USB Laser Scanners

Scanned 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.

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CLASS II LASER   C E   FC   USB

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Introduction

Worth Data's USB Keyboard Laser Scanners are versatile bar code readers that attach to a USB port on a PC Computer running Windows®, macOS, Mac OS X, or Linux operating systems. 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 Laser Scanner features include:

- **LZ165-USB, LZ365-USB 1D Bar code Laser Scanners**

    These Bar Code Laser Scanners automatically read and discriminate between all common 1D Bar Codes including; 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.

    If you need to read 2D Bar Codes you will need the Worth Data 520-2D USB Imaging Scanner.

- **Configuration is easy**

    The USB Lasser Scanners are easily configured for your system by scanning a bar coded **USB Laser Setup Menu**. 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 menu.

    Jump to the Setup Menu (Appendix J)

Getting Started

Components of USB Laser Scanner

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 Laser Scanner shipment should include some or all of the following:

1. The Laser Scan Gun.

2. A USB Cable installed on the gun for attaching the Laser Scanner to your computer.
   For the: **LZ165-USB & LZ365-USB a C45** USB Cable/End Cap assembly is Pre-Installed

3. A Laser Scanner Holder for Desk or Wall Mounting.

4. A QwikStart Installation Guide.

Installation

The Laser Scanners attach directly to a USB port on a computer using the installed C45 USB Cable/End Cap assembly for the LZ165-USB and LZ365-USB Laser Scanners. The Windows®, Macintosh® or Linux operating systems provide the software required to access the USB port. Data coming from the scanner through the USB port appears as keyboard data in your application.

Models with built-in USB are:
LZ165-USB Laser Bar Code Reader
LZ365-USB Laser Bar Code Reader

USB Installation for PC or Mac

Model LZ165-USB, LZ365-USB
The USB Laser Scanners have a USB cable that can be attached directly to the USB port on any Computer Running Windows, macOS, Mac OS X, or Linux. The LZ165-USB and LZ365-USB Readers use a C45 USB Cable/End Cap assembly.

When you plug the Reader into the USB port on a computer running Windows 11, 10, 8 , 7, Vista, XP, 2000, ME, 98SE or Mac OS X, the operating system will sense the new device and proceed to install the necessary software for a HID USB Keyboard (Older Windows systems may ask for the original Windows installation media to install the needed USB drivers - be prepared). There are no additional drivers needed other than what is already standard in Windows or the Mac OS. To install the Laser Scanners on the USB port:

1. Plug the flat USB connector end of the C45 USB Cable/End Cap assembly into an available USB Port on the host computer or USB hub. Make sure you are using a full power USB port. Many laptops, and newer mini form factor computers, will sometimes have low powered USB ports. You should use on of the motherboard USB ports or use a powerd hub for sytems with low power USB ports.

2. The computer will sense the USB device and install the necessary software. The necessary drivers are standard in both Windows, Mac & Linux. 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.

USB Laser Installation

USB Laser Scanner Setup

Configuring the USB Laser Scanner

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

Find the ***USB Laser Scanner Setup Menu*** at the end of the manual in ***Appendix J*** of this manual and print it out (the scanner will not scan from a screen). This simple menu lets you easily configure the Worth Data USB Laser Scanners to work with almost any computer system, and tailor its bar code reading and formatting characteristics precisely to your needs. To scan ***USB Laser Scanner 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.*

Below are the USB Laser Scanner's default settings. The Scanners are shipped configured 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 ***USB Laser Scanner Setup Menu***. If you need to change any settings, or want to learn more about the USB Laser Scanner setup 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		
Other Settings	NO preamble or postamble set		
	CR as Terminator Character		
	Medium pitch beep tone		

Using the USB Laser Setup Menu

The **USB Laser Setup Menu** provided in Appendix J of this manual, or on our website www.barcodehq.com/downloads.html. You need to print the PDF menu to scan it properly.

1 If you have never scanned before, refer to **Chapter 3** for scanning instructions. To configure your reader using the *USB Laser Setup Menu,* you must first scan the **Start Setup** code at the top left corner. Do this now. You'll hear two beeps. During Setup, nothing will be transmitted to your computer; the 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 code. 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 Table" on the right side of the Reader Setup Menu, 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 "Barpad Table". You will again hear two beeps.

4 Now scan **End Setup** (at the top-right corner of the *USB Laser Setup Menu* 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 Setup Option. Default settings are shown in bold in this manual and are marked with an * on the *USB Laser Setup Menu*.

USB Laser Setup Menu Configuration Options

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 USB Laser Scanner 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 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 Scanner 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 scanner 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 USB Laser Scanner 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 Scanner 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 users: **Emulating special keys in the preamble:** Programmers and other advanced 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 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 USB Laser Scanner 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 USB Laser Scanner for your non-US keyboard -- instead, use the *Keyboard Country* option described below.)

