

**HAND HELD[®]
PRODUCTS**
a WelchAllyn[®] affiliate

SCANTEAM[®] 3700 Wedge



Technical Manual

This Technical Manual is used to operate and program the SCANTEAM 3700 Wedge.

Special Pages

A Sample Bar Codes page (located on page 14–4) contains bar code symbols you may scan to verify that your scanner has been programmed correctly.

Charts listing the factory default selections are included on the pages just before the Sample Bar Codes. On the programming menu pages, default selections are indicated by a “*” next to the bar code title.

A Bar Code Data Chart (found on the inside back cover of this manual) contains alphanumeric bar codes for setting additional programming options, such as the digits representing Symbology Message Length. The information on the menu pages explains how to use this chart.

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Statement of Agency Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Class B Compliance Statement

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

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

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

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Canadian Notice

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

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.



The CE mark on the product indicates that the system has been tested to and conforms with the provisions noted within the 89/336/EEC Electromagnetic Compatibility Directive and the 73/23/EEC Low Voltage Directive.

For further information, please contact:

Welch Allyn Ltd.
1st Floor
Dallam Court Dallam Lane
Warrington, Cheshire WA2 7LT
England

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

Patents

The SCANTEAM 3700 Wedge product is covered by the following U.S. Patent: 5,932,862. Other U.S. and foreign patents pending.

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1.1 Introduction

This chapter explains the SCANTEAM 3700 Wedge setup for use in the design lab and a brief description of installation in a host instrument. The setup procedures are intended for a technician or design engineer to explore the functions and features of the 3700 Wedge in a hands-on setting, before the 3700 Wedge is embedded in host equipment. The System Hardware Description section includes the general mounting dimensions of the 3700 Wedge.

Setup and installation includes unpacking the unit, checking for possible damage during shipment, and connecting the Machine Mount CCD to the host system. The host system will typically be a PC/DOS computer with an external keyboard.

The Hand Held Products SCANTEAM 3700 Wedge is a fixed mount CCD bar code scanner with integral decoder for easy integration into host equipment. Typical host equipment with bar code requirements satisfied by the 3700 Wedge include automated clinical chemistry analyzers, pharmaceutical label verification systems, industrial automation equipment, robotic systems, materials handling equipment, library systems, point of sale terminals and office equipment.

The 3700 Wedge features Hand Held Products' time proven decoding algorithms in a microprocessor controlled bar code scanner/decoder and offers configurable operating parameters, providing you with the capability to tailor the 3700 Wedge to your present requirements and the flexibility to meet your future application requirements.

The following features are available with every SCANTEAM 3700 Wedge:

- Economical, reliable, safe CCD scanning technology
- Autodiscrimination of 12 bar code symbologies
- 100 scans per second
- Decoder configurable for high security
- Scan voting to ensure bar code data integrity

1.2 SCANTEAM 3700 Wedge Hardware Description

The SCANTEAM 3700 Wedge housing is molded ABS formed to enclose the optics platform and electronics. Housing width is 3.5 inches (88.9mm). The housing length is 2.9 inches (73.7mm) and the height is fixed at 1.05 inches (26.7mm).

The scanner uses red (660 nm wavelength) LED's to illuminate the bar code label. A CCD (charge coupled device) is used as an image or reading sensor. The scanned code is converted to a digital signal in the scanner, then decoded and sent to the host computer or system.

1.2.1 Interface Port

The SCANTEAM 3700 Wedge has one port for I/O and Power. The port is a 10 pin RJ11 modular female connector. Cables are available from Hand Held Products for evaluation of the 3700 Wedge. A modular connector was chosen as the standard configuration for ease in servicing the scanner once installed.

1.2.2 Nonvolatile Memory

The 3700 Wedge contains nonvolatile FLASH memory which is used to store operating parameters configured by means of bar code menu.

1.3 SCANTEAM 3700 Wedge Software Description

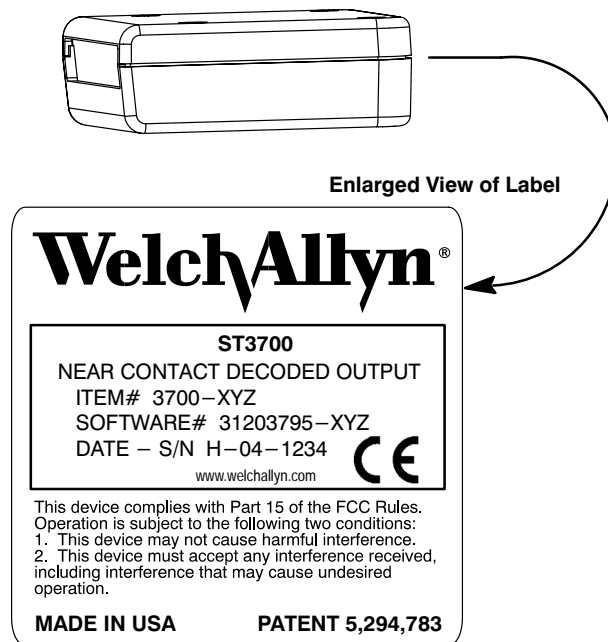
SCANTEAM 3700 Wedge software employs Hand Held Products' time proven decoding algorithms, controls the microprocessor functions, decodes the bar codes, and formats the output messages.

The 3700 Wedge standard default parameters can be easily reconfigured to meet most scanning requirements. Application specific features and options are configurable through menus.

The 3700 Wedge can be configured to autodiscriminate among the following bar code symbologies and their variations: Codabar, Code 39, Code 93, Code 128, Code 2 or 5, Matrix 2 of 5, Code 11, Interleaved 2 of 5, UPC, EAN, EAN/UPC Addenda, MSI, and Plessey. Most common bar code options, such as validating symbol length and optional check character, are supported and easily selected.

In addition to decoding selections; data output formats, such as prefix and suffix strings, and operating parameters are also configurable.

1.4 3700 Wedge Identification



2.1 Introduction

Use this chapter to install and program the SCANTEAM 3700 Wedge to work with your terminal/computer.

This section contains the following areas:

- Connecting to a PC
- Terminal Selection
- Quick Suffix Selections

About Terminal Selection Programming

With Terminal Selection programming, you program the 3700 Wedge for *any* supported terminal/computer.

About Quick Suffix Programming

With Quick Suffix programming, you can either program the 3700 Wedge for a carriage return suffix, or clear all suffixes.

Additional Programming Options

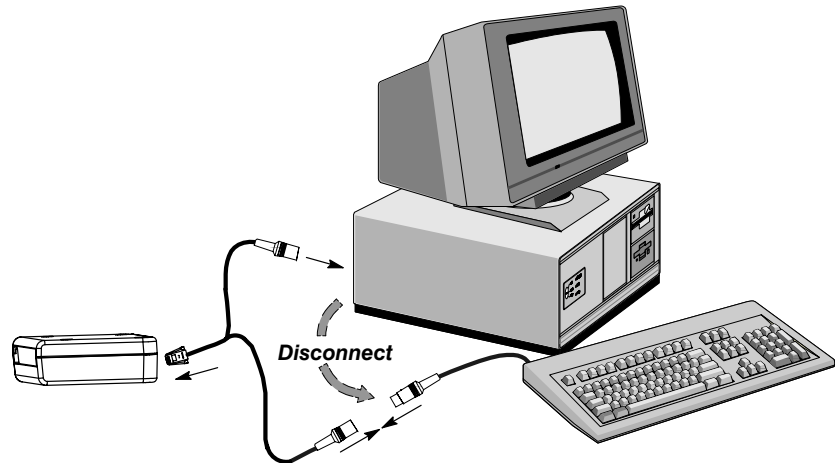
If you need additional programming options, refer to Section 3 (Tailoring the Terminal and Keyboard), Section 4 (Output Parameters Menu), or Section 5 (Symbology Menu) to configure the 3700 Wedge to:

- select factory default settings
- *any* variation of the programmable features available.

2.2 Connecting to a PC

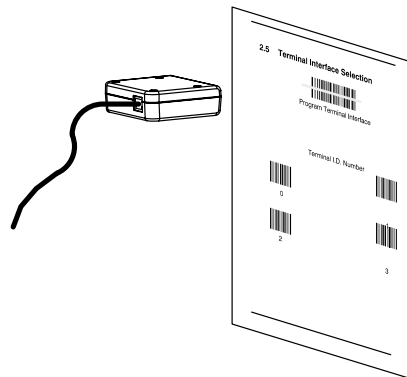
Install the 3700 Wedge by following the steps shown below:

- ❶ Disconnect power to the terminal/computer by turning the host system OFF.
- ❷ Connect the interface cable to the 3700 Wedge and to the terminal/computer and to the keyboard.



(Cable, Keyboard, and Terminal will vary.)

- ❸ Once the 3700 Wedge has been fully connected, restore power to the terminal/computer by turning the host system power ON.
- ❹ You must program the 3700 Wedge to work with your terminal or computer by scanning the appropriate programming bar code(s).



Scan Terminal Interface Bar Code

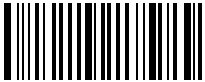


For further installation and mounting information, see Chapter 10.




2.3 Terminal Selection Programming Instructions



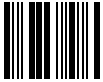
Use this section to program the 3700 Wedge to work with *any* supported terminal or computer.

To program the 3700 Wedge:

- 1 Locate the two-digit terminal I.D. number for your terminal or computer.
- 2 Scan the Program Terminal Interface bar code.
- 3 Scan the bar code representing the first digit of the terminal I.D. number. (e.g., for an IBM AT, scan the number 0.)
- 4 Scan the bar code representing the second digit of the terminal I.D. number. (e.g., for an IBM AT, scan the number 3.)

Terminal/Model	Terminal ID	
IBM PC/XT	01	
		Program Terminal Interface
		 0
		 1

Terminal/Model	Terminal ID	
IBM PS/2 25, 30	02	
		Program Terminal Interface
		 0
		 2

Terminal/Models	Terminal ID	
IBM AT, PS/2 30–286, 50, 55SX, 60, 70, 70–061, 70–121, 80	03	
		Program Terminal Interface
		 0
		 3

Your terminal interface is set up.

If you wish to program a carriage return (CR) suffix or turn off the carriage return (or any other suffix), see the “Quick Suffix Selections” on the next page.

2.4 Quick Suffix Selections

If you want a carriage return suffix, scan the **Carriage Return Suffix – Yes** bar code. This will program a carriage return (CR) suffix for all enabled bar code symbologies. **Scanning this bar code clears all previously programmed prefixes and suffixes.**

Scan the **Carriage Return Suffix – No** bar code to disable (or clear) all previously programmed prefixes and suffixes (such as the carriage return prefix).



Carriage Return Suffix – Yes



Carriage Return Suffix – No

3.1 Introduction

Use this chapter to program the SCANTEAM 3700 Wedge for General Operating features.

This programming section contains the following menu selections:

- Country Code Selections
- Keyboard Selections

About Country Code Programming

Country Code programming allows you to:

- Select a Foreign Keyboard

About Keyboard Programming

Keyboard programming allows you to:

- Select the Keyboard Style for your terminal
- Select the Keyboard Style Modifiers for your terminal

3.2 Country Code Selections

Foreign Keyboards

This programming selection allows you to re-map the keyboard layout for the selected country. *Default = United States.*

As a general rule, the following characters are not supported by the 3700 Wedge for countries other than the United States:

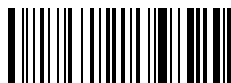
@ | \$ # { } [] = / ' \ < > ~



* United States



Belgium



Denmark, Finland, Norway, Sweden



France



Germany, Austria



Italy



Switzerland



United Kingdom

3.3 Keyboard Style Selections

This programming selection allows you to program the 3700 Wedge to support special keyboard features, such as Caps Lock and SHIFT LOCK.

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

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

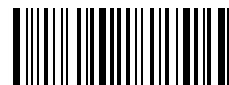
Shift Lock is used when you normally have the Shift Lock key on. (Not common to U.S. keyboards.)

Automatic Caps Lock is used if you change Caps Lock key On and Off. The software tracks and reflects if you have Caps Lock on or off. (AT and PS/2 Only.) Requires systems with keyboard Caps Lock status LED.

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



* Regular



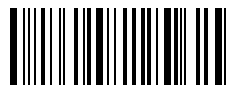
Caps Lock



Shift Lock



Automatic Caps Lock



Emulate External Keyboard

3.4 Keyboard Style Modifiers



Default All Keyboard Style Modifiers

This programming selection allows you to program the 3700 Wedge to support special keyboard features, such as CTRL+ codes and Turbo Mode.

Control + ASCII Mode On – If you scan this selection, the 3700 Wedge sends key combinations for ASCII control characters for values 00–1F. Refer to page 9–1 for CTRL+ Values. *Default = Off*

Turbo Mode On – If you scan this selection, the 3700 Wedge sends characters faster. (IBM AT only) *Default = Off*

Numeric Output from Keypad – If you scan this selection, the 3700 Wedge sends numeric characters as if entered from a numeric keypad. *Default = Numeric Output from Main Keyboard*



Control + ASCII Mode On



* Control + ASCII Mode Off



Turbo Mode On



* Turbo Mode Off



Numeric Output from Keypad



* Numeric Output from Main Keyboard

4.1 Introduction

Use this chapter to program the SCANTEAM 3700 Wedge for Interface operation. This programming section contains the following menuing selections:

- Prefix and Suffix Selections
- Output Selections
- Data Formatter Selections

About Prefix and Suffix Programming

Prefix and Suffix programming allows you to:

- Set Interface Prefixes and Suffixes
- Clear One or All Prefixes
- Clear One or All Suffixes

You may save your current Prefix / Suffix changes or discard them, as you wish.

About Output Programming

Output programming allows you to:

- Set the Beeper Volume
- Set Output Delays (Intercharacter, Interfunction, or Intermessage)
- Program Reread or Good Read Delays
- Enable or disable Voting
- Enable or disable Code I.D. or AIM I.D. transmission
- Enable or disable Function Code transmission

4.2 Prefix/Suffix Selections

The 3700 Wedge will transmit a decoded message after every successful bar code read. Prefix and Suffix characters are data characters you may assign to be sent before and after the transmitted bar code data.

