Slot Badge USB

Worth Data® USB Slot Badge Bar Code Readers

Bar Codes appear as keyed data on a computer running Windows®, macOS, Mac OS X, & Linux

Owner's Guide

Warning: This equipment generates, uses and can radiate radio frequency energy. If not installed and used in accordance with the instruction manual, it may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated ina commercial environment. operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

PROPOSITION 65 WARNING: This product, its packaging, and/or components may contain chemicals known to the state of California to cause cancer or birth defects or other reproductive harm

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Introduction

Worth Data's USB Slot Badge Bar Code Readers are bar code scanners that attach to the a PC running Windows, macOS, Mac OS X, or Linux. Once installed the scanner provides bar code input data to any host computer program exactly as if the data had been typed at the keyboard, including function and control key support. USB Slot Badge Scanner features include:

- **Scans Standard 1D Bar codes**

  These USB Scanners automatically read and discriminate between Code 39, Full ASCII Code 39, STK Code, ITF Interleaved 2 of 5, Codabar, Code 128, EAN-13, EAN-8, UPC-E, UPC-A (with or without supplements), GS1 DataBar, MSI, LabelCode4, LabelCode5, Code 93, and Plessey.

- **Choice of SLV-WDP, SLI-WDP Slot Badge Scanners**

  The SLV-WDP Integrated USB Slot Badge Reader has a red Visible Light scanning element for standard bar code scanning - if you can see the bar code lines then you need the Visible light version.

  The SLI-WDP Integrated USB Infrared Slot Badge Reader with a Infrared (IR) scanning element for Security Badges. This allows the bar code to be hidden from the human eye but still visible to the bar code scanner. Typically a secondary coating or ink covers the bar code on the badge - this cover is invisible to the IR scanner so all it sees is the hidden bar code underneath.

- **Configuration is easy**

  The Reader is easily configured for your system by scanning a bar coded **Setup Menu Card Deck**. There are no dip switches, or programming that needs to be done from the computer to configure these scanners. All settings are saved in the unit until the operator makes any changes via the Setup Deck.

Chapter 1

Installation

Components of SLx-WDP

In the event the shipping box shows damage on arrival, please note the damage on the carrier's receipt log. Open the box and inspect the contents for damage. If there is visible damage, or if the unit fails to work, contact us with the details of the trouble; we will be happy to send you a replacement.

The contents of your USB Scanner shipment should include some or all of the following:

1. USB Slot Badge Reader, **SLV-WDP** or **SLI-WDP**
2. A cable for attaching the SLx-WDP Reader to your computer.

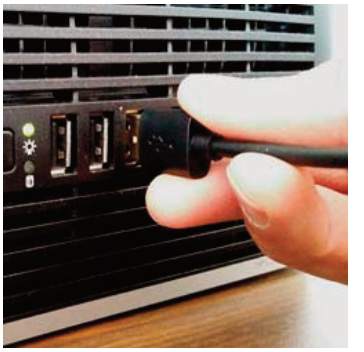
   For the: **SLx-WDP** the **C44-A** USB Cable is hardwired into the unit (it is field replaceable in the future)
3. Slot-Scanner Setup Card Deck
4. A Utilities CD-ROM with Manuals & Setup Menus in PDF Format.

USB Installation for PC or Mac

Model SLV-WDP and SLI-WDP

The SLx-WDP Slot Badge Readers have an integrated USB cord that can be attached directly to the USB port on any PC running Windows, macOS, or Linux. The SLV-WDP and SLI-WDP use the hardwired **C44-A USB Cable**.

When you plug into the USB port on a computer running Windows 10, 8, 7, Vista, XP, 2000, ME, 98SE, macOS, or Mac OS X, the operating system will sense the new device and proceed to install the necessary software for a HID USB Keyboard (Windows systems may ask for the original Windows CD-ROM to install the needed USB drivers - be prepared). There are no additional drivers needed other than what is already standard in Windows or the macOS. To install the Integrated Reader on the USB port:



1. Plug the flat USB connector end of the C44-A cable into a USB port on the host computer or USB hub.

2. The computer will sense the USB device and install the necessary software. The necessary drivers are standard in both Windows and the Mac. In Windows, simply click “Next” or press ENTER at each prompt until the installation is complete.

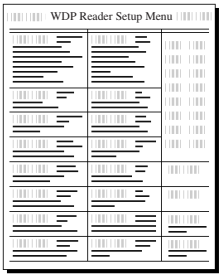
If you have a problem with your USB installation, please see **Appendix I**, ***Resolving USB Installation Issues*** for details.

Model SLx-WDP

Chapter 2

SLx-WDP Reader Setup

Configuring the SLx-WDP Reader



Turn on your computer: You should hear three beeps from the SLx-WDP-- an indication that the reader is functioning correctly.

Find the ***WDP Reader Setup Deck*** - a deck of bar coded cards. This lets you easily configure the SLx-WDP Reader to work with almost any computer system, and tailor its bar code reading and formatting characteristics precisely to your needs. To scan ***WDP Reader Setup Menu*** bar codes and configure your reader and you are new to bar code scanning be sure to read **Chapter 3; *Scanners and Scanning Technique.***

These are the SLx-WDP Reader's default settings. The SLx-WDP Reader is shipped con-figured to these settings, and can be reset to them at any time by reading the **Start Setup, Reset** and **End Setup** bar codes on the ***Card Deck Setup Cards***. If you need to change any settings, or want to learn more about the SLx-WDP Reader options, the next pages explain, step by step, how to set them and what they do.

Parameter	Default Setting	Parameter	Default Setting
Code 39	Code 39 enabled	MSI/Plessey	MSI/Plessey disabled
	Check Digit disabled		Check Digits not transmitted
	Start/Stop characters not transmitted		Label Code 4/5 disabled
	Accumulate Mode enabled		
	Caps Lock OFF		
2 of 5	I 2of 5 disabled	Code 128	Code 128 disabled
	6 digit code length		UCC-128/EAN disabled
	Check digit disabled		Bar Code ID's disabled
UPC/EAN	UPC/EAN enabled	Code 93	Code 93 disabled
	UPC Supplements disabled		Full ASCII extension disabled
	UPC-E compressed, NSC of 0		
	Transmit UPC-A in UPC-A format		
	ISBN conversion disabled		
	UPC-A NSC and EAN-13 first two characters and check digits transmitted		
	UPC-E NSC and EAN-8 first two characters and check digits not transmitted		
General			
Settings	NO preamble or postamble set		
	CR as Terminator Character		
	Medium pitch beep tone		

Using the WDP Reader Setup Deck & Menu

To change setup you use the correct card from the **WDP Reader Setup Deck** included with your scanner. You can also use the WDP Setup Deck Codes provided in Appendix J of this manual, but you will need to cut out the sections to scan through the slot scanner - the page is formated to print on Avery® Business Card Stock. You can also find the **WDP Reader Setup Deck** on the Utilities CD-ROM or on our website www.barcodehq.com/downloads.html.

1 If you have never scanned before, refer to **Chapter 3** for scanning instructions. To configure your reader using the ***WDP Reader Setup Deck,*** you must first scan the **Start Setup** card. Do this now. You'll hear two beeps. During Setup, nothing will be transmitted to your computer; the Reader Setup Menu codes are strictly for configuring the reader. If you did not hear two beeps, try scanning the code again, until you hear the two beeps.

2 Next, choose the topic you want to change an option for, and scan its card. Let's use **Beep Tone**, at the lower left corner of the menu, as an example. Scan the **Beep Tone** code now. You'll hear two beeps.

3 Then, choose the option you want to change, from the list next to the topic bar code you just scanned. For **Beep Tone,** the options range from **0** for the lowest pitch to **4** for the highest pitch. Using the "Barpad Card", scan the number or letter associated with the option you have selected. Let's change the beep pitch to **Highest**. Now scan the **4** on the Correct Barpad Card. You will again hear two beeps.

4 Now scan **End Setup Card** to complete the setup exercise. You'll hear three beeps. If you followed the instructions correctly and successfully changed beep tone to "highest", the three beeps will be higher in pitch than the other beeps had been. If they aren't higher in pitch, repeat the steps on this page until you are successful at changing the beep tone.

Now that your beep tone is at the "highest" pitch, you may want to change it back to "medium" or a different setting. Repeat the steps above, selecting the option you prefer to "highest" in step 3.

When you've successfully changed the beep pitch, and are ready to configure the reader for your specific application, scan **Start Setup** again. Continue scanning topics and options until you've made all the changes you desire, and then scan **End Setup** to complete setup.

The next section describes in detail each SLx-WDP Reader option. Default settings are shown in bold in this manual and are marked with an * on the ***WDP Reader Setup Cards***.

