EVO Laser

Barcode Scanner

User's Guide

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Introduction

Components

Item No.	Description
1	Red Output Window (Laser Aperture)
2	Trigger
3	Pinhole for Cable Release (*see page 3*)
4	10-Pin RJ45, Female Socket
5	Beeper Hole
6	LED Indicator *(see page 5)*
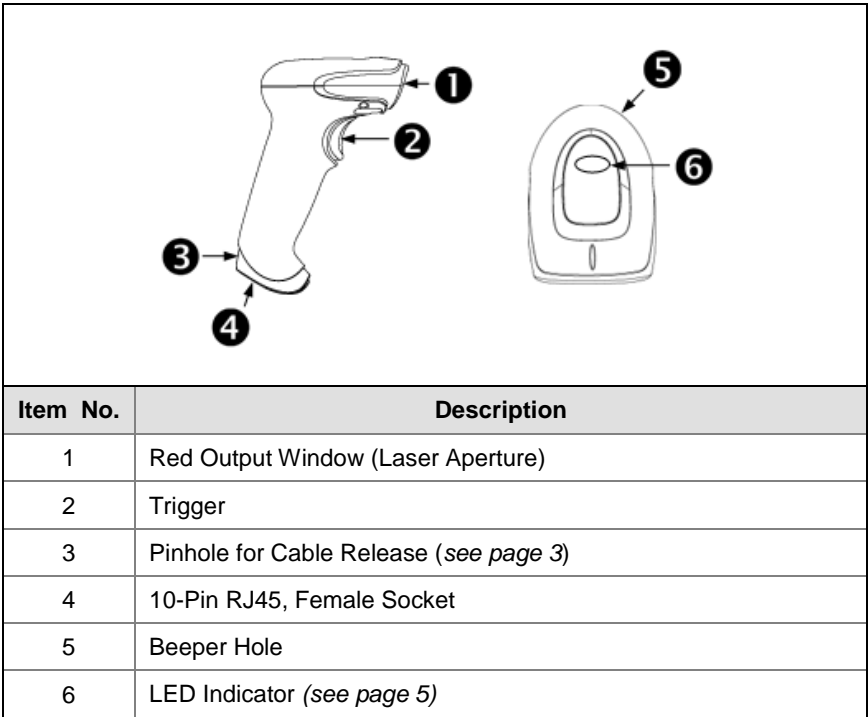
Figure 1. Scanner Components

Maintenance

Smudges and dirt on the unit's window can interfere with the unit's performance. If the window requires cleaning, use only a mild glass cleaner containing no ammonia. When cleaning the window, spray the cleaner onto a lint free, non-abrasive cleaning cloth then gently wipe the window clean.

If the unit's housing requires cleaning, use a mild cleaning agent that does not contain strong oxidizing chemicals. Strong cleaning agents may discolor or damage the unit's exterior.

Caution and Serial Number Labels

Item Number,
Serial Number and
Compliance Information
location.
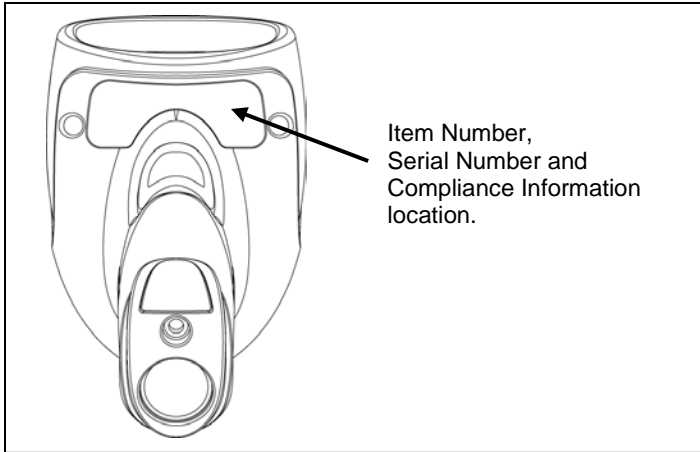
Figure 2. Label Location on the Bottom of the Scanner

Caution: ⚠	To maintain compliance with applicable standards, all circuits connected to the imager must meet the requirements for SELV (Safety Extra Low Voltage) according to EN/IEC 60950-1.
	To maintain compliance with standard CSA C22.2 No. 60950-1/UL 60950-1 and norm EN/IEC 60950-1, the power source should meet applicable performance requirements for a limited power source.

Cable Installation and Removal

Installation

1. Insert the cable's modular connector into the socket on the scanner.

2. Pull gently on the cable strain relief to ensure the cable is installed.
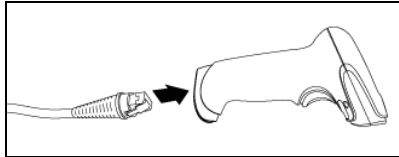
Figure 3.

