

CCD Programming Guide



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.



Tech 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.

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Rev H.

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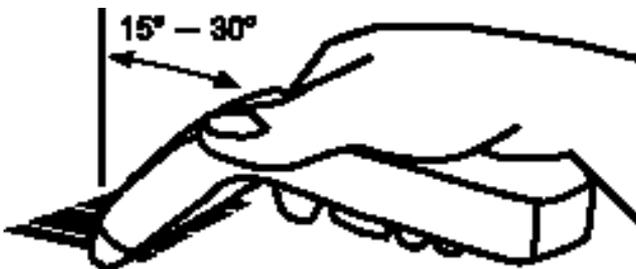
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Introduction

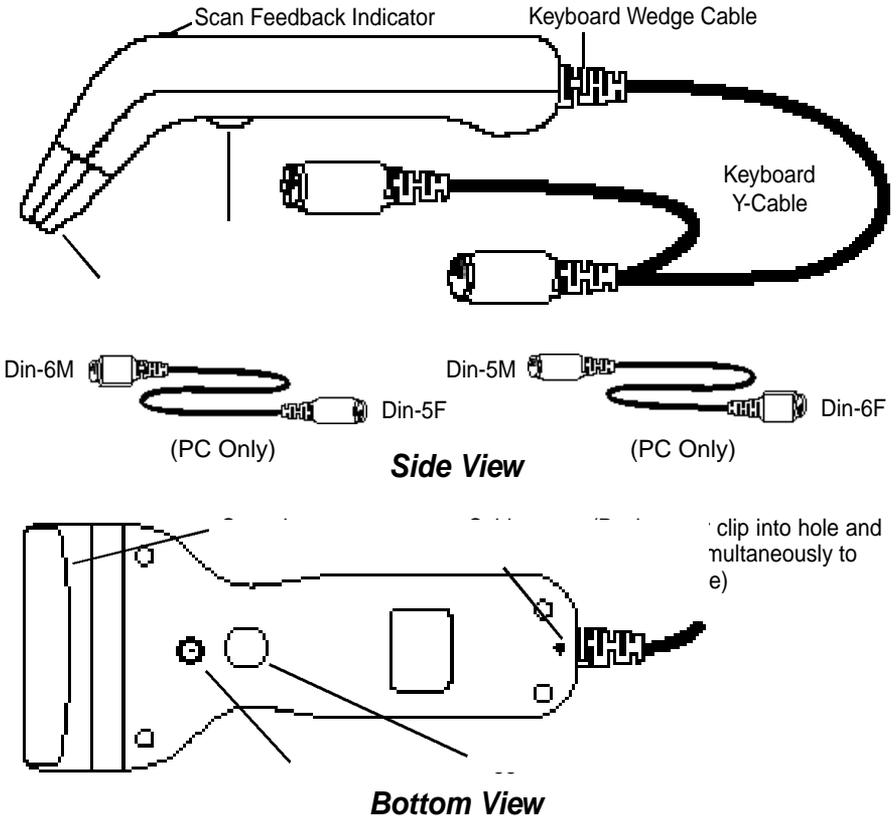
Bar coding is the most common Automated Data Collection (ADC) technology providing timely, error-free information that can be used to increase productivity, accuracy, and efficiency in the workplace. Virtually every type of industry is using bar codes to replace keyboard data entry. Studies have shown 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 3.15 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