SLx-WDP Setup Parameters

Beep Tone

Lowest	0
Low	1
Medium	**2**
High	3
Highest	4
Turn Beeper OFF, No “Laser Good” LED	5
Turn Beeper OFF, Yes “Laser Good” LED	6

The SLx-WDP Reader gives you a choice of five different beep pitches.

Code 39

Enable Code 39	**0**
Disable Code 39	1
Enable Full ASCII Code 39	**2**
Disable Full ASCII Code 39	3
Enable Code 39 Accumulate Mode	**4**
Disable Code 39 Accumulate Mode	5
Enable Start/stop character transmission	6
Disable Start/Stop character transmission	**7**
Enable Mod 43 Check Digit	8
Disable Mod 43 Check Digit	**9**
Enable Check Digit Transmission	A
Disable Check Digit Transmission	**B**
Caps Lock ON	C
Caps Lock OFF	**D**

For information about **Code 39, Full ASCII Code 39** and **Accumulate Mode**, see *Appendix A*. The Storage Tek variation of Code 39 is also supported any time Code 39 is enabled.

Enabling Start/Stop character transmission means that the WDP Reader will transmit the * Start/Stop characters to your computer along with the data. For example, data of 1234 would be transmitted as *1234*. Most people don't need this option, but it is useful if you want your software to be able to differentiate between keyboard and bar code data.

Enabling the Mod 43 Check Digit requires the units position of your data to match the calculation for the check digit explained in *Appendix A*. If you've enabled the check digit, **enabling Check Digit transmission** causes the reader to transmit the check digit to your computer along with the bar code data.

"**Caps Lock ON**" means that lowercase letters read as data will be transmitted as uppercase, and uppercase as lower. Numbers, punctuation and control characters are not affected. "**Caps Lock OFF**" means that letters will be transmitted exactly as read.

UPC/EAN

Enable UPC/EAN	**0**
Disable UPC/EAN	1
Enable UPC/EAN Supplements	2
Disable UPC/EAN Supplements	**3**
Enable transmission of UPC-A NSC and EAN-13 first two digits	**4**
Disable transmission of UPC-A NSC and EAN-13 first two digits	5
Enable transmission of UPC-A/EAN-13 Check Digit	**6**
Disable transmission of UPC-A/EAN-13 Check Digit	7
Enable transmission of UPC-E NSC and EAN-8 first digit	8
Disable transmission of UPC-E NSC and EAN-8 first digit	**9**
Enable transmission of UPC-E/EAN-8 Check Digit	A
Disable transmission of UPC-E/EAN-8 Check Digit	**B**
UPC-E Compressed	**C**
UPC-E Expanded	D
EAN-8 observes 9 and A above	**E**
EAN-8 if forced to transmit 8 digits	F
UPC-A transmitted in UPC-A format	**(see below)**
UPC-A transmitted in EAN-13 format	(see below)
ISBN conversion disabled	**(see below)**
ISBN conversion enabled	(see below)

For general information about UPC and EAN, see ***Appendix E***.

Enabling supplements allows you to read 2 and 5-digit supplemental codes used with magazines and books. This disallows right-to-left reading of UPC/EAN codes, to assure that the supplement doesn't get skipped. This setting also allows for reading of the *UCC/EAN 128 Extended Coupon Code*. The Extended Coupon Code consists of a UPC(must have NSC of 5) or an EAN (NSC of 99) code along with a Code 128 supplemental code right next to it. This setting allows you to read the Code 128 supplement as long as the correct NSC characters are present in the UPC or EAN code.

Enabling transmission of UPC or EAN NSC's (leading digits, 1 for UPC; 2 for EAN-13) or Check Digits means that these digits will be transmitted to your computer along with the rest of the UPC or EAN data.

UPC-E Compressed Format transmits UPC-E codes as is; Expanded Format adds zeros to make them the same length as UPC-A.

UPC-E can be used in either normal **UPC-E format** (implicit NSC of 0) or UPC-E1 format (NSC of 1). **UPC-E1** settings are found in the **2 of 5 Code** parameter. Setting **8** enables UPC-E1 reading while **9** disables UPC-E1 (**9** is the default). It is very easy to read an EAN-13 bar code partially as UPC-E1, so don't enable UPC-E1 when reading EAN-13.

If you wish the **UPC-A data to be transmitted in EAN-13 format**, (with an additional leading 0 for the USA's country code), you should scan Terminator Character and F. Scanning E, the default, sets UPC back to no country code transmitted.

ISBN bar codes are EAN-13 bar codes where the first three digits are the "Bookland" country code of 978 for books and 977 for periodicals, and the following nine are the first nine digits of the ISBN.The ISBN settings are located in the **Terminator Character** parameter. To enable transmission of ISBN bar codes in ISBN format (the nine ISBN digits plus a new calculated mod-11 check digit), scan **Terminator Character** and **D**. Scanning **C**, the default, disables conversion to ISBN format.

2 of 5 Code

Enable Interleaved 2 of 5	0
Disable Interleaved 2 of 5	**1**
Enable Interleaved 2 of 5 check digit	2
Disable Interleaved 2 of 5 check digit	**3**
Enable check digit transmission	4
Disable check digit transmission	**5**
Enable Standard 2 of 5	6
Disable Standard 2 of 5	**7**
Enable UPC-E1	8
Disable UPC-E1	**9**

For information about Interleaved 2 of 5, see ***Appendix D***.

Enabling the check digit requires that the data's units position (last character) match the calculation for the check digit explained in ***Appendix D***. If you have enabled the check digit and want to transmit the check digit to the computer along with the rest of the bar code data, choose "Enable check digit transmission".

See the UPC/EAN parameter on page 2-4 for more information on UPC-E1 format.

2 of 5 Data Length

Default Length	**06**

2 of 5 Code is so susceptible to interpreting partial scans as valid reads that the WDP Reader uses fixed-length data as a safeguard. To choose a data length, scan it as a two-digit number using the Barpad Table. For example, to select 8-digit data length, you would scan a 0 and then a 8. Because Interleaved 2 of 5 is required to be an even number of digits in length, you must use an even number. If you're unsure of your bar code length, temporarily set length to 00, read a bar code, and count its digits. Variable-length 2 of 5 codes are very dangerous.

Codabar

Enable Codabar	0
Disable Codabar	**1**
Enable CLSI Codabar	2
Disable CLSI Codabar	**3**
Disable Start/Stop character transmission	**4**
Enable Start/Stop character transmission	5

For information about Codabar, see ***Appendix B.***

CLSI format is a form of Codabar often used by libraries

Enabling Start/Stop character transmission means that the WDP will transmit the Start and Stop characters to your computer along with the bar code data. Enable transmission if you are varying the Start and Stop characters according to label type in order to differentiate between bar code data and data from the keyboard. Most people do not need to transmit the Start/Stop characters.

Code 93

Enable	0
Disable	1
Enable Full ASCII	2
Disable Full ASCII	3

For more information about Code 93, See ***Appendix G***.

Code 128

Disable Code 128	**0**
Enable Standard Code 128	1
Disable UCC-128/EAN-128	**2**
Enable UCC-128/EAN-128	3
Bar Code ID's transmitted	E
Bar Code ID's not transmitted	**F**

See ***Appendix C*** for details on Code 128 and UCC-128/EAN-128.

Bar Code ID's are characters assigned to each bar code type to identify that particular type of code. These Bar Code ID's can be used to identify what type of bar code you are using when you are not sure or you want your application to differentiate between the different types. The Bar Code ID's are assigned as follows:

Bar Code	ID	Bar Code	ID
Codabar	a	Code 39	b
UPC-A	c	EAN-13	d
I 2 of 5	e	2 of 5 (standard)	f
Code 128	g	Code 93	i
MSI	j		
UPC-E(0)	n	UPC-E1 (1)	o
EAN-8	p	Storage Tek	s
Plessey	x	LabelCode 4	y
LabelCode 5	z	RSS-14	r

MSI and Plessey

Disable MSI and Plessey	**0**
Enable MSI with 1 Mod 10 check digit	1
Enable MSI with 2 Mod 10 check digits	2
Enable MSI with 1 Mod 11 and 1 Mod 10 check digit	3
Transmit no check digits	**4**
Transmit 1 Check digit	5
Transmit 2 Check digits	6
Enable Plessey Code	7
Enable LabelCode5	8
Enable LabelCode4	9

Plessey has two check digits which are not transmitted. MSI, Plessey, LabelCode4, and LabelCode5 are mutually exclusive. For information about MSI codes, see *Appendix F*.

If you've enabled the Mod 10 or Mod 11 check digit(s), enabling transmission of one or two check digits causes the WDP Reader to transmit it/them to your computer along with the bar code data.

