Scan a series of programming barcodes in the correct order. Fold out, print or view on the screen, the back page of this manual. You will see a table of alphanumeric barcodes, which are used to program the various options presented.

To program each option, you must:
1. Scan the Program barcodes.
2. Enter the option mode by scanning the option barcodes.
3. The necessary alphanumeric inputs are listed. Scan these alphanumeric entries from the . To confirm the above steps, you must scan the Save barcode.

Interface Selection

This decoder built-in scanner comes in one model and supports interfaces such as RS232 serial, USB virtual COM and USB HID. In most of the cases, simply selecting an appropriate cable and configure the proper interface by following interface selection.

Interface selection: You can change factory interface default (USB Virtual COM) for other type interface. By plugging different cables, setting right interface, then scan the interface barcode, power cycle the scanner will be changed to another interface. However, you must make sure which cable you need.

RS-232 Interface

USB HID (PC)

USB HID (MAC)

*USB Virtual COM

RS-232

Default Setting

Baud Rate   115200 bps

Data Format   8 data bits, no parity bit, 1 stop bit

Baud Rate

```
300
```

```
600
```

```
1200
```

```
2400
```

```
4800
```

```
9600
```

```
19200
```

```
38400
```

```
57600
```

```
*115200
```

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

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

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

Data Format

||||||||||||||||||||||||
7 Data,1 Stop, Parity Even

||||||||||||||||||||||||
7 Data,2 Stop, Parity Odd

||||||||||||||||||||||||
7 Data,1 Stop, Parity None

||||||||||||||||||||||||
8 Data,1 Stop, Parity Even

||||||||||||||||||||||||
7 Data,1 Stop, Parity Odd

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

||||||||||||||||||||||||
7 Data,2 Stop, Parity Even

||||||||||||||||||||||||
8 Data,1 Stop, Parity Odd

||||||||||||||||||||||||
7 Data,2 Stop, Parity None

RS-232

RTS/CTS-If the scanner wants to send the barcode data to host computer, it will issue the RTS signal first, wait for the CTS signal from the host computer, and then perform the normal data communication. If there is no replied CTS signal from the host computer after the timeout (Response Delay) duration, the scanner halts transmission until it detects another active CTS signal.

Xon/Xoff- When the host computer is unable to accept data, it sends a Xoff code to inform the scanner to suspend data transmission, and Xon to continue.

ACK/NAK- When the ACK/NAK protocol is used, the scanner waits for an ACK (acknowledge) or (not acknowledge) from the host computer after data transmission, and will resend in response to a NAK.

Response Delay

The unit stays awake to receive data until the RS-232 Receiver Time-Out expires. A trigger command resets the time-out. When an RS-232 receiver is sleeping, a character may be sent to wake up the receiver and reset the time-out. A transaction on the CTS line will also wake up the receiver. The receiver takes 300 milliseconds to completely come up. Change the RS-232 receiver time-out by scanning the barcode

below, then scanning digits from the inside back cover of this manual, then scanning **Save**. The range is 0 to 300 seconds. Default = 0 seconds (no time-out - always on).

Handshaking

RTS/CTS On

*RTS/CTS Off

XON/XOFF On

*XON/OFF Off

ACK/NAK On

*ACK/NAK Off

Response Delay

USB HID

Scan the following code to program for USB HID barcode imagers.

USB HID (PC)

USB HID (MAC)

USB Virtual COM

Scan the following code to program the scanner to emulate a regular RS-232-based COM port. If you are using a PC, you will need to download a driver from CD-ROM, The driver will use the next available COM port number

USB Virtual COM

CTS/RTS Emulation & ACK/NAK Mode

CTS/RTS On

*CTS/RTS Off

ACK/NAK On

*ACK/NAK Off

System Control

Scan

Scanning output:

You can set the image size to a VGA resolution to accommodate older applications that require a smaller image size. When Image VGA is set to On, the resultant image is 640x480 pixels. When Image VGA is Off, the image is 752x480 pixels.

Scanning mode:

Manual/Serial Trigger Mode

When in manual trigger mode, the scanner scans until a barcode is read, or until the hardware trigger is released.

When in serial mode, the scanner scans until a barcode has been read or until the deactivate command is sent. In serial mode, the scanner can also be set to turn itself off after a specified time has elapsed (see Read Time-Out, which follows).

Read Time-Out

Use this selection to set a time-out (in milliseconds) of the scanner's trigger if the scanner is in manual trigger mode. Once the scanner has timed out, you can activate the scanner by pressing the trigger. After scanning the **Read Time-Out** barcode, set the time-out duration (from 0-300,000 milliseconds) by scanning digits from the inside back cover, then scanning **Save**. Default = 0 (infinite, or no time-out).

Scan

Manual Trigger, Low Power **(**For RS-232 only**)**

The scanner powers down until the trigger is pulled. When the trigger is pulled, the scanner powers up and operates until there is no triggering for the time set with the **Low Power Time-Out** barcode below. There is a delay of up to one second in operation when the scanner is first triggered, but there is no delay when operating in low power time-out mode.

Low Power Time-Out Timer

Scan the Low Power Time-Out barcode to change the time-out duration (in seconds). Then scan the time-out duration (from 0-300 seconds) from the inside back cover, and **Save**. Default = 120 seconds.

If the unit remains idle during the low power time-out interval, the unit goes into low power mode. Whenever the trigger is enabled, the low power time-out timer is reset.

Auto-Sense Mode

This programs the scanner to work in Auto-sense mode. The LEDs are either off or at the lowest power for ambient conditions until a barcode is presented to the scanner. Then the LEDs turn on automatically to read the code. Auto-sense Mode uses ambient light to detect the barcodes. If the light level in the room is not high enough, Auto-sense Mode may not work properly.

Scanning Output

VGA Off

*VGA On

Scanning Mode

*Manual/Serial Trigger

Manual Trigger, Low Power

Read Time-Out

Low Power Time-Out

Auto-sense Mode

Auto-sense LED Behavior after Decode

When an scanner is in Auto-sense mode, the LEDs remain on and continue scanning for a short time after a barcode is decoded. If you wish to turn the LEDs off immediately after a barcode is decoded, scan the **LEDs Off** barcode, below. Default = LEDs On.

Auto-sense LED Time-Out

When using Auto-sense LED Behavior after Decode, you may want to set the time the LEDs remain off after a decode. To set the duration of this delay, scan the barcode below, then set the time-out by scanning digits (0 - 9,999 ms), then scanning **Save.** Once the unit has completed this time-out, it will immediately resume scanning.

Auto-sense Sensitivity

Auto-sense Sensitivity increases or decreases the scanner's reaction time to barcode Auto-sense. To set the sensitivity, scan the **Sensitivity** barcode, then scan the degree of sensitivity (from 0-20) from the inside back cover, and **Save**. 0 is the most sensitive setting, and 20 is the least sensitive. Default = 1.

Scan

Hands Free Time-Out

The Auto-sense Modes is referred to as "hands free" modes. If the hardware trigger is pulled when using hands free mode, the scanner changes to manual trigger mode. You can set the time the scanner should remain in manual trigger mode by setting the Hands Free Time-Out. Once the time-out value is reached, (if there have been no further trigger pulls) the scanner reverts to the original hands free mode. Scan the **Hands Free Time-Out** barcode, then scan the time-out duration (from 0-300,000 milliseconds) from the inside back cover, and **Save**. Default = 5,000 ms.

Auto-sense

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
*LEDs On

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
LEDs Off

LED Time-Out

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
LED Time-Out Duration

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
Sensitivity

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
Hands Free Time-Out

Indication

Beeper

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

Volume
The beeper volume codes modify the volume of the beep the scanner emits on a good read.