Transmitted data frame →

Prefix	Bar Code Message	Suffix
--------	------------------	--------

Characters for the Prefix and Suffix are selected by their hexadecimal ASCII value, up to 12 characters each. Prefix and Suffix characters may be sent for a specific symbology, or may be sent with all bar code scans. *Default Prefix = none. Default Suffix = none.*

Programming Steps to Add an Interface Prefix / Suffix:

- ❶ To add a Prefix, scan the **Add Prefix** programming bar code.
To add a Suffix, scan the **Add Suffix** programming bar code.
- ❷ Refer to the Symbology Chart (page 4–5) to find the Hex value that represents the symbology(s) you want transmitted with one or more Prefixes or Suffixes. Scan the two digits on the Programming Chart (on the inside of the back cover of this menu).
- ❸ Refer to the Hex ASCII Chart (page 4–5) to find the Hex value that represents the ASCII characters you wish to transmit with the bar code data. Use the Programming Chart (inside back cover) to scan the alphanumeric combination that represents the ASCII characters.
- ❹ To complete Prefix / Suffix programming, scan either:
 - **Save Current Prefix or Suffix Changes**† programming bar code. This exits, saving the Prefix / Suffix selections you just assigned.
 - **Discard Current Prefix or Suffix Changes** programming bar code. This exits without changing the Prefix / Suffix.

† You may also start scanning bar codes; your Prefix / Suffix selections will be saved.

Programming Steps to Clear (or Delete) One Prefix / Suffix Entry:

- ❶ To clear the Prefix entry for a specific symbology, scan the **Clear One Prefix** programming bar code.
To clear the Suffix entry for a specific symbology, scan the **Clear One Suffix** programming bar code.
- ❷ Refer to the Symbology Chart to find the Hex value representing the symbology's entry you want cleared. Scan the two digits on the Programming Chart (on the inside of the back cover of this menu).
- ❸ You don't need to scan **Save Current ... Changes** or **Discard Current ... Changes** programming bar codes to complete programming.

Other Programming Selections: Scanning the **Clear All Prefixes** or **Clear All Suffixes** bar code deletes all Prefix or Suffix selections. You don't need to scan the **Save Current ... Changes** or **Discard Current ... Changes** programming bar code to complete programming.

Note: Prefix / Suffix programming examples may be found on page 4–4.

Interface Prefix Selection



Add Prefix ‡



Clear All Prefixes



Clear One Prefix ‡

Interface Suffix Selection



Add Suffix ‡



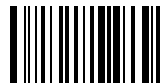
Clear All Suffixes



Clear One Suffix ‡

Exit Selection for Prefix / Suffix

Save Current Prefix or Suffix Changes



Discard Current Prefix or Suffix Changes



‡ One or more two-digit numbers are required after scanning this programming bar code. Please scan your selection on the Programming Chart (inside back cover).

4.2.1 Prefix and Suffix Examples

Example 1: Add Suffix for Specific Symbology

You want to send a CR (carriage return) Suffix for UPC only.

- Scan the **Add Suffix** Suffix Selection bar code.
- The Symbology Chart indicates that the Hex value of UPC is “63”. Scan **6** and **3** on the Programming Chart (inside back cover).
- A “CR” is equivalent to “0D” (see the Hex ASCII Chart). Scan **0** and **D** on the Programming Chart.
- Scan the **Save Current Suffix Changes** Exit Selection bar code.

Example 2: Add Suffix for ALL Symbologies

You want to send a CR (carriage return) Suffix for all symbologies.

- Scan the **Add Suffix** Suffix Selection bar code.
- The Symbology Chart indicates that the Hex value for All Symbologies is “99”. Scan **9** and **9** on the Programming Chart.
- A “CR” is equivalent to “0D”. Scan **0** and **D** on the Programming Chart.
- Scan the **Save Current Suffix Changes** Exit Selection bar code.

Example 3: Add Prefix for Specific Symbology / Suffix for ALL Symbologies

You want to send a HT (tab) Prefix for UPC only and a CR / LF (carriage return / line feed) Suffix for all symbologies.

- Scan the **Add Prefix** Prefix Selection bar code.
- The Symbology Chart indicates that the Hex value of UPC is “63”. Scan **6** and **3** on the Programming Chart.
- An “HT” is equivalent to “09”. Scan **0** and **9** on the Programming Chart.
- Scan the **Add Suffix** Suffix Selection bar code.
- The Symbology Chart indicates that the Hex value for All Symbologies is “99”. Scan **9** and **9** on the Programming Chart.
- A “CR” is equivalent to “0D” and an “LF” is “0A”. Scan **0**, **D**, **0**, and **A** on the Programming Chart.
- Scan the **Save Current Prefix / Suffix Changes** Exit Selection bar code.

Example 4: To Clear a Specific Prefix Entry

You’ve programmed the 3700 Wedge to send a CR / LF (carriage return / line feed) Prefix for all symbologies (Hex value, 99). This is one Prefix entry. You’ve also programmed a “#” Prefix for UPC (Hex, 63). You decide that you want to clear the UPC entry, but not the Prefix entry for all symbologies.

- Scan the **Clear Specific Prefix** Prefix Selection bar code.
- The Symbology Chart indicates that the Hex value for UPC is “63”. Scan **6** and **3** on the Programming Chart.

Symbology Chart					
Symbology	Code ID †	Hex Value	Symbology	Code ID †	Hex Value
Codabar	a	61	Code 11	h	68
Code 39	b	62	Code 93	i	69
UPC	c	63	Code 128	j	6A
EAN	d	64	Matrix 2 of 5	m	6D
Interleaved 2 of 5	e	65	Plessey	n	6E
Code 2 of 5	f	66	<i>All Symbologies</i>		99
MSI	g	67			

Figure 1. Symbology Chart

Hex to ASCII Conversion Chart															
ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex	ASCII	Hex				
NUL	00	DLE	10	SP	20	0	30	@	40	P	50	'	60	p	70
SOH	01	DC1	11	!	21	1	31	A	41	Q	51	a	61	q	71
STX	02	DC2	12	"	22	2	32	B	42	R	52	b	62	r	72
ETX	03	DC3	13	#	23	3	33	C	43	S	53	c	63	s	73
EOT	04	DC4	14	\$	24	4	34	D	44	T	54	d	64	t	74
ENQ	05	NAK	15	%	25	5	35	E	45	U	55	e	65	u	75
ACK	06	SYN	16	&	26	6	36	F	46	V	56	f	66	v	76
BEL	07	ETB	17	'	27	7	37	G	47	W	57	g	67	w	77
BS	08	CAN	18	(	28	8	38	H	48	X	58	h	68	x	78
HT	09	EM	19	)	29	9	39	I	49	Y	59	i	69	y	79
LF	0A	SUB	1A	*	2A	:	3A	J	4A	Z	5A	j	6A	z	7A
VT	0B	ESC	1B	+	2B	;	3B	K	4B	[	5B	k	6B	{	7B
FF	0C	FS	1C	,	2C	<	3C	L	4C	\	5C	l	6C	|	7C
CR	0D	GS	1D	-	2D	=	3D	M	4D	]	5D	m	6D	}	7D
SO	0E	RS	1E	.	2E	>	3E	N	4E	^	5E	n	6E	~	7E
SI	0F	US	1F	/	2F	?	3F	O	4F	_	5F	o	6F	DEL	7F

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

Note: Adding a Prefix or a Suffix appends that Prefix / Suffix to any existing entries for the symbology(s) you've chosen. For example, if you've already programmed and saved a CR / LF (carriage return / line feed) and add a "#" Prefix, the "#" will be sent after the CR / LF.

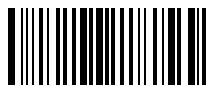
If you add a Prefix / Suffix but want existing entries cleared, you'll need to use the **Clear Specific Prefix / Suffix** programming selection first. Then use the **Add Prefix / Suffix** programming selection to program your new Prefix / Suffix.

Figure 2. Hex to ASCII Conversion Chart

4.3 Output Selections

Default All Output Selections

Scanning the Default bar code will program the 3700 Wedge to the output options indicated by a “*” in the menu selections on this and the following two programming pages.



** Default All Output Settings **

Beeper Volume

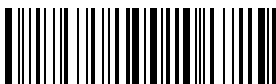
This programming selection provides control of the 3700 Wedge's beeper volume. The beeper volume may be turned off, or it may be set from low to high in three increments. *Default = High.*



Off



Low



Medium



*** High**

Output Delays

This programming selection provides control of the **Output Delays**, which are time delays between data output by the 3700 Wedge to the host terminal. (Specific output delays are described below.) The actual delay is 5 milliseconds multiplied by the programmed value (00 – 99). *Default = 00.*

Note: To select digits 0 through 9, use the Programming Chart found on the inside of the back cover of this menu. Scan the programming selection bar code first, and then scan the bar code(s) representing the digits you wish to set.

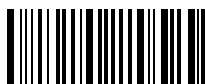
Intercharacter Delay is the time delay between data characters output by the 3700 Wedge to the host terminal.

Interfunction Delay is the time delay between function (key) codes output by the 3700 Wedge to the host terminal.

Intermessage Delay is the time delay between data messages or records output by the 3700 Wedge to the host terminal.

Example:

- You need a 45 millisecond delay. Scan the **Intercharacter Delay** bar code. Then scan “0” and “9” on the Programming Chart (09 x 5ms = 45 ms). Two digits are always required for a delay setting.



Intercharacter Delay (x5mS) ‡



Interfunction Delay (x5mS) ‡



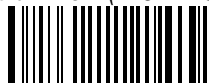
Intermesssage Delay (x5mS) ‡

‡ A two-digit number is required after scanning this programming bar code. Please scan your selection on the Programming Chart (inside back cover).

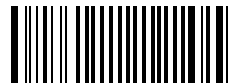
Reread Delay

This programming selection allows you to set a time period that must pass before the 3700 Wedge can read the *same* bar code again. Setting a reread delay protects against accidental rereads of the same bar code. Longer delays are effective in minimizing accidental rereads at POS (point of sale) terminals. Use shorter delays in applications where repetitive bar code scanning is required.

Default = Low (175 milliseconds).



* Low (175 milliseconds)



Medium (450 milliseconds)



High (1.0 second)



Extra High (2.0 seconds)

Good Read Delay

This programming selection allows you to set a time period that must pass before the 3700 Wedge can read another bar code. Some terminals require a slower read rate. By setting a good read delay, you can ensure a good read.

Default = None.



* None



Low (500 milliseconds)



Medium (1.0 second)



High (1.5 second)

Voting

When this selection is enabled, the 3700 Wedge requires multiple identical, consecutive decodes before the bar code data will be accepted and transmitted to the terminal. *Default = Disable.*



Enable



* Disable

Code I.D. Transmit

This programming selection allows you to enable or disable transmission of a Code I.D. before the decoded bar code symbology. (See the Symbology Chart on page 4–5 for the single character code that identifies each symbology.) *Default = Disable.*



Enable



* Disable

AIM I.D. Transmit

This programming selection allows you to enable or disable transmission of an AIM I.D. before the decoded bar code symbology. (See AIM Guidelines on Symbology Identifiers for more information on the AIM symbology ID characters.) *Default = Disable.*



Enable



* Disable

Function Code Transmit

When this programming selection is enabled, and function codes are contained within the scanned data, the 3700 Wedge transmits the key code (which corresponds to the decoded ASCII function code) to the terminal. ASCII function codes are represented by the HEX values 00–1F. (Charts of these function codes are shown in Section 7, Supported Interface Keys.) *Default = Enable.*



* Enable



Disable

5.1 Introduction

Use this chapter to edit the data being scanned by the SCANTEAM 3700 Wedge. This programming section contains the following menuing selections:

- Data Formatter Selections
- Format Editor commands chart
- Data Formatter example

5.1 Data Formatter Selections

Status Check

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



Show Formats

Require Data Format

When this programming selection is disabled, the bar code data will be output to the host as scanned (including preambles and postambles). When enabled, all input data must conform to an edited format or the 3700 Wedge will not transmit the input data to the host device. *Default = Disable.*



Enable



* Disable

Data Format Editor

This programming selection provides editing of all input (scanned) data. All Industrial and Retail symbologies can be formatted. You may scan the **Clear All Data Formats** bar code if you are sure you want to delete or clear all formats.

To make Data Format Editor selections, you'll need to know the terminal type, code I.D., code length, and editor commands your application requires. Use the Alpha-numeric bar codes (inside back cover) to scan these options. For Hex values of ASCII characters, refer to the Hex to ASCII Conversion Chart on page 4-5.

Use the Data Format Editor by following the steps below:

- ❶ Scan the **Enter Data Format** bar code to start Format Editor selection.
- ❷ **Terminal Type**
Scan two bar codes that represent the terminal type (00-03†, inside back cover or on page 2-3 in the Terminal Selection Programming Instructions section.)
- ❸ **Code I.D.**
Refer to the Symbology chart (page 4-5), then scan two bar codes from the "Hex Value" column that represent the Code I.D. of the symbology you want formatted.
- ❹ **Length**
Scan two bar codes representing the bar code length you require (00-99†). Be sure to include all spaces in the bar code length.
- ❺ **Editor Command Sequences**
Refer to the Format Editor Commands chart (page 5-3). Scan two bar codes that represent the command you need.
- ❻ **End Format (FF)**
Scan "F" *twice* to end Format Editor selection.



Enter Data Format



Clear All Data Formats

† 99 is the Universal number, indicating all terminal types and all code lengths.

Format Editor Commands Chart

The available Data Formatter commands are:

- F1 **INCLUDE IN OUTPUT** all characters followed by the “XX” key or function code, starting from the current cursor position. The cursor is left pointing at the last character included plus one. *Command syntax is F1XX where XX is a hexadecimal value in the range of 00–FE. If XX equals 00, then XX is not included.*
- F2 **INCLUDE IN OUTPUT** “NN” characters followed by the “XX” key or function code, starting from the current cursor position. The cursor is left pointing at the last character included plus one. *Command syntax is F2NNXX where NN is a decimal value in the range of 00–99 and XX is a hexadecimal value in the range of 00–FE. If XX equals 00, then XX is not included.*
- F3 **INCLUDE IN OUTPUT** all characters up to but not including “SS” character followed by the “XX” key or function code, starting from the current cursor position. The cursor is left pointing at the last character included plus one (“SS” character). *Command syntax is F3SSXX where SS equals a hexadecimal value 01–7F and XX equals a hexadecimal value in the range 00–FE. If XX equals 00, then XX is not included.*
- F4 **INSERT** “XX” character “NN” times at the current cursor position. The cursor is not moved. *Command syntax is F4XXNN where XX is a hexadecimal value in the range of 00–7F and NN is a decimal value in the range of 00–99.*
- F5 **MOVE** the cursor forward “NN” characters from the current position. *Command syntax is F5NN where NN is a decimal value in the range of 00 to 99.*
- F6 **MOVE** the cursor backward “NN” characters from the current position. *Command syntax is F6NN where NN is a decimal value in the range of 00 to 99.*
- F7 **MOVE** the cursor to the beginning of the data string. *Command syntax is F7.*
- F8 **SEARCH FORWARD** from the current position for “XX” character. The cursor is left pointing at “XX”. *Command syntax is F8XX where XX is the hexadecimal value in the range of 01 to 7F.*
- F9 **SEARCH BACKWARD** from the current position for “XX” character. The cursor is left pointing at “XX”. *Command syntax is F9XX where XX is a hexadecimal value in the range of 01 to 7F.*
- FA **SUPPRESS** all ASCII zeros from the current cursor position forward to the first non-zero character. The cursor is left pointing at the first non-zero character. *Command syntax is FA.*
- FB **SUPPRESS** all occurrences of up to three different characters “XX”, “YY” and “ZZ” starting from the current cursor position. The cursor is not moved. *Command syntax is FBXXFB or FBXXYYFB or FBXXYYZZFB where XX, YY, and ZZ are hexadecimal values in the range of 01 to 7F.*
- FC **TERMINATE** current FB **SUPPRESS** characters. *Syntax = FC.*
- FE **COMPARE** the character at the current cursor position to character “XX” and if equal move the cursor forward one character. If characters are not equal then abort formatting. *Command syntax is FEXX where XX is a hexadecimal value in the range of 01 to 7F.*

Caution: Do not program the Data Formatter to include extended ASCII characters (hexadecimal values 80 – FF) in the output when operating as a keyboard wedge or keyboard replacement.

Data Formatter Example

You are using an IBM PC AT and are scanning a UPC A bar code with a five digit addenda (shown below). The bar code has a total of 18 characters, including the number system, the check digits, and a space between the main bar code data and the addenda bar code data.



For your application, you don't want the space between the main bar code data and the addenda bar code data transmitted. You also want the bar code data followed by a carriage return (CR).

Using the programming bar codes on pages 5-2 and inside back cover, and referring to the Format Editor Commands Chart on page 5-3; scan the following to format the bar code data for your application:

- Scan the **Enter Data Format** bar code (page 5-2).
- Scan the **03** bar codes (inside back cover) for PC AT Terminal Type.
- Scan the **63** bar codes (inside back cover), the Hex value for UPC symbology.
- Scan the **18** bar codes (inside back cover) for the bar code length†.

(The following are the Editor Command Sequences:)

- Scan the **FB** (suppress characters command) bar codes (inside back cover), scan **20** (the Hex value for a space), and then scan **FB** to frame (complete) the command.
- Scan the **F7** bar codes (inside back cover) to move the cursor back to the beginning of the bar code data.
- Scan the **F1** and **0D** bar codes (inside back cover) to send all the characters followed by a carriage return (CR= 0D in Hex value).
- Scan the **FF** bar codes (inside back cover) to end Format Editor selection.

† The bar code length includes all spaces.

6.1 Introduction

Use this chapter to program the SCANTEAM 3700 Wedge for Industrial and Retail Symbology selections.

This programming section contains the following menuing selections:

- Codabar Selections
- Code 39 Selections
- Code 93 Selections
- Interleaved 2 of 5 Selections
- Code 2 of 5 Selections
- Matrix 2 of 5 Selections
- Code 11 Selections
- Code128 Selections
- EAN Selections
- UPC Selections
- MSI Selections
- Plessey Selections

Industrial Symbologies

About Codabar, Code 39, Interleaved 2 of 5 Programming

Codabar, Code 39, and Interleaved 2 of 5 programming allows you to:

- Enable or disable symbology decoding.
- Program all symbology options, such as Start/Stop Characters, Adaptive/Traditional Decoding, Check Characters/Digits, and others.
- Set minimum and maximum Message Length.

About Code 93, Code 2 of 5, Matrix 2 of 5 Programming

Code 93, Code 2 of 5, and Matrix 2 of 5 programming allows you to:

- Enable or disable symbology decoding.
- Set minimum and maximum Message Length.

About Code 11 Programming

Code 11 programming allows you to:

- Enable or disable symbology decoding.
- Select Check Digits Required.
- Set minimum and maximum Message Length.

About Code 128 Programming

Code 128 programming allows you to:

- Enable or disable symbology decoding.
- Set minimum and maximum Message Length.

Retail Symbologies

About EAN, UPC Programming

EAN and UPC programming allows you to:

- Enable or disable symbology decoding.
- Program all symbology options, such as symbology versions, 2/5 Digit Addenda, Check Digits, and others.

About MSI, Plessey Programming

MSI and Plessey programming allows you to:

- Enable or disable symbology decoding
- Set minimum and maximum Message Length

6.2 Industrial Symbology Selections

6.2.1 Codabar

Default All Codabar Settings

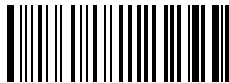
Scanning the Default bar code will program the 3700 Wedge to the symbology options indicated by a “*” in the menu selections on this and the following programming page.

** Default All Codabar Settings **



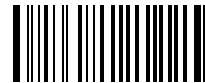
Codabar

Codabar is a discrete, two-width symbology capable of encoding variable-length messages from the set of numerics 0 through 9, and the \$: / . + - characters. Any one of the four start/stop characters A,B,C, or D can be used as a start or a stop character; often the same character is used for both. *Default = On.*



* On

Codabar



Off

Start / Stop Characters

The start and stop characters are used to identify the leading and trailing ends of the bar code. Since they are not considered part of the message they are not ordinarily transmitted, though the reader can be programmed to transmit them. *Default = Don't Transmit.*



Transmit

*Start / Stop
Characters*



* Don't Transmit

Decoding

The 3700 Wedge uses industry standard decoding algorithms to ensure data integrity. Adaptive decoding employs a more aggressive decoding algorithm that is more tolerant when bar code symbols do not conform to the symbology specifications and that results in “snappier” scanning. *Default = Adaptive.*



* Adaptive

Decoding



Traditional

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

Message Length

We recommend setting the minimum and maximum message lengths according to the smallest range [Minimum, Maximum] the application allows. The start/stop, check characters should not be counted as message characters. For a fixed-length message Minimum Length=Maximum Length. This will also help minimize the chance of a misread. *Defaults on default chart at the end of this manual.*

Note: To select digits 0 through 9 use the Programming Chart found on the inside of the back cover of this menu. Scan the programming selection bar code first, and then scan the bar code(s) representing the digits you wish to set.



Minimum ‡

Message
Length



Maximum ‡

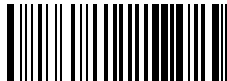
‡ A two-digit number is required after scanning this programming bar code. Please scan your selection on the Programming Chart (inside back cover).

Check Character

Use of a check character is optional in Codabar. For applications requiring enhanced security, symbols should be printed with a check character using the format described in the AIM specification, and the reader should be programmed to verify its value. Since it is not considered part of the message the check character is not ordinarily transmitted, though the reader can be programmed to transmit it. *Default = No Check Character.*



* No Check Character



Validate, But Don't Transmit



Validate, And Transmit

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

Concatenation

Codabar supports symbol concatenation. When you **Allow** concatenation, the reader will look 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 = Allow.*



Select the **Require** concatenation option to prevent the reader from decoding a lone Codabar symbol.



Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

Full ASCII

The Code 39 specification provides a means of encoding the full ASCII set of characters by using two-character sequences made up of one of the four Code 39 characters (\$ + % /) followed by one of the 26 letters as shown in the Full ASCII Code 39 chart (on page 6–9). The 3700 Wedge can't distinguish Code 39 labels encoded in full ASCII mode from those encoded in standard mode. Set this decoder option according to the mode used when the symbols were printed. *Default = Enable.*



* Enable

Full ASCII



Disable

Append

When the append option is enabled, the reader will identify Code 39 messages whose leading character is a SPACE, as *Append39* symbols. The leading SPACE is discarded and the remaining message characters are stored in a buffer. When a non-*Append39* symbol is scanned, all data is transmitted in the order it was scanned. *Default = Disable.*



Enable

Append



* Disable

Decoding

The 3700 Wedge uses industry standard decoding algorithms to ensure data integrity. Adaptive decoding employs a more aggressive decoding algorithm that is more tolerant when bar code symbols do not conform to the symbology specifications and that results in “snappier” scanning. *Default = Adaptive.*



* Adaptive

Decoding



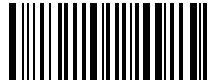
Traditional

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

Message Length

We recommend setting the minimum and maximum message lengths according to the smallest range [Minimum, Maximum] the application allows. The start/stop, check characters should not be counted as message characters. For a fixed-length message Minimum Length=Maximum Length. This will also help minimize the chance of a misread. *Defaults on default chart at the end of this manual.*

Note: To select digits 0 through 9 use the Programming Chart found on the inside of the back cover of this menu. Scan the programming selection bar code first, and then scan the bar code(s) representing the digits you wish to set.



Minimum ‡

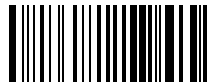
Message
Length



Maximum ‡

Check Character

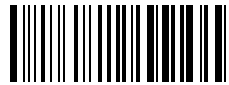
Use of a check character is optional in Code 39. For applications requiring enhanced security, symbols should be printed with a check character using the format described in the AIM specification, and the reader should be programmed to verify its value. Since it is not considered part of the message the check character is not ordinarily transmitted, though the reader can be programmed to transmit it. *Default = No Check Character.*



* No Check Character



Validate, But Don't Transmit



Validate, And Transmit

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

FULL ASCII CHART †															
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

† This chart is used for encoding the above characters in Full ASCII when using Code 39 bar codes. For example, to get a "<", encode %G (which is 25 47 on the Hex ASCII chart in the Prefix / Suffix Programming section).

‡ A two-digit number is required after scanning this programming bar code. Please scan your selection on the Programming Chart (inside back cover).

6.2.3 Code 93

Default All Code 93 Settings

Scanning the Default bar code will program the 3700 Wedge to the symbology options indicated by a “*” in the menu selections on this programming page.

*** Default All Code 93 Settings ***



Code 93

Code 93 was designed to drop into applications that use Code 39. It is a continuous, edge-to-edge symbology capable of encoding variable-length messages from the set of alphanumerics, and 12 additional characters. Each Code 93 character is nine modules wide, and is comprised of 3 bars and 3 spaces. Its characters are spatially efficient for the set of alphanumerics.

Code 93 can be used to represent all 128 ASCII characters in a fashion similar to Code 39’s Full ASCII mode; however, Code 93’s special shift characters distinguish full-ASCII combinations from the standard alphanumeric set. There is no need to enable full-ASCII decoding.

The Code 93 specification requires the use of two check characters; the symbology is highly secure.



Message Length

We recommend setting the minimum and maximum message lengths according to the smallest range [Minimum, Maximum] the application allows. The start/stop and check characters should not be counted. This will also help minimize the chance of a misread. *Defaults on default chart at the end of this manual.*

Note: To select digits 0 through 9 use the Programming Chart found on the inside of the back cover of this menu. Scan the programming selection bar code first, and then scan the bar code(s) representing the digits you wish to set.



Minimum ‡

Message Length



Maximum ‡

Programming Tip: If a symbology won’t be used, we recommend turning it off to minimize the chance of a misread.

6.2.4 Interleaved 2 of 5

Default All 2 of 5 Settings

Scanning the Default bar code will program the 3700 Wedge to the symbology options indicated by a “*” in the menu selections on this and the Code 2 of 5 / Matrix 2 of 5 programming page.

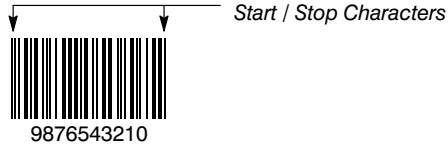
*** Default All Interleaved 2 of 5 Settings ***



Interleaved 2 of 5

Interleaved 2 of 5 is a continuous, two-width symbology capable of encoding an even number of numerics. Odd-length messages are usually padded with a leading 0. Each pair of digits is represented by five bars and five spaces. The bars encode the first digit: two of these five bars are wide, the other three are narrow. Following each bar is a space; collectively, the spaces encode the second digit of the pair. Interleaved 2 of 5 characters are spatially efficient for the set of numerics.