Enabling check digit transmission (if check digit(s) are enabled) causes the WDP to transmit it/them to your computer along with bar code data.

GS1 DataBar (RSS-14)

Disable GS1 DataBar RSS-14	**0**
Enable Standard 14 digits	1
Enable 14 plus Identifiers	2
Enable 14 plus UCC 128 Emulation	3

By default, standard GS1 DataBar (RSS-14) is disabled, scan 1 to enable. Options 3 and 4 enable the alternate GS1 DataBar formats. For more information on GS1 DataBar, see the AIM website at http://www.aimglobal.org/standards/symbinfo/rss_overview.asp

Preamble

A "Preamble" is a user-specified data string transmitted at the beginning of each bar code. For example, if you specify the preamble **@@** and read data of **123456**, "**@@123456**" would be transmitted to your computer.

The default is no preamble. To select a preamble, scan up to 15 characters from the "**FULL ASCII MENU**" on the back of the Reader Setup Menu, and then scan **SET** when you're done. To return to the no preamble setting, scan **CLEAR** here instead of scanning **SET** or any characters from the **FULL ASCII MENU**.

You can trim 1-15 leading characters from bar code codes by scanning a ~ (tilde -- ASCII 126) followed by a single digit, 1 through F (A through F are for 10 to 15), as part of the Preamble. (Bar codes which are shorter than the amount-to-trim are transmitted with no trimming.) Consider the examples in the following table to understand how trimming works:

Bar Code Data	Preamble	Data Transmitted
123	XYZ	XYZ123
12345678	~3XYZ	XYZ45678
12345678	~9	12345678
12345	~A	~A12345
123456	~5	6

You can also trim selectively by bar code type. For example, you can trim 2 characters from Code 39 and a different amount from other bar code outputs. This is done by using the bar code ID character in conjunction with the tilde (~). A pre-amble of **~b2~c1** says trim **2** characters from the front of **Code 39** output and trim **1** character from the front of **UPC-A**. Refer to the Code 128 parameters previous discussion for a list of the ID character associated with each bar code type.

For advanced PC users: **Emulating special keys in the preamble:** Programmers and other advanced PC users can also embed keyboard hex scan codes in the preamble, for emulation of key presses specific to their computers, such as the left shift key or F12 key. This is done by specifying the make and break hex scan codes for one or more keys enclosed in "left" and "right" apostrophes (` and ').

Make and break codes are hardware-specific -- see the keyboard section of your computer's manual or tech references for descriptions of its make and break codes. Break codes follow one of two conventions depending on which "keycode set" a keyboard uses. Keycode set 1 (usually on older systems) uses a two-digit break code formed by adding hex 80 to the make code. Keycode set **2** (usually on newer systems) uses two digit break codes: the first is **F0** and the second is identical to the make code.

For example, let's say you want to emulate the left shift key. First, using the **FULL ASCII MENU**, you'd scan a left apostrophe, to identify subsequent characters as keyboard scan codes. Next, the two-digit hex make code -- let's say it's **12**. First you'd scan a **1** and then a **2**. Next, the break code. Let's say your computer uses keycode **2** break codes of **F0** followed by the make code. Finally, a right apostrophe to mark the end of the scan codes. **` 1 2 F 0 1 2 '** (scanned from the Full ASCII Menu) The preamble is limited to 15 characters. As the single scan code example above uses eight characters, you can see that you can't put very many keyboard scan codes in the preamble.

A final use of the Preamble/Postamble is to enter a minimum/maximum length check for bar code data read. Use the Preamble or Postamble by entering **|*nnmm*** where "**|**" is ASCII 124, "***nn***" is the two digit minimum to be read and "***mm***" is the two digit maximum to be read.

Postamble

"Postamble" refers to a user-specified data string transmitted at the end of each bar code. For instance, if you specify the postamble **@@** and read data of **123456**, "**123456@@**" would be transmitted to your computer.

To select a postamble, scan up to 15 characters from the "**FULL ASCII MENU**" on the back of the Reader Setup Menu, scanning **SET** when done. To return to no postamble (the default setting), scan **CLEAR** here instead of scanning **SET** or any characters from the **FULL ASCII MENU**.

You can trim 1-15 trailing characters from bar code codes by scanning a ~ (tilde -- ASCII 126) followed by a single digit, 1 through F (A through F are for 10 to 15). (Bar codes which are shorter than the amount-to-trim are transmitted without trimming.) Consider the examples in the following table to understand the options of the Postamble:

Bar Code Data	Postamble	Data Transmitted
123	XYZ	123XYZ
12345678	~3XYZ	12345XYZ
12345678	~9	12345678
12345	~A	12345~A
123456	~5	1

Bar codes which are shorter than the sum of the Postamble trimming and Preamble trimming will be transmitted without trimming.

You can also trim selectively by bar code type. For example, you can trim 2 characters from Code 39 and a different amount from other bar code outputs. This is done by using the bar code ID character in conjunction with the tilde (~). A postamble of **~b2~c1** says trim **2** rightmost characters from **Code 39** output and trim **1** rightmost character from the **UPC-A**. Refer to the Code 128 parameters previous discussion for a list of the ID character associated with each bar code type.

For advanced PC users: **Emulating special keys in the postamble** See the "***emulating special keys in the preamble***" section on page 2-8.

A final use of the Preamble/Postamble is to enter a minimum/maximum length check for bar code data read. Use the Preamble or Postamble by entering ***/nnmm*** where "**|**" is ASCII 124, "***nn***" is the two digit minimum to be read and "***mm***" is the two digit maximum to be read.

Reset

Don't scan **Reset** unless you're sure you want to restore the SLx-WDP Reader to its default settings (as described on page 2-1), erasing all changes you've made, because that's exactly what **Reset** will do.

Characters

This setup option allows you to output ASCII characters different from the ones scanned. (Don't use this option to configure the WDP Reader for your non-US keyboard -- instead, use the *Keyboard Country* option described below.)

For example: Suppose you want the WDP Reader to output a hex 92 character every time you scan a 1 (hex 31); you want to remap hex 31 to hex 92, (If you're using 8 data bits, output of 80-F8 codes is possible.) Your Full ASCII Menu has ASCII and hex values for the 128 characters.

1) Scan the **Start Setup** Bar Code
2) Scan the **Characters** Bar Code on the Setup Sheet.
3) Scan **3 1** and **9 2** to output hex **92** when reading a "**1**".
4) Scan up to 7 other pairs of character reassignments.
5) Scan **Set** when complete.
6) Scan **End Setup** to exit setup mode.

You can also eliminate characters by reassigning hex codes to FF. For example, to strip all $ (dollar sign) characters from transmission, you would follow the above instructions and scan **2 4 F F** in step 3.

Keyboard Country

This option configures the SLx-WDP Reader for your choice of 15 keyboard country settings, such as USA (the default), UK, French, German, etc.

Scan the keyboard country bar code and then the two-digit code for your keyboard country (listed on the Reader Setup Menu), such as 14 for UK.

USA	00	French	01	German	02	Belgian	0	3
Fr. Canadian	04	Danish	05	Dutch	06	Italian	0	7
Latin America	08	Norwegian	09	Portuguese	10	Spanish	11	
Swedish	12	Swiss	13	U.K.	14			

Terminator Characters

Enter (carriage return)	**0**
None	1
Tab	2

Depending on your application, you may wish the SLx-WDP Reader to transmit bar code data to your computer with an Enter (carriage return), a Tab at the end, or with no extra terminating character at all.

If you need a terminator character other than CR or HT (such as LF for LINUX/UNIX), you can get it by specifying **None** here and then selecting your desired terminator character(s) through the Postamble specification.

Chapter 3

Slot Badge Scanning

Slot Badge Scanners let the user slide a bar coded card through a slot, similar to using the familiar magnetic stripe card scanners. The bar code must be oriented and positioned correctly on the card for this scanner to work. Typical applications include club membership cards, security badges, and library cards. It can also be used for reading bar codes on file folders, envelopes and any other thin, flat surfaces with bar codes printed along an edge. There are two types of bar code slot scanners:

- The standard SLV-WDP Bar Code Slot Scanner is a high-resolution scanner using visible-red light.
- Optionally, you can order the SLI-WDP with a high-resolution infrared-light scanner. This is useful for hiding the bar code number for security.

To read a card or other object with the bar code slot scanner, orient the card so that its bar code faces the lighted side of the scanner. Now make a continuous wipe motion through the slot.

For optimum use with the slot scanner, bar codes should be printed or applied so that the center of the bar code is .5" from the edge of the card.

The Slot Scanner can be permanently mounted to a desk or wall with double sided tape. If you have ordered SLV-WDP or SLI-WDP Integrated Slot Badge Reader model, you will need the **WDP Card Setup Deck** in addition to or instead of the Reader Setup Menu.