For example: Suppose you want the USB Laser Scanner 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 USB Laser Scanner 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	03
Fr. Canadian	04	Danish	05	Dutch	06	Italian	07
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 USB Laser Scanner 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), you can get it by specifying **None** here and then selecting your desired terminator character(s) through the Postamble specification.

Chapter 3
Laser Scanners and Scanning Technique

Different bar code applications require different scanner solutions. Worth Data offers a variety of scanners and the features of our Laser Scanners are described below:

Laser Scanners offer not only the ease of "point-and-shoot" scanning, but allow the user to scan from a distance away. These features make Lasers easier use and allow the user to scan bar codes in hard-to-reach places (i.e. shelves).

Worth Data offers the following USB Laser Scanners: **LZ165-USB**, and **LZ365-USB**. Laser's offer these advantages:

✔ Fast reading of difficult-to-read bar codes

✔ Can read bar codes from a distance: .5" - 9.5" for the LZ160-USB Laser
.5"- 13" for the LZ365-USB Laser

✔ Can read moving objects, such as on an assembly line

✔ No-hands operation when mounted in our S11 or S21 Stand. Scanners mounted in these stands have a sensor and automatically scan when an object passes underneath them. See page 3-3 for details on stand use.

✔ Ability to read through thick (up to five inches) glass or plastic laminates

✔ Ability to read curved or uneven surfaces, such as plastic bags of items.

✔ Rugged Handle & Case - Recessed Scratch Resistant Optical Window

Laser Scanners

LZ165-USB

The LZ165-USB Keyboard Laser Scanners are triggered, visible light, laser scanners. They can read from 1" to 9.5" away, depending on the length of the bar code. There is no particular limitation on the length of the bar code, readability is dependent on both the density of the code (how close or far apart the bars and spaces are) and the length of the code. The LZ165-USB can read curved and uneven surfaces. The Laser scans 48 times per second, scanning until it has a successful read - to the user, reading is instantaneous. The LZ165-USB is durable and well suited for every day use and can read bar codes with a 3.3mil narrow bar for high density reading. This is equivalent to a 19cpi Code 39 bar code. If you need to read even higher density codes take a look at the LZ365-USB scanners below that use a more powerful scan engine.

LZ365-USB

The LZ365-USB Keyboard Laser Readers are triggered, visible light laser scanners. They can read from 0" to 13" away, depending on the length of the bar code. There is no particular limitation on the length of the bar code, readability is dependent on both the density of the code (how close or far apart the bars and spaces are) and the length of the code. The LZ365-USB can read curved and uneven surfaces. The Laser scans 100 times per second, scanning until it has a successful read - to the user, reading is instantaneous. The LZ365-USB uses the high performance scan engine, is very durable, and has a 3 year warranty - it is well suited for every day use.

Tips for Laser Scanning

Simply aim the laser scanner straight at the bar code and pull the trigger. The beam must cover the bar code from end-to-end, including a "quiet zone" of white space both before and after the bar code. The beam should cover only 1 bar code. Use a piece of blank paper to cover any adjacent bar codes if they are too close to the one you are trying to scan.

To read longer bar codes, move the Laser further away to create a wider beam. To read bar codes that are "high density" (the bars and spaces are very close together), you will need to move the Laser closer to the bar code.

With the LZ165-USB, you can read a typical 100% UPC code from .5" to 9.5" away, the LZ365-USB, you can read a typical UPC code from 1" to 13" away. You should be able to read the Test Label shown below with any Worth Data Laser - LZ165, LZ365 - from anywhere between 1" to 9" away - probably even further!

Our lasers use a low-power, 650-680 nm IEC/CDRH Class II visible laser diode. Although momentary exposure to a CDRH II laser scanner is not known to be harmful, avoid staring directly into the beam or shining the beam into CAUTION CLASS 2 LASER LIGHT - DO NOT STARE INTO BEAM

Avoid aiming the laser into your own eyes or other people's eyes. The required safety label advising the user of the laser cautions appears on our lasers as shown below.

Right   Wrong   Wrong

TEST LABEL

CLASS II LASER

Laser Scanner Options

Special options for your Laser Scanner that can be set from the bar coded **USB Laser Setup Menu**:

Multiple Decode - Redundancy

By default, the Laser Scanner keeps reading until it gets two results that are exactly the same. This "double-scan decode mode" takes a little longer but minimizes the possibility of misreads - especially when reading poorly printed codes or reading through windshields. For even stricter scanning you can increase or decrease the decode tries up to 4 times to ensure perfect decoