

CCD Programming Guide

for Wasp Bar Code CCD Scanner



Please Read

Note:

The Wasp CCD Scanner is ready to scan the most popular bar codes out of the box. ***This manual should only be used to make changes in the configuration of the scanner for specific applications.*** This scanner does not require software or drivers to operate. The scanner enters data as keyboard data. Please review this manual before scanning any of the programming bar codes in this manual.



Each Tip

If you are unsure of the scanner configuration or have scanned the incorrect codes, please scan the default bar code on page 6. This will reset the scanner to its factory settings.

© Copyright Wasp Technologies
All rights reserved.
Version 2.0

No part of this publication may be reproduced or transmitted in any form or by any means without the written permission of Wasp Technologies. The information contained in this document is subject to change without notice.

Wasp is a trademark of Wasp Technologies. All other trademarks or registered trademarks are the property of their respective owners.

Table of Contents

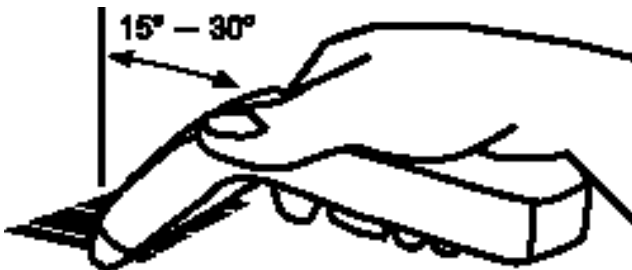
Chapter 1.	Introduction.....	1
Chapter 2.	Installation.....	2
Chapter 3.	Quick Start	3
Chapter 4.	Bar Code Symbologies.....	4
Chapter 5.	CCD Setup & Configuration	5-19
	1. Set Default	6
	2. Preamble/Postamble	7
	3. CCD Audio Configuration.....	8
	4. Keyboard Setting	9
	5. CCD Scanning Control	10
	6. Enable Bar Code Symbologies.....	11-12
	7. Code 39.....	13
	10. Interleaved 2 of 5.....	14
	11. Codabar.....	15
	12. UPC-A	16
	13. UPC-E	17
	14. EAN/JAN-13.....	18
	15. EAN/JAN-8.....	19
Appendix A.	Bar Code Test Symbols.....	20-22
Appendix B.	Preamble/Postamble Addition Table	23-25
Appendix B.	Preamble/Postamble Special Characters.....	26
Appendix C.	Additional Scanner Functions.....	27
Product Support	.....	28
Warranty	.....	28

Introduction

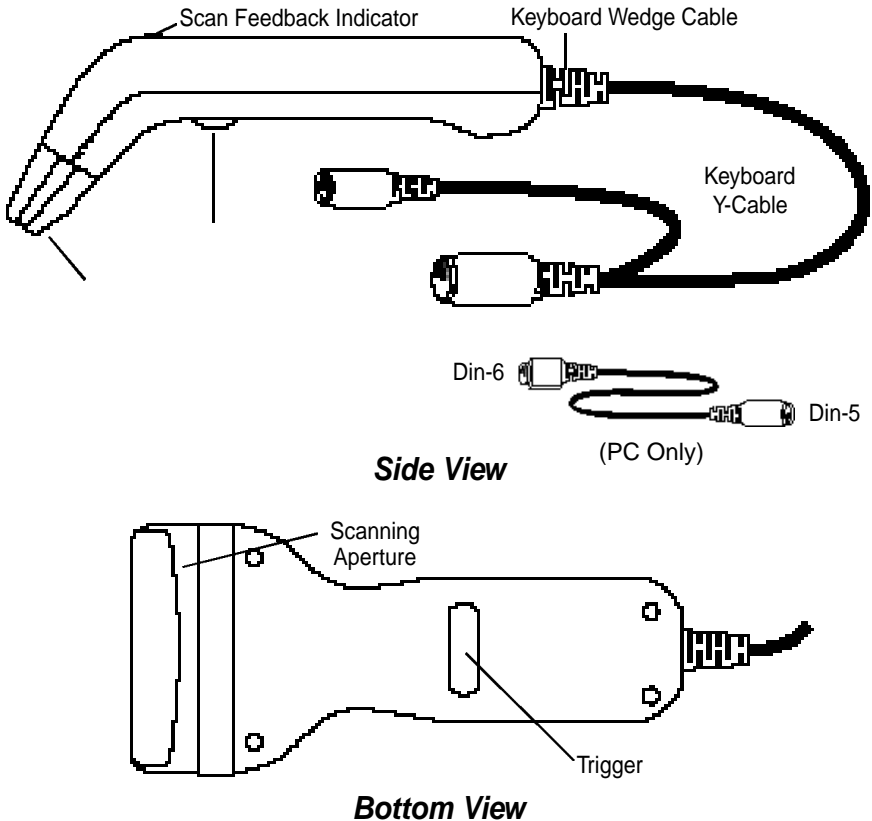
Bar coding is the most common Automated Data Collection (ADC) technology providing timely, error-free information that can be used to increase productivity, accuracy, and efficiency in the workplace. Virtually every type of industry is using bar codes to replace keyboard data entry. Studies have shown that a proficient data entry operator will make one error for every 300 characters that are manually entered. The error rate using bar codes is almost negligible and can be error-free using bar code symbologies with the check digit enabled.