The SLV-WDP and the SLI-WDP are integrated models with the decoder built in to the slot scanner itself. They are available as a USB interface ONLY.

Chapter 4

Special Features

Function and Control Key Support

The **SLx-WDP** Reader can also transmit key sequences for **function**, **control**, **alt** (**command** and **option** keys on Macs), **cursor** and **shift** keys, for ease of use with the many software packages using these keys for menus or commands. These "keystrokes" are scanned in to your Preamble or Postamble in order to add them to every scan from your reader. For this to work, you must have Full ASCII Code 39 enabled on your reader (this is the default setting). To use them in your Preamble or Postamble, see pages 2-8 and 2-9 for details. Scan the corresponding bar code from the Full ASCII menu to emulate the chosen key.

PC Key	Mac Key	Full ASCII Menu Bar Code
F1	F1	SOH (f1)
F2	F2	STX (f2)
F3	F3	ETX (f3)
F4	F4	EOT (f4)
F5	F5	ENQ (f5)
F6	F6	ACK (f6)
F7	F7	BEL (f7)
F8	F8	SO (f8)
Numpad 5*	Enter	LF
Enter	Return	CR
F9	F9	SI (f9)
F10	Cmnd On	DLE (f10)
Del	Del	DC1 (Del)
Insert	Cmnd Off	DC2 (Ins)

PC Key	Mac Key	Full ASCII Menu Bar Code
Left Arrow*	Left Arrow+	DC3 ( )
Rt Arrow*	Rt Arrow+	DC4 (→)
Dn Arrow*	Dn Arrow+	NAK ( )
Up Arrow*	Up Arrow+	SYN ( )
Pg Up*	Pg Up+	VT (Pg Up)
Pg Dn*	Pg Down+	FF (Pg Dn)
Home*	Home+	ETB (Home)
End*	End+	CAN (End)
Shift ON	Shift ON	EM (Shift ON)
Shift OFF	Shift OFF	SUB (Shift OFF)
Control On	Control On+	FS (Ctrl ON)
Control Off	Control Off+	GS (Ctrl OFF)
Alt On	Option On	RS (Alt ON)
Alt Off	Option Off	US (Alt OFF)

** refers to the keys on the Number pad on the far right side of a PC keyboard. To emulate any of the keys above, scan the appropriate bar code from the FULL ASCII MENU. For example, to emulate the F5 key, scan the ENQ bar code.*

+ these keys apply to Mac ADB interface ONLY. For Mac USB, you must use the keys in the table below.

PC Key	Mac Key	Full ASCII Menu Bar Codes
Insert	Ins	NUL 0
Delete	del	NUL . (period)
End	end	NUL 1
Down Arrow	down arrow	NUL 2
Page Down	page down	NUL 3
Left Arrow	left arrow	NUL 4
Line Feed	Line Feed	NUL 5

PC Key	Mac Key	Full ASCII Menu Bar Codes
Right Arrow	right arrow	NUL 6
Home	home	NUL 7
Up Arrow	up arrow	NUL 8
Page Up	page up	NUL 9
Windows ON	control ON	NUL C
Windows OFF	control OFF	NUL D
ENTER (num)	ENTER (num)	NUL E

This chart corresponds to the small center section of keys between the main letter keys and the Numeric keypad on the right of the keyboard and requires you to scan two bar codes from the FULL ASCII MENU - the NULL bar code and then the appropriate character. For example, to emulate the END key, scan the NULL bar code, then the 1 bar code.

Function keys F1 through F10, and numeric-pad keys

Function keys F1 through F10, and numeric-pad keys (such as Left Arrow and Del), are encoded by a single control character as shown in the table above. Simply scan the correct bar code from the FULL ASCII MENU.

For example, if the WDP reads the bar code **SOH** (ASCII 001 -- a control-A) from the FULL ASCII MENU, it will transmit an F1 key sequence to your computer.

Function keys F11 and F12

Function keys F11 and F12 require two bar codes to be scanned to make these functions keys. The F11 key is created by combining the **Null** and **SOH**. The F12 key is created by combining the **Null** and the **STX** .

Shift, Ctrl and Alt keys

Shift, Ctrl and Alt keys require three sequences

1) The ON code generated when the Shift, Ctrl or Alt key is pressed.
2) The other key to be used in conjunction with the Shift, Ctrl or Alt key.
3) The OFF code generated when the Shift, Ctrl or Alt key is released.

For example, to properly emulate the keystrokes for Ctrl-C, you would scan the bar code for Control ON (**FS**), **C**, and Control OFF (**GS**).

Windows Key

The Windows key on a Windows keyboard is transmitted by scanning 4 bar codes - **NULL** and **C** for *Windows On* (pressing down) and **NULL** and **D** for *Windows Off* (releasing the key).

Macintosh Command and Option Keys on USB

When you have a Slx-WDP Reader attached to a Macintosh Computer's USB port, to emulate the Command key, use the Windows key ON/OFF bar codes **NULL, C** (Command ON) and **NULL, D** (Command OFF) For the Option Key ON/OFF use **RS** (Option On) and **US** (Option Off).

Transmitting any ASCII character using its 3-digit ASCII code

You can also transmit any ASCII character from 000 to 255 by emulating the PC technique of typing a character's ASCII number on the numeric pad while holding down the Alt key. For example, to transmit ASCII 250, you would scan the bar codes for:

Keystroke	Full ASCII Menu Bar Code
Alt ON	**RS**
Ins (*0 on the numeric pad*)	**DC2**
Down Arrow (*2 on the numeric pad*)	**NAK**
Numpad 5	**LF**
Ins (*0 on the numeric pad*)	**DC2**
Alt OFF	**US**

Accumulate Mode

Accumulate Mode is an option (which can be enabled or disabled using the Reader Setup Menu's Code 39 section) allowing the reader to accumulate multiple bar codes in its buffer, then transmit them to the computer as if they had been a single bar code. This is useful for entering quantities and other variable data.

It works with Code 39 only, and can't be used with a check digit. When the reader reads a bar code with a leading space, it beeps and buffers the data with-out transmission. It continues to read and buffer bar codes (up to 40 characters) until it reads a bar code without a leading space. Then the entire buffer (including that last code) is transmitted as one long bar code. A bar code of a double minus (--) sign clears the buffer. Scanning a backspace code ($H) backspaces in Full ASCII mode. A handy code for Enter (as seen on the "Barpad" below) is a Start/Stop only. (No data.) If you don't have a Terminator Character programmed, you will have to scan a CR (see the Full ASCII menu) instead of the Enter bar code shown below.

This numeric "Barpad" illustrates Accumulate Mode. Scan 5, 3, 8, and Enter. The reader transmits a single message of 538.


0


1


2


3


4


5


6


7


8


9


Clear


Backspace


Enter

Chapter 5

Troubleshooting

The USB reader initializes and then turns off.

- There is not enough power available on the USB port. If you are connected to a USB port on the keyboard or other peripheral, try connecting to a USB port on the main PC itself. You may need to buy a powered USB Hub with its own power supply - you can pick them up inexpensively at your nearest computer store.

Using USB, the reader powers up and beeps when a bar code is scanned but no data is transmitted.

- Go to the **Control Panel**, then to **System**, then **Device Manager**. Check your **HID** devices. Right click on the **HID** device to see if the device is working properly. If it is not, click on **Driver** and proceed to reinstall the driver. **See Appendix I for details for your operating system.**

The reader won't beep when reading bar codes

- Recheck all the connections using the installation section as a guide. Try reading a known good bar code - the test label on page 3-2, following the steps for scanning in **Chapter 3**; *Scanners and Scanning Technique*. If you're trying to read Code 39 bar codes with leading spaces (such as the Barpad on page 4-3) and have enabled **Accumulate Mode**, those bar codes will not be transmitted to your computer until you read a bar code without a leading space. Try reading the Test Label on page 3-2 as an example of a known good label.
- If the read failure is on Interleaved 2 of 5 codes, make sure the data length is the same that you selected on the Reader Setup Menu. Be sure you don't have the check digit enabled for Code 39 or Interleaved 2 of 5 if you're trying to read data without check digits.

Extra characters at the beginning or end of your bar code data

- Clear the Preamble and Postamble.
- Make sure you haven't enabled transmission of any start/stop characters, checksums, leading digits or terminator characters that you don't want transmitted. For UPC-E, select Compressed transmission if you don't want it padded with extra zeros.