Pitch
The beeper pitch codes modify the pitch of the beep the scanner emits on a good read.

Duration
The beeper duration codes modify the length of the beep the scanner emits on a good read.

Beeper

*On

Off

Volume

Low

*Medium

High

Off

Pitch

Low(1600 Hz)

*Medium (3250 Hz)

High (4200 Hz)

Duration

*Normal Beep

Short Beep

Indication

LED

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

Polarity

LED Good Read Polarity sets the idle and active states of the LED signal. When set to **Active High**, the LEDs turn on when the signal shifts from low to high. When set to **Active Low**, the LEDs turn on when the signal shifts from high to low. If the LED is enabled for a good read, the polarity change takes effect after the next successful decode or a power cycle. If the LED is disabled, a polarity change only takes effect after a power cycle.

Note: LED Good Read Polarity sets the LED signal voltage level to either high (Active Low) or low (Active High). This will affect LED-Good Read setting. If the LED has been disabled, make sure it is not turned on accidentally by a polarity change.

LED

*On

Off

Polarity

Active High

*Active Low

LED Power Level

This selection allows you to adjust LED and aimer brightness. **Off** is used when no illumination is needed. **Low** is used if low illumination is sufficient. **High** is the brightest setting. If you have an aimer delay programmed, the aimer will be at 100% power during the delay, regardless of the LED Power Level.

23

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

Illumination Lights
If you want the illumination lights on while reading a barcode, scan the **Lights On** barcode, below. However, if you want to turn just the lights off, scan the **Lights Off** barcode.
Note: This setting does not affect the aimer light. The aiming light can be set using Aimer Modes.

Scanner Time-Out
Scanner Time-Out powers down the scanner after the unit has been idle for the specified time. To prevent the scanner from powering down, set this time-out to 0. Scan the barcode below, then set the time-out by scanning digits (from 0 -999,999 ms) from the inside back cover, then scanning **Save.** Default = 1 ms.

LED Power Level

Off

Low (50%)

*High (100%)

Illumination Light

*Lights On

Lights Off

Scanner Time-Out

Scanner Time-Out

Indication

Reread Delay

This sets the time period before the scanner can read the same barcode a second time. Setting a reread delay protects against accidental rereads of the same barcode. Longer delays are effective in minimizing accidental rereads at POS (point of sale). Use shorter delays in applications where repetitive barcode scanning is required. Reread Delay only works when in Auto-sense Mode.

User-Specified Reread Delay

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

Reread Delay

Short (500 ms)

*Medium (750ms)

Long (1000 ms)

Extra Long (2000 ms)

User-Specified Reread Delay

User-Specified Reread Delay

Indication

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 activated 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.

User-Specified Aimer Delay

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

Aimer Modes

Interlaced, the illumination and aiming timing is automatically synchronized to the scanner exposure period by the Image Engine. The engine turns illumination on while the image is being exposed, and it turns the aiming off at all other times. The interlaced mode provides the lowest overall current draw and is recommended for most applications. It also provides the brightest aimer in most applications. The Image Engine software automatically maintains an approximate 25% aimer duty cycle, even when the scanner exposure time is at its maximum in dark operating environments.

Concurrent is provided for backwards compatibility with the 4X00 Image Engine series, and is not recommended for most applications. In concurrent mode, the illumination LEDs are on continuously, while the aimer LEDs turn off during the scanner exposure period, and on while the scanner is not exposing. Concurrent mode is used to eliminate any flicker of the illumination LEDs that may be objectionable to the user, especially when running the engine at 12 MHz. The illumination LED current is reduced compared to interlaced mode to limit engine peak current. The image engine software automatically maintains an approximate

25% aimer duty cycle, even when the scanner exposure time is at its maximum in dark operating environments. Concurrent mode provides the brightest appearance of the illumination LEDs of any of the scanner operating modes. This mode may be useful for applications when an operator is using the illumination LEDs for aiming, such as in fixed mount, kiosk, or auto trigger applications. Select **Off** if you don't want to use either aimer mode.

Aimer Delay

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
200Milliseconds

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
400Milliseconds

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
*Off (no delay)

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
Delay Duration

Aimer Modes

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
Concurrent

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
*Interlaced

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
Off

Indication

Number of Beeps

The number of beeps of a good read can be programmed from 1 - 9. The same number of beeps will be applied to the beeper and LED in response to a good read. For example, if you program this option to have five beeps, there will be five beeps and five LED flashes in response to a good read. The beeps and LED flashes are in sync with one another. To change the number of beeps, scan the barcode below and then scan a digit (1-9) barcode and the **Save** barcode.

Beep Polarity
Beep Polarity sets the idle and active states of the beeper signal. When set to **Active High**, the beeper sounds when the signal shifts from low to high. When set to **Active Low**, the beeper sounds when the signal shifts from high to low. If the beeper is enabled for a good read, the polarity change takes effect after the next successful decode or a power cycle. If the beeper is disabled, a polarity change only takes effect after a power cycle.
Note: Beep Polarity sets the beeper signal voltage level to either high (Active Low) or low (Active High). This will affect Beeper-Good Read settings. If the beeper has been disabled, make sure it is not turned on accidentally by a polarity change.

Good Read Delay
This sets the minimum amount of time before the scanner can read another barcode. Default = No Delay.

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

Number of Beeps

||||||||||||||||||||||||||||||||||
Number of Pulses

Beep Polarity

||||||||||||||||||||||||||||||||||
Active High

||||||||||||||||||||||||||||||||||
*Active Low

Good Read Delay

||||||||||||||||||||||||||||||||||
*No Delay

||||||||||||||||||||||||||||||||||
Short Delay (500 ms)

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

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

||||||||||||||||||||||||||||||||||
User-Specified Good Read Delay

Thermal and Centering

Thermal Considerations

Care must be taken when designing the Image Engine into any system. Internal heating of the Image Engine can occur in high duty cycle scanning applications. The high visibility aimer dissipates a significant amount of power as heat. The illumination and aiming LEDs also release heat, and are a major contributor to thermal increases in high use or in Auto-sense mode. An increase in temperature around an Image Engine can cause noise levels on the imager, degrading image quality. The thermal rise can also affect the laser diode. In a continuous scanning or high use environment, the Image Engine temperature can rise 15° to 20°C. Under high ambient temperature conditions, the laser diode is at risk of thermal breakdown and possible failure. The image quality and decode performance will also degrade. The Power Control PWM can be used to reduce the effect of the Illumination LEDs on thermal rise, however, this also reduces the intensity of the illumination. Reducing the intensity of the illumination reduces total power used but can also reduce the depth of field in low light environments.