Removal

Turn off power to the host system before removing the cable from the scanner.

1. Locate the small pinhole on the front side of the scanner near the end of the handle.
2. Bend an ordinary paper clip into the shape shown.
3. Insert the paper clip (or other small metallic pin) into the small pinhole. There will be a faint 'click' when the connector's lock releases.
4. Pull gently on the cable's strain relief to remove the cable.
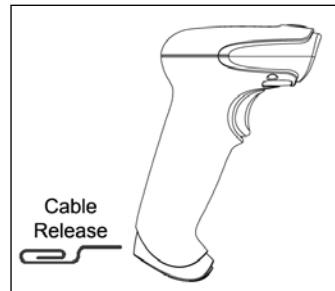
Figure 4.

Scanner Operation

Audible Indicators

When the scanner is operational, the scanner provides audible feedback to indicate the status of the scanner and the last scan. Eight settings are available for the tone of the beep (normal, six alternate tones and no tone).

One Beep – On Power Up

When the unit powers up, the green LED turns on, then the red LED flashes and the scanner beeps once. The red LED will remain on for the duration of the beep. The scanner is now ready to scan.

One Beep – During Operation

When the scanner successfully reads a bar code, the red LED will flash and the scanner beeps once (if programmed to do so). If the scanner does not beep once and the red light does not flash, then the bar code has not been successfully read.

Three Beeps – During Operation

When entering the configuration mode, the red LED flashes while the scanner simultaneously beeps three times. The red LED continues to flash until the unit exits configuration mode. Upon exiting configuration mode, the scanner beeps three times and the red LED stops flashing.

When configured for communication timeout, three beeps during operation indicates that a communication timeout has occurred.

Visual Indicators

The scanner is equipped with a red LED and green LED, which indicate the scanner's state and the status of the current scan respectively when the unit is in operation.
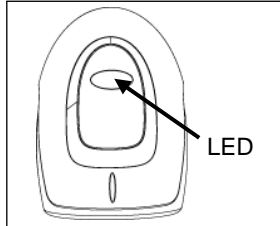
Figure 5. LED Location

Green and Red LEDs Are Off

The LEDs will not be illuminated if the scanner is not receiving power from the host or transformer.

Steady Green

Steady green indicates normal pulse or continuous laser operation. Accompanied by a razzberry tone, a steady green LED indicates that an invalid bar code has been scanned.

Steady Green and Single Red Flash

When the scanner successfully reads a bar code, the red LED will flash and the scanner will beep. If the red LED does not flash and the scanner does not beep, the bar code has not been successfully read.

Steady Green and Steady Red

After a successful read, the scanner transmits the data to the host device. Some communication modes require that the host inform the scanner when data is ready to be received. If the host is not ready to accept the information, the scanner's red LED will remain on until the data can be transmitted.

Steady Green and Continuous Flashing Red

When entering the configuration mode, the red LED will flash, the green LED will turn on and the scanner will beep three times. The red LED will continue to flash and the green LED will stay on until the unit exits the configuration mode.

Failure Modes

One Razzberry Tone – On Power Up

This indicates the scanner has experienced a laser or subsystem failure. Return the unit for repair to an Authorized Service Center.

Continuous Razzberry Tone with no LEDs

If, upon power up, the scanner emits a continuous razzberry tone, then the scanner has an experienced an electronic failure. Return the unit for repair to an Authorized Service Center.

Three Beeps – On Power Up

If the scanner beeps three times on power up, then the non-volatile memory (NovRAM) that holds the scanner configuration has failed. You must return the unit for repair to an Authorized Service Center.

Typical Depth of Field by Bar Code Element Width

Bar Code Element Width		Depth of Field	
		Start (From Scanner Face)	End (From Scanner Face)
0.13 mm	5.2 mil	76 mm (3")	127 mm (5")
0.19mm	7.5 mil	51 mm (2")	203 mm (8")
0.26 mm	10.4 mil	25 mm (1")	229 mm (9")
0.33 mm	13 mil	13 mm (0.5")	254 mm (10")

Troubleshooting Guide

The following guide is for reference purposes only. Contact a customer service representative to preserve the limited warranty terms.