The reader transmits incorrect data to the screen

- If the reader is transmitting punctuation characters (!@#$%^&*) when reading numeric bar codes, or transmitting letters in the wrong (upper/ lower) case, you may have a Num Lock, Caps Lock, shift or timing problem. Check your keyboard to see if the Num Lock or Caps Lock keys have been activated.
- If you're using Code 39, read page 2-4 to see if you've set Caps Lock properly for your application. If your Code 39 bar codes include punctuation characters %, $, / or +, the reader is seeing them as part of Full-ASCII Code 39 sequences. Using the Reader Setup Deck, disable Full ASCII Code 39.

Poor read rate

- Examine your bar codes to make sure they have dark bars, clearly defined bars and white spaces, and a "quiet zone" of at least 1/4 inch to the left and right. If the bars are grey, or so dark that they "bleed" into the white spaces, the person or organization printing them will need to adjust the printer or get a new ribbon or toner cartridge for it.
- Carefully follow the scanning instructions in **Chapter 3** when reading any and all bar codes. As straightforward as scanning may seem, many people who call Worth Data with a complaint about poor read rate are simply not doing it correctly.
- If you're using the SLI-WDP Infrared Slot Badge Scanner, be sure the bar codes you're trying to read were printed with infrared-quality ink. Also, make sure if the bar code is hidden behind another ink printed over the bar code - or another laminate material covering the bar code - that the covering ink or material is *invisible* to Infrared. This enables the bar code to be hidden from eyesight, but still visible to the scanner.

Appendix A

Specifications for Code 39

Code 39 (or Code 3 of 9) is the de facto standard of non-retail American industry. It is widely used in the automotive industry (AIAG specifications) as well as in government and military applications (LOGMARS specifications). Code 39 is flexible, features a large character set, variable data length and density, and bi-directional readability. Code 39 is extremely accurate; substitution errors are almost nonexistent. Its character set consists of numbers 0 through 9, upper case A-Z, and characters Space, $, %. / + and -.

The name "Code 39" comes from both the fact that its character set originally contained 39 characters (it now has 43) and from its structure. Each character is formed of three wide and six narrow elements, made up of five bars and four spaces. Code 39's density can vary from a low of .75 characters per inch (cpi) to a high of 9.4 cpi. There should be a ¼" "quiet zone" (white space) to the left and right of the bar code. Code 39 uses an asterisk (*) as a start and stop character. This character must precede and follow the data in the bar code. The WDP gives you the option of transmitting or not transmitting these characters when the bar code is read.

Exact specifications for Code 39 and other bar code symbologies can be obtained from ANSI at the address below:

American National Standards Institute
Customer Service
11 West 42nd St.
New York, NY 10036

http://web.ansi.org
document ANSI/AIM BC1-1995

Mod 43 Check Character

Standard Code 39 can be printed with a "Mod 43 Check Character". This Mod 43 check character cannot be used with Full Ascii Code 39. The check character is derived by assigning a value to each character in the data to be bar coded from the table as follows:

Char	Value	Char	Value	Char	Value	Char	Value
	0	0	B	11	M	22	X
33							
	1	1	C	12	N	23	Y
34							
	2	2	D	13	O	24	Z
35							
	3	3	E	14	P	25	-
36							
	4	4	F	15	Q	26	.
37							
	5	5	G	16	R	27	Space
38							
	6	6	H	17	S	28	$

Here is an example to illustrate how the check character is calculated for bar code data of 123XYZ:

1. Take the sum of the values assigned to each character:

1 + 2 + 3 + 33 + 34 + 35 = 108

1 2 3 X Y Z

2 Divide the sum by 43: (thus the name modulus 43)

108/43 = 2 with a Remainder of 22

3. Find the character corresponding with the remainder.

M (value 22) is the CHECK CHARACTER

The data becomes 123XYZM, with M added as the Mod-43 check character.

Full ASCII Extension to Code 39

"Full-ASCII Code 39" expands the Code 39 character set to include all 128 ASCII characters. Symbols 0-9, A-Z and punctuation characters . and - are identical to their Code 39 representations. Lower-case letters, additional punctuation characters and control characters are represented by sequences of two Code 39 characters.

This table depicts the Full ASCII character set as a function of Code 39 characters:

ASCII	C39	ASCII	C39	ASCII	C39	ASCII	C39
NUL	%U	SP	Space	@	%V	‘	%W
SOH	$A	!	/A	A	A	a	+A
STX	$B	“	/B	B	B	b	+B
ETX	$C	#	/C	C	C	c	+C
EOT	$D	$	/D	D	D	d	+D
ENQ	$E	%	/E	E	E	e	+E
ACK	$F	&	/F	F	F	f	+F
BEL	$G	‘	/G	G	G	g	+G
BS	$H	(	/H	H	H	h	+H
HT	$I	)	/I	I	I	i	+I
LF	$J	*	/J	J	J	j	+J
VT	$K	+	/K	K	K	k	+K
FF	$L	,	/L	L	L	l	+L
CR	$M	-	- *or* /M	M	M	m	+M
SO	$N	.	. *or* /N	N	N	n	+N
SI	$O	/	/O	O	O	o	+O
DLE	$P	0	0 *or* /P	P	P	p	+P
DC1	$Q	1	1 *or* /Q	Q	Q	q	+Q
DC2	$R	2	2 *or* /R	R	R	r	+R
DC3	$S	3	3 *or* /S	S	S	s	+S
DC4	$T	4	4 *or* /T	T	T	t	+T
NAK	$U	5	5 *or* /U	U	U	u	+U
SYN	$V	6	6 *or* /V	V	V	v	+V
ETB	$W	7	7 *or* /W	W	W	w	+W
CAN	$X	8	8 *or* /X	X	X	x	+X
EM	$Y	9	9 *or* /Y	Y	Y	y	+Y
SUB	$Z	:	/Z	Z	Z	z	+Z
ESC	%A	;	%F	[	%K	}	%P
FS	%B	<	%G	\	%L	|	%Q
GS	%C	=	%H	]	%M	{	%R
RS	%D	>	%I	^	%N	~	%S
US	%E	?	%J	_	%O	DEL	%T,%X

See page 4-1 for instructions on encoding **Function**, **Control**, **Alt** and **Shift** keys with Full-ASCII Code 39 bar code characters.

Appendix B

Codabar

Codabar is widely used in libraries, blood banks, the cotton industry and transportation industries. Its' character set consists of numbers 0 through 9, and punctuation characters + . - / : and $. Symbols a, b, c, d, t, n, * and e are used as start and stop characters. Characters are constructed of four bars and three spaces.

Codabar is a numeric-only code, but different combinations of start and stop characters can be used to identify different types of labels. Codabar's variable data length and extremely low error rate make for a versatile bar code.

Codabar start/stop transmission

The Codabar section on the WDP Setup Menu lets you determine whether Codabar start/stop characters are transmitted or not. If you are varying start/ stop characters with different types of labels, you'll want to "Enable Stop/Start character Transmission". Start/stop character transmission can also be helpful if you want your program to differentiate between data coming from the WDP reader and data coming from the keyboard. If neither of these situations apply, you'll probably want to disable it.

Appendix C

Code 128 Specifications

Code 128 is a very powerful bar code, combining an extensive character set and variable length with compact-ness and error checking. The character set contains all 128 ASCII characters with each character made up of three bars and three spaces. Each element (bar or space) varies from one to four units in width, totaling 11 units of width per character. Code 128 contains two levels of error checking:

Each character is checked for internal parity, and

The last character is a checksum.

- Code 128 has three subsets, A, B and C. Subset A contains alphanumeric characters and unprintable control characters,
- subset B contains alphanumeric characters plus printable control characters and subset C contains only numeric characters and uses a 2-character encoding scheme to create a more compact bar code. Code 128 uses an internal Mod 103 check character that is not displayed by the bar code reader. Code 128 bar codes can be made up of only one subset or may be a combination of several.

The Code 39 features of *Accumulate Mode*, *Caps Lock ON* and *Caps lock OFF* also apply to Code 128.

UCC-128/ EAN-128

UCC-128/EAN-128 Code is a subset of Code 128 adopted by the UCC and EAN council's for use as a shipping label symbology. UCC/EAN-128 bar codes always start with a Function Code 1 character. In addition, all variable length fields are terminated by a Function Code 1 character unless they are the last field in the bar code.

The WDP outputs the following for the special function codes and start sequences:

]C1 *Start C/Function Code 1*

^] *(GS) Function Code 1 as a variable string terminator*

If UCC/EAN 128 is enabled, the WDP reader looks for the Start C/Function Code 1 characters to indicate a UCC/EAN 128 bar code. ***The UCC Serial Shipping Container Code*** specification calls for a 19 digit UCC/EAN 128 code with an additional Mod 10 Check Digit (20 digits in all for the code). The Mod 10 Check digit is calculated the same as the Interleaved 2 of 5 example in Appendix D. It is the data length as well as the MOD 10 check digit that distinguishes the ***Serial Shipping Container Code*** from other UCC /EAN 128 bar codes.