Centering

Use Centering to narrow the scanner's field of view to make sure the scanner reads only those barcodes intended by the user. For instance, if multiple codes are placed closely together, centering will insure that only the desired codes are read. (Centering can be used in conjunction with Aimer Delay, for the most error-free operation in applications where multiple codes are spaced closely together. Using the Aimer Delay and Centering features, the scanner can emulate the operation of older systems, such as linear and laser scanners. In the example below, the gray area is the full scanner field of view and the white area is the centering window. barcode 1 will not be read, while barcode 2 will be.
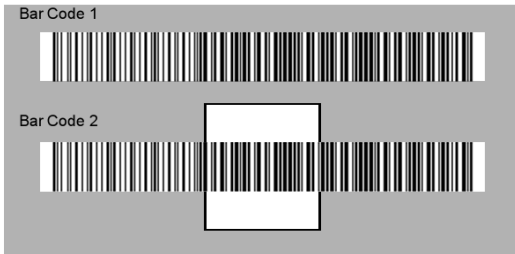
The default centering window is a 128x96 pixel area (640x480 default image size) in the center of the scanner's field of view. The following diagram illustrates the default top, bottom, left, and right pixel positions, measured from the top and the left side of the scanner's field of view.
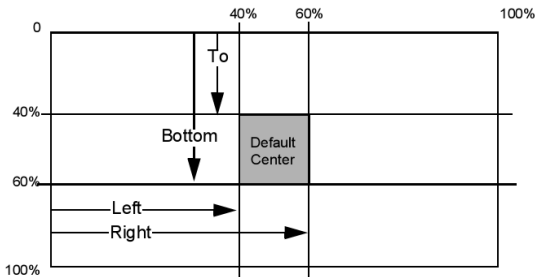
Thermal and Centering

If a barcode is not within the predefined window, it will not be decoded by the scanner. If centering is turned on by scanning **Centering On**, the scanner only reads codes that intersect the centering window you specify using the **Top**, **Bottom**, **Left**, or **Right** barcodes. Scan **Centering On**, then scan one of the following barcodes to change the top, bottom, left, or right of the centering window. Then scan the percent you want to shift the centering window using digits on the inside back cover of this manual. Scan **Save**. Default Centering = 40% for Top and Left, 60% for Bottom and Right.

Centering On

*Centering Off

Top of Centering Window

Bottom of Centering Window

Left of Centering Window

Right of Centering Window

Decode Search Mode

There are three selectable decode (scanning) modes:

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

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

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

Full Omni-directional

Quick Omni-directional

Advanced Linear Decoding

Note: This search mode is the default setting.

Output Sequence

Require Output Sequence

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

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

Output Sequence Editor

This programming selection allows you to program the scanner to output data (when scanning more than one symbol) in whatever order your application requires, regardless of the order in which the barcodes are scanned. Reading the **Default Sequence** symbol programs the scanner 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 matches your application requires. Use the Alphanumeric symbols (inside back cover) to read these options.

Note: You must hold the trigger while reading each barcode in the sequence.

To Add an Output Sequence

1. Scan the **Enter Sequence** symbol

2. **Code I.D.**

On the Product Code ID, find the symbology to which you want to apply the output sequence format. Locate the Hex value for that symbology and scan the 2 digit hex value from the Programming Chart (inside back cover).

3. **Length**

Specify what length (up to 9999 characters) of data output will be acceptable for this symbology. Scan the four digit data length from the Programming Chart. (Note: 50 characters is entered as 0050.

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

4. **Character Match Sequences**

On the ASCII Chart, find the Hex value that represents the character(s) you want to match. Use the Programming Chart to read the alphanumeric combination that represents the ASCII characters. (99 is the Universal number, indicating all characters.)

5. **End Output Sequence Editor**

Scan **F F** to enter an Output Sequence for an additional symbology, or **Save** to save your entries. Other Programming Selections

•**Discard**

This exits without saving any Output Sequence changes.

Output Sequence

Output Sequence Example

In this example, you are scanning Code 93, Code 128, and Code 39 barcodes, 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 To program the previous
example using specific lengths, you would have to count any
programmed prefixes, suffixes, or formatted characters as part of
the length. **SEQBLK62001241FF6A001342FF69001243FF**

The breakdown of the command line is shown below:

SEQBLK sequence editor start command

62 code identifier for **Code 39**

0012 A - Code 39 sample length (11) plus CR suffix (1) = 12

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

FF termination string for first code

6A code identifier for **Code 128**

0013 B - Code 128 sample length (12) plus CR suffix (1) = 13

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

FF termination string for second code

69 code identifier for **Code 93**

0012 C - Code 93 sample length (11) plus CR suffix (1) = 12

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

FF termination string for third code

Output Sequence

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 barcode data is output to the host as the scanner decodes it.

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

Output Sequence Editor

Enter Sequence

Default Sequence

Require Output Sequence

Required

On/Not Required

*Off

Multiple Symbols

When this programming selection is turned **On**, it allows you to read multiple symbols when the trigger is activated. If you press and hold the trigger, aiming the scanner at a series of symbols, it reads unique symbols once, beeping (if turned on) for each read. The scanner attempts to find and decode new symbols as long as the trigger is activated. When this programming selection is turned **Off**, the scanner will only read the symbol closest to the aiming beam.

No Read

With No Read turned **On**, the scanner notifies you if a code cannot be read. If using a Quick*View Scan Data Window, an "NR" appears when a code cannot be read. If No Read is turned **Off**, the "NR" will not appear.

Multiple Symbols

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

On

*Off

No Read

On

*Off

Print Contrast Weight

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

Print Contrast Weight

Set Print Contrast Weight

*Default

Video Reverse

Video Reverse is used to allow the scanner to read barcodes that are inverted. The "Off" barcode below is an example of this type of barcode. If additional menuing is required, Video Reverse must be disabled to read the menu barcodes 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.

Video Reverse

On

* Off

Working Orientation

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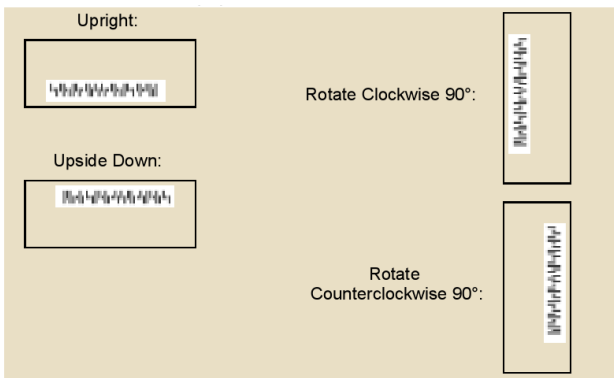
Working Orientation

*Upright

Upside Down

Rotate Clockwise 90˚

Rotate Counterclockwise 90˚

Code Option

If you want to decode all the symbologies allowable for your imager, scan the **All Symbologies On** code. On the other hand, you want to decode only a particular symbology, scan All Symbologies Off followed by the On symbol for that particular symbology. NOTE: Enabling **All Symbologies On** will decrease scan time and enabling only the symbology used will significantly increase performance.

All Symbologies

All Symbologies On

All Symbologies Off

Message Length Description

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

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

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

Start/Stop Characters
Start/Stop characters identify the leading and trailing ends of the barcode.

[Codabar]

Check Character

Codabar check characters are created using different "modulos." You can program the scanner to read only Codabar barcodes with Modulo 16 check characters. **No Check Character** indicates that the scanner reads and transmits barcode data with or without a check character. When Check Character is set to **Validate and Transmit**, the scanner will only read Codabar barcodes printed with a check character, and will transmit this character at the end of the scanned data. When Check Character is set to **Validate, but Don't Transmit**, the unit will only read Codabar barcodes printed with a check character, but will not transmit the check character with the scanned data.

<Default All Codabar Settings>

*On

Off

Start /Stop Character

Transmit

*Don't Transmit

Check Character

*No Check Character

Validate and Transmit

Validate Modulo 16 and Transmit

Validate Modulo 16 ,but Don't Transmit

Codabar

Concatenation

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

Character	Start	Stop	Start	Stop
Codabar				

A12D   D34A

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

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 2-60. Minimum Default = 4, Maximum Default = 60.

Message Length

*On

Off

Require

Minimum Message Length

Maximum Message Length

[Code 39](#)

Start/Stop Characters

Start/Stop characters identify the leading and trailing ends of

the barcode. You may either transmit, or not transmit

Start/Stop characters. Default = Don't Transmit.