Symptoms	Possible Causes	Solution
All Interfaces		
The unit has no LEDs, beep or laser.	No power is being supplied to the unit.	Check the transformer, the outlet and power strip. Make sure the cable is plugged into the unit.
	No power is being supplied to the unit from host.	Some host systems cannot supply enough current to power the scanner. A power supply may be needed.
At power up the unit beeps two times and alternately flashes the LEDs.	There is a ROM failure.	A flash ROM upgrade is required.
At power up the unit beeps three times.	There is a non-volatile RAM failure.	Contact a customer service representative.
At power up there is a continuous razz tone.	There has been a diagnostic failure.	
At power up there is a razz tone and the green LED flashes.	There is a VLD failure.	
At power up there is a razz tone and both LEDs flash.	There is a scanning mechanism failure.	
The unit scans, communicates and beeps twice.	The same symbol timeout is set too short.	Adjust the same symbol timeout for a longer time.
The unit powers up, but does not beep.	The beeper may be disabled or no tone has been selected.	Enable beeper and select a tone.

Symptoms	Possible Causes	Solution
The unit powers up, but does not scan and/or beep.	The unit is trying to scan a particular symbology that is not enabled.	UPC/EAN, Code 39, interleaved 2 of 5, Code 93, Code 128 and Codabar are enabled by default. Verify the type of bar code being read has been selected.
The unit powers up, but does not scan and/or beep.	The bar code being scanned does not satisfy the configured criteria for character length lock or minimum length.	Verify the bar code being scanned falls into the configured criteria. *The scanner defaults to a minimum of three-character bar code.*
Serial Emulation USB Interfaces		
The unit scans a bar code, but locks up after the first scan and the red LED stays on.	The unit is configured to support some form of host handshaking but is not receiving the signal.	If the unit is setup to support ACK/NAK, RTS/CTS, XON/XOFF or D/E, verify that the host cable and host are supporting the handshaking properly.
The unit scans, but the data transmitted to the host is incorrect.	The unit's data format does not match the host system's requirements.	Verify the unit's data format matches that required by the host. Make sure that the unit is connected to the proper host port.
The unit beeps at some bar codes but NOT for others of the same bar code symbology.	The bar code may have been printed incorrectly.	Check if it is a check digit/character/or border problem.
	The unit is not configured correctly for the type of bar code being scanned.	
	The minimum symbol length setting does not work with the bar code.	Check if the correct minimum symbol length is set.
Keyboard Wedge Interface		
The unit scans the bar code but there is no data.	The unit's configuration is not correct.	Make sure the scanner is configured for the appropriate mode.

Symptoms	Possible Causes	Solution
The unit scans but the data is not correct.	The unit's configuration is not correct.	Make sure that the proper PC type AT, PS2 or XT is selected. Verify the correct country code and data format is selected. Adjust the inter-character delay symptom.
The unit is transmitting each character twice.	The unit's configuration is not correct.	Increase the interscan code delay setting. Adjust whether the F0 break is transmitted. It may be necessary to try this in both settings.
Alpha characters show as lower case.	The computer is in *Caps Lock* mode.	Enable the *Caps Lock* detect feature of the scanner to detect whether the PC is operating in Caps Lock.
Everything works except for a couple of characters.	These characters may not be supported by that country's key look up table.	Try operating the scanner in Alt mode.

Design Specifications

Operational

Light Source:	**V**isible **L**aser **D**iode (VLD) @ 650 nm
Laser Power:	Less than 1.0 mW average
Depth of Scan Field:	12.7 mm – 254 mm (0.5" – 10") — 0.33 mm (13 mil) Bar Code
Scan Speed:	72 ± 2 scan lines per second
Scan Pattern:	Single scan line
Minimum Bar Width:	0.1016 mm (4 mil)
Decode Capability:	Reads standard 1D and GS1 DataBar symbologies.
System Interfaces:	USB, Keyboard Wedge
Print Contrast:	35% minimum reflectance difference
No. Characters Read:	Up to 80 data characters. The maximum number will vary based on symbology and density.
Scan Angle:	46° Horizontal
Pitch, Yaw:	68°, 52°
Beeper Operation:	7 tones or no beep
Indicators (LED):	Red = good read
	Green = laser on, ready to scan

Mechanical

Length:	110 mm (4.3")
Width:	70 mm (2.8")
Height:	153 mm (6.0")
Weight:	120 g (4.23 oz)

Specifications subject to change without notice.

Electrical

Input Voltage:	5VDC ± 0.25V	
Operating Power:	Standby:	700 mW
	Decoding USB:	975 mW
	Decoding KBW:	875 mW
Operating Current:	Standby:	140 mA average @ 5VDC
	Decoding USB:	195 mA average @ 5VDC
	Decoding KBW:	175 mA average @ 5VDC
DC Transformers:	Class II; 5.2VDC @ 1A	

Environmental

Temperature:	Operating:	0°C to 40°C (32°F to 104°F)
	Storage:	-40°C to 60°C (-40°F to 140°F)
Humidity:	5% to 95% relative humidity, non-condensing	
Light Levels:	Up to 4842 Lux (450 footcandles)	
Shock:	Designed to withstand 1.0 m (3.3 ft.) drops	
Contaminants:	Sealed to resist airborne particulate contaminants	
Ventilation:	None required	

Specifications subject to change without notice.

Configuration Introduction

Your new scanner has been factory configured with a set of default parameters. Since many host systems have unique formats and protocol requirements, a wide range of configurable features that may be selected using this bar code based configuration tool are provided. Once the configuration is completed, the scanner stores the settings in nonvolatile memory (NOVRAM). NOVRAM saves the settings when the power is off.

*Note: Bar code descriptions marked with an asterisk (*) define a feature that is a factory default. Bar codes marked with a tilde (~) require the Multi-Code configuration method.*

Bar Code Configuration Methods

Scanners can be bar code configured in two ways:
the *Single-Code Method* and the *Multi-Code Method*.

Single-Code Method

Most features can be enabled or disabled using the Single-Code Method.

1. Power up the scanner.
2. Scan the bar code for the desired feature.
3. The scanner will emit a multi-toned beep to indicate the configuration has been saved to NOVRAM.

Multi-Code Method

All features can be enabled or disabled using the Multi-Code Method.
A feature marked with a tilde (~) requires the Multi-Code Method.

1. Power up the scanner.
2. Scan the E*nter/Exit Configuration Mode* bar code (3 beeps).
3. Scan the bar code for the desired feature (1 beep). Multiple features can be enabled/disabled before scanning the enter/exit configuration mode bar code.
4. Scan the E*nter/Exit Configuration Mode* bar code (3 beeps) and save the new configuration. To abort a configuration change, power off the scanner before scanning the *Enter/Exit* code.

Enter/Exit Configuration Mode

³ 9   9   9   9   9

Returning to Factory Defaults

Scan the *Recall Defaults* bar code to erase all previous settings and return the scanner to its factory default communication protocol.

Recall Defaults

||| ||| ||||||||||||| ||| || |||
³ 9 9 9 9 9 8

Code Types and Decode Rules

Bar code descriptions marked with an asterisk (*) define a feature that is a factory default. Bar codes marked with a tilde (~) require the Multi-Code configuration method.

2 of 5 Codes

~ **ITF Symbol Length Lock 1 –** To specify a first ITF symbol length lock**,** scan this bar code and the appropriate code byte sequence located on page 23.

~ **ITF Symbol Length Lock 2** – To specify a second ITF symbol length lock, scan this bar code and the appropriate code byte sequence located on page 23.

~ **ITF Minimum Symbol Length** – To specify a minimum number of ITF characters to be decoded, scan the appropriate code byte sequence located on page 23.

Additional Decode Features

~ **Minimum Symbol Length** – Single-line default is 3. Combine this code with the proper code bytes (on page 23), to specify the minimum number of characters in all non-UPC/EAN bar codes.

~ **Symbol Length Lock** – Combine this code with the proper code bytes, to lock the bar code's length into place.

Supplements

|||| ||| |||||||| ||||||| |||
³ 1 2 5 1 1 4

Enable Bookland (979) Supplement Required

||| || |||||||| ||| ||| |||
³ 1 2 5 1 0 4

* **Disable Bookland (979) Supplement Required**

||| || ||||| ||||| ||| |||
³ 1 0 1 4 1 7

Enable Bookland (978) Supplement Required

||| || ||||| |||||| ||| |||
³ 1 0 1 4 0 7

* **Disable Bookland (978) Supplement Required**

||| || ||||||| ||||| ||| |||
³ 1 0 1 3 1 4

Enable 977 (2 Digit) Supplement Required –
The scanner will require a 2 digit supplement to be
scanned when an EAN-13 code begins with 977.

||| || ||||||| ||||| ||| |||
³ 1 0 1 3 0 4

* **Disable 977 (2 Digit) Supplement Required**

||| || ||||| ||||| ||| |||
³ 1 0 1 3 1 5

Enable ISBN Check Digit Transmission

||| || ||||| ||| ||| |||
³ 1 0 1 3 0 5

Disable ISBN Check Digit Transmission

||| || ||||| ||||| ||| |||
³ 1 0 1 3 1 7

Enable Bookland to ISBN Conversion

||| || ||||| ||||| |||| |||
³ 1 0 1 3 0 7

* **Disable Bookland to ISBN Conversion**

Scanner Operation

Redundant Scans

‖‖ ‖ ‖‖‖‖‖ ‖ ‖‖‖‖‖ ‖‖
³ 3 0 1 1 0 0

* 0 Redundant Scans – Requires 1 good decode for a *good scan*.