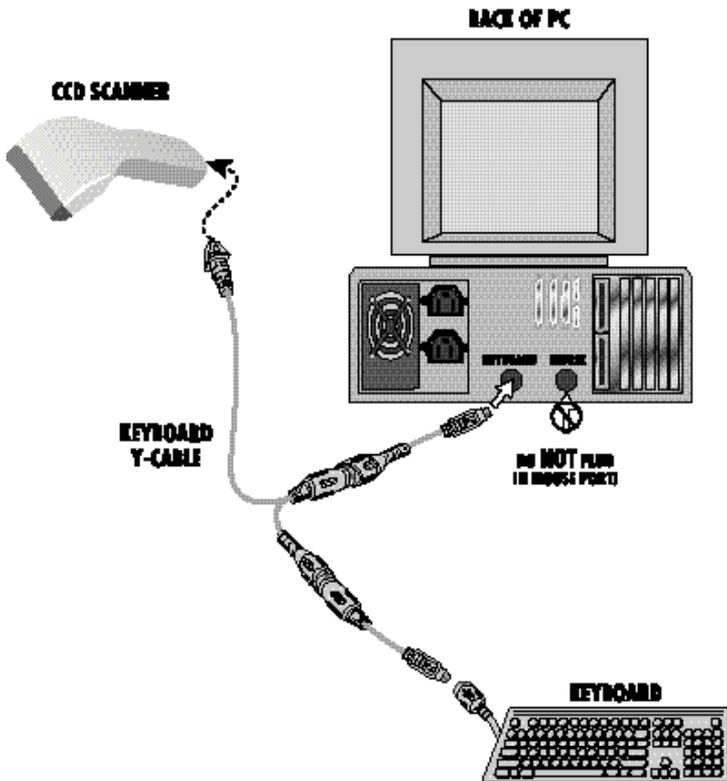


1. Turn off your computer.
2. Plug the keyboard wedge cable into the handle of the CCD reader.
3. Unplug your PC keyboard cable and plug the male end (Din 5) of the Wasp CCD scanner directly into your PC keyboard port. Plug your keyboard cable into the other end (female Din 5) of the the Wasp CCD scanner. 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 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 Symbolologies' configuration on page 16 to see the list of bar code symbolologies which are enabled by default.

Tip: Use the pre-printed "Bar Code Test Symbols" in Appendix A on page 31 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 31.

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

Three or more audible beeps will be heard after each step is completed.

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

CCD Setup & Configuration

—Terminator Configuration

The 'Terminator' configuration is used to specify the end-of-text message. The terminator character is the last character sent to the keyboard buffer and comes after the Postamble characters if they are configured. It is primarily used to denote the end of the bar code value.

Tip: If you need another character that is not listed as one of the terminator characters, you can use the 'Postamble' Configuration to add a suffix character or string.



Begin

None



Carriage Return



*

Space



Escape



End

*Default

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 7 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 C on page 36 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 35. Make sure that you scan the two bar codes associated with each letter before proceeding 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 35. The letter "A" will always appear in your data as a prefix or suffix to the bar code value.
- (4) Scan the 'Set' option on page 35.
- (5) Scan the 'End' bar code on this page.



Begin

Preamble



Note: Please use Appendix C regarding the prefix string. You may add up to 7 characters as a Preamble.

Postamble



Note: Please refer to Appendix C regarding the suffix string. You may add up to 7 characters as a Postamble.



End

CCD Setup & Configuration

—CCD Hardware Configuration:

The 'CCD Hardware' configuration supports the general control options for the CCD reader. These options include the buzzer volume, buzzer duration, and intercharacter delay. The intercharacter delay should be changed only if the transfer rate cannot be maintained between the CCD reader and the keyboard buffer of the computer.

Note: The default for the intercharacter delay is set to 'Medium' and is the most common configuration; however, your PC may be different. When you scan a bar code, if some characters are missing, use the 'Fast' option to speed up the transfer rate. If some stray or scrambled characters appear at your cursor, use the 'Slow' option to slow down the transfer rate.



Begin



* Highest



High



Medium



Low



Lowest

Buzzer Volume



End

cont. on next page

CCD Setup & Configuration

—CCD Hardware Configuration (cont.):



Begin



0.3 Seconds

Buzzer Duration



* 0.1 Seconds



1 Second



* Medium



Fastest

Intercharacter Delay



Fast



Slowest



Slow



End

CCD Setup & Configuration

—Keyboard Type Configuration

The 'Keyboard Type' configuration is used to program the reader for the type of computer it is attached to. This configuration is only used when the 'Interface Options' configuration is set to 'Keyboard'.