Check Character

No Check Character indicates that the scanner reads and

transmits barcode data with or without a check character. Default =

No Check Character.

<Default All Code 39 Settings>

*On

Transmit

*No Check Character

Validate and Transmit

Off

*Don't Transmit

Validate, but Don't Transmit

[Code 39](#)

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 0-48. Minimum Default = 0, Maximum Default = 48.

Append

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

Code 39

Minimum Message Length

Maximum Message Length

Append On

Append Off

Full ASCII

If Full ASCII Code 39 decoding is enabled, certain character pairs within the barcode 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	/	/O	?	%J	O	O	_	%O	o	+O	DEL	%T

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

Code 39

Code Page

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

Full ASCII On

*Full ASCII Off

Code 39 Code Page

Code 32

Code 32 Pharmaceutical is a form of the Code 39 symbology used by Italian pharmacies. This symbology is also known as PARAF. Trioptic Code must be turned off while scanning Code 32 Pharmaceutical codes.

Code 32

On

*Off

Interleaved 2 of 5

Check Digit

No Check Digit indicates that the scanner reads and transmits barcode data with or without a check digit. When Check Digit is set to **Validate, but Don't Transmit**, the unit only reads Interleaved 2 of 5 barcodes printed with a check digit, but will not transmit the check digit with the scanned data.

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

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 80.

<Default all Interleaved 2 of 5 Settings>

*On

Off

*No Check Digit

Validate , but Don't Transmit

Validate and Transmit

Minimum Message Length

Maximum Message Length

Code 93

Code 93 Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 0-80. Minimum Default = 0, Maximum Default = 80.

Code Page

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

<Default All Code 93 Settings>

*On

Minimum Message Length

Code 93 Code Page

Off

Maximum Message Length

Straight 2 of 5 Industrial

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-48. Minimum Default = 4, Maximum Default = 48.

<Default All Straight 2 of 5 Industrial Settings>

On

Minimum Message Length

*Off

Maximum Message Length

Straight 2 of 5 IATA

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-48. Minimum Default = 4, Maximum Default = 48

<Default All Straight 2 of 5 IATA Settings>

On

Maximum Message Length

*Off

Minimum Message Length

Matrix 2 of 5

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-80. Minimum Default = 4, Maximum Default = 80.

<Default All Matrix 2 of 5 Settings>

On

Minimum Message Length

*Off

Maximum Message Length

[Code 11](#)

Check Digits Required

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

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-80. Minimum Default = 4, Maximum Default = 80.

<Default All Code 11 Settings>

On

One Check Digit

Minimum Message Length

*Off

*Two Check Digits

Maximum Message Length

Code 128

ISBT 128 Concatenation

The use of ISBT formats requires a paid license. The ISBT 128 Application Specification describes 1) the critical data elements for labeling blood products, 2) the current recommendation to use Code 128 due to its high degree of security and its space-efficient design, 3) a variation of Code 128 that supports concatenation of neighboring symbols, and 4) the standard layout for barcodes on a blood product label. Use the barcodes below to turn concatenation on or off. Default = Off.

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 0-80. Minimum Default = 0, Maximum Default = 80.

Code Page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the barcode being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, scan the barcode below, select the code page with which the barcodes were created, and scan the value and the **Save** The data characters should then appear properly. Default = 2.

||||||||||||||||||||||||||
<Default All Code 128 Settings>

||||||||||||||||||||||||||
*On

||||||||||||||||||||||||||
Off

||||||||||||||||||||||||||
ISBT 128 On

||||||||||||||||||||||||||
* *ISBT 128* Off

||||||||||||||||||||||||||
Minimum Message Length

||||||||||||||||||||||||||
Maximum Message Length

Code Page

||||||||||||||||||||||||||
Code 128 Code Page

Telepen

Telepen Output

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

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-60. Minimum Default = 1, Maximum Default = 60.

<Default All Telepen Settings>

On

*AIM Telepen Output

Minimum Message Length

*Off

Original Telepen Output

Maximum Message Length

[UPC-A](#)

Check Digit

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

Number System

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

<Default All UPC-A Settings>

*On

Off

Check Digit

*On

Off

Number System

*On

Off

UPC-A

Addenda

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

Addenda Required

When **Required** is scanned, the scanner will only read UPC-A barcodes that have addenda. You must then turn on a 2 or 5 digit addenda. Default = Not Required.

Addenda Separator

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

UPC-A/EAN-13 with Extended Coupon Code

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

Addenda

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
2 Digit Addenda On

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
*2 Digit Addenda Off

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
5 Digit Addenda On

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
*5 Digit Addenda Off

Addenda Required

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
Required

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
*Not Required

Addenda Separator

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
*On

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
Off

UPC-A/EAN-13 with Extended
Coupon Code

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
*On

‖‖‖‖‖‖‖‖‖‖‖‖‖‖‖
Off

UPC-E0

Most U.P.C. barcodes 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. Default = On.

UPC-E0 Expand
UPC-E Expand expands the UPC-E code to the 12 digit, UPC-A format. Default = Off.

Addenda Required
When Addenda Required is set to on, the scanner will only read UPC-E barcodes that have addenda.

Addenda Separator
When this feature is on, there is a space between the data from the barcode and the data from the addenda. When turned off, there is no space.

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

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

||||||||||||||||||||||||||

<Default All UPC-E Settings>

||||||||||||||||||||||||||
*UPC-E0 On

||||||||||||||||||||||||||
UPC-E0 Off

UPC-E0 Expand
||||||||||||||||||||||||||
On

||||||||||||||||||||||||||
*Off

Addenda Required
||||||||||||||||||||||||||
Required

||||||||||||||||||||||||||
*Not Required

Addenda Separator
||||||||||||||||||||||||||
*On

||||||||||||||||||||||||||
Off

Check Digit
||||||||||||||||||||||||||
*On

||||||||||||||||||||||||||
Off

Number System
||||||||||||||||||||||||||
*On

||||||||||||||||||||||||||
Off

UPC-E0

Addenda

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

UPC-E1

Most U.P.C. barcodes lead with the 0 number system. For these codes. If you need to read codes that lead with the 1 number system, use the UPC-E1 selection. Default = Off

Addenda

2 Digit Addenda On

*2 Digit Addenda Off

5 Digit Addenda On

*5 Digit Addenda Off

UPC-E1

UPC-E1 On

*UPC-E1 Off

EAN/JAN-13

Check Digit
This selection allows you to specify whether the check digit should be transmitted at the end of the scanned data or not.

ISBN Translate
This selection causes EAN-13 Bookland symbols to be translated into their equivalent ISBN number format.

<Default All EAN/JAN Settings>

*On

Off

Check Digit

*On

Off

ISBN Translate

On

*Off

[EAN/JAN-13](#)

Addenda

This selection adds 2 or 5 digits to the end of all scanned EAN/JAN-13 data.

Addenda Required

When Addenda required is set to on, the scanner will only read EAN/JAN-13 barcodes that have addenda.

Addenda Separator

When this feature is on, there is a space between the data from the barcode and the data from the addenda. When turned off, there is no space.

Addenda

2 Digit Addenda On

*2 Digit Addenda Off

5 Digit Addenda On

*5 Digit Addenda Off

Addenda Required

Required

*No Required

Addenda Separator

*On

Off

EAN/JAN-8

Check Digit

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

Addenda

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

<Default All EAN/JAN-8 Settings>

*On

Off

Check Digit

*On

Off

Addenda

2 Digit Addenda On

*2 Digit Addenda Off

5 Digit Addenda On

*5 Digit Addenda Off

EAN/JAN-8

Addenda Required

When Addenda Required is set to on, the scanner will only read EAN/JAN-8 barcodes that have addenda.