Interleaved 2 of 5



The start/stop characters are short, but not secure. Their patterns can occur erroneously in partial scans of a symbol. As a result Interleaved 2 of 5 is prone to misreads when the scanning path does not include both quiet zones. *Default = On.*



*** On**

*Interleaved
2 of 5*



Off

Decoding

The 3700 Wedge uses industry standard decoding algorithms to ensure data integrity. Adaptive decoding employs a more aggressive decoding algorithm that is more tolerant when bar code symbols do not conform to the symbology specifications and that results in “snappier” scanning. *Default = Adaptive.*



*** Adaptive**

Decoding



Traditional

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

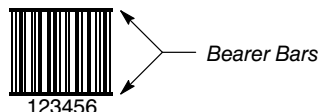
Message Length

If the application requires the ability to read variable-length messages, or some other fixed-length, then choose the minimum and Maximums accordingly. We recommend setting the range [Minimum, Maximum] as small as the application allows. *Defaults on default chart at the end of this manual.*

Note: To select digits 0 through 9 use the Programming Chart found on the inside of the back cover of this menu. Scan the programming selection bar code first, and then scan the bar code(s) representing the digits you wish to set.

Bearer bars having a width comparable to the wide elements can be printed to further enhance security.

Interleaved 2 of 5



Minimum ‡

Message
Length



Maximum ‡

Check Digit

Use of a check digit is optional in Interleaved 2 of 5. For applications requiring enhanced security, symbols should be printed with a check digit using the format described in the AIM specification, and the reader should be programmed to verify its value. Since it is not considered part of the message the check digit is not ordinarily transmitted, though the reader can be programmed to transmit it. *Default = No Check Digit.*

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.



* No Check Digit



Validate, But Don't Transmit



Validate, And Transmit

‡ A two-digit number is required after scanning this programming bar code. Please scan your selection on the Programming Chart (inside back cover).

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

6.2.5 Code 2 of 5

Default All 2 of 5 Settings

Scanning the Default bar code will program the 3700 Wedge to the symbology options indicated by a “*” in the menu selections on this and the Interleaved 2 of 5 programming page.

** Default All Matrix / Code 2 of 5 Settings **



Code 2 of 5

Code 2 of 5 is a discrete, two-width symbology capable of encoding variable-length messages from the set of numerics. Each character is represented by five bars: two bars are wide, the other three are narrow. The width of the spaces carries no meaning and generally will be the same as the width of the narrow bars. The resulting characters are not spatially efficient.

In one form, Code 2 of 5 start/stop characters are represented by patterns of three bars (WWN / WNW). In another form, start/stop characters are represented by patterns of two bars (NN / WN). This reader will recognize and decode both forms of Code 2 of 5. The AIM symbology identifier can be used to distinguish which form was decoded. *Default = On.*



Message Length

We recommend setting the minimum and maximum message lengths according to the smallest range [Minimum, Maximum] the application allows. The start/stop characters should not be counted. This will also help minimize the chance of a misread. *Defaults on default chart at the end of this manual.*

Note: To select digits 0 through 9 use the Programming Chart found on the inside back cover of this menu. Scan the programming selection bar code first, then scan the bar code(s) representing the digits you wish to set.



‡ A two-digit number is required after scanning this programming bar code. Please scan your selection on the Programming Chart (inside back cover).

6.2.7 Code 11 and Code 128

Default All Code 11 / Code 128 Settings

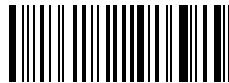
Scanning the Default bar code will program the 3700 Wedge to the symbology options indicated by a “*” in the menu selections on this programming page.

*** Default All Code 11 / Code 128 Settings ***



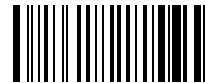
Code 11

Code 11 is a discrete code capable of encoding variable-length messages from the set of numerics plus the “-” character. The symbology derived its name from the size of its character set. Each character in Code 11 has three bars and two internal spaces: two of these elements are wide, the other three are narrow. The exceptions to this are the “0”, “9”, and “-” characters, which have one extra-wide element and four narrow elements. Code 11 can be decoded as a two-width symbology, though the bars can assume one of three widths. *Default = On.*



* On

Code 11



Off

Check Digits Required

The Code 11 specification strongly recommends the use of two check digits. The decoder can be programmed to read Code 11 symbols having only one check digit. Bar code readers cannot autodiscriminate the number of check digits encoded in a symbol. *Default = 2 Check Digits.*

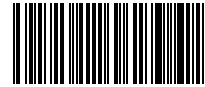
Code 11

With 2 Check Digits



123456 11

With 1 Check Digit



1234567890 1



* 2 Check Digits

*Check Digits
Required*



1 Check Digit



Minimum ‡

*Message
Length*



Maximum ‡

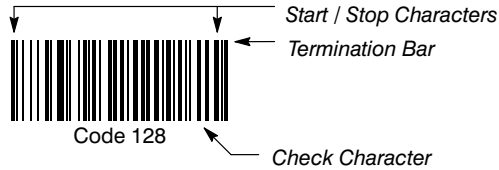
‡ A two-digit number is required after scanning this programming bar code. Please scan your selection on the Programming Chart (inside back cover).

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

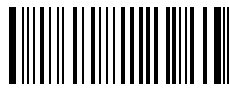
Code 128

Code 128 is a continuous, edge-to-edge symbology capable of encoding variable-length messages from the full 128-character ASCII set. Through the use of mode switching, the extended 256-character ASCII set can be encoded, and double-density numerics are possible. Each Code 128 character is eleven modules wide, and is comprised of three bars and three spaces. Its characters are spatially efficient.

Code 128



The Code 128 specification requires the use of one check character; the symbology is highly secure. *Default = On.*



* On

Code 128



Off

Message Length

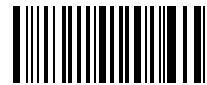
We recommend setting the minimum and maximum message lengths according to the smallest range [Minimum, Maximum] the application allows. The start/stop and check characters should not be counted. This will also help minimize the chance of a misread. *Defaults on default chart at the end of this manual.*

Note: To select digits 0 through 9 use the Programming Chart found on the inside of the back cover of this menu. Scan the programming selection bar code first, and then scan the bar code(s) representing the digits you wish to set.



Minimum ‡

Message
Length



Maximum ‡

‡ A two-digit number is required after scanning this programming bar code. Please scan your selection on the Programming Chart (inside back cover).

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

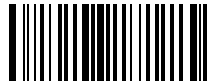
6.3 Retail Symbology

6.3.1 EAN (European Article Numbering) Settings

Default All EAN / UPC Settings

Scanning the Default bar code will program the 3700 Wedge to the symbology options indicated by a “*” in the menu selections on this and the UPC programming page, including EAN / UPC Addenda Selections (page 6–21).

** Default All EAN / UPC Settings **



EAN

EAN (European Article Numbering system) is the international standard symbology and coding system for identifying goods that will be scanned at point-of-sale. It is a superset of UPC.

EAN / JAN 13 and EAN / JAN 8

EAN is a continuous, edge-to-edge symbology. EAN 13 encodes 13 numerics: 12 message digits and one check digit. EAN 8 encodes eight numerics: seven message digits and one check digit. *Default = On.*



Check Digit

The decoder always verifies the check digit and normally will transmit it. If you don't want the check digit transmitted, a programming option is provided to turn transmission off. *Default = Transmit.*



Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

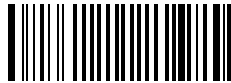
ISBN

The decoder can transmit the EAN message into ISBN (International Standards Book Numbering System) message format if desired. An ISBN EAN bar code starts with a “978” or “979” prefix (example shown below). If ISBN is enabled, the bar code shown below will be transmitted as 0123456789. If ISBN is disabled, the bar code data will be transmitted as 9780123456786. *Default = Disable.*

EAN 13



978 ISBN prefix → 9 780123 456786



Enable

ISBN



* Disable

Note: For programming addendas, see the *EAN / UPC Addenda Selections menu* on page 6–21.

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

6.3.2 UPC (Universal Product Code) Settings

Default All UPC / EAN Settings

Scanning the Default bar code will program the 3700 Wedge to the symbology options indicated by a “*” in the menu selections on this and the EAN programming page, including EAN / UPC Addenda Selections (page 6–21).

*** Default All UPC / EAN Settings ***



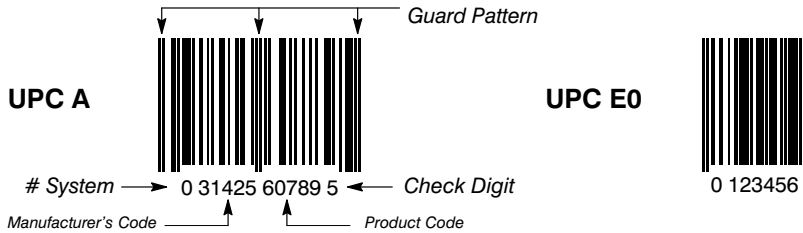
UPC

UPC (Universal Product Code) was designed to uniquely identify a product and its manufacturer. It has been successfully employed by the supermarket industry since 1973.

UPC A

UPC A is a continuous, edge-to-edge symbology. UPC A encodes 12 numerics: 11 message characters and one check character. The first message character is called the number system digit, and it indicates the product type. The next five characters identify the manufacturer of the product, while the last five message characters identify the product. *Default = On.*

Note: *UPC A is a subset of EAN13. UPC A symbols will be read and interpreted as EAN-13 symbols when UPC A is turned off.*



* On

UPC A



Off

UPC E0

UPC A codes having one or more zeros in the manufacturer ID, and having a number system digit of zero can use UPC E0, which encodes a limited number of product ID's in only seven numerics: six message characters and one check character. *Default = On.*



* On

UPC E0



Off

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

UPC E1

UPC E1 is no longer supported by the UPC specification because of a similarity to EAN 13. This decoder can be programmed to read UPC E1 as long as EAN 13 is turned off. *Default = Off.*

UPC D can encode variable-length messages, but is rarely used and is not supported by this decoder.



On

UPC E1



* Off

Check Digit

The decoder always verifies the check digit and normally will transmit it. If you don't want the check digit transmitted, a programming option is provided to turn transmission off. *Default = Transmit.*



* Transmit

Check
Digit



Don't Transmit

Number System

The number system digit of a UPC symbol is normally transmitted, though the reader can be programmed to suppress it. *Default = Transmit.*



* Transmit

Number
System



Don't Transmit

Version E Expand

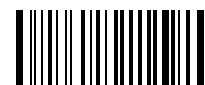
The decoder can expand a UPC E message into the 12 character UPC A message format if desired. *Default = Don't Expand.*

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.



Expand

Version E
Expand



* Don't Expand

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

6.3.3 EAN / UPC Addenda

EAN / UPC Addenda

Two and five character addenda are allowed, but not required. If an addenda will always be used, we recommend selecting **Require Addenda and Enable** the appropriate format (two or five character). If an addenda won't always be used, you may select **Don't Require**, and then **Enable** or **Disable** the EAN and UPC Two and Five Digit Addenda selections. *Default = Don't Require.*

Note: *This option affects both EAN and UPC decoding.*



Require

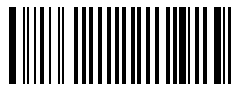
*EAN / UPC
Addenda*



* Don't Require

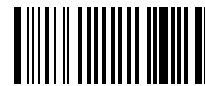
EAN / UPC Addenda Format

The EAN / UPC addenda may be sent with or without a space between the main bar code data and the addenda bar code data. *Default = Space.*



No Space

*EAN / UPC
Addenda
Format*

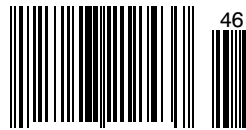


* Space

EAN Addenda

If your application needs a two or five digit addenda, select **Enable**. To make scanning faster if your application doesn't require an addenda, select **Disable**. The EAN bar code will be sent without the addenda data. *Default = Disable.*

EAN 13



6 127847 218437

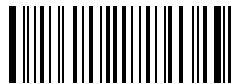
46 ← 2-Digit Addendum

EAN 8



01 23456 5

50595 ← 5-Digit Addendum



Enable

*Two Digit
Addenda*



* Disable



Enable

*Five Digit
Addenda*



* Disable

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

UPC Addenda

If your application needs a two or five digit addenda, select **Enable**. To make scanning faster if your application doesn't require an addenda, select **Disable**. The UPC bar code will be sent without the addenda data. *Default = Disable.*



*Two Digit
Addenda*

Enable



* Disable



*Five Digit
Addenda*

Enable



* Disable

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

6.3.4 MSI Settings

Default All MSI & Plessey Settings

Scanning the Default bar code will program the 3700 Wedge to the symbology options indicated by a “*” in the menu selections on this programming page.

*** Default All MSI & Plessey Settings ***



MSI (Sometimes referred to as Modified Plessey Code)

MSI is a discrete code capable of encoding variable-length messages (up to 14 characters) from the set of numerics. Each character has four bars and four spaces. When read from left to right, each bar-space pair represents one bit: a narrow bar / wide space combination represents a zero, a wide bar / narrow space combination represents a one. Characters are comprised of four bits each, with the MSB (most significant bit) first.

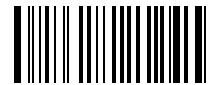


Despite the requirement of one check digit, the symbology requires high quality printing and is not secure. *Default = Off.*



On

MSI

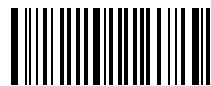


* Off

Message Length

We recommend setting the minimum and maximum message lengths according to the smallest range [Minimum, Maximum] the application allows. The start/stop and check characters should not be counted. This will also help minimize the chance of a misread. *Defaults on default chart at the end of this manual.*

Note: To select digits 0 through 9 use the Programming Chart found on the inside of the back cover of this menu. Scan the programming selection bar code first, and then scan the bar code(s) representing the digits you wish to set.



Minimum ‡

Message Length



Maximum ‡

‡ A two-digit number is required after scanning this programming bar code. Please scan your selection on the Programming Chart (inside back cover).

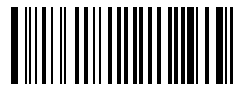
Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

6.3.5 Plessey Settings

Plessey

Plessey Code is a continuous code capable of encoding variable-length messages from the set of hexadecimal characters. Each character has four bars and four spaces. When read from left to right, each bar-space pair represents one bit: a narrow bar / wide space combination represents a zero, a wide bar / narrow space combination represents a one. Characters are comprised of four bits each, with the LSB (least significant bit) first.