Begin



*PC AT, PS/2 50 60 70 80



PC XT

Keyboard Type



PS/2 25 30



Macintosh



End

*Default

CCD Setup & Configuration

—Keyboard Setting Configuration

The 'Keyboard Setting' configuration provides specific options on how to pass your data to the keyboard buffer. 'Lower Case' is the default and toggles upper to lower case letters. For example, "A" is modified to "a". 'Upper Case' toggles lower to upper case letters. Either 'Lower Case' or 'Upper Case' can be enabled, but not both simultaneously. When 'Alphanumeric' is enabled all characters are passed unmodified. When 'Number Lock' is enabled, numbers that are in your bar coded values will be passed to the keyboard buffer if the "Num Lock" key is enabled on your keyboard. If the "Num Lock" key is disabled, numbers that are in your bar coded values will not be passed to the keyboard buffer of your computer.



Begin

***Upper/Lower Case
Alphanumeric***



*Lower Case



Upper Case

Alphanumeric/Number Lock



*Alphanumeric



Number Lock



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 seven (7) 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

Trigger Pressed

When this option is selected, the LEDs become visible when the trigger is pressed, and the LEDs will immediately go off when the trigger is released.



Trigger pressed

**** Trigger with 3 Sec. Delay***

This is the default option for the Wasp CCD scanner. When this option is selected, the LEDs become visible when the trigger is pressed, and will remain on for three (3) seconds or until a bar code is scanned.



* Trigger with Delay

Tip: The delay option is a useful feature if you are scanning multiple bar codes back-to-back. 'Trigger with 3 Sec.Delay' is the default because it is the optimal configuration when you are setting up the Wasp CCD reader. Three bar codes are generally scanned for each step: 'Begin', an option, and 'End'. When this option is enabled, the trigger is typically only pressed one time to scan all three steps.



End

cont. on next page

CCD Setup & Configuration

—CCD Scanning Control Configuration (cont.)



Begin

On/Off Trigger with 3 Second Delay

When this option is selected, the LEDs become visible when the trigger is pressed, and will remain on for 3 seconds. The LEDs will turn off automatically after 3 seconds whether a bar code is successfully scanned or not or if the trigger is pressed again.



On/Off Trigger—
3 Second Delay

On/Off Trigger with 30 Second Delay

When this option is selected, the LEDs become visible when the trigger is pressed, and will remain on for 30 seconds. The LEDs will turn off automatically after 30 seconds whether a bar code is successfully scanned or not or if the trigger is pressed again.



On/Off Trigger—
30 Second Delay

On/Off Trigger with 120 Second Delay

When this option is selected, the LEDs become visible when the trigger is pressed, and will remain on for 120 seconds. The LEDs will turn off automatically after 120 seconds whether a bar code is successfully scanned or not or if the trigger is pressed again.



On/Off Trigger—
120 Second Delay



End

cont. on next page

CCD Setup & Configuration

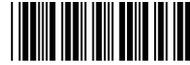
—CCD Scanning Control Configuration (cont.)



Begin

Auto 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. In this mode, the CCD reader will not read identical bar code values back-to-back (i.e. one right after another).



Auto Scan

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 is very similar to the 'Auto Scan' mode with the exception that the CCD reader will read identical bar code values back-to-back.



Continuous Scan



End

*Default

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 decode. Multiple bar code symbolgies can be enabled simultaneously.



Begin

	<i>ON</i>		<i>OFF</i>
Code 39	 *		
Interleaved 2 of 5			 *
Codabar	 *		
UPC-A EAN/JAN-13	 *		
EAN-8	 *		
UPC-E	 *		
EAN/UPC Add-on 2/5			 *
Code 128	 *		
MSI/Plessey			 *
Code 93			 *



End

CCD Setup & Configuration

—Code Identification Configuration

The 'Code Identification' configuration provides the option to precede each bar code symbology read with a character that identifies the type of symbology read. Only one code identifier is allowed for each specific type of bar code. These can be found in Appendix C on page 36. For example, to set the code identifier for Code 39 to be "A":

- (1) Scan the 'Begin' bar code on this page
- (2) Scan the 'Code 39' option
- (3) Turn to page 35 and scan the two bar codes associated with letter "A"
- (4) Scan the 'Set' option in Appendix C.
- (5) Scan the 'End' bar code on this page.

In this example, each and every time a Code 39 bar code symbology is scanned, the letter "A" will precede the bar code value.