EAN/JAN-8 Addenda Separator

When this feature is on, there is a space between the data from the barcode and the data from the addenda. When turned off, there is no space.

Addenda Required

Required

*Not Required

Addenda Separator

*On

Off

68

MSI

MSI Check Character

Different types of check characters are used with MSI barcodes. You can program the scanner to read MSI barcodes with Type 10 check characters.

When Check Character is set to **Validate and Transmit**, the scanner will only read MSI barcodes printed with the specified type check character, and will transmit this character at the end of the scanned data. When Check Character is set to **Validate, but Don't Transmit**, the unit will only read MSI barcodes printed with the specified type check character, but will not transmit the check character with the scanned data.

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 4-48. Minimum Default = 4, Maximum Default = 48.

<Default All MSI Settings>

On

*Off

*Validate Type 10, but Don't Transmit

Validate Type 10 and Transmit

Minimum Message Length

Maximum Message Length

Plessey Code

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 4-48. Minimum Default = 4, Maximum Default = 48.

<Default All Plessey Code Settings>

On

Minimum Message Length

*Off

Maximum Message Length

GS1 DataBar Omnidirectional

<Default All GS1 DataBar Omnidirectional Settings>

*On

Off

GS1 DataBar Limited

<Default All GS1 DataBar Limited Settings>

*On

Off

GS1 DataBar Expanded

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 4-74. Minimum Default = 4, Maximum Default = 74.

<Default All GS1 DataBar Expanded Settings>

*On

Minimum Message Length

Off

Maximum Message Length

PosiCode

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

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 48.

Trioptic Code

Note: If you are going to scan Code 32 Pharmaceutical codes, Trioptic Code must be off. Trioptic Code is used for labeling magnetic storage media

<Default All PosiCode Settings>

* On

Off

A and B On (No Limited)

A and B and Limited On
(Limited B Off)

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

Message Length

Minimum Message Length

Maximum Message Length

Trioptic Code

On

*Off

73

Codablock F

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-2048. Minimum Default = 1, Maximum Default = 2048

<Default All Codablock F Settings>

On

*Off

Minimum Message Length

Maximum Message Length

Code 16K

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 0-160. Minimum Default = 1, Maximum Default = 160.

<Default All Code 16K Settings>

On

*Off

Minimum Message Length

Maximum Message Length

Code 49

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-81. Minimum Default = 1, Maximum Default = 81.

<Default All Code 49 Settings>

*On

Off

Minimum Message Length

Maximum Message Length

[PDF417](#)

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-2750. Minimum Default = 1, Maximum Default = 2750.

<Default All PDF417 Settings>

*On

Off

Minimum Message Length

Maximum Message Length

[MicroPDF417](#)

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-366. Minimum Default = 1, Maximum Default = 366.

\<Default All Micro PDF417 Settings\>

* On

Off

Minimum Message Length

Maximum Message Length

GS1 (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.

UPC/EAN Version
Scan the **UPC/EAN Version On** barcode to decode EAN•UCC Composite symbols that have a UPC or EAN linear component. (This does not affect EAN•UCC Composite symbols with a UCC/EAN-128 or GS1 DataBar linear component.)

Message Length
Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-2435. Minimum Default = 1, Maximum Default = 2435

Emulation
The scanner can automatically format the output from any EAN•UCC data carrier to emulate what would be encoded in an equivalent UCC/EAN-128 or GS1 DataBar and Composite symbol. EAN•UCC data carriers include UPC-A and UPC-E, EAN-13 and EAN-8, ITF-14, UCC/EAN-128, and EAN•UCC GS1 DataBar and Composites. Data from 2D symbols such as Aztec Code, Data Matrix, or QR Code, which encode a leading FNC1, also invoke EAN•UCC emulation. If UCC/EAN-128 Emulation is selected, the AIM Symbology Identifier is reported as "]C1". If GS1 DataBar Emulation is selected, the AIM Symbology Identifier is reported as "]e0." Any application that accepts EAN•UCC data can be simplified since it only needs to recognize one data carrier type.

GS1 (EAN•UCC) Composite Codes

TCIF Linked Code 39 (TLC39)

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

Composite Codes

On

UPC/EAN Version

UPC / EAN Version On

Message Length

Minimum Message Length

Emulation

GS1 DataBar Emulation

* Emulation Off

TCIF Link Code 39

TLC39 On

*Off

*UPC / EAN Version Off

Maximum Message Length

128 Emulation

*TLC39 Off

Postal Codes

Note: For best performance when reading a postal symbology, all other postal symbologies should be turned off; by default all postal symbologies are off. The following postal codes can be enabled.

USPS Intelligent Mail

On

* Off

USPS Postnet

Check Digit

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

On

Transmit Check Digit

*Off

*Don't Transmit Check Digit

Planet Code

Check Digit

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

On

*Off

Transmit Check Digit

*Don't Transmit Check Digit

Postal Codes

British Post

On

*Off

Canadian Post

On

*Off

Kix (Netherlands) Post

On

*Off

Australian Post

On

*Off

Japanese Post

On

*Off

China Post

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 80.

<Default All China Post Settings>

On

*Off

Minimum Message Length

Maximum Message Length

Postal Codes

Korea Post

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 2-80. Minimum Default = 4, Maximum Default = 48.

<Default All Korea Post Settings>

On

Minimum Message Length

*Off

Maximum Message Length

QR Code

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

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-3500. Minimum Default = 1, Maximum Default = 3500.

<Default All QR Code Settings>

*On

Minimum Message Length

Off

Maximum Message Length

[Data Matrix]

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-1500. Minimum Default = 1, Maximum Default = 1500.

<Default All Data Matrix Settings>

*On

Off

Minimum Message Length

Maximum Message Length

[MaxiCode](#)

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-150. Minimum Default = 1, Maximum Default = 150.

<Default All MaxiCode Settings>

*On

Off

Minimum Message Length

Maximum Message Length

Aztec Code

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-3750.

Minimum Default = 1, Maximum Default = 3750

<Default All Aztec Code Settings>

*On

Off

Minimum Message Length

Maximum Message Length

Aztec Runes

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

Enable Runes

*Disable Runes

Chinese Sensible (Han Xin) Code

Message Length

Scan the barcodes below to change the message length. Minimum and Maximum lengths = 1-7833. Minimum Default = 1, Maximum Default = 7833.

<Default All Han Xin Settings >

On

*Off

Minimum Message Length

Maximum Message Length

String Format

Prefix/Suffix

When a barcode is scanned, additional information is sent to the host computer along with the barcode data. This group of barcode 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:

Prefix / Suffix characters setting: Characters defined as prefix or suffix characters will be transmitted immediately with the scanned data for all symbologies. Up to 11 ASCII characters can be defined for both Prefix and Suffix.