The Wasp Charged Coupled Device (CCD) technology is a technique whereby a bar code is photographed, digitized, and electronically sampled by built-in photodetectors. The detectors process the measurement of every bar and space using the number of adjacent photodetectors which contrast a black mark and a white space. The Wasp CCD is extremely rugged since it has no moving parts. The Wasp CCD reader supports PC AT/XT and PS/2 keyboard interfaces and easily wedges between the computer and keyboard. Bar code data is passed directly into the keyboard buffer as if it had been typed in by hand by a data entry operator.

Of all the hand held, bar code scanning devices on the market, the CCD reader is the easiest to use and most cost effective for the typical business user. The Wasp CCD scanner is a one touch scanner allowing the user to come in direct contact with the bar code. It also supports a depth of reading of up to 1.4 inches to successfully decode a bar code symbology. Bar codes up to 2.75 inches in length can be scanned. To activate the scanner, the user simply covers the bar code with head of the scanner and pulls the trigger. The Wasp CCD supports a scan rate of 50 scans per second.



Installation

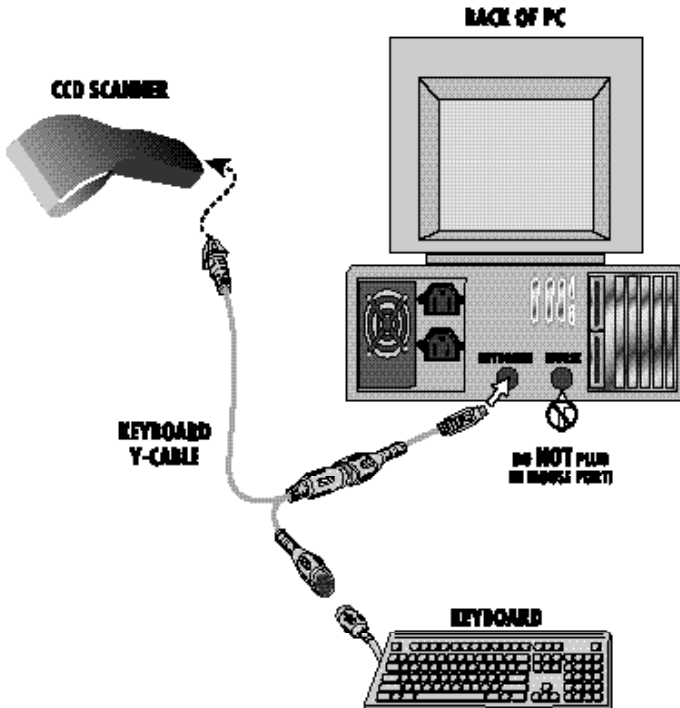


1. Turn off your computer.
 2. Plug the keyboard wedge cable into the handle of the CCD reader.
 3. Unplug your PC keyboard cable and plug the male end (Din 5) of the Wasp CCD scanner directly into your PC keyboard port. Plug your keyboard cable into the other end (female Din 5) of the the Wasp CCD scanner. If your keyboard and PC support a Din 6 connection, use the enclosed Din 5 to Din 6 converter cables.
 4. Turn your computer on.
- Note:** Make sure scanner is not plugged into the mouse port. Scanner will not function properly if plugged into the mouse port.