The specification requires the use of two checksum characters. *Default = Off.*



On

Plessey

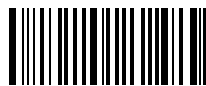


* Off

Message Length

We recommend setting the minimum and maximum message lengths according to the smallest range [Minimum, Maximum] the application allows. The start/stop and check characters should not be counted. This will also help minimize the chance of a misread. *Defaults on default chart at the end of this manual.*

Note: To select digits 0 through 9 use the Programming Chart found on the inside of the back cover of this menu. Scan the programming selection bar code first, and then scan the bar code(s) representing the digits you wish to set.



Minimum ‡

Message Length



Maximum ‡

‡ A two-digit number is required after scanning this programming bar code. Please scan your selection on the Programming Chart (inside back cover).

Programming Tip: If a symbology won't be used, we recommend turning it off to minimize the chance of a misread.

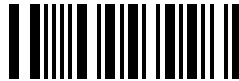
7.1 Introduction

Use this chapter to reset the SCANTEAM 3700 Wedge to the original factory default settings, or to output the software revision number to the host terminal.

Reset Factory Settings

All operating parameters are stored in non-volatile memory resident in the 3700 Wedge, where they are permanently retained in the event of a power interruption. When you receive your 3700 Wedge, certain operating parameters have already been set. These are the factory defaults, indicated by the symbol “*” on the programming menu pages (beneath the default bar code). Default charts may be found near the end of this programming menu.

Scanning the **Factory Default Settings** bar code resets the 3700 Wedge to the original factory settings, clearing any programming changes you may have made.



Factory Default Settings

Status Check

Scan the **Show Software Revision** bar code to transmit the software revision level to the host terminal. The software revision will be printed out as “WA34561XXX.” (The “X’s” will vary according to the firmware ID.)

Note: A bar code to **Show Formats** may be found on the *Data Formatter Selections programming menu page in Section 3, Serial Interface Menu.*



Show Software Revision

8.1 Introduction

The wedge's internal operational firmware is contained in a "Flash EEPROM" (a programmable / erasable ROM – Read Only Memory). This enables you to download new firmware upgrades, without opening the wedge or changing a chip (IC). A download kit that includes the software (in DOS or Windows versions) and an instruction manual is available from your sales distributor.

This programming section contains the following menuing selections:

- Downloading Utility
- Uploading Utility
- Temporary Serial Communication Configuration

8.1.1 Downloading Utility

Scanning the **Download New Firmware** bar code prepares the scanner to be downloaded with new firmware. New firmware is downloaded by using the Quick*Load application software (in the download kit). Quick*Load can perform firmware uploads (reading the device's memory) and downloads (writing to the device's memory). The Quick*Load application will prompt you to scan the symbol (shown below) at the appropriate time.



Download New
Firmware

8.1.2 Uploading Utility

Scanning the **Memory Upload** bar code sends the entire contents of ROM to the host terminal. The data is transmitted serially, as INTEL-formatted ASCII text strings, at 19,200 baud, no parity, 8 data bits, and 1 stop bit.



Memory Upload

8.1.3 Temporary Serial Communication Configuration

For quick download communication configuration, scan the **W + A** bar code to temporarily configure the scanner for 9600 baud rate, no parity, 8 data bits, and 1 stop bit. Standard receive (RX) and transmit (TX) voltages are also selected. RTS / CTS handshaking is disabled. This change is *temporary*. The next time the scanner is powered down and then up, its serial communication settings are restored to the programmed settings.



W + A

Supported Interface Keys

9.1 Keyboard Function Relationships

The following Keyboard Function Code, HEX/ASCII Value, and Full ASCII "CTRL" + "CTRL"+ relationships apply to all terminals that can be used with the SCANTEAM 3700 Wedge.

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

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

Country	[	\	\]	6	-
United States	[	\	\]	6	-
Belgium	[	<	]	6	-
Scandinavia	8	<	9	6	-
France	^	8	\$	6	=
Germany		Ä	+	6	-
Italy		\	+	6	-
Swiss		<	..	6	-
United Kingdom	[	'	]	6	-
Denmark	8	\	9	6	-
Norway	8	\	9	6	-
Spain	[	\	\]	6	-

Supported Interface Keys

Supported Interface Keys		IBM AT and PS/2 Compatibles	IBM XTs and Compatibles
NUL	00	Reserved	Reserved
SOH	01	Enter (KP)	CR/Enter
STX	02	Cap Lock	Caps Lock
ETX	03	Reserved	Reserved
EOT	04	Reserved	Reserved
ENQ	05	Reserved	Reserved
ACK	06	Reserved	Reserved
BEL	07	CR/Enter	CR/Enter
BS	08	Reserved	Reserved
HT	09	Tab	Tab
LF	0A	Reserved	Reserved
VT	0B	Tab	Tab
FF	0C	Delete	Delete
CR	0D	CR/Enter	CR/Enter
SO	0E	Insert	Insert
SI	0F	Escape	Escape
DLE	10	F11	Reserved
DC1	11	Home	Home
DC2	12	Print	Print
DC3	13	Backspace	Backspace
DC4	14	Back Tab	Back Tab
NAK	15	F12	Reserved
SYN	16	F1	F1
ETB	17	F2	F2
CAN	18	F3	F3
EM	19	F4	F4
SUB	1A	F5	F5
ESC	1B	F6	F6
FS	1C	F7	F7
GS	1D	F8	F8
RS	1E	F9	F9
US	1F	F10	F10

* IBM 3191/92, 3471/72, 3196/97, 3476/77, DDC 3596, Telex (all models), Harris H180/190 with 122 key keyboards

10.1 Introduction

The major components of the system are the SCANTEAM 3700 Wedge and the host instrument or equipment. Electrical power is generally supplied to the 3700 Wedge by the host system. Figure 3 shows the functional relationships between the components of the basic system.

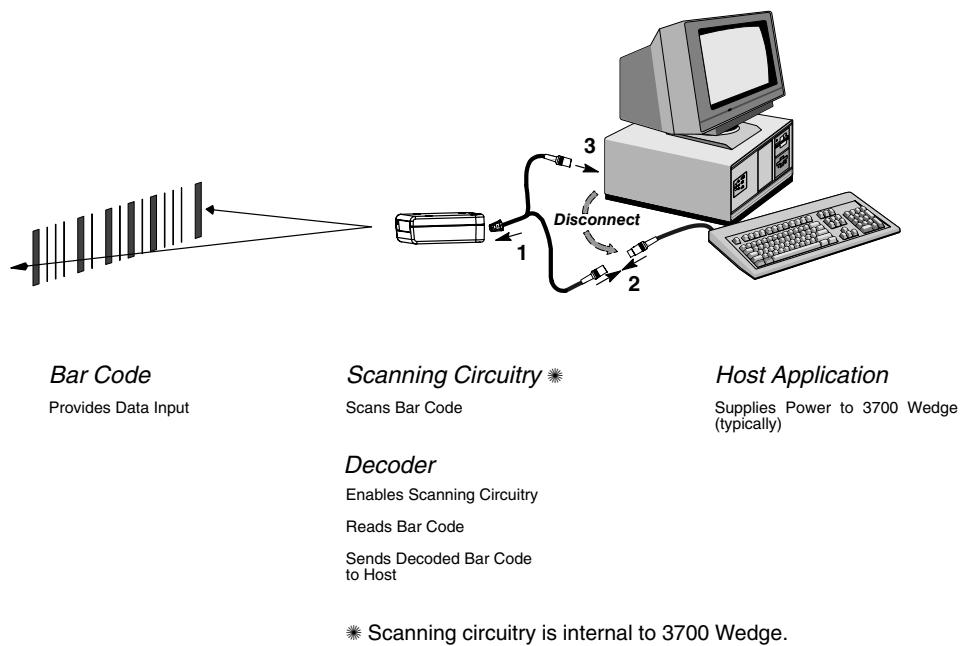


Figure 3. Basic System Operation

10.2 General Characteristics of the 3700 Wedge

10.2.1 Mechanical Layout of the 3700 Wedge

Figure 4, on page 10-2, shows several views of the SCANTEAM 3700 Wedge, including general dimensions, the location of connectors, and the scanner window.

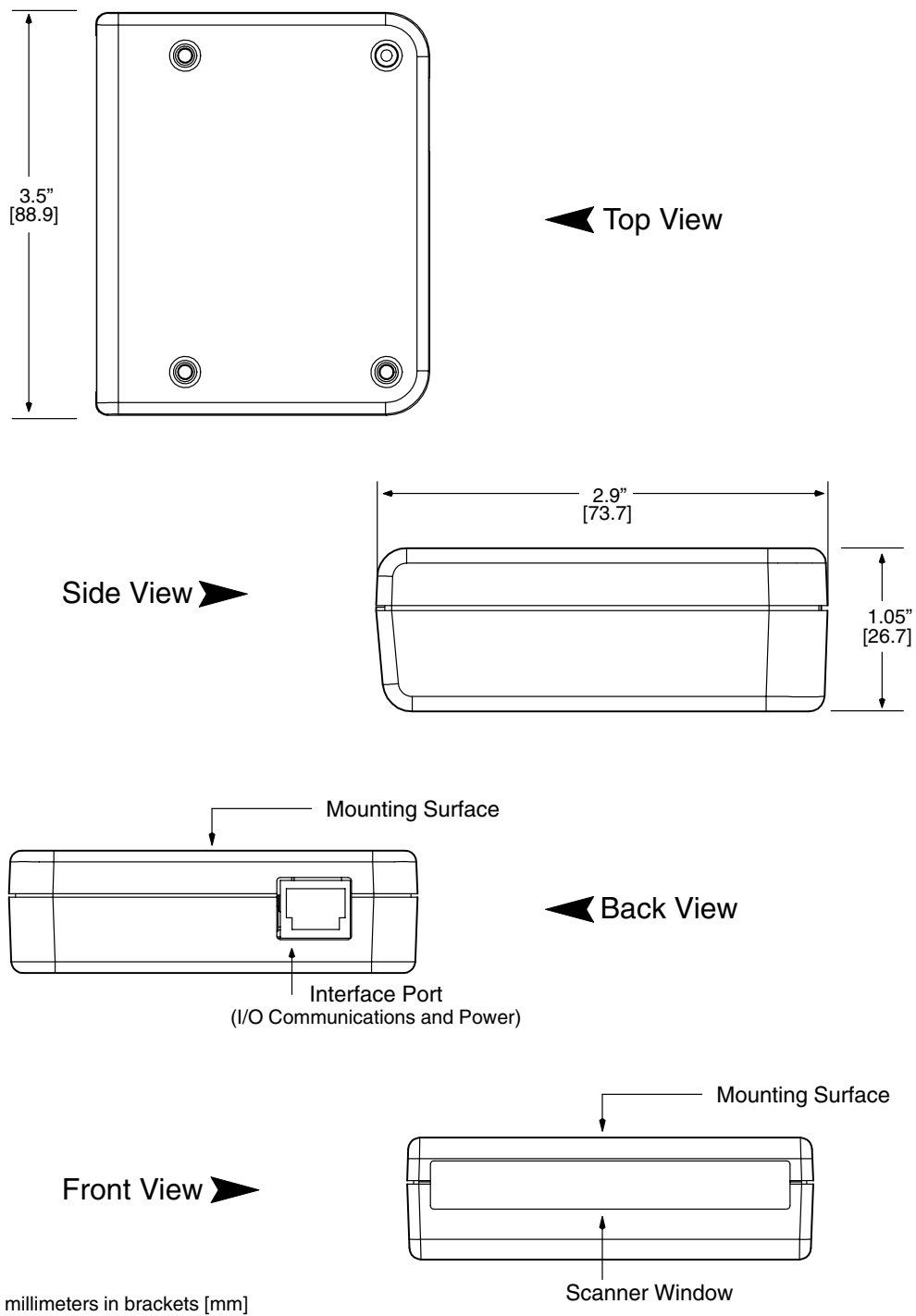
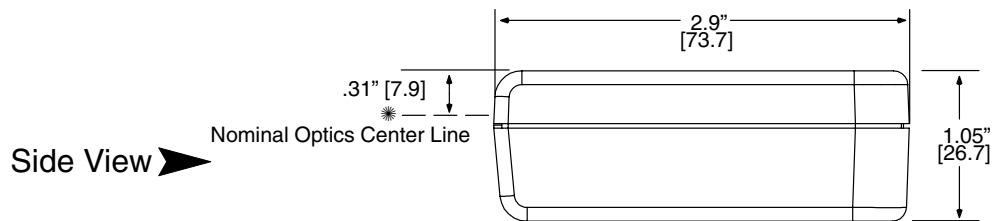
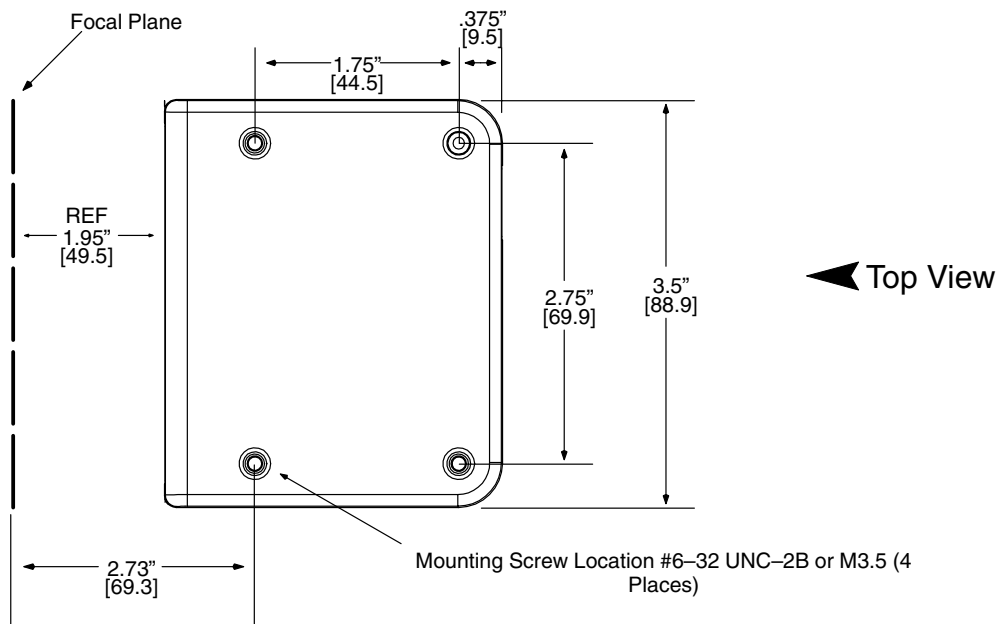
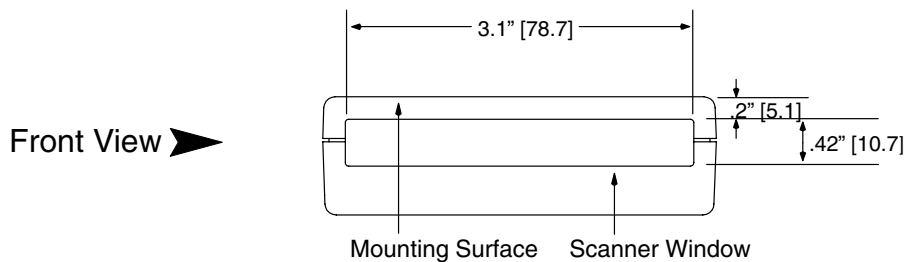