Tips

- A prefix or suffix may be added or cleared from one symbology or all symbologies.
- You can add any prefix or suffix f, plus Code I.D. and AIM I.D.
- You can string together several entries for several symbologies at one time.
- Enter prefixes and suffixes in the order in which you want them to appear on the output.
- When Setting up for specific symbologies, instead of All Symbologies, the symbology ID value counts as an added prefix or suffix character. Prefix Scanned Data Suffix

To Add a Prefix or Suffix:

Step 1. Scan the **Add Prefix** or **Add Suffix** symbol.
Step 2. Determine the 2 digit Hex value from the Symbology Chart
or the symbology to which you want to apply the prefix or suffix.
For example, for Code 128, Code ID is "j" and Hex ID is "6A".
Step 3. Scan the 2 hex digits or scan **9**, **9** for all symbologies.
Step 4. Determine the hex value from the for the prefix or suffix
you wish to enter.
Step 5. Scan the 2 digit hex value.
Step 6. Repeat Steps 4 and 5 for every prefix or suffix character.
Step 7. To add the Code I.D., scan **5**, **C**, **8**, **0**.
To add AIM I.D., scan **5**, **C**, **8**, **1**.
To add a backslash (\), scan **5**, **C**, **5**, **C**.
Note: To add a backslash (\) as in Step 7, you must scan 5C twice –
once to create the leading backslash and then to create the backslash
itself.
Step 8. Scan **Save** to exit and save, or scan **Discard** to exit without
saving. Repeat Steps 1-6 to add a prefix or suffix for another
symbology.
Example: Add a Suffix to a specific symbology

To send a CR (carriage return)Suffix for UPC only:
Step 1. Scan **Add Suffix**.
Step 2. Determine the 2 digit hex value for UPC.
Step 3. Scan **6**, **3** .
Step 4. Scan **0**, **D** (carriage return).
Step 5. Scan **Save**, or scan **Discard** to exit without saving.

To Clear One or All Prefixes or Suffixes:

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

Step 1. Scan the **Clear One Prefix** or **Clear One Suffix** symbol.
Step 2. Determine the 2 digit Hex value for the symbology from
which you want to clear the prefix or suffix.
Step 3. Scan the 2 digit hex value or scan **9**, **9** for all symbologies.
Your change is automatically saved.

To Add a Carriage Return Suffix to all Symbologies:

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

Prefix Selections

Add Prefix

Clear One Prefix

Clear All Prefixes

Suffix Selections

Add Suffix

Clear One Suffix

Clear All Suffixes

Function Code Transmit

When this selection is enabled and function codes are contained within the scanned data, the scanner transmits the function code to the terminal.

Function Code Transmit

* Enable

Disable

Intercharacter, Interfunction, and Intermessage Delays

Some terminals drop information (characters) if data comes through too quickly. Intercharacter, interfunction, and intermessage delays slow the transmission of data, increasing data integrity. Each delay is composed of a 5 millisecond step. You can program up to 99 steps (of 5 ms each) for a range of 0-495 ms.

Intercharacter Delay

An intercharacter delay of up to 495 milliseconds may be placed between the transmission of each character of scanned data. Scan the **Intercharacter Delay** barcode below, then scan the number of milliseconds and the **SAVE** barcode.
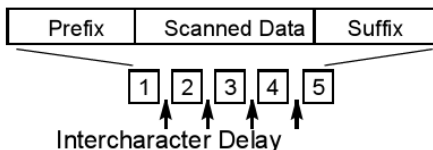
Intercharacter Delay

To remove this delay, scan the **Intercharacter Delay** barcode, then set the number of steps to 0. Scan the **SAVE** barcode.
Note: Intercharacter delays are not supported in USB serial emulation.

User Specified Intercharacter Delay

An intercharacter delay of up to 495 milliseconds may be placed after the transmission of a particular character of scanned data. Scan the **Delay Length** barcode below, then scan the number of milliseconds and the **SAVE** barcode. Next, scan the **Character to Trigger Delay** barcode, then the 2-digit hex value for the ASCII character that will trigger the delay.

*User Specified Intercharacter Delay*

Delay Length

Character to Trigger Delay

To remove this delay, scan the **Delay Length** barcode, and set the number of steps to 0. Scan the **SAVE** barcode.

Interfunction Delay

An interfunction delay of up to 495 milliseconds may be placed between the transmission of each segment of the message string. Scan the **Interfunction Delay** barcode below, then scan the number of milliseconds and the **SAVE.**

Interfunction Delay
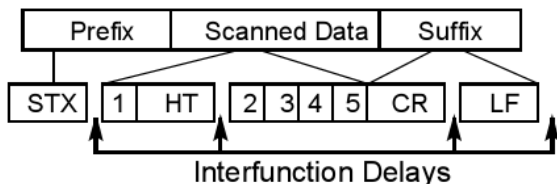
To remove this delay, scan the **Interfunction Delay** barcode, then set the number of steps to 0. Scan the **SAVE** barcode.

Intermessage Delay

An intermessage delay of up to 495 milliseconds may be placed between each scan transmission. Scan the **Intermessage Delay** barcode below, then scan the number of milliseconds and the **SAVE** barcode.

Intermessage Delay
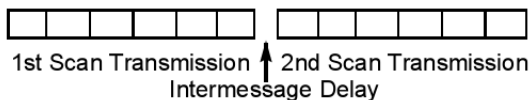
To remove this delay, scan the **Intermessage Delay** barcode, then

set the number of steps to 0. Scan the **SAVE** barcode.

Data Formatting

Data Format Editor Introduction

You may use the Data Format Editor to change the scanner's output. For example, you can use the Data Format Editor to insert characters at certain points in barcode data as it is scanned. The selections in the following pages are used only if you wish to alter the output. Default Data Format setting = None. Normally, when you scan a barcode, it gets outputted automatically; however when you do a format, you must use a "send" command within the format program to output data. Multiple formats may be programmed into the scanner. They are stacked in the order in which they are entered. However, the following list presents the order in which formats are applied:

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

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

To Add a Data Format

Step 1. Scan the **Enter Data Format** symbol

Step 2. Primary/Alternate Format

Determine if this will be your primary data format, or one of 3 alternate formats. (Alternate formats allow you "single shot" capability to scan one barcode using a different data format. After the one barcode has been read, the scanner reverts to the primary data format. If you are programming the primary format, scan **0** using the inside the back cover of this manual. If you are programming an alternate format, scan **1**, **2**, or **3**, depending on the alternate format you are programming.

Step 3. Interface Type

Select the Interface ID number for your PC. Scan three numeric barcodes on the inside back cover to program the scanner for your Interface ID (you must enter 3 digits). For example, scan **0 0 0** for RS-232.

Note: The wildcard for all terminal types is 099.

Step 4. Code I.D.

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.

Step 5. Length

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

Step 6. Editor Commands

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

Step 7. Scan **Save** to save your entries.

• 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 Interface Type and Code I.D. , and the barcode data length for the specific data format that you want to delete. All other formats remain unaffected.

• Save: This exits, saving any Data Format changes.

• Discard : This exits without saving any Data Format changes.

Enter Data Format

* Default Data Format

Clear One Data Format

Clear All Data Formats

Save

Discard

Data Format Editor Commands

Send Commands

F1 Send all characters followed by "xx" key or function code, starting from current cursor position.

Syntax = F1xx (xx stands for the hex value for an ASCII code.

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.

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.

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, 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 a head "nn" characters from current cursor position. **Syntax = F5nn** (nn stands for the numeric value (00-99) for the number ofcharacters 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.

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.

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.
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,

Miscellaneous Commands

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

E4 Replaces up to 15 characters in the data string with user specified characters. Replacement continues until the E5 command is encountered. **Syntax = 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.

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 Formatter

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

* Data Formatter On,
but Not Required

Data Formatter Off

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

Data Formatter On, Format Required

Alternate Data Formats

Alternate formats allow you "single shot" capability to scan one barcode using a different data format than your primary format. When data formats are programmed, 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 barcodes below. The scanner will scan the next barcode, 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

OCR Programming

Use this section to program the scanner for optical character recognition (OCR). The scanner engine reads 6 to 60 point OCR typeface. **Note:** OCR is not as secure as barcodes. To enhance security in OCR applications, create an OCR template to match the data, and print an OCR check character.