Quick Start

Your Wasp CCD Scanner is ready to go. The default settings of the Wasp CCD Scanner *have been pre-programmed for the most common bar code configurations*. Use the "CCD Setup & Configuration" sections only to customize the Wasp CCD settings. Please review the 'Enable Bar Code Symbologies' configuration on pages 11 and 12 to see the list of bar code symbologies which are enabled by default.

Tip: Use the pre-printed "Bar Code Test Symbols" in Appendix A on page 20 as a test chart to begin practicing scanning.



Bar Code Symbologies

Bar codes are symbols consisting of a series of bars and spaces which can be applied to packages, cartons, bottles, and other commercial products. The bars and spaces in each symbol are grouped in such a way to represent a specific ASCII character or function. The interpretation of these groups is based on a particular set of rules called symbologies. Various symbologies have been developed for particular applications. Some examples are shipping and receiving, manufacturing, retail, healthcare, transportation, document processing, tracking, and libraries.

The resolution of a bar code is dependent on the narrowest element of a bar code (X dimension), and can vary from high density (nominally less than 0.009 in./0.23 mm), medium density (between 0.009 in./0.23 mm and 0.020 in./0.50 mm), and low density (greater than 0.020 in./0.50 mm). Medium and low densities are the most common since these are the easiest to read (scan) with nearly all scanning devices. The Wasp CCD scanner can read bar codes with X-dimensions as low as 5 mils (0.005 in./0.127 mm).

The Wasp CCD scanner can read the most popular bar code symbologies including Code 39, Code 128, Interleaved 2 of 5, UPC-A, UPC-E, EAN/JAN-8, EAN/JAN-13, Codabar, MSI Plessey, and Code 93.

Please see test chart on page 20.

CCD Setup & Configuration

In order to configure the Wasp CCD scanner, you must familiarize yourself with the setup procedures on the following pages. The default settings of the Wasp CCD scanner are identified on each page and clearly marked with an asterisk (*). **The default settings have been preprogrammed for the most common bar code configurations. Use the CCD Setup & Configuration only to customize the Wasp CCD settings.** If you need to configure the Wasp CCD reader, the default settings will be overwritten. All the programmed settings are stored permanently in non-volatile memory. Therefore, your configuration will be maintained even if keyboard power to the Wasp CCD scanner is removed by turning off your PC.

In order to configure the Wasp CCD, three basic steps need to be followed for each programmed setting:

- (1) Scan the 'Begin' bar code with the Wasp CCD reader to select your configuration
- (2) Scan the appropriate setting(s) to customize the CCD configuration
- (3) Scan the corresponding 'End' bar code with the Wasp CCD reader

Note: If you are unsure whether or not you have programmed the scanner properly, return to page 6 and return the scanner back to the default settings. Then begin the configuration process again.

CCD Setup & Configuration

—Set Default Configuration

The 'Set Default' configuration restores the factory default settings.

Tip: Use this option to restore the factory default settings if you are unsure of your CCD's configuration. The 'Set Default' configuration is very useful when you need to reprogram your Wasp CCD reader after the defaults have been changed. By setting the default configuration, the user knows precisely the configuration for each programmed setting.



Begin



Default



End

CCD Setup & Configuration

—Preamble/Postamble Configuration

The 'Preamble/Postamble' configuration is used to add a prefix or suffix set of characters to the bar code value. Up to 4 characters may be added for each option separately. Preamble and postamble characters can function concurrently, but need to be configured separately.

To add preamble or postamble characters, follow the steps below:

- (1) Scan the 'Begin' bar code on this page
- (2) Scan the 'Preamble' or 'Postamble' option
- (3) Use Appendix B on page 23 to locate the characters you want to add as preamble or postamble characters. Find the two character 'Code' associated with the character you want to add. Scan the two characters on page 25. Make sure that you scan the two bar codes associated with each letter before preceding to the next character. This step can be repeated up to six more times - seven total. For example, to add the letter "A," scan the "4," and then the "1" on page 25. The letter "A" will always appear in your data as a prefix or suffix to the bar code value.
- (4) Scan the 'Set' option at the bottom of this page.
- (5) Scan the 'End' bar code on this page.



Begin

Preamble



Note: Please use Appendix B regarding the prefix string. You may add up to 4 characters as a Preamble.

Postamble



Note: Please refer to Appendix B regarding the suffix string. You may add up to 4 characters as a Postamble.