‖‖ ‖ ‖‖‖‖‖ ‖‖‖‖ ‖ ‖‖
³ 3 0 1 1 1 0

1 Redundant Scan – Requires 2 consecutive decodes of the same bar code data for a *good scan*.

Data Transmission Delays

Use these codes to select the amount of delay between sending data characters from the scanner to the host. This helps prevent the scanner from overflowing host-input buffers.

‖‖ ‖ ‖‖‖‖‖‖‖ ‖ ‖‖‖ ‖‖‖
³ 8 1 8 8 1 0

* 1 msec Intercharacter Delay

‖‖ ‖ ‖‖‖‖‖‖‖ ‖‖‖ ‖‖ ‖‖‖
³ 8 1 8 8 1 0 0

10 msec Intercharacter Delay

‖‖ ‖ ‖‖‖‖‖‖‖ ‖‖‖ ‖‖‖‖ ‖‖
³ 8 1 8 8 2 5 0

25 msec Intercharacter Delay

‖‖ ‖ ‖‖‖‖‖‖‖ ‖‖‖ ‖‖‖ ‖‖
³ 9 1 8 8 0 0

~ Variable msec Intercharacter Delay – Scan this bar code and a sequence of code bytes on page 23 to set the delay between characters sent to the host system (range from 1 to 255 msecs.).

Laser/Scan Modes

‖‖ ‖ ‖‖‖‖‖ ‖‖‖‖‖‖ ‖‖‖ ‖‖‖
³ 1 1 8 7 0 3

Enable Automatic Scanning

‖‖ ‖ ‖‖‖‖‖ ‖ ‖‖‖‖‖ ‖‖ ‖‖ ‖‖
³ 4 1 8 3 3 4

Continuous Blinky Scan – The laser blinks continuously and the IR is inactive.

‖‖ ‖ ‖‖‖‖‖ ‖ ‖‖‖‖ ‖‖ ‖‖ ‖‖‖
³ 4 1 8 3 5 4

Enable Manual Trigger – The laser activates when the CodeGate button is pressed.

Prefixes/Suffixes

Scan the Enter Configuration Mode bar code before trying to set these features (see the Multi-Code Method on page 12.)

User Configurable Prefixes, All Data

||| || ||||||| | |||||| |||
³ 9 0 3 5 0 0

~ **Configurable Prefix Character #1** – A prefix ID can be added and assigned for data transmission. Use this code with a code byte sequence, on page 23, which represents the desired character.

||| || ||||||| | |||||| |||
³ 9 0 3 6 0 0

~ **Configurable Prefix Character #2** – Assigns a second configurable prefix character**.**

Standard Prefix Characters

||| || ||||| |||| ||||| |||
³ 1 1 6 6 1 5

Enable STX Prefix – The scanner will transmit a Start of TeXt (ASCII 02H) before each bar code.

||| || ||||| |||| || ||||| |||
³ 1 1 6 6 0 5

* **Disable STX Prefix**

Standard Suffix Characters

||| || ||||| |||| ||||| | |||
³ 1 1 6 6 1 3

* **Enable CR Suffix** – The scanner transmits a carriage return after each bar code.

||| || ||||| |||| ||| ||| |||
³ 1 1 6 6 0 3

Disable CR Suffix

||| || ||||| |||| ||||| || |||
³ 1 1 6 6 1 2

* **Enable LF Suffix** – The scanner transmits a line feed after each bar code. *Disabled when keyboard wedge defaults are loaded*.

||| || ||||| |||| ||||||| |||
³ 1 1 6 6 0 2

Disable LF Suffix

```
|||| ||| ||||| |||| ||| ||| |||
³  1  1  6  6  1  0
```
Enable Tab Suffix – The scanner will transmit a TAB (ASCII 09H) after each bar code**.**

```
||| ||| ||||| |||| ||| ||| |||
³  1  1  6  6  0  0
```
* Disable Tab Suffix

```
||| ||| ||||| |||| ||| ||| |||
³  1  1  6  6  1  4
```
Enable ETX Suffix – The scanner will transmit End of TeXt (ASCII 03H) after the bar code date.

```
||| ||| ||||| |||| ||| |||| |||
³  1  1  6  6  0  4
```
* Disable ETX Suffix

```
||| ||| ||||| |||| ||| |||| |||
³  1  1  6  6  1  6
```
Enable UPC Suffix ID – The scanner will transmit a suffix after any UPC/EAN bar code. The suffixes are A (UPC-A), E (UPC-E), F (EAN-13) and F (EAN-8).

```
||| ||| ||||| |||| ||| ||| |||
³  1  1  6  6  0  6
```
* Disable UPC Suffix ID

```
||| ||| ||||| |||||||||| |||
³  9  4  1  6  0  0
```
Enable NCR Suffix Character

User Configurable Suffixes, All Data

Note: Scan the Enter/Exit Configuration mode code before trying to set this feature. Refer to Multi-Code Method on page 12.

```
||| ||| ||||||||||| |||||| |||
³  9  0  4  5  0  0
```
~ Configurable Suffix Character #1 – A suffix ID can be added and assigned for data transmission. Use this code with a 3 code byte sequence, on page 23, which represents the desired character.

```
||| ||| ||||||||||| |||||| |||
³  9  0  4  6  0  0
```
~ Configurable Suffix Character #2 – Assigns a second configurable suffix character.