The scanner engine will read OCR-A, OCR-B, U.S. Currency Serial Number (Money), MICR E-13B, and SEMI fonts. 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 9-1 for programming codes that will enable your scanner to read OCR-A, OCR-B, U.S. Currency, MICR E-13B, or SEMI fonts. See "OCR Templates" on page 9-3 if you want to create a custom "template," or character string that defines the length and content of OCR strings that will be read with your scanner. **Note:** Setting the template and check character options are essential for OCR reading.

OCR Fonts

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

Note: OCR symbols can misread when scanned sideways or upside down. Use Working Orientation, if your OCR symbols will not usually be presented upright to the scanner. Only one OCR symbology can be read at a time. **OCR-A On** allows you to scan characters in the OCR-A font. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned. **OCR-B On** allows you to scan characters in the OCR-B font. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned.

<Default All OCR Settings>

OCR-A On

OCR-B On

U.S. Currency Font

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

U.S Currency On

MICR E-13B Font

MICR E-13B On allows you to scan MICR characters on a bank check. The default setting allows you to scan any eight digit combination. If you have created an OCR template, character combinations that fit the template can be scanned.

MICR E-13B On

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

the transit character is output as **T**

the amount character is output as **A**

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

the dash character is output as **D**

SEMI Font

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

SEMI Font On

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

*All OCR Off

OCR Templates

You can create a custom "template," or character string that defines the length and content of OCR strings that will be read with your 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.	
Note: In MICR E-13B templates, TOAD characters (capital letters T, O, A, and D), represent Transit, On Us, Amount, and Dash.	

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

To Add an OCR Template:

1. Turn on the OCR font you want to read.
2. Begin building the template.

3. Scan the **Enter OCR Template** symbol.

4. 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 to scan the characters for your template.

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

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

37680981

Character Match Sequences

On the ASCII Chart, find the Hex value that represents the character(s) you want to match.

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

ddd414243ddd

hex codes for
letters A, B, and C

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

551ABC983

Adding Spaces

You may also need to put spaces in your template.

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

ddd2041424320ddd
          ↓   ↓
  hex code for a space

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

551 ABC 983

Note: If using Quick*View to program, use the space bar to designate a space and not the hex value of 20.4. Exit OCR Template Editor Scan **Save OCR Template** to save your entries. **Discard OCR Template** exits without saving any OCR Template changes.

Stringing Together Multiple Formats
(Creating "Or" Statements)

You may want to program the 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: You need to read any combination of eight digits, or a combination of four digits, two uppercase letters, and two digits. The template would be: dddddddddtddddlldd

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

99028650

or
9902XZ50

You can string together as many templates as you need.

OCR User-Defined Variables

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

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

414243 To create this template, you would enable the OCR-A font. Scan the **Enter User-Defined Variable g** symbol. Scan **414243** (the hex characters for "A," "B," and "C"). Scan **Save OCR Template** . 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: dddddggg This template would then let you read data that began with six digits, and had an A, B, or C trailing. So you would be able to read:

654321ABC

or
654321BAC

or
654321CCC

Reading Multi-Row OCR

The scanner is capable of decoding multi-row OCR text.
Note: Reading rows longer than sixteen characters is not recommended. **Example:** You need to read multiple rows of OCR-A data as shown below:

12345678

ABCDEFGH

First, enable the OCR-A font. To read the first row of OCR data, you would program the following template: OCRTMP"dddddddd". This template is the default OCR template. If you wanted to read the second line of data, you would use the following template:
OCRTMP"llllllll". To read both lines of OCR at one time, use the variable **r** to indicate the start of a new row. All the other templating variables for the individual rows work the same as previously described. For instance, in the above example, you would use the following template to read both rows:
OCRTMP"ddddddddrllllllll".
To read the three rows below, you would use the template command
"OCRTMP"ddddddddrllllllllrlllldddd".

12345678

ABCDEFGH

ABCD1234.

OCR Check Character

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

Scan the **OCR Modulo 10** or **OCR Modulo 36 Check Character** barcode 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 scanner transmits the OCR data without the check character data. You must specify the location of the check character in the template with a **c**.

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

To create this template, you would enable the OCR-A font. Scan the **Modulo 10 Check Character** symbol. Then scan the **Enter OCR Template** symbol, and scan the **d** from the OCR Programming Chart seven times, and scan the **c** once. Scan **Save OCR Template** . This template will let you read any combination of six 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:

0123456ﬂ

and the output would be: 0123456

OCR Modulo 10 Check Character

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

OCR Modulo 10 Check Character

OCR Modulo 36 Check Character

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

OCR Modulo 36 Check Character

OCR User-Defined Check Character

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

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

0123456789X

Also enter the OCR template: **ddddddddc**

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

6512351X

The scanner performs the following check character computation:

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

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

Programming a User-Defined Check Character

1. Scan the **Enter OCR Check Character** barcode, below:

Enter OCR Check Character

OCR Modulo 36 Check Character Enter OCR Check Character
2. Enter the characters in order. For each character, look up the corresponding hex value from the ASCII Chart.

3. Scan the **Save** barcode on the inside back cover.
Example: To program the modulo 11 check character from

example #8 , enable the OCR-A font. Scan the **Enter OCR Check Character** barcode, then scan the following hex values in order:
3031323334353637383958
After you enter all the desired hex values, scan the **Save** barcode on the inside back cover of this manual.

Weighting Options

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

Weighted Modulo 10 Check Character

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

a   Weighted Modulo 10
    Check Character

Example: Scan the Weighted Modulo 10 Check Character symbol. Also enter the OCR template: ddddddc

Then scan the string below:

0123456 5

The reader performs the check character computation below:
$(0 \times 3 + 1 \times 1 + 2 \times 3 + 3 \times 1 + 4 \times 3 + 5 \times 1 + 6 \times 3 + 5 \times 1)$
modulo $10 = 0$

a.Weighted Modulo 10 Check Character
Since the result is zero, the message is considered to be valid, so the reader outputs the message: 0123456

b.Weighted Modulo 10 Check Character
Starting with the check character and working backward through the message, the scanner applies a multiplier of 1, then 2, then 1, then 2, and so on. When the result of the multiplication is greater than 9, add both digits to the running sum. This is often referred to as the LUHN formula. One common application of the LUHN formula is validate credit card numbers. This is the modulo 10 checking scheme used in MSI Code and in Code 32 Pharmaceutical (PARAF). To apply this weighting scheme, set the OCR check character to **"0123456789x2x1"** or scan the following symbol:

b. Weighted Modulo 10
   Check Character

Example: Scan the Weighted Modulo 10 Check Character symbol.

Also enter the OCR template: dddddddc
Then scan the string below:

0128454

The reader performs the check character computation below:

$(0 \times 1 + 1 \times 2 + 2 \times 1 + 8 \times 2 + 4 \times 1 + 5 \times 2 + 4 \times 1)$ modulo 10
$= (0 + 2 + 2 + (1 + 6) + 4 + (1 + 0) + 4)$ modulo 10
$= 0$

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

OCR ISBN Application Example

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

ISBN4-594-03019-X

C0097 ¥838E

1. Scan the OCR-B On barcode
2. Program the user-defined variable "g" to comprise the ten digits plus the dash: 0123456789-
3. In Japan, it is common for two fields to follow the ISBN number, the three digit price field, and the four digit price field. The first field typically starts with a "C" (uppercase c), followed by four digits. The second field typically starts with a "P" or a yen symbol,

followed by three or four digits, followed by an "E." Program the user-defined variable "h" to comprise the "P" and the yen symbol (represented by a backslash P\ ) .