Set



End

CCD Setup & Configuration

—CCD Audio Configuration:



Begin

Scanner Volume



Low



High*

Beep On/Off



On*



Off



End

CCD Setup & Configuration

—Keyboard Setting Configuration

The 'Case Sensitivity' setting provides specific options on how to pass your data to the keyboard buffer. 'Case Sensitive' is the default and does not toggle upper to lower case letters. 'Ignore Case' transmits only lower case letters. Either 'Case Sensitive' or 'Ignore Case' can be enabled, but not both simultaneously.



Begin



Case Sensitive*

Case Sensitivity



Ignore Case



End

*Default

CCD Setup & Configuration

—CCD Scanning Control Configuration

The 'CCD Scanning Control' configuration allows the user to customize how the trigger is to operate, the length of time in which the LEDs (i.e. the CCD photodetectors) are on, and activates auto scanning. The Wasp CCD has two (2) options to control this configuration. Only one option can be enabled at a time.

Note: When the LEDs are visible, the CCD scanner can read the bar code symbologies that are enabled. See 'Enable Bar Code Symbologies' for further information.



Begin

On/Off Trigger with 7 Second Delay

When this option is selected, the LEDs become visible when the trigger is pressed, and will remain on for 7 seconds. The LEDs will turn off automatically after 7 seconds whether a bar code is successfully scanned or not or if the trigger is pressed again.



On/Off Trigger—
7 Second Delay*

Continuous Scan

When this option is enabled, the LEDs are always visible and the CCD reader will operate continuously without the need of using the trigger. This mode will read identical bar code values back-to-back.



Continuous Scan



End

CCD Setup & Configuration

—Enable Bar Code Symbolgies Configuration

The 'Enable Bar Code Symbolgies' configuration is used to enable or disable the various codes that the reader is able to scan. Multiple bar code symbolgies can be enabled simultaneously.



Begin

ON

OFF

Code 39



*



Interleaved 2 of 5



*



Codabar



*



UPC-A



*



UPC-A 2 digit add-on



*



UPC-A 5 digit add-on



*



UPC-E



*



UPC-E 2 digit add-on



*



UPC-E 5 digit add-on



*



Code 93



*



End

CCD Setup & Configuration

—Enable Bar Code Symbolgies Configuration

The 'Enable Bar Code Symbolgies' configuration is used to enable or disable the various codes that the reader is able to scan. Multiple bar code symbolgies can be enabled simultaneously.



Begin

ON

OFF

Code 128



*



MSI



*

EAN/8



*



EAN/8 2 digit add-on



*

EAN/8 5 digit add-on



*

EAN/13



*



EAN/13 2 digit add-on



*

EAN/13 5 digit add-on



*



End

CCD Setup & Configuration

—Code 39 Configuration

Code 39 is the most frequently used symbology in industrial bar code systems today and is extensively used within the Department of Defense (DOD). The principal feature is to encode messages using the full alphanumeric character set. The Code 39 bar code uses four special characters "\$", "/", "+", "." which can be paired with alphanumeric characters to extend to the full ASCII character set. Standard Code 39 contains only 43 characters (0-9, A-Z, \$, /, %, +, -, ., SPACE) and can be extended to a 128 character symbology (full ASCII) by combining one of the special characters (\$, /, %, +) with a letter (A-Z) to form the characters that are not present in the standard Code 39 symbology.



Begin

Type	Standard Type		*
	Full ASCII		

Transmit Start/Stop Character	No		*
	Yes		

Verify Checksum	No		*
	Yes		

Transmit Check Character	No		
	Yes		*



End

CCD Setup & Configuration

—Interleaved 2 of 5 Configuration

Interleaved 2 of 5 is a variable length, numeric bar code with an even number of digits. It is typically used in industrial and master carton labeling and also in the automotive industry. The symbology uses bars to represent the first character and the interleaved (white) spaces to represent the second character.



Begin

No



Transmit Check Digit

Yes



*

No



*

Verify Check Digit

Yes



End

CCD Setup & Configuration

—Codabar Configuration

Codabar is a variable length symbology capable of encoding up to 16 characters. Codabar can encode six special alphanumeric characters, capital letters A through D, T, N, *, E, and all numeric digits. Codabar is one of the oldest bar code symbologies and is still used in some library applications. Codabar symbology is not recommended for any new applications.