GS1-128 UCC/EAN 128 is enabled by scanning the appropriate bar codes on the *WDP Reader Setup Menu*. If **UCC/EAN 128** is ***enabled***, you will be able to read both standard Code 128 as well as the UCC/EAN 128 bar codes with the Function 1 character and the Mod 10 check digit.

The GS1-128 UCC 128 specification is used extensively by the retail industry. If you have a requirement for a UCC 128 Serial Shipping Container bar code, be sure to follow the specification as closely as possible as many vendors will impose fines for non-conformance. For more information on GS1-128 UCC 128, contact the GS1 (formerly the Uniform Code Council) at:

GS1-128 UCC/EAN Code 128 Serial Shipping Container Code

GS1 US
7887 Washington Village Drive, Suite 300
Dayton, OH 45459
ph 937-435-3870
fax 937-435-7317
email: info@gs1us.org
8:00 am to 6:00pm EST Mon-Fri

Many of the specifications are available online at:

http://www.gs1us.org

Appendix D

Interleaved 2 of 5 Code

Interleaved 2 of 5 Code is a numeric-only, even-number-of-digits bar code. It is widely used in warehouse and industrial applications. A combination of five elements, two wide and three narrow represent each character. Odd-number position digits are encoded in the bars, even-number positions in the spaces.

Interleaved 2 of 5 Code is so susceptible to partial scans being interpreted as valid reads that we recommend at least one of the following safeguards:

- Use one length of I 2 of 5 code. Using one length of data allows you to tell the SLx-WDP to look for one length of I 2 of 5 code only. By default, the SLx-WDP is set to look for a 6 digit I 2 of 5 code but you can set the length to something different using the Setup Menu Deck. Setting the length to 00 digits allows variable length bar codes scanning.
- Use a check digit. Worth Data' LabelRIGHT printing program automatically calculates and prints a check digit upon request using the method below:

Interleaved 2 of 5 Mod 10 check digit calculation

1. Assume that the bar code data is 1987.
2. Starting with the least significant digit (in this case, a 7), label the digits alternatively even and odd.

   7 - even
   8 - odd
   9 - even
   1 - odd

3. Take the sum of the odd digits: **8 + 1 = 9**
4. Multiply the sum of the even digits by 3: **(7 + 9) x 3 = 48**
5. Add the results of steps 3 and 4: **9 + 48 = 57**
6. Subtract the result of step 5 from the next highest multiple of 10: **60 - 57 = 3**
7. The checksum becomes the low-order digit: **19873**
8. Because the data now has an odd length, a leading zero is added, for the final result of: **019873**

Appendix E

UPC/EAN Specifications

UPC symbols are found on almost all grocery products and many other retail items. The UPC code most people are familiar with (UPC-A) is a fixed-length (12 digits) numeric only code, with the first digit controlled by UPC coding assignments and the last digit a checksum. UPC-E and UPC-E1 are variations of the standard UPC-A code. Each digit is constructed of two bars and two spaces. UPC has very precise standards of code size, structure, and numbers to be used.

EAN is an international superset of UPC. EAN-13 has 13 digits, with the first two digits representing a country code. The final digit is, as with UPC, a check digit. EAN-8 is a shorter version on the EAN-13 code containing seven data digits and ending again with a checksum.

The exact UPC/EAN symbol specifications are available from:

GS1 US
7887 Washington Village Drive, Suite 300
Dayton, OH 45459
ph 937-435-3870
fax 937-435-7317
email: info@gs1us.org
8:00am to 6:00pm EST Mon-Fri

Specifications are also available via the internet at:

http://www.gs1us.org

Keep the following guidelines in mind when printing UPC bar codes:

- If you plan to use a "supermarket-type" in-counter scanner to read the codes, specify a bar code height of at least .9" for an optimal first read rate.
- Make it an early practice to observe the numbering conventions of the UPC Council. Do not label unmarked merchandise with a bar code whose numbers may conflict with those already assigned. If products with these numbers are not in your store now, they are likely to be in the future, causing conflicts in your inventory system.

The leading Number System Character, (the first number of the 11 digits to be entered) should conform to these UPC assignments:

0,6,7,8 Regular UPC 12 digit codes with numbers assigned by the UPC Council. (Do not use 0 as the leading number for in-store marking).

2 Store-marked random weight items of meat and produce.

3 Reserved for National Drug Code and Health Related Items.

4 Use this leading digit for in-store marking of non-food items.

5 Reserved for coupons. Do not use this today, or you will not be able to process coupons through your system tomorrow.

UPC 2 and 5-character supplemental codes

The UPC standards include the addition of a 2 or 5-character supplemental code used with magazines and paperback books. To read the supplements, you must first enable them using the *WDP Reader Setup Menu*.

NOTE: Enabling the supplements disallows the reading of UPC codes from right to left to assure that the supplement does not get missed.

ISBN Specifications

ISBN (International Standard Book Numbering) bar codes are essentially EAN-13 with a 5 digit supplement, where the first 3 digits are the Bookland country codes of 978 for books and 977 for periodicals. Although the bar code contains 18 characters, the ISBN format uses only 9 of them, along with a newly calculated Mod-11 check digit. For example, a bar code containing the numbers 978055337062153495 would transmit as 0553370626 in the ISBN format. The WDP has the option of transmitting in the ISBN format.

ISBN specifications are available from:

American National Standards Institute
Customer Service
11 West 42nd St.
New York, NY 10036
http://web.ansi.org
document ISO 2108:1992

The UPC/EAN checksum character

The last character in a UPC-A, UPC-E, UPC-E1, EAN-13 or EAN-8 bar code is the checksum. For reference, these are the methods of calculation:

Checksum calculation for UPC-A, EAN-13 and EAN-8
Use Worth Data's phone number (it's not a real UPC-A code) as sample data:

18314589938

Assign even and odd positions, starting at the right and moving left:

8	3	9	9	8	5	4	1	3	8	1
odd	even	odd	even	odd	even	odd	even	odd	even	odd

1. Starting with the leading digit, 8, take the sum of all the characters in the odd positions.

   8 + 9 +8 + 4 + 3 + 1 = 33

2. Multiply the result of step 1 by 3.

   33 x 3 = 99

3. Now take the sum of all the even-position characters.

   3 + 9 + 5 + 1 + 8 = 26

4. Add the result in Step 2 to the result in Step 3.

   99 + 26 = 125

5. Subtract the result from the next higher multiple of 10.

   Next higher multiple of 10 over 125 = 130
   130 - 125 = 5

5 is the Modulo-10 check character. The data to be printed becomes:

183145899385

This same formula is used for EAN-13 (using the 1-12 digits) and EAN-8 (using the 1-7 digits).

UPC-E Checksum Calculation

Use the sample data of 123456 to demonstrate the UPC-E checksum calculation:

1. The 6 digit UPC-E code is converted to a 10-digit code, using an expansion scheme based on the sixth digit:

Because the sample UPC-E code ends in a 6, the insertion digits 0000 are inserted at the sixth digit (insertion position 6):

1234500006

2. Add the Number System Character of 0 to the sample data:

01234500006

3. Use the UPC-A check digit calculation described in the previous section to produce a check digit as if it were a UPC-A code. The check digit for the sample data is:

5

4. The complete 8 digit code consists of the Number System Character, the original 6 digit code and the check digit:

01234565

If the code ends in:	UPC-E data	Insertion digits	Insertion Position	10 digit code
0	abcde0	0 0 0 0 0	3	ab 0 0 0 0 0 cde
1	abcde1	1 0 0 0 0	3	ab1 0 0 0 0 cde
2	abcde2	2 0 0 0 0	3	ab2 0 0 0 0 cde
3	abcde3	0 0 0 0 0	4	abc0 0 0 0 0 de
4	abcde4	0 0 0 0 0	5	abcd 0 0 0 0 0 e
5	abcde5	0 0 0 0	6	abcde 0 0 0 0 5
6	abcde6	0 0 0 0	6	abcde 0 0 0 0 6
7	abcde7	0 0 0 0	6	abcde 0 0 0 0 7
8	abcde8	0 0 0 0	6	abcde 0 0 0 0 8
9	abcde9	0 0 0 0	6	abcde 0 0 0 0 9

Appendix F

MSI/Plessey Specifications

Plessey is a variable length numeric only bar code. MSI Bar Code is a variable length, numeric-only code with an automatically appended Modulus 10 check digit. MSI is sometimes called Modified Plessey Code. If the user specifies an additional check digit, the MSI code can be 14 digits long, otherwise it has a maxi-mum length of 13 characters. This is how the MSI check digit(s) are calculated:

The MSI Mod 10 check digit is calculated as follows:
The example bar code data is:

82345

1. Form a number from the odd positions, starting in the units position.

   835

2. Multiply the new number by 2

   (835) x 2 = 1670

3. Add the digits of product

   1 + 6 + 7 + 0 = 14

4. Add the even digits of the original number to the result in 3

   2 + 4 + 14 = 20

5. Subtract the result from the next highest multiple of 10

   20 - 20 = 0

6. New Check Digit

   0

7. Data with check digit is:

   823450

The MSI Mod 11 check digit is calculated as follows:
The example bar code data is:

943457842

1. Assign a checking factor to each number, starting with the units position of the number (in this example, the 2) up to the highest order position (the 9). Use checking factors of:

   2,3,4,5,6,7,2,3,4,5,6,7...