Begin

Code 39



Interleaved 2 of 5



Codabar



EAN-13/UPC-A



EAN-8



UPC-E



MSI/Plessey



Code 128



End

CCD Setup & Configuration

—Code 39 Configuration

Code 39 is variable length and 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

On/Off	Off		
	On		*
Type	Standard Type		*
	Full ASCII		
Transmit Start/Stop Character	No		*
	Yes		
Verify Checksum	No		*
	Yes		
Transmit Check Character	No		
	Yes		*



End

CCD Setup & Configuration

—Code 128 Configuration

Code 128 is the most easily read bar code with the highest message integrity due to several separate message check routines. Of all the common linear symbologies, Code 128 is the most flexible. It supports both alpha and numeric characters, has the highest number of characters per inch, and is variable length. Code 128 is usually the best choice when implementing a new symbology. United Parcel Service (UPS) extensively uses this symbology.



Begin

On/Off

Off



On



*



End

*Default

CCD Setup & Configuration

—MSI Plessey Configuration

MSI Plessey is a variable length numeric symbology primarily used in marking retail shelves. Each character consists of four bars with intervening spaces for each encoded digit, one or two symbol check digits, and a reverse start code.



Begin

On/Off

Off



*

On



End

*Default

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.

The 'Interleaved 2 of 5' configuration provides the option to define up to three (3) fixed bar code lengths (i.e. number of characters). For example, to define the length of the bar code symbology, you must refer to Appendix B on page 34 and follow the steps below:

- (1) Scan the 'Begin' bar code on this page
- (2) Scan the 'Define Length' option
- (3) Use the lookup table (Appendix B) to find the value (0 - 255) and to define the bar code length. If, for example, the length is to be "10", the lookup value is "0A". Scan "0" first and then scan "A". This step can be repeated one to three times.
- (4) Scan the 'Set' option in Appendix B.
- (5) Scan 'End'.



Begin

On/Off

Off



*

On



Transmit Check Digit

No



*

Yes



Verify Check Digit

No



*

Yes



Define Length



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

On/Off

Off



On



*

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. The reduced size is 80% of the nominal size.



Begin

On/Off

Off



On



*

Truncate Leading Digit

No



*

Yes



Truncate Leading 0

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. The reduced size is 80% of the nominal size.



Begin

On/Off

Off



On



*

Truncate Leading Digit

No



*

Yes



Transmit Check Digit

No



Yes



*



End

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. The reduced size is 80% of the nominal size.



Begin

On/Off

Off



On



*

Truncate Leading Digit

No



*

Yes



Truncate Leading 0

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. The reduced size is 80% of the nominal size.



Begin

On/Off

Off



On



Truncate Leading Digit

No



Yes



Transmit Check Digit

No



Yes



End

CCD Setup & Configuration

—Language Configuration

The 'Language' configuration is used to setup the appropriate keyboard translation for a particular country. Only one language can be selected at a time.



Begin

US



*

French



German



Spanish



Swiss



UK



End

CCD Setup & Configuration

—Interface Options:

The Wasp CCD 'Interface Options' configuration supports a keyboard wedge and RS232 (serial) interface. Only one interface option can be enabled at a time. **Note:** The RS232 interface is a special option. Please see the 'Product Support' section to contact us for this option.



Begin



*Keyboard



RS-232



End

CCD Setup & Configuration

—Serial (COM) Port Setting Configuration

Note: The RS232 interface is a special option. Please see the 'Product Support' section to contact us for this option.

The WASP CCD supports an RS232 serial configuration for baud rate, data bits, parity, and hand shaking. The 'Serial (COM) Port Setting' configuration must correspond to your manufacturer's requirement for serial communication. Please consult your manufacturer's documentation for your serial (COM) card.



Begin



Reserved



150



300



600



1200



2400



4800



*9600



19200

Baud Rate



End

cont. on next page

CCD Setup & Configuration

—Serial (COM) Port Setting Configuration (cont.)



Begin

Data Bits



7 Bits



* 8 Bits

Parity



* None



Even



Odd

Flow Control



* None



Xon/Xoff



Hardware (RTS/CTS)



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 16 to enable specific symbologies.