Code Formatting

UPC/EAN Formatting

||| || ||||||| || ||||||| |||
³ 1 0 7 5 1 7

* Transmit UPC-A Check Digit

||| || ||||||| || |||| |||| |||
³ 1 0 7 5 0 7

Do Not Transmit UPC-A Check Digit

||| || ||||||| || |||||||| |||
³ 1 0 7 5 1 6

Transmit UPC-E Check Digit

||| || ||||||| || |||| ||| |||
³ 1 0 7 5 0 6

* Do Not Transmit UPC-E Check Digit

||| || ||||||| ||| ||||| |||
³ 1 0 7 5 1 5

Expand UPC-E to 12 Digits – Expand UPC-E bar codes to the 12 digit equivalent, UPC-A bar codes.

||| || ||||||| || ||| ||| |||
³ 1 0 7 5 0 5

* Do Not Expand UPC-E to 12 Digits

||| || ||||||| |||| ||||||| |||
³ 1 0 7 6 0 2

* Send Number System on Expanded UPC E

||| || ||||||| |||| ||||| | |||
³ 1 0 7 6 1 2

Do Not Send Number System on Expanded UPC E

||| || ||||||| || |||| |||| |||
³ 1 0 7 5 1 0

Enable GTIN Formatting

||| || ||||||| || ||||||| |||
³ 1 0 7 5 0 0

* Disable GTIN Formatting

||| || ||||||| || |||||||| |||
³ 1 0 7 5 1 4

Convert UPC-A to EAN-13 – The scanner converts UPC-A to EAN-13 by transmitting a leading zero before the bar code.

||| || ||||||| ||| |||||||| |||
³ 1 0 7 5 0 4

* Do Not Convert UPC-A to EAN-13

‖‖ ‖ ‖‖‖‖ ‖‖ ‖‖‖‖ ‖‖
³ 1 0 7 5 1 3

Transmit Lead Zero on UPC-E – This option will transmit a zero before each UPC-E bar code.

‖‖ ‖ ‖‖‖‖ ‖ ‖‖‖‖ ‖‖
³ 1 0 7 5 0 3

Do Not Transmit Lead Zero on UPC-E

‖‖ ‖ ‖‖‖‖ ‖ ‖‖‖ ‖‖
³ 1 0 7 5 1 2

Convert EAN-8 to EAN-13 – The scanner will transmit five zeros before the bar code to convert EAN-8 to EAN-13.

‖‖ ‖ ‖‖‖‖ ‖ ‖‖‖‖‖ ‖‖
³ 1 0 7 5 0 2

* **Do Not Convert EAN-8 to EAN-13**

Keyboard

Enable Keyboard Emulation

‖‖ ‖‖ ‖‖‖‖‖‖‖ ‖‖‖‖‖ ‖‖
³ 9 9 9 9 9 4

Load Keyboard Wedge Defaults – Loads the default settings for keyboard wedge mode.

‖‖‖ ‖‖ ‖‖‖‖‖‖‖‖‖‖ ‖‖ ‖‖‖ ‖‖ *
³ 5 1 5 5 1 4 3

Enable Keyboard Wedge Emulation – Use this with an external keyboard. Transmit in wedge made to allow standard PC keyboards to communicate when no bar code data is available.

ASCII (HEX)	ASCII Control	Extended Key
00H	Null	Numeric Keypad + (Plus)
01H	SOH	Num Lock
02H	STX	Down Arrow
03H	ETX	Numeric Keypad - (Minus)
04H	EOT	Insert
05h	ENQ	Delete
06H	ACK	System Request
07H	BEL	➔ (Right Arrow)
08H	BS	← (Left Arrow)
09H	TAB	Tab
0AH	LF	Caps Lock
0BH	VT	Shift Tab
0CH	FF	Left Alt
0DH	CR	Enter
0EH	SO	Left Control
OFH	SI	Up Arrow
10H	DLE	F1
11H	DC1	F2
12H	DC2	F3
13H	DC3	F4
14H	DC4	F5
15H	NAK	F6
16H	SYN	F7
17H	ETB	F8
18H	CAN	F9
19H	EM	F10
1AH	SUB	Home
1BH	ESC	Esc
1CH	FS	Page Up
1DH	GS	Page Down
1EH	RS	Print Screen
1FH	US	End

Code Bytes Usage

The scanner must be in Configuration Mode for the features requiring code bytes for configuration. The Enter/Exit Configuration Mode bar code must be scanned before starting the configuration cycle. User configurable prefix/suffix characters can then be saved by scanning the 3 digit decimal equivalent of the ASCII character into the appropriate character location with the code byte bar codes.