Figure 4. SCANTEAM 3700 Wedge Dimensions



* Installation should provide adjustment to align the optical center line on the intended target. This adjustment should account for tolerance variation in the 3700 Wedge scanner, as well as the host equipment.



millimeters in brackets [mm]

Figure 5. Mounting Dimensions for the 3700 Wedge

The 3700 Wedge may be oriented in any way so the beam scanning path moves across the bar code as shown in Figure 6. Bar code presentation to the scanner is important for successful scanning of the label. The first requirement is that the beam scan path cross all bars on the label, as well a 0.25 inch quiet zone before and after the code. The Automatic Identification Manufacturers (AIM), the industry association, has defined orientation of the bar code label according to Figure 7.

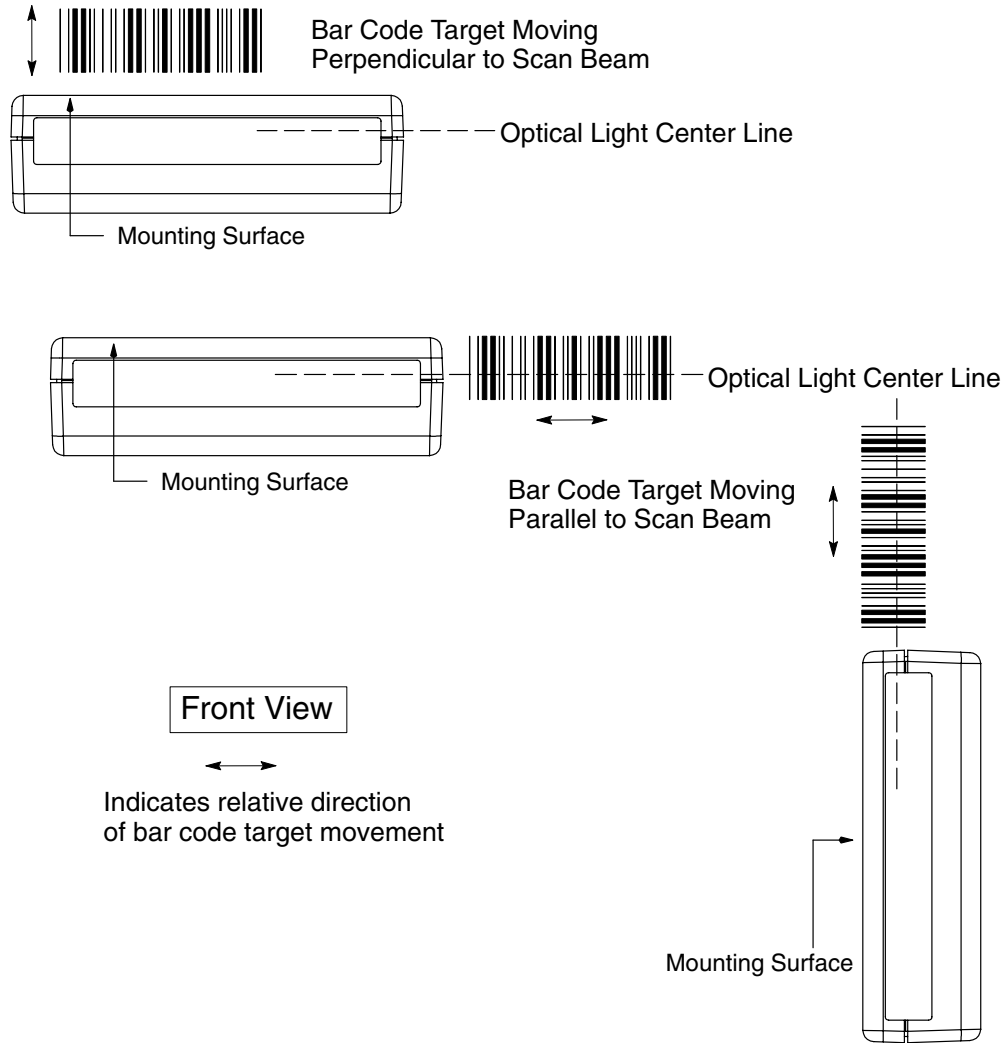
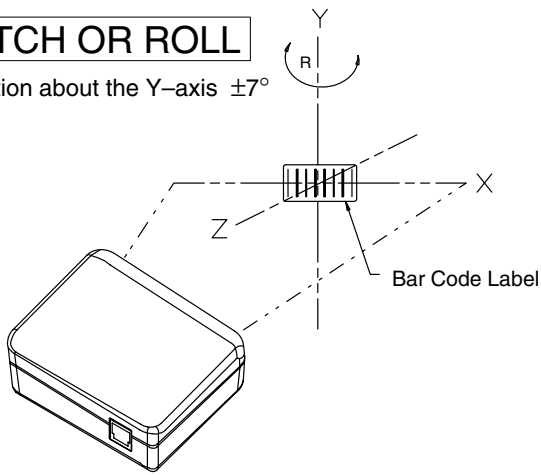


Figure 6. Examples of SCANTEAM 3700 Wedge Barcode Orientation

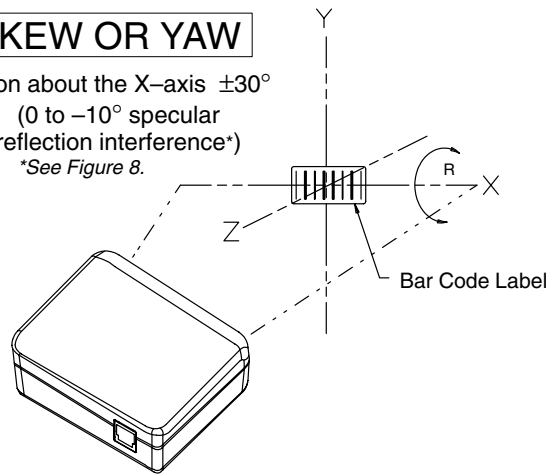
PITCH OR ROLL

Rotation about the Y-axis $\pm 7^\circ$



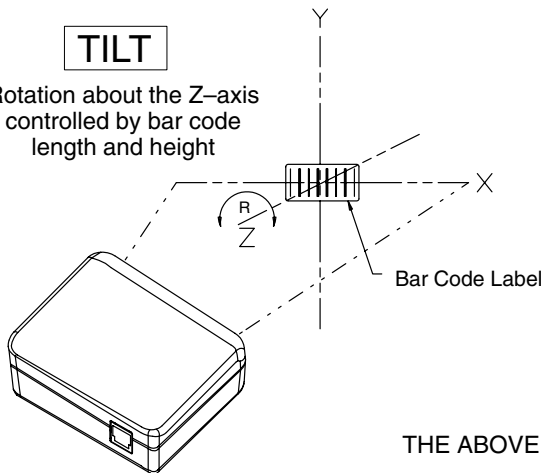
SKEW OR YAW

Rotation about the X-axis $\pm 30^\circ$
 (0 to -10° specular reflection interference*)
 *See Figure 8.



TILT

Rotation about the Z-axis controlled by bar code length and height



Rear View

R = Rotation

THE ABOVE DEFINITIONS ARE FROM AIM® SPECIFICATIONS

Figure 7. SCANTEAM 3700 Wedge Pitch, Skew and Tilt Tolerance

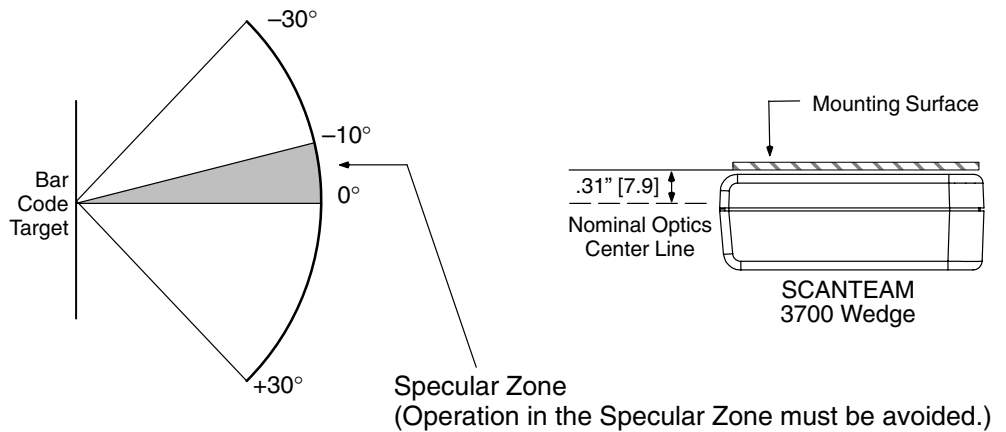
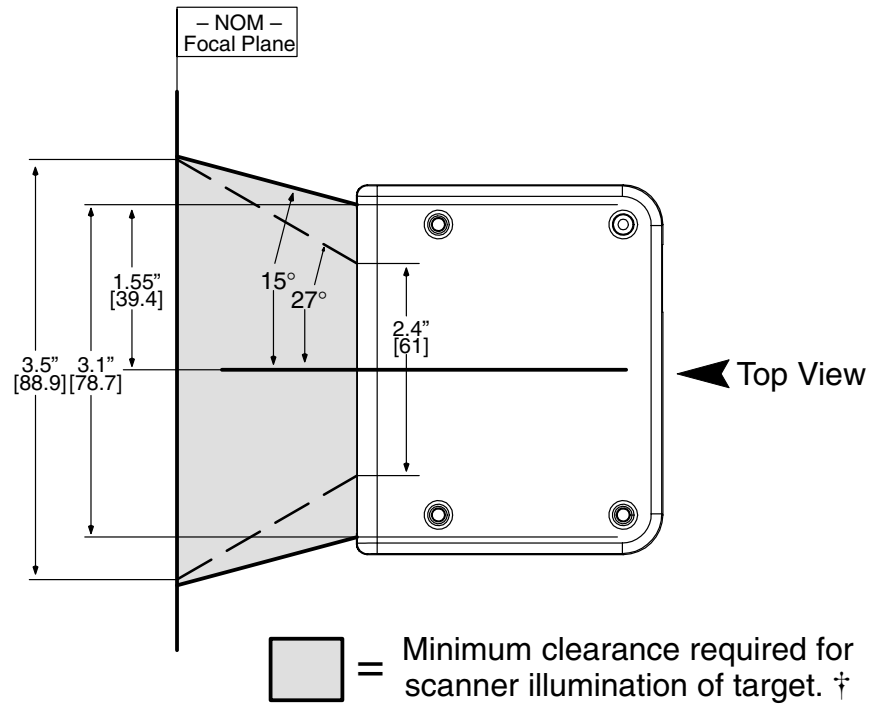
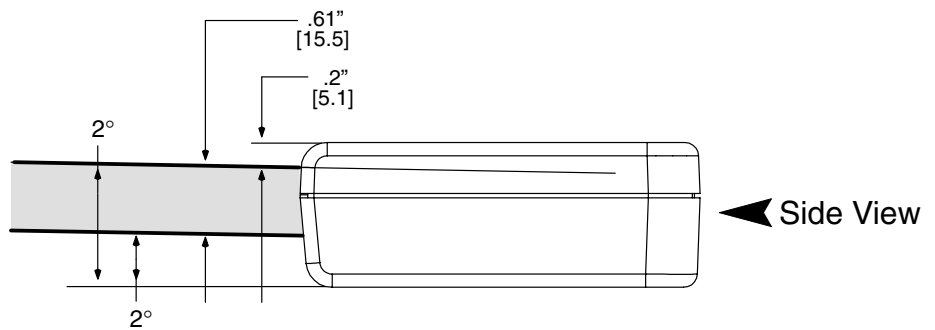


Figure 8. Specular Reflection Interference



█ = Minimum clearance required for scanner illumination of target. †

--- = Receive path/area. †



† Illumination area is larger than receive area.

millimeters in brackets [mm]

Figure 9. Scanner Illumination Clearance

10.2.2 Single Modular Input/Output/Power Port

The interface port is an 8-pin female modular connector used for attaching the keyboard wedge cable. Power and ground connections are also on this port.

10.2.3 Audible Indicator

The beeper can be disabled by using a configuration command. Refer to page 4–6 for information on setting beeper volume. The beeper also sounds on power–up or reconfiguration as an audible self–check of software configuration.

10.2.4 Mounting Inserts

Inserts are molded into the housing to retain mounting screws. Inserts are available for metric (3.5) or SAE (#6–32) screws.