Code 39
(Default: Enabled)



Interleaved 2 of 5
(Default: Disabled)



Codabar
(Default: Enabled)



Code 128
(Default: Enabled)



MSI/Plessey
(Default: Disabled)



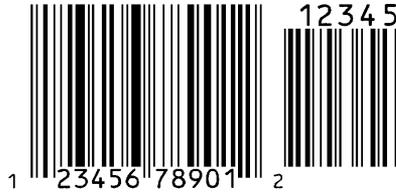
CCD Setup & Configuration

—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

—Lookup Table for Bar Code Lengths—Appendix B

Use this Lookup Table to specify the lengths (i.e. the number of bar code characters) when scanning. **Note:** Please refer to the configuration topic of your specific bar code symbology to see if this option is relevant and how many values can be entered. Use the lookup values on page 35 to enter the values between 0 and 255. The 'Set' bar code option must be scanned after the final value has been read in order to successfully set the bar code length.

		FIRST BAR CODE VALUE															
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
SECOND BAR CODE VALUE	0	0	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240
	1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
	2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
	3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
	4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
	5	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
	6	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
	7	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
	8	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
	9	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
	A	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
	B	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
	C	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
	D	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
	E	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
	F	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255

CCD Setup & Configuration

—Lookup Table—Appendix B (cont.)



CCD Setup & Configuration

—Preamble/Postamble Addition Table—Appendix C

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 35 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 postamble:

- Scan 'Begin' and 'Preamble' on page 8
- Scan '7' and 'D' on page 35 for the right brace
- Scan '8' and '9' on page 35 for the Tab
- Scan 'Set' on page 35 to terminate the addition of preamble characters
- Scan 'End' on page 8 to complete the preamble addition

Preamble/Postamble Addition Table							
Code	ASCII	Code	ASCII	Code	ASCII	Code	ASCII
00	NULL	15	NAK	2A	*	3F	?
01	SOH	16	SYN	2B	+	40	@
02	STX	17	ETB	2C	,	41	A
03	ETX	18	CAN	2D	-	42	B
04	EOT	19	EM	2E	.	43	C
05	ENQ	1A	SUB	2F	/	44	D
06	ACK	1B	ESC	30	0	45	E
07	BEL	1C	FS	31	1	46	F
08	BS	1D	GS	32	2	47	G
09	HT	1E	RS	33	3	48	H
0A	LF	1F	US	34	4	49	I
0B	VT	20	Space	35	5	4A	J
0C	FF	21	!	36	6	4B	K
0D	CR	22	"	37	7	4C	L
0E	SO	23	#	38	8	4D	M
0F	SI	24	\$	39	9	4E	N
10	DLE	25	%	3A	:	4F	O
11	DC1	26	&	3B	;	50	P
12	DC2	27	'	3C	<	51	Q
13	DC3	28	(	3D	=	52	R
14	DC4	29	)	3E	>	53	S

CCD Setup & Configuration

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

Preamble/Postamble Addition Table (cont.)							
Code	ASCII	Code	ASCII	Code	ASCII	Code	ASCII
54	T	67	g	7A	z	8D	Enter (kpd)
55	U	68	h	7B	{	8E	Up Arrow
56	V	69	i	7C	|	8F	Down Arrow
57	W	6A	j	7D	}	90	F1
58	X	6B	k	7E	~	91	F2
59	Y	6C	l	7F		93	F4
5A	Z	6D	m	80		94	F5
5B	[	6E	n	81	Home	95	F6
5C	\	6F	o	82	End	96	F7
5D	]	70	p	83	Page Up	97	F8
5E	^	71	q	84	Page Down	98	F9
5F	_	72	r	85	Insert	99	F10
60	`	73	s	86	Delete	9A	F11
61	a	74	t	87	Num Lock	9B	ESC
62	b	75	u	88	Break	9C	F12
63	c	76	v	89	Tab	9D	Shift
64	d	77	w	8A	Enter	9E	Ctrl
65	e	78	x	8B	Left Arrow	9F	Alt
66	f	79	y	8C	Right Arrow		

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.