Example: To add an asterisk (*) as a Prefix, scan the bar codes.

1. *Enter/Exit Configuration Mode*   (3 beeps)
2. Configurable Prefix #1   (1 beep)
3. Code Byte 0   (1 beep)
4. Code Byte 4   (2 beeps)
5. Code Byte 2   (3 beeps)
6. *Enter/Exit Configuration Mode*   (3 beeps)

Code Bytes 0–9

‖‖‖ ‖‖ ‖‖‖‖‖‖ ‖‖‖ ₃ ₀	**Code Byte 0**
‖‖‖ ‖‖ ‖‖‖‖‖ ‖‖‖ ₃ ₁	**Code Byte 1**
‖‖‖ ‖‖ ‖‖‖‖‖ ‖‖‖ ₃ ₂	**Code Byte 2**
‖‖‖ ‖‖ ‖‖‖‖‖‖ ‖‖ ₃ ₃	**Code Byte 3**
‖‖‖ ‖‖ ‖‖‖‖ ‖ ‖ ₃ ₄	**Code Byte 4**
‖‖‖ ‖‖ ‖‖‖‖ ‖ ‖‖‖ ₃ ₅	**Code Byte 5**
‖‖‖ ‖‖ ‖‖‖‖ ‖ ‖‖ ‖‖ ₃ ₆	**Code Byte 6**
‖‖‖ ‖‖ ‖‖‖‖ ‖‖ ‖‖‖ ₃ ₇	**Code Byte 7**

||| || ||||| ||| ‖ ‖   **Code Byte 8**

```
³        8
```

||| || |||| ||| ||| **Code Byte 9**

```
³        9
```

Reserved Codes

||| || ||||||||||| ||||| ||| ~ **Enable Reserved Code**

```
³  9  9  9  9  8   8
```

||| || ||||||||||| ||| |||| ~ **Disable Reserved Code**

```
³  9  9  9  9  8  7
```

Code Type Table

Code Byte	Code Types
004	UPC-A
002	UPC-E
003	EAN-8
005	EAN-13
080	Code 39
081	Codabar
082	Interleaved 2 of 5
083	Code 128
084	Code 93
091	MSI Plessey
092	Code 11
093	Airline 2 of 5 (15 digits)
094	Matrix 2 of 5
095	Telepen
096	UK Plessey
099	TRI-OPTIC
098	Standard 2 of 5
097	Airline (13 digits)

ASCII Reference Table

HEX Value	Decimal Value/ Code Byte Value	Character	Control Keyboard Eqv
00	000	NUL	@
01	001	SOH	A
02	002	STX	B
03	003	ETX	C
04	004	EOT	D
05	005	ENQ	E
06	006	ACK	F
07	007	BEL	G
08	008	BS	H
09	009	HT	I
0A	010	LF	J
0B	011	VT	K
0C	012	FF	L
0D	013	CR	M
0E	014	SO	N
0F	015	SI	0
10	016	DLE	P
11	017	DC1	Q
12	018	DC2	R
13	019	DC3	S
14	020	DC4	T
15	021	NAK	U
16	022	SYN	V
17	023	ETB	W
18	024	CAN	X
19	025	EM	Y
1A	026	SUB	Z
1B	027	ESC	[
1C	028	FS	\

HEX Value	Decimal Value/ Code Byte Value	Character	Control Keyboard Eqv
1D	029	GS	^
1E	030	RS	_
1F	031	US	space,blank
20	032	SP	
21	033	!	
22	034	"	
23	035	#	
24	036	$	
25	037	%	
26	038	&	
27	039	'	apostrophe
28	040	(	
29	041	)	
2A	042	*	
2B	043	+	
2C	044	,	comma
2D	045	-	minus
2E	046	.	period
2F	047	/	
30	048	0	number zero
31	049	1	number one
32	050	2	
33	051	3	
34	052	4	
35	053	5	
36	054	6	
37	055	7	
38	056	8	
39	057	9	
3A	058	:	
3B	059	;	