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

5. Finally, set up the ISBN check digit, which is a special position-weighted modulo 11 checksum. The scanner automatically invokes the ISBN checksum for template rows that are:

1.) at least fourteen characters long,

2.) whose first four characters are the letters "ISBN,"

3.) whose last character is a check character, and

4.) when the modulo 11 check character "0123456789X" is programmed.

OCRENA2,TMP"ISBNgggggggggggggctCdddd hdddEtCdddd hddddE",GPG"0123456789-",GPH"P\",CHK"0123456789X".

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

OCR Template Codes

Note: Reading more than three rows of OCR is not recommended.

OCR Template Codes

Enter OCR Template †

Enter User-Defined
Variable "g"†

Enter User-Defined
Variable "h"†

Exit Selections

Save OCR Template

Discard OCR Template

Utilities

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

This selection allows you to turn on transmission of a Code I.D. before the decoded symbology. This action first clears all current prefixes, then programs a Code I.D. prefix for all symbologies. This is a temporary setting that will be removed when the unit is power cycled.

Show Data Format

Scan the barcode below to show current data format settings.

Resetting the Standard Product Defaults

If you aren't sure what programming options are in your imager, or you've changed some options and want the standard product default settings restored, scan the **Standard Product Default Settings** barcode below. The Menu Commands starting on page 11-5 lists the standard product default settings for each of the commands.

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.

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

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

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

Show Data Format

Data Format Settings

Standard Product Default Settings

Standard Product Default Settings

Test Menu

On

*Off

Test Chart of Common Barcodes

Additional barcode symbols may be created on-line as

needed at www.bcgen.com for testing purposes.

CODE-128

CODE-39

GS1 DataBar Stacked

(01)00123456789012

QR Code

DataMatrix

OCR A

12345678

Interface ID

If you want to change the pre-programmed interface of your image engine, below.For example, a USB Virtual COM device has a Interface ID of 130. You would scan the **Interface ID** barcode, then **1**, **3**, **1** , then **Save**. If you make an error while scanning the digits (before scanning Save), scan the **Discard** code.

Interface	Interface ID
RS-232	000
USB HID (PC)	124
USB HID (Mac)	125
USB Virtual COM	130

Terminal ID

Save

Product Code ID

Symbology	AIM ID	Code ID	Code ID (HEX)
All Symbologies			0x99
Australian Post	]x0	'A	0x41
Aztec Code	]zm	'z	0x7A
British Post	]X0	'B	0x42
Canadian Post	]X0	'C	0x43
China Post	]X0	'Q	0x51
Codabar	]Fm	'a	0x61
Codablock F	]Om	'q	0x71
Code 11	]H3	'h	0x68
Code 128	]Cm	'j	0x6A
Code 16K	]Km	'o	0x6F
Code 32	]X0	'<	0x3C
Code 39	]Am	'b	0x62
Code 49	]Tm	'I	0x6C
Code 93	]Gm	'i	0x69
Data Matrix	]dm	'w	0x77
EAN-13	]E0	'd	0x64
EAN-8	]E4	'D	0x44
EAN UCC Composite	]em	'y	0x79
EAN-13 w Extended Coupon Code	]E3	'd	0x64
Interleaved 2 of 5	]Lm	'e	0x65
Japanese Post	]X0	'J	0x4A
KIX Post	]X0	'K	0x4B
Korea Post	]X0	'?	0x3F
Matrix 2 of 5	]X0	'm	0x6D
MaxiCode	]Um	,x	0x78
MicriPDF417	]Lm	'R	0x52
MSI	]Mm	'g	0x67

No Read			0x9C
OCR-A	]o1	'O	0x4F

Symbology	AIM ID	Code ID	Code ID (HEX)
OCR-B	]o2	'O	0x4F
OCR MICR E-13B	]ZE	'O	0x4F
OCR US Money Font	]o3	'O	0x4F
SEMI Font	]o3	'O	0x4F
PDF 417	]Lm	'r	0x72
Planet Code	]X0	'L	0x4C
Plessey Code	]P0	'n	0x6E
PosiCode	]pm	'W	0x57
Postnet	]X0	'P	0x50
QR Code	]Qm	's	0x73
GS1 DataBar Family	]em	'y	0x79
Straight of 2 of IATA	]Rm	'f	0x66
TCIF Linked Code 39	]L2	'T	0x54
Telepen	]Bm	't	0x74
Trioptic Code	]X0		0x3D
UCC\EAN-128	]C1	'I	0x49
UPC-A	]E0	'c	0x63
UPC-A w Extended Coupon Code	]E3	'c	0x63
UPC-E	]E0	'E	0x45
VeriCode	]X0	'v	0x76

ASCII Code Table

Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char
0	00	NUL	32	20		64	40	@	96	60	`
1	01	SOH	33	21	!	65	41	A	97	61	a
2	02	STX	34	22	"	66	42	B	98	62	b
3	03	ETX	35	23	#	67	43	C	99	63	c
4	04	EOT	36	24	$	68	44	D	100	64	d
5	05	ENQ	37	25	%	69	45	E	101	65	e
6	06	ACK	38	26	&	70	46	F	102	66	f
7	07	BEL	39	27	'	71	47	G	103	67	g
8	08	BS	40	28	(	72	48	H	104	68	h
9	09	HT	41	29	)	73	49	I	105	69	i
10	0A	LF	42	2A	*	74	4A	J	106	6A	j
11	0B	VT	43	2B	+	75	4B	K	107	6B	k
12	0C	FF	44	2C	,	76	4C	L	108	6C	l
13	0D	CR	45	2D	-	77	4D	M	109	6D	m
14	0E	SO	46	2E	.	78	4E	N	110	6E	n
15	0F	SI	47	2F	/	79	4F	O	111	6F	o
16	10	DLE	48	30	0	80	50	P	112	70	p
17	11	DC1	49	31	1	81	51	Q	113	71	q
18	12	DC2	50	32	2	82	52	R	114	72	r
19	13	DC3	51	33	3	83	53	S	115	73	s
20	14	DC4	52	34	4	84	54	T	116	74	t
21	15	NAK	53	35	5	85	55	U	117	75	u
22	16	SYN	54	36	6	86	56	V	118	76	v
23	17	ETB	55	37	7	87	57	W	119	77	w
24	18	CAN	56	38	8	88	58	X	120	78	x
25	19	EM	57	39	9	89	59	Y	121	79	y
26	1A	SUB	58	3A	:	90	5A	Z	122	7A	z
27	1B	ESC	59	3B	;	91	5B	[	123	7B	{
28	1C	FS	60	3C	<	92	5C	\	124	7C		
29	1D	GS	61	3D	=	93	5D	]	125	7D	}
30	1E	RS	62	3E	>	94	5E	^	126	7E	~
31	1F	US	63	3F	?	95	5F	_	127	7F	

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

OCR Programming Chart

a

c

d

e

g

h

l

r

t

Save OCR Template

Discard OCR Template

Program Chart

||||||||||||||||||||

A

||||||||||||||||||||

B

||||||||||||||||||||

C

||||||||||||||||||||

D

||||||||||||||||||||

E

||||||||||||||||||||

F

||||||||||||||||||||

0

||||||||||||||||||||

1

||||||||||||||||||||

2

||||||||||||||||||||

3

||||||||||||||||||||

4

||||||||||||||||||||

5

Program Chart

||||||||||||||||||||
6

||||||||||||||||||||
7

||||||||||||||||||||
8

||||||||||||||||||||
9

||||||||||||||||||||
Save

||||||||||||||||||||
Discard

Show Data Format

||||||||||||||||||||

Reset Scanner to Default Settings

||||||||||||||||||||

Enable USB Keyboard Emulation (PC)

||||||||||||||||||||