Begin

Transmit Start/End

No



*

Yes



Start/End Transmit Type

ABCD/ABCD



ABCD/TN*E



abcd/abcd



*

abcd/tn*e



End

CCD Setup & Configuration

—UPC-A Configuration

UPC-A (Universal Product Code-A) is a fixed length symbology and is the most common bar code used for retail product labeling. It is seen in most grocery stores across the United States. The symbology encodes a 12-digit, numeric-only number. The first six digits are assigned by the Uniform Code Council (UCC) in Dayton, Ohio. The next five digits are assigned by the manufacturer, and the final digit is a modulo 10 check digit. The nominal height for the UPC-A bar code is one inch.



Begin

Convert to EAN/13

Off



On



*

Transmit System Number

No



Yes



*

Transmit Check Digit

No



Yes



*



End

CCD Setup & Configuration


—UPC-E Configuration

UPC-E (Universal Product Code-E) is also a fixed length symbology and is a compressed six digit code used for marking small packages including magazines and paperback books. UPC-E symbols are UPC-A symbols that have been zero suppressed (i.e. consecutive zeros are not included in the symbol). The printed value of the UPC-E code is a twelve digit code. The nominal height for the UPC-E bar code is one inch.



Begin

System Number Selection	0 and 1		
	0 only		*
Convert to UPC-A	No		*
	Yes		
Transmit System Number	No		*
	Yes		
Transmit Check Digit	No		
	Yes		*


 End

*Default

CCD Setup & Configuration

—EAN/JAN-13 Configuration

EAN/JAN-13 (European Article Number/Japanese Article Number) is a fixed length symbology and is similar to the UPC-A symbology, but encodes a 13th digit. The nominal height for the EAN/JAN-13 bar code is one inch.



Begin

Convert to ISBN

No



*

Yes



Convert to ISSN

No



*

Yes



Transmit Check Digit

No



Yes



*



End

CCD Setup & Configuration

—EAN/JAN-8 Configuration

The EAN/JAN-8 is a fixed length symbology and is similar to the UPC-E code, but includes two more digits for the country code. The nominal height for the EAN/JAN-8 bar code is one inch.



Begin

Convert to EAN/13

No



*

Yes



Transmit Check Digit

No



Yes



*



End

CCD Setup & Configuration

—Bar Code Test Symbols—Appendix A

Note: Make sure that the appropriate bar code symbology is configured properly and enabled before trying to scan. Use the 'Enable Bar Code Symbologies' configuration on page 11-12 to enable specific symbologies.

Code 39
(Default: Enabled)



Interleaved 2 of 5
(Default: Enabled)



Codabar
(Default: Enabled)



Code 128
(Default: Enabled)



MSI/Plessey
(Default: Disabled)



CCD Setup & Configuration

—Bar Code Test Symbols—Appendix A (cont.)

UPC-A
(Default: Enabled)



UPC-A
5 digit supplement
(Default: Disabled)



UPC-A
2 digit supplement
(Default: Disabled)



UPC-E
(Default: Enabled)



UPC-E
5 digit supplement
(Default: Disabled)



UPC-E
2 digit supplement
(Default: Disabled)



CCD Setup & Configuration

—Bar Code Test Symbols—Appendix A (cont.)

EAN/JAN 13
(Default: Enabled)



EAN/JAN 13
5 digit supplement
(Default: Disabled)



EAN/JAN 13
2 digit supplement
(Default: Disabled)



EAN/JAN 8
(Default: Enabled)



EAN/JAN 8
5 digit supplement
(Default: Disabled)



EAN/JAN 8
2 digit supplement
(Default: Disabled)



CCD Setup & Configuration

—Preamble/Postamble Addition Table—Appendix B

Use this table to add preamble and postamble characters to your bar code value. Make sure that you scan the two bar codes associated with each ASCII character on page 25 before preceding to the next character. Up to seven ASCII characters can be added. Scan the 'Set' option when you are finished.