2. Multiply the checking factor with its assigned number and add the products:

   4 + 12 + 32 + 35 + 30 + 28 + 6 + 12 + 36 = 195

3. Divide the sum by 11

   195/11 = 17 remainder 8

4. Subtract remainder from 11

   11 - 8 = 3

5. New Check Digit

   3

   (If the remainder is 10, no check digit is added.)

6. Data with check digit is:

   943457823

Appendix G

Code 93 Specifications

Code 93 is variable length, continuous, bi-directional, compact code. Code 93 is an alphanumeric bar code which consists of 43 data characters (0-9,A-Z,$/+% .- and Space), 4 control characters, and a unique start/stop character. The entire set of 128 ASCII characters is represented in Code 93 using combinations of control characters and data characters.

The control characters are ($) (%) (/) and (+) . Full ASCII 93 is created by pairing these control characters with normal data characters. It is almost identical to the pairings for Code 39; Code 39 uses $*M* to produce a Carriage Return (ASCII 13) character -- Code 93 uses ($) M to produce the Carriage Return.

Code 93's two built-in check digits greatly minimize the possibility of reader substitution errors. These check digits are never transmitted by the bar code reader. Code 93's Start and Stop characters are also never transmitted.

If you have not decided which bar code type to use for your application and are considering using Code 93, while we agree that Code 93 is an excellent code, we believe that Code 128 is generally preferable because:

1. Code 93 does not have the numeric compression capability that 128 does, and
2. Code 93 requires pairings to make all Full ASCII characters while 128 does not.

Appendix H

ASCII Code Equivalent Table

The 128 ASCII codes and their 3 digit decimal equivalents are detailed in the table below.

Char	hex	ASCII	Char	hex	ASCII	Char	hex	ASCII	Char	hex	ASCII
NUL	00	000	SP	20	032	@	40	064	‘	60	096
SOH	01	001	!	21	033	A	41	065	a	61	097
STX	02	002	“	22	034	B	42	066	b	62	098
ETX	03	003	#	23	035	C	43	067	c	63	099
EOT	04	004	$	24	036	D	44	068	d	64	100
ENQ	05	005	%	25	037	E	45	069	e	65	101
ACK	06	006	&	26	038	F	46	070	f	66	102
BEL	07	007	‘	27	039	G	47	071	g	67	103
BS	08	008	(	28	040	H	48	072	h	68	104
HT	09	009	)	29	041	I	49	073	i	69	105
LF	0A	010	*	2A	042	J	4A	074	j	6A	106
VT	0B	011	+	2B	043	K	4B	075	k	6B	107
FF	0C	012	,	2C	044	L	4C	076	l	6C	108
CR	0D	013	-	2D	045	M	4D	077	m	6D	109
SO	0E	014	.	2E	046	N	4E	078	n	6E	110
SI	OF	015	/	2F	047	O	4F	079	o	6F	111
DLE	10	016	0	30	048	P	50	080	p	70	112
DC1	11	017	1	31	049	Q	51	081	q	71	113
DC2	12	018	2	32	050	R	52	082	r	72	114
DC3	13	019	3	33	051	S	53	083	s	73	115
DC4	14	020	4	34	052	T	54	084	t	74	116
NAK	15	021	5	35	053	U	55	085	u	75	117
SYN	16	022	6	36	054	V	56	086	v	76	118

Appendix I

Resolving USB Installation Issues

The USB HID (Human Interface Device) keyboard driver is standard with Windows. All recent versions of Windows include necessary files in the installed Windows system folders so driver installation is easy if not automatic. It is possible for the user to cancel the HID driver installation before it is completed and this results in a problem. Also Windows 10, 8 & 7 Systems may not automatically load the driver - Requiring you to manually install the driver from the ***Device Manager*** in the **Control Panel.**

Restarting Windows does NOT initiate a re-installation; the user must go into the device management utility in Windows. Location and operation of the device management utility is different depending on the version of Windows:

Windows 10:

1. Click the Windows **Start Menu**
2. Select **Settings** ⚙
3. At The *Windows Settings* Type: **Device Manager** into the "Find a setting" Box
4. Select **Device Manager** under the Search Box
5. Double Click on **Human Interface Devices**
6. Locate the USB Human Interface Device with a **!** in the icon.
7. Click on **Update Driver**
8. Follow instructions.

If Windows 10 fails to find the driver on the computer's hard disk, you may have to insert and point to the original Windows 10 CD-ROM or DVD to complete the installation. However, the HID Keyboard driver is a standard component of the Windows Operating System so you should just be able to select "Use Best Available Driver" and it will install the correct driver by default.

Also make sure you have rights to add new hardware to your computer - many Windows 10 installations problems can be solved by logging in as the **Administrator** of the computer which allows the user to add new Hardware. In the Windows 10 *Control Panel* you may need to change the User Account Settings using the **User Account** icon in the Control Panel.

Windows 8, 8.1:

1. Navigate to the Desktop Portion of Windows 8 (Click on the **Windows Key** or the **Desktop Tile**)
2. Open the **Charms Bar** by moving your Mouse to the Right Corner of the Screen
3. Click **Settings** ⚙
4. Click **Control Panel** - or Type Device Manager in the Search Box
5. Select **Hardware** tab.
6. Select **Device Manager** - If you do not see Device Manager click the "View by:" drop down and select "Small icons"
7. Double Click on **Human Interface Devices**
8. Locate the USB Human Interface Device with a **!** in the icon.
9. Click on **Update Driver**
10. Follow instructions.

If Windows 8 fails to find the driver on the computer's hard disk, you may have to insert and point to the original Windows 8, CD-ROM or DVD to complete the installation. The HID Keyboard driver is a standard component of the Windows Operating System so you should just be able to select "Use Best Available Driver" and it will install the correct driver by default. Also make sure you have rights to add new hardware to your computer - many Windows 8 installations problems can be solved by logging in as the **Administrator** of the computer with Hardware Installation Rights. You may need to turn off the **UAC** (UserAccount Control). **UAC** is turned off using the **User Account** icon. UAC is turned on using the **Security Center** icon.

Windows 7 & Vista:

1. Go to the **Start menu.**
2. Select **Control Panel**.
3. Switch to **Classic View** if you are in **Category View**
4. Select **System**.
5. Select **Hardware** tab.
6. Select **Device Manager**
7. Double Click on **Human Interface Devices**
8. Locate the USB Human Interface Device with a **!** in the icon.
9. Click on **Update Driver**
10. Follow instructions.

If Windows 7 or Vista fails to find the driver on the computer's hard disk, you may have to insert and point to the original Windows CD-ROM or DVD to complete the installation. The HID Keyboard driver is a standard component of the Windows Operating System so you should just be able to select "Use Best Available Driver" and it will install the correct driver by default. Also make sure you have rights to add new hardware to your computer - many installations problems can be solved by logging in as the **Administrator** of the computer with Hardware Installation Rights. You may need to turn off the **UAC** (UserAccount Control). **UAC** is turned off using the **User Account** icon. UAC is turned on using the **Sercurity Center** icon.

Windows XP:

1. Go to the **Start menu.**
2. Select **Control Panel**.
3. Switch to **Classic View** if you are in **Category View**
4. Select **System**.
5. Select **Hardware** tab.
6. Select **Device Manager**
7. Double Click on **Human Interface Devices**
8. Locate the USB Human Interface Device with a **!** in the icon.
9. Click on **Update Driver**
10. Follow instructions.

If XP fails to find the driver on the computer's hard disk, you may have to insert and point to the original Windows XP CD-ROM to complete the installation. Also make sure you have rights to add new hardware to your computer - some XP installations problems can be solved by logging in as the **Administrator** of the computer.