HEX Value	Decimal Value/ Code Byte Value	Character	Control Keyboard Eqv
3C	060	<	less than
3D	061	=	
3E	062	>	greater than
3F	063	?	
40	064	@	shift P
41	065	A	
42	066	B	
43	067	C	
44	068	D	
45	069	E	
46	070	F	
47	071	G	
48	072	H	
49	073	I	letter I
4A	074	J	
4B	075	K	
4C	076	L	
4D	077	M	
4E	078	N	
4F	079	O	letter O
50	080	P	
51	081	Q	
52	082	R	
53	083	S	
54	084	T	
55	085	U	
56	086	V	
57	087	W	
58	088	X	
59	089	Y	

HEX Value	Decimal Value/ Code Byte Value	Character	Control Keyboard Eqv
5A	090	Z	
5B	091	[	shift K
5C	092	\	shift L
5D	093	]	shift M
5E	094	^	à,shift N
5F	095	_	♣, shift 0, underscore
60	096	'	accent grave
61	097	a	
62	098	b	
63	099	c	
64	100	d	
65	101	e	
66	102	f	
67	103	g	
68	104	h	
69	105	I	
6A	106	j	
6B	107	k	
6C	108	l	
6D	109	m	
6E	110	n	
6F	111	o	
70	112	p	
71	113	q	
72	114	r	
73	115	s	
74	116	t	
75	117	u	
76	118	v	
77	119	w	
78	120	x	

HEX Value	Decimal Value/ Code Byte Value	Character	Control Keyboard Eqv
79	121	y	
7A	122	z	
7B	123	{	
7C	124	|	vertical slash
7D	125	}	alt mode
7E	126	~	(alt mode)
7F	127	DEL	delete, rubout

Extended Key Code Reference Table

Key	At Scan Code	PS2 Scan Code	3151	Prefix/Suffix Value Hex = Decimal
↑	75H	48H	63H	80H = 128
↓	72H	50H	60H	81H = 129
→	74H	4DH	6AH	82H = 130
←	6BH	4BH	61H	83H = 131
Insert	70H	52H	67H	84H = 132
Delete	71H	53H	64H	85H = 133
Home	6CH	47H	6EH	86H = 134
End	69H	4FH	00H	87H = 135
Page Up	7DH	49H	00H	88H = 136
Page Down	7AH	51H	00H	89H = 137
Right Alt	11H	38H	00H	8AH = 138
Right Ctrl	14H	1DH	39H	8BH = 139
Reserved	00H	00H	00H	8CH = 140
Reserved	00H	00H	00H	8DH – 141
Numeric Keypad Enter	5AH	1CH	79H	8EH = 142
Numeric Keypad/	4AH	35H	00H	8FH = 143
F1	05H	3BH	07H	90H = 144
F2	06H	3CH	0FH	91H = 145
F3	04H	3DH	17H	92H = 146
F4	0CH	3EH	1FH	93H = 147
F5	03H	3FH	27H	94H = 148
F6	0BH	40H	2FH	95H = 149
F7	83H	41H	37H	96H = 150

Key	At Scan Code	PS2 Scan Code	3151	Prefix/Suffix Value Hex = Decimal
F8	0AH	42H	3FH	97H = 151
F9	01H	43H	47H	98H = 152
F10	09H	44H	4FH	99H = 153
F11	78H	57H	56H	9AH = 154
F12	07H	58H	5EH	9BH = 155
Numeric +	79H	4EH	00H	9CH = 156
Numeric -	7BH	4AH	7CH	9DH = 157
Numeric *	7CH	37H	00H	9EH = 158
Caps Lock	58H	3AH	14H	9FH = 159
Num Lock	77H	45H	00H	A0H = 160
Left alt	11H	38H	00H	A1H = 161
Left Ctrl	14H	1DH	11H	A2H = 162
Left Shift	12H	2AH	12H	A3H = 163
Right Shift	59H	36H	59H	A4H = 164
Print Screen	Multiple	00H	00H	A5H = 165
Tab	ODH	OFH	0DH	A6H = 166
Shift Tab	8DH	8FH	65H	A7H = 167
Enter	5AH	1CH	5AH	A8H = 168
ESC	76H	01H	08H	A9H = 169
Left ALT Make	11H	36H	00H	AAH = 170
Left ALT Break	11H	B6H	00H	ABH = 171
Left CTRL Make	14H	1DH	00H	ACH = 172
Left CTRL Break	14H	9DH	00H	ADH = 173
*Left ALT + 1 character	11H	36H	00H	AEH = 174
*Left Crtl + 1 character	14H	1DH	00H	AFH = 175
*Send			58H	C0H = 192
Clear			6FH	C1H = 193
Jump			76H	C2H = 194
Send Line			7EH	C3H = 195
Erase EOF			6DH	C4H = 196
Send - Make Only			58H	C5H = 197

* Example:
        1st Configurable Prefix = 174
        2nd Configurable Prefix = 065
        Scanner will transmit <left ALT Make> "A" <Left ALT Break>

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