For example, to add a Right Brace and a Tab as a preamble:

- Scan 'Begin' and 'Preamble' on page 7
- Scan '7' and 'D' on page 25 for the right brace
- Scan '8' and '9' on page 25 for the Tab
- Scan 'Set' on page 7 to terminate the addition of preamble characters
- Scan 'End' on page 7 to complete the preamble addition

Preamble/Postamble Addition Table							
Code	ASCII	Code	ASCII	Code	ASCII	Code	ASCII
01	INS	16	F8	2E	.	43	C
02	DEL	17	F9	2F	/	44	D
03	Home	18	F10	30	0	45	E
04	End	19	F11	31	1	46	F
05	Up	1A	F12	32	2	47	G
06	Down	1B	ESC	33	3	48	H
07	Left	1C	Exec	34	4	49	I
08	BS	20	Space	35	5	4A	J
09	HT	21	!	36	6	4B	K
0A	LF	22	"	37	7	4C	L
0B	Right	23	#	38	8	4D	M
0C	PgUp	24	\$	39	9	4E	N
0D	Enter	25	%	3A	:	4F	O
0E	PgDn	26	&	3B	;	50	P
0F	F1	27	'	3C	<	51	Q
10	F2	28	(	3D	=	52	R
11	F3	29	)	3E	>	53	S
12	F4	2A	*	3F	?	54	T
13	F5	2B	+	40	@	55	U
14	F6	2C	,	41	A	56	V
15	F7	2D	-	42	B	57	W

CCD Setup & Configuration

—Preamble/Postamble Addition—Appendix B (cont.)

Preamble/Postamble Addition Table (cont.)					
Code	ASCII	Code	ASCII	Code	ASCII
58	X	6B	k	7E	~
59	Y	6C	l	7F	Null
5A	Z	6D	m	8F	Enter*
5B	[	6E	n		
5C	\	6F	o		
5D	]	70	p		
5E	^	71	q		
5F	~	72	r		
60	`	73	s		
61	a	74	t		
62	b	75	u		
63	c	76	v		
64	d	77	w		
65	e	78	x		
66	f	79	y		
67	g	7A	z		
68	h	7B	{		
69	i	7C	|		
6A	j	7D	}		

*Enter Key of the numeric keypad

CCD Setup & Configuration

—Preamble/Postamble Addition—Appendix B (cont.)



0



1



2



3



4



5



6



7



8



9



A



B



C



D



E



F

CCD Setup & Configuration

—Preamble/Postamble Addition—Special Characters

Use these barcodes to add special preamble and postamble characters to your bar code value.

For example, to add a Control, Function 1 as a postamble:

- Scan 'Begin' and 'Postamble' on page 7
 - Scan 'Add Right Control' on page 26
 - Scan '0' and 'F' on page 25 for the Function 1
 - Scan 'Set' on page 7 to terminate the addition of postamble characters
 - Scan 'End' on page 7 to complete the postamble addition
-



Add Shift



Add Right Control



Add Left Control



Add Right ALT



Add Left ALT

CCD Setup & Configuration ***—Additional Scanner Functions—Appendix C***

Your Wasp Bar Code CCD Scanner can perform additional functions, such as:

1. Negative image bar code scanning
2. Code identification
3. Advanced data editing

Call our support department for more details and programming materials if you need to use these functions. Contact us at 214-547-4100.

Product Support

If you experience any problems with Wasp CCD that you are unable to resolve, call for technical assistance at (214) 547-4100, Monday through Friday, 8:00 AM - 5:00 PM U.S. Central Standard Time. Also, please consult our FAQ (Frequently Asked Questions) section on our web site at

www.waspbarcode.com

You may also contact us in writing at:

Wasp Technologies
1400 10th Street
Plano, TX 75074
(214) 547-4100
(214) 547-4101 Fax

Warranty Information

Wasp Technologies products are warranted against defects in workmanship and materials for a period of one year from the date of shipment, provided that the product remains unmodified and is operated under normal and proper conditions.

This warranty is limited to repair or replacement at Wasp Technologies option, with reasonable promptness after being notified. These provisions do not extend the original warranty term for any product which has been repaired or replaced by Wasp Technologies.

This warranty applies to the original owner and does NOT extend to any product which has been subject to misuse, neglect, accidental damage, unauthorized repair, or tampering.

No other express warranty is given. The replacement or repair of a product is your exclusive remedy. Any other implied warranty of merchantability or fitness is limited to the duration of this written warranty. Some states, provinces, and countries do not allow limitations on the duration of an implied warranty, so the above limitation may not apply to you.

In no event shall Wasp Technologies be liable for consequential damages. Some states, provinces, and countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you.