10.3 Operating Theory

Figure 10 presents a block diagram of the basic SCANTEAM 3700 Wedge operation.

The SCANTEAM 3700 Wedge looks for data input from the scanning circuitry, which includes the LED reflector (illuminates the bar code target), the CCD sensor and imaging lens (focuses the scattered optical energy from the bar code symbol), and the peak detectors and comparator (generates a digital representation of the bar code symbol to send to the microprocessor).

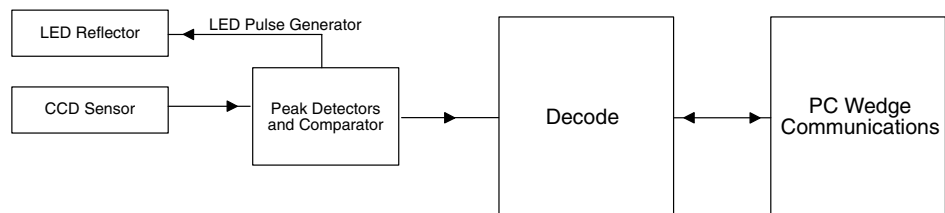


Figure 10. Basic Scanner/Decoder Operation

While scanning, the 3700 Wedge evaluates scanner data for a valid bar code symbol. If a valid bar code symbol is seen, data is placed into the output queue where it is transmitted to the host.

11.1 Troubleshooting

The SCANTEAM 3700 Wedge automatically performs self-tests whenever you turn it on. If your 3700 Wedge is not functioning properly, review the following Troubleshooting Guide to try to isolate the problem.

Troubleshooting Guide

Is the power on? Is the red illuminated beam on?

If the red scan beam on the 3700 Wedge isn't illuminated, check that:

- ❶ the cable is connected properly.
- ❷ the host system power is on.

Is the 3700 Wedge having trouble reading your bar codes?

If the 3700 Wedge isn't reading bar codes well, check that the bar codes:

- ❶ aren't smeared, rough, scratched, or exhibiting voids.
- ❷ aren't coated with frost or water droplets on the surface.
- ❸ are enabled in the 3700 Wedge.

Is the bar code displayed but not "entered"?

The bar code is displayed on the host device correctly, but you still have to press a key to enter it (*the Enter/Return key or the Tab key, for example*).

You need to program a suffix.

Programming a suffix enables the 3700 Wedge to output the scanned bar code *plus* the key you need (such as a "CR," carriage return) to enter the bar code into your application. (See *Suffix Selection in Section 3, Output Parameters Menu*.)

Does the 3700 Wedge read your bar code incorrectly?

If the 3700 Wedge reads a bar code (*one beep for a good read*), but the bar code is not displayed correctly on the host screen:

- ❶ The 3700 Wedge may not be programmed for the appropriate terminal interface.

Example: You scan “12345” and the host displays “@es%.”

Reprogram the 3700 Wedge with the correct or Terminal Selection bar code (see *Section 2, Quick Start Menu*).

- ❷ The 3700 Wedge may not be programmed to output your bar code properly.

Example: You scan “12345” and the host displays “A12345B.”

Reprogram the 3700 Wedge with the proper Symbology selections (see *Section 5, Symbology Menu*).

The 3700 Wedge won't read your bar code at all?

If the 3700 Wedge will not read your bar code:

- ❶ Try scanning the Sample Bar Codes (*found at the end of the Default Charts section*).

If the 3700 Wedge reads the Sample Bar Codes, check that your bar code is readable. (See “*Is the 3700 Wedge having trouble reading your bar codes*” on the previous page.)

Verify that your bar code symbology is enabled. (See *Sections 5, Symbology Menu*.)

If the 3700 Wedge does not read the Sample Bar Codes either, continue to #2, below...

- ❷ If the 3700 Wedge won't read the Sample Bar Codes either:

Verify that the bar code symbologies are enabled. (See *Sections 5, Symbology Menu*.)

Scan the “Default All...” bar code on each symbology menu page in *Section 5* to enable most symbologies. (*MSI and Plessey will have to be enabled individually, as they are defaulted Off.*)

To Reset Factory Settings

If you aren't sure *what* programming options have been set up in your 3700 Wedge, or you've changed some options and now want the factory settings restored, see Section 7, Factory Settings and scan the **Factory Default Settings** bar code.

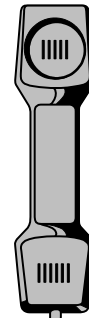
If All Else Fails...

If you are still experiencing problems, call your Distributor or Hand Held Products:

315-685-2476
(8 a.m. to 6 p.m. EST)

Fax: 315-685-4960
Web Site: www.handheld.com
E-Mail: support@handheld.com

(For more information on Customer Support or Warranty information see the two sections following this one.)



12.1 Obtaining Factory Service

Hand Held Products provides service for all its products through a service center located at its manufacturing facilities in Skaneateles, New York. To obtain warranty or non-warranty service, return the unit to Hand Held Products (postage paid) with a copy of the dated purchase record attached.

In the United States, please contact the Hand Held Products' Product Service Department at the address/telephone number listed below to obtain a Return Material Authorization number (RMA #).

Main Office

Welch Allyn Data Collection, Inc. (d/b/a Hand Held Products)

4619 Jordan Road
P.O. Box 187
Skaneateles Falls, New York 13153-0187

Product Service Department

Telephone: (315) 685-4278 or 685-4360
Fax: (315) 685-4156

For service in Europe, please contact your Hand Held Products' representative (at the address that follows) or your local distributor.

European Office

Hand Held Products, Ltd.

Hondsruglaan 87 D
5628 DB Eindhoven
The Netherlands

Telephone: Int+ 31 40 242 4486
Fax: Int+ 31 40 242 5672

United Kingdom Office

Hand Held Products (UK) Ltd.

Dallam Court
Dallam Lane
Warrington
Cheshire WA2 7LT
United Kingdom

Telephone: Int+44 (0) 1 925 240055
or Int+353 1 216 0070
Fax: Int+44 (0) 1 925 631280
or Int+353 1 295 6353

For service in Asia, please contact your Hand Held Products' representative (at the address that follows) or your local distributor.

Asia/Pacific Office
Hand Held Products

10/F Tung Sun Commercial Centre
194–200 Lockhart Road
Wanchai, Hong Kong

Telephone: Int+852–2511–3050 *or* 2511–3132
Fax: Int+852–251–1355

For service in Japan, please contact your Hand Held Products' representative (at the address that follows) or your local distributor.

Japan Office
Hand Held Products

Bon Marusan 8F
3–5–1 Kanda–Jinbocho
Chiyoda–ku
Tokyo 101, Japan

Telephone: Int+81–3–5212–7392
Fax: Int+81–3–3261–7372

For service in Latin America, please contact your Hand Held Products' representative (at the address that follows) or your local distributor.

Latin America Office
Hand Held Products

5150 North Tamiami Trail
Suite 302
Naples, FL 34103–2821

Telephone: (941) 263–7600
Fax: (941) 263–9689

12.2 Help Desk

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

North America:

Telephone: (315) 685–2476 (8 a.m. to 6 p.m. EST)
Fax number: (315) 685–4960
E-mail: support@handheld.com

Europe:

Telephone–
European Ofc: Int+31 40 242 4486
U.K. Ofc: Int+44 1925 240055
E-mail: support@handheld.com

Asia:

Telephone: Int+852–2511–3050 *or* 2511–3132
E-mail: support@handheld.com

13.1 Limited Warranty

Welch Allyn Data Collection, Inc. (d/b/a Hand Held Products), hereby warrants its products to be functional and free from manufacturing defects at the time of delivery. Hand Held Products further warrants that it will replace or repair, at its option, any unit that fails to perform according to Hand Held Products' published specifications during a period of two (2) years from the time of shipment by Hand Held Products to the user at the time it is purchased from any of Hand Held Products' Authorized Distributors. Any attempt on the part of the user to disassemble or service the equipment shall void the warranty.

The warranty does not apply to product which have been damaged by improper handling, shipping, or misuse. The warranty does not apply, if, in the sole opinion of Hand Held Products, the unit has been damaged by accident, misuse, neglect, improper shipping and handling. Since the unit is sensitive to static, the responsibility to protect it from static damage is solely that of the user. The warranty is valid only if the unit or scanner has not been tampered with or serviced by any party unauthorized by Hand Held Products as a repair facility.

THE WARRANTIES SET FORTH HEREIN ARE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE BUYER ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS WERE MADE OR RELIED UPON WITH RESPECT TO THE QUALITY AND FUNCTION OF THE BOARD AND SCANNER HEREIN SOLD.

In no event shall Hand Held Products or its resellers be liable for any loss, inconvenience or damage whether direct, incidental, consequential or otherwise, and whether caused by negligence or other fault resulting from the breach of any express warranty except as set forth herein. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state or country to country.

14.1 Tailoring the Terminal and Keyboard

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

<i>Parameter Name</i>	<i>Default Setting</i>	<i>Page Reference</i>
Country Code Selections		
Foreign Keyboards	United States	Page 3–2
Keyboard Selections		
Keyboard Style	Regular	Page 3–3
Keyboard Style Modifiers	CTRL+ ASCII Mode Off	Page 3–4
	Turbo Mode Off	Page 3–4
	Numeric Keypad Mode Off	Page 3–4

14.2 Configuring Output Parameters Defaults

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

<i>Parameter Name</i>	<i>Default Setting</i>	<i>Page Reference</i>
Prefix / Suffix Selections		
Primary Prefix	None	Page 4–3
Primary Suffix	None	Page 4–3
Output Selections		
Beeper Volume	High	Page 4–6
Output Delays		
Intercharacter Delay	00 (x5mS)	Page 4–7
Interfunction Delay	00 (x5mS)	Page 4–7
Intermessage Delay	00 (x5mS)	Page 4–7
Reread Delay	Low (175mS)	Page 4–8
Good Read Delay	None	Page 4–8
Voting	Disable	Page 4–8
Code I.D. Transmit	Disable	Page 4–9
AIM I.D. Transmit	Disable	Page 4–9
Function Code Transmit	Enable	Page 4–9
Data Formatter Selections		
Require Data Format	Disable	Page 5–2

14.3 Symbology Menu Defaults - Industrial

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

<i>Parameter Name</i>	<i>Default Setting</i>	<i>Page Reference</i>
Codabar Selections		
Codabar	On	Page 6–3
Start / Stop Characters	Don't Transmit	Page 6–3
Decoding	Adaptive	Page 6–3
Message Length	Min = 4, Max = 60	Page 6–4
Check Character	No Check Character	Page 6–4
Concatenation	Allow	Page 6–5
Code 39 Selections		
Code 39	On	Page 6–6
Start / Stop Characters	Don't Transmit	Page 6–6
Full ASCII	Enable	Page 6–7
Append	Disable	Page 6–7
Decoding	Adaptive	Page 6–7
Message Length	Min = 0, Max = 48	Page 6–8
Check Character	No Check Character	Page 6–8
Code 93 Selections		
Code 93	On	Page 6–10
Message Length	Min = 0, Max = 64	Page 6–10
Interleaved 2 of 5 Selections		
Interleaved 2 of 5	On	Page 6–11
Decoding	Adaptive	Page 6–11
Message Length	Min = 4, Max = 80	Page 6–12
Check Digit	No Check Digit	Page 6–12
Code 2 of 5 Selections		
Code 2 of 5	On	Page 6–13
Message Length	Min = 4, Max = 48	Page 6–13
Matrix 2 of 5 Selections		
Matrix 2 of 5	On	Page 6–14
Message Length	Min = 4, Max = 80	Page 6–14
Code 11 Selections		
Code 11	On	Page 6–15
Check Digits Required	2 Check Digits	Page 6–15
Message Length	Min = 4, Max = 80	Page 6–15
Code 128 Selections		
Code 128	On	Page 6–16
Message Length	Min = 0, Max = 80	Page 6–16

14.4 Symbology Menu Defaults - Retail

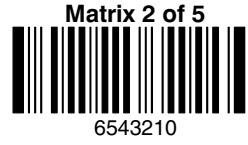
The following chart lists the factory default Retail Symbology Menu settings (indicated by a “*” on the programming menu pages).

<i>Parameter Name</i>	<i>Default Setting</i>	<i>Page Reference</i>
EAN Selections		
EAN / JAN 13	On	Page 6–17
EAN / JAN 8	On	Page 6–17
Check Digit	Transmit	Page 6–17
ISBN	Disable	Page 6–18
UPC Selections		
UPC A	On	Page 6–19
UPC E0	On	Page 6–19
UPC E1	Off	Page 6–20
Check Digit	Transmit	Page 6–20
Number System	Transmit	Page 6–20
Version E Expand	Don't Expand	Page 6–20
EAN / UPC Addenda Selections		
EAN / UPC Addenda	Don't Require	Page 6–21
EAN / UPC Addenda Format	Space	Page 6–21
EAN Addenda		
Two Digit Addenda	Disable	Page 6–21
Five Digit Addenda	Disable	Page 6–21
UPC Addenda		
Two Digit Addenda	Disable	Page 6–22
Five Digit Addenda	Disable	Page 6–22
MSI Selections		
MSI	Off	Page 6–23
Message Length	Min = 4, Max = 48	Page 6–23
Plessey Selections		
Plessey	Off	Page 6–24
Message Length	Min = 4, Max = 48	Page 6–24

14.5 Sample Bar Codes



† The default is normally
"Off" for this symbology.



Technical Specifications

A

A.1 Scanner Performance

The SCANTEAM 3700 performance has been measured in terms of the first bar elongation/contraction and inner bar (space) elongation/contraction when scanning Hand Held Products test targets. If you need more information on these measurements, contact your Hand Held Products representative.

A.2 Optical Specifications

Scanning Direction: Single Line (Unidirectional)

Scan Rate: 100 scans per second.
See chart below.