11. Click **Finish**

Windows 2000:

1. Log on as **Administrator** and open the **Administrative Tools** folder in your **Control Panel**.
2. Run the **Computer Management** utility.
3. Select the **Tree** tab on the left panel
4. Find the **Device Manager** entry under **System Tools** and click on it. The right panel will display current devices.
5. Problem devices will be identified with an **!** icon. Find either the **HID Keyboard Device** under ***Keyboards*** or the **USB Human Interface Device** under ***Human Interface Devices*** and double-click on one of those entries.
6. Select the **Driver** tab at the top of the window and click on the **Update Driver** button. Follow the prompts to re-install the HID driver.

Windows 98SE & ME:

1. Go to the **Start** menu.
2. Go to **Settings**.
3. Select **Control Panel**.
4. Go to **System**.
5. Click on the **Device Manager** tab.
6. Double Click on the **USB Human Interface Devices**
7. Click on the **Reinstall Driver** button.
8. Follow directions. If the installer cannot find the right driver file on your hard disk, you may have to insert the original Windows® 98SE or ME CD-ROM and point to it to complete the installation.
9. Click **Finish**.

WDP Setup Menu

START SETUP

Scan **START SETUP** to enter setup mode

WDP Setup Menu

RESET

Warning: *Scanning this bar code after scanning START SETUP will reset the reader back to all of the default parameter settings.*

WDP Setup Menu

2 of 5 Length

Scan 2 digit length (default is 06)

WDP Setup Menu

MSI / Plessey

*0) **Disable MSI**
1) Enable MSI 1 Mod 10 check digit
2) Enable MSI 2 Mod 10 check digits
3) Enable MSI Mod 11/10 check digits
*4) **Transmit no check digit**
5) Transmit 1 check digit
6) Transmit 2 check digits
7) Enable Plessey
8) Enable Labelcode 5
9) Enable Labelcode 4

WDP Setup Menu

Postamble

Scan up to 15 characters from the **Full ASCII Menu**.
Scan **SET** when completed.

WDP Setup Menu

CLEAR

Clears Preamble & Postamble and resets current individual parameter back to default settings.

WDP Setup Menu

UPC / EAN

*0) **Enable UPC/EAN**
1) Disable UPC/EAN
2) Enable Supplements
*3) **Disable Supplements**
*4) **Transmit UPC-A NSC**
5) Don't transmit UPC-A NSC
*6) **Transmit UPC-A Check Digit**
7) Don't transmit UPC-A Check Digit
8) Transmit UPC-E NSC & EAN-8 Flag Ch
9) **Don't transmit UPC-E NSC & EAN-8 Flag Ch**
A) Transmit UPC-E & EAN-8 Check digit
* B) **Don't transmit UPC-E & EAN-8 Check digit**
* C) **UPC-E Compressed transmission**
D) UPC-E Expanded transmission
* E) **EAN-8 observes 9 & A above**
F) EAN-8 is forced to transmit 8 digits always

WDP Setup Menu

Codabar

0) Enable Codabar
*1) **Disable Codabar**
2) Enable CLSI Codabar
*3) **Disable CLSI Codabar**
*4) **Suppress start/stop characters**
5) Enable start/stop characters

WDP Setup Menu

Data Transmission Timing

*0) **None**
1) Short
2) Short Medium
3) Medium
4) Long

This adjusts for differences in BIOS and clock speeds

WDP Setup Menu

Beep Tone

0) Lowest
1) Low
*2) **Medium**
3) High
4) Highest
5) No Beep Tone

WDP Setup Menu

SET

WDP Setup Menu

END SETUP

When all changes have been made, scan **END SETUP**

WDP Setup Menu

2 of 5 Code

0) Enable I 2 of 5
* **1) Disable I 2 of 5**
2) Enable check digit
* **3) Disable check digit**
4) Transmit check digit
* **5) Don't transmit check digit**
6) Enable 2 of 5
* **7) Disable 2 of 5**

WDP Setup Menu

Code 3 of 9

* **0) Enable Code 39**
1) Disable Code 39
* **2) Enable Full ASCII Code 39**
3) Disable Full ASCII Code 39
* **4) Enable Accumulate Mode**
5) Disable Accumulate Mode
6) Transmit Start/Stop characters
7) Don't transmit Start/Stop characters
8) Enable Mod 43 Check Character
* **9) Disable Mod 43 Check Character**
A) Transmit Mod 43 Check Character
* **B) Don't transmit Mod 43 Check Character**
C) Caps Lock ON
* **D) Caps Lock OFF**

WDP Setup Menu

RSS-14

* **0) Disable RSS-14**
1) Standard 14 digits
*3) 14 + identifiers
*4) 14 + UCC-128 emulation

WDP Setup Menu

Code 128

0) Disable 128
* **1) Enable 128**
2) Disable UCC/EAN-128
3) Enable UCC/EAN-128

WDP Setup Menu

Preamble

Scan up to 15 characters from the **Full ASCII Menu**.
Scan **SET** when completed.

WDP Setup Menu

Computer Interface

* **1) PC Keyboard and USB Wedge Saver**
3) PC Learned Timing

WDP Setup Menu

Magstripe

* **0) None**
1) Track 1
2) Track 2
3) Track 3
4) Tracks 1 & 2, 2 & 3
* **E) Caps Lock OFF**
F) Caps Lock ON

WDP Setup Menu

Characters

Scan up to 8 sets of hex characters to reassign and delete characters in the bar code output.
Scan **SET** when completed.

WDP Setup Menu

Terminator Character

*0) Enter
1) None
2) Tab

WDP Setup Menu

Keyboard Country

*00) USA
01) French
02) German
03) Belgian
04) Fr. Canadian
05) Danish
06) Dutch
07) Italian
08) Latin Amer.
09) Norwegian
10) Portuguese
11) Spanish
12) Swedish
13) Swiss
14) U.K.

WDP Setup Menu

3

4

WDP Setup Menu

7

8

WDP Setup Menu

A

B

WDP Setup Menu

E

F

WDP Setup Menu

1

2

WDP Setup Menu

Code 93

0) Enable Code 93
*** 1) Disable Code 93**

2) Enable Full ASCII Code 93
*** 3) Disable Full ASCII Code 93**

WDP Setup Menu

9

0

WDP Setup Menu

5

9

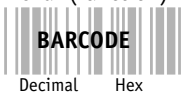
WDP Setup Menu

C

D

LEGEND:

Char (function)



Full ASCII Menu

(Items in parentheses are transmitted in keyboard wedge mode.)

NUL 000 00	DLE(f10) 016 10	SP 032 20	0 048 30	@ 064 40	P 080 50	` 096 60	p 112 70
SOH(f1) 001 01	DC1(Del) 017 11	! 033 21	1 049 31	A 065 41	Q 081 51	a 097 61	q 113 71
STX(f2) 002 02	DC2(Ins) 018 12	“ 034 22	2 050 32	B 066 42	R 082 52	b 098 62	r 114 72
ETX(f3) 003 03	DC3(←) 019 13	# 035 23	3 051 33	C 067 43	S 083 53	c 99 63	s 115 73
EOT(f4) 004 04	DC4(→) 020 14	$ 036 24	4 052 34	D 068 44	T 084 54	d 100 64	t 116 74
ENQ(f5) 005 05	NAK(↓) 021 15	% 037 25	5 053 35	E 069 45	U 085 55	e 101 65	u 117 75
ACK(f6) 006 06	SYN(↑) 022 16	& 038 26	6 054 36	F 070 46	V 086 56	f 102 66	v 118 76
BEL(f7) 007 07	ETB(Home) 023 17	‘ 039 27	7 055 37	G 071 47	W 087 57	g 103 67	w 119 77
BS 008 08	CAN(End) 024 18	(040 28	8 056 38	H 072 48	X 088 58	h 104 68	x 120 78
HT 009 09	EM(Shift ON) 025 19	) 041 29	9 057 39	I 073 49	Y 089 59	i 105 69	y 121 79
LF 010 0A	SUB(Shift OFF) 026 1A	* 042 2A	: 058 3A	J 074 4A	Z 090 5A	j 106 6A	z 122 7A
VT(Pg Up) 011 0B	Esc 027 1B	+ 043 2B	; 059 3B	K 075 4B	[091 5B	k 107 6B	{ 123 7B
FF(Pg Dn) 012 0C	FS(Ctrl ON) 028 1C	, 044 2C	< 060 3C	L 076 4C	\ 092 5C	l 108 6C	| 124 7C
CR 013 0D	GS(Ctrl OFF) 029 1D	- 045 2D	= 061 3D	M 077 4D	] 093 5D	m 109 6D	} 125 7D
SO(f8) 014 0E	RS(Alt ON) 030 1E	. 046 2E	> 062 3E	N 078 4E	^ 094 5E	n 110 6E	~ 126 7E
SI(f9) 015 0F	US(Alt OFF) 031 1F	/ 047 2F	? 063 3F	O 079 4F	_ 095 5F	o 111 6F	DEL 127 7F