Scan Speeds Scans/Second	Approximate Lateral Scan Speed	
	Inch/Sec	mm/Sec
100	375	9500

Lateral Motion Sensitivity: 5 inches per second (254mm/sec)

Scan Width: 2.4 inches [61mm] at contact
3.5 inches [89mm] maximum

Focal Distance from scanner window:

Focal Distance	Maximum Scan Width
1.95 inches [50mm] with a 3.5 inch [89mm] maximum scan width	

MRD (minimum reflective difference): 37.5%

Tilt Angle: Controlled by bar code length and height. (See Figure 8, on page 10–5.)

Skew Angle: +30 to –30 degrees (See Figure 8, on page 10–5.)
Specular reflection 0 to –10°
(Operation in the Specular reflection zone must be avoided.)

Pitch Angle: +7 to – 7 degrees on 7.5 mil
(See Figure 8, on page 10–5.)

Light Source (Illumination): Visible Red LED
(Wavelength = 645 nm ±30)

A.3 Electrical Specifications

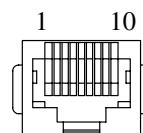
Operating Voltage: +5V±5% *

Operating Current: 250 mA, *

* Power for the SCANTEAM 3700 Wedge is provided by the host system.

Communications Port Connector Pin Assignments:

**10–Pin Modular Connector
Communications Port**



Pin	Signal	Function
1		
2	Shield	Shield
3	Not used	
4	Ground	System Ground
5	TCLK	Terminal Clock
6	TDAT	Terminal Data
7	VCC	+5VDC Power (Input)
8	KDAT	Keyboard Data
9	KCLK	Keyboard Clock
10		

Beeper: The good read beeper indicator is configurable and can be disabled.

A.4 Environmental Specifications

Operating Temperature:	32° F to 122° F (0° C to +50° C)
Storage Temperature:	–40° F to 158° F (–40° C to +70° C)
Relative Operating and Storage Humidity:	0 to 95% (non–condensing)
Barometric Pressure:	101,000 to 69,000 Pascals (Sea level to 3000 meters)
ESD:	15 KV (A drain path for ESD should be provided when installing a 3700 in the host system.)
Shock (Drop Test):	Sustains three (3) drops from 4 feet (1.2 meters) to a non–yielding surface
Mean Time Between Failure (Ground Benign):	45,000 hrs. minimum

ASCII Conversion Table

B

BIT NUMBERS								0 ₀₀	0 ₀₁	0 ₁₀	0 ₁₁	1 ₀₀	1 ₀₁	1 ₁₀	1 ₁₁	
b ₇	b ₆	b ₅	b ₄	b ₃	b ₂	b ₁	ROW	COLUMN	0	1	2	3	4	5	6	7
			0	0	0	0	0	0	NUL	DLE	SP	0	@	P	'	p
			0	0	0	1	1	1	SOH	DC1	!	1	A	Q	a	q
			0	0	1	0	2	2	STX	DC2	"	2	B	R	b	r
			0	0	1	1	3	3	ETX	DC3	#	3	C	S	c	s
			0	1	0	0	4	4	EOT	DC4	\$	4	D	T	d	t
			0	1	0	1	5	5	ENQ	NAK	%	5	E	U	e	u
			0	1	1	0	6	6	ACK	SYN	&	6	F	V	f	v
			0	1	1	1	7	7	BEL	ETB	'	7	G	W	g	w
			1	0	0	0	8	8	BS	CAN	(	8	H	X	h	x
			1	0	0	1	9	9	HT	EM	)	9	I	Y	i	y
			1	0	1	0	10	10	LF	SUB	*	:	J	Z	j	z
			1	0	1	1	11	11	VT	ESC	+	;	K	[	k	{
			1	1	0	0	12	12	FF	FS	,	<	L	\	l	|
			1	1	0	1	13	13	CR	GS	-	=	M	]	m	}
			1	1	1	0	14	14	SO	RS	.	>	N	^	n	~
			1	1	1	1	15	15	SI	US	/	?	O	_	o	DEL

CONTROL FUNCTION DEFINITIONS

NUL	Null, or all zeros	DC1	Device control 1
SOH	Start of heading	DC2	Device control 2
STX	Start of text	DC3	Device control 3
ETX	End of text	DC4	Device control 4
EOT	End of transmission	NAK	Negative acknowledge
ENQ	Enquiry	SYN	Synchronous idle
ACK	Acknowledge	ETB	End of transmission block
BEL	Bell, or alarm	CAN	Cancel
BS	Backspace	EM	End of medium
HT	Horizontal tabulation	SUB	Substitute
LF	Line Feed	ESC	Escape
VT	Vertical tabulation	FS	File separator
FF	Form feed	GS	Group separator
CR	Carriage Return	RS	Record separator
SO	Shift out	US	Unit separator
SI	Shift in	SP	Space
DLE	Data link escape	DEL	Delete

Glossary

AIM– is the Automatic Identification Manufacturers, Inc. AIM is an industry organization that supports the application of all varieties of automatic identification technology including bar codes. An important contribution has been AIM's efforts to standardize bar code symbologies and the way they are identified in data communication.

Algorithm– is a finite set of rules to solve a problem in a measurable number of steps. It is a predetermined numerical calculation which is permanently programmed into the data system's memory to provide a desired result (bar code decoding, for example).

Ambient Light Immunity– describes the ability of a scanner to maintain its specified scanning ability in the presence of external light sources. Usually, scanners are specified for incandescent, florescent, and sunlight.

Analog– (used in contrast to Digital) describes a signal whose amplitude is directly proportional to the physical factors responsible for the signal. An example of this is an optical sensor's output depicting the bars and spaces of a bar code as it "sees" it.

ASCII– is an acronym for the American Standard Code for Information Interchange. It is a data communications protocol for data transmission between an originating and a destination interface. 128 coded characters are included, comprising 96 noncommunications data characters and 32 control characters. It should be noted that most bar code symbologies are unable to encode the full ASCII set.

Asynchronous Serial Communication– is a form of data communication transmission which occurs without a regular or predictable time relationship. The transmission of data characters is one at a time.

Autodiscriminates– refers to the ability of the SCANTEAM 3700 to recognize and decode multiple bar code symbologies.

Bar code– is an array of parallel bars and spaces arranged in a predetermined pattern to represent data elements called characters.

Baud Rate– is a means of expressing data transmission speed, where "baud" equals the number of signal events per second (roughly equivalent to bits per second).

Beam Velocity– is the speed of a laser's scanning beam on the target.

Bidirectional– refers to the ability of a scanner to scan a bar code in either a left-to-right or right-to-left direction.

Bit– is a contraction of “binary digit,” the smallest unit of information used in data processing.

Buffer– refers to a storage facility in a data communications system which can compensate for a difference in time or rate of data transmission.

Byte– is a group of 8 bits handled as a unit.

Character (Bar code)– is group of bars and spaces which represents a single number, letter, mark or other graphic element.

Check Character or Digit– is a special character which is part of the bar code and can be generated by an algorithm, and used to insure data integrity. When transmitted, the same algorithm can be used by the host on the data characters and this independent calculation can be compared to the transmitted check character. This procedure can also be accomplished wholly within the decoder. Often the check character is not transmitted because it is not a data character.

Codabar Start and Stop Enabled– is a decoder option. When enabled, the capital letters representing the start and stop characters will be included in the data message.

Code ID– is a letter that designates the symbology which has been decoded. The Code ID can be included in the data preamble or postamble to identify the scanned symbology to the host device. Welch Allyn has a standard set of lower case Code ID's. These are given in Table 4.2. See also Port ID.

Code 39 Check Character Included– is a decoder option. When enabled with Code 39 check character required, the check character will be confirmed and included in the data message.

Code 39 Check Character Required– is a decoder option. When enabled, Code 39's checksum will be calculated and confirmed for a valid read.

(Host) Computer– is the data system's controlling processor which interfaces with the decoder (either directly or through a multiplexer) and other system elements to receive their data outputs and command their functions.

Decoder– (bar code) is a microprocessor based electronic device which translates the electrical signals from a bar code scanner into recognizable or computer compatible data.

Decoding Enabled– is a decoder option that allows the decoding of an individual bar code symbology to be enabled or disabled.

Density (Bar code)– refers to the number of characters in a linear inch of bar code.

Depth of Field– refers to the range of distances over which a scanner can accurately digitize barcode. This distance is measured from the front of the scanner at the exit window and is dependent on code size, contrast, and quality. Depth of field is equal to the far distance minus the near distance (Δ distance).

Digital– (used in contrast to Analog) describes a coded squarewave signal (processed from an analog signal) which is utilized by decoding circuitry. Digital bar code is generally square wave pulses (0 to 5 volts) with widths which depict the bar and space widths in the code.

DIP– is an acronym for “dual in–line pins,” a type of integrated circuit package. DIP components are used with through–hole or viahole circuit board technology.

Exit Window– is the optical opening through which the laser beam, or other method of illumination, leaves the scanner.

Far Distance– is the farthest distance that a scanner can accurately digitize a given bar code.

Field Width– is the window width. Refers to the greatest width of bar code label that can be successfully interpreted.

Firmware– is a term for software which is permanently designed into a data system device (such as a bar code decoding algorithm) to provide special programs and service routines.

Focal Distance– is the distance of highest resolution in front of the scanner window.

Host Computer– refers to the data system’s controlling processor which interfaces with the decoder and other system elements to receive their data outputs and command their functions.

Interleaved 2 of 5 Check Digit Included– is a decoder option. When enabled with Interleaved 2 of 5 check digit required, the check digit will be confirmed and included in the data message.

Interleaved 2 of 5 Check Digit Required– is a decoder option. When enabled, Interleaved 2 of 5’s checksum will be calculated and confirmed for a valid read.

Laser Enable– is a scanner input signal that controls the flow of power to the scanner. Usually this signal will control all the scanning functions in the scanner.

LED– is an acronym for “light emitting diode.”

Marker Beam– refers to a visual indicator that an infrared laser beam is present. The marker beam is an aid to pointing a hand–held or set up a machine mount scanner. This beam is not necessary for the optical performance of the laser scanner.

Message Length– refers to the number of characters in the data message decoded from a bar code label.

Minimum and Maximum Message Lengths– refers to how the various symbologies may be restricted in code length to minimize the chances of misreading a bar code. By setting the message length, the decoder will count the data characters plus any others (start/stop, check digit, etc.) and only accept those bar code reads that fall within the set message length parameters. The default values of the minimum and maximum message lengths are indicated in section 4.4 under the specific configuration commands for setting the bar code symbologies.

Near Distance– is the nearest distance that a scanner can accurately digitize a given bar code.

No Read, Non-read, Non-scan– is the absence of data at the scanner output after an attempted scan due to no code, defective code, scanner failure or operator error.

Non-volatile– refers to the characteristic of a device which allows it to retain data in memory when power is lost or turned off.

Optical Axis– is a line extending from the center of the exit window to the midpoint of the usable scan length.

Parity– is a means of checking character bit patterns for validity by confirming if they contain an Even or Odd number of “1”s.

PLCC– is an acronym for “plastic leaded chip carrier,” a type of integrated circuit package. PLCC components are used in surface mount circuit board technology.

Port– refers to the electrical connector on a decoder, computer or other system component through which data is transmitted or received.

Port ID– is a number that designates the scanner port from which a bar code signal has been decoded. The Port ID can be included in the data preamble or postamble to identify the scanner input port to the host device. The Port ID numbers are given in Table 4.1. See also Code ID.

Protocol– refers to a set of procedures for establishing and controlling data transmissions.

Quiet Area– is an area of clear space, containing no dark marks, which precedes the start character of a symbol and follows the stop character. Also known as Quiet Zone.

RS-232-C– is a set of rules which govern the transfer of data between Data Terminal Equipment (DTE) and Data Communications Equipment (DCE), effected through 25 pin plug-in connectors. This standard applies to both synchronous and asynchronous transmissions at speeds up to 20K bps (bits/sec) in full or half-duplex modes.

Scan Enable– is a scanner input signal that controls the flow of power to the scanner. Usually this signal will control all the scanning functions in the scanner.

Scan Rate– is the number of times a laser’s scanning beam passes through the exit window in one second.

Scan Velocity– is the speed of a laser’s scanning beam on a target at a given distance from the front of the scanner or rotating polygon mirror. Usually expressed in inches/sec.

Scan Width– is the length of the widest bar code label that can be successfully interpreted by the scanner.

Scanner– is an opto–electronic device which produces electrical signals representing the light it detects as it “sees” a bar code.

SMT– is an acronym for “surface mount technology.”

Specular Reflection Zone – The zone where light from the scanner’s illumination source is reflected directly back into the scanner. Specular reflection interferes with the scanner’s operation. This zone should be avoided.

Start/Stop Characters– are characters used at the beginning and end of a bar code label that indicate the start and stop (end) of the label.

Trigger– is a signal input to the decoder that the scanning process should be initiated. The actual trigger mechanisms can be a push button switch, photoelectric control, internal object sense, proximity sensor, or multiple combinations of all of these.

Usable Scan Length– refers to that portion of the scan path for which the scanner can accurately digitize bar code and maintain all its specifications. This length is specified on a flat surface which is perpendicular to the optical axis of the scanner.

Volatile– refers to the characteristic of a device which loses data in memory when power is lost or turned off.

Voltage Range– refers to the specified range of voltages over which a decoder or a scanner can maintain all of its electrical, optical (for scanners), and environmental specifications.

Voting– is a feature of the SCANTEAM 3700 set by using the Set Votes Configuration Command, **Km**. If the Voting selection is set to more than 1, the SCANTEAM 3700 decodes and compares consecutive outputs from the scanner(s); successive reads of the same data are required for a valid read. Voting results is a slightly slower read rate, but will reduce the probability of reading errors when a laser scanner, especially, is being used. If the Voting selection is set to 1, only one laser scan resulting in a successful decode is required for a valid read.

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4619 Jordan Road
P.O. Box 187
Skaneateles Falls, New York 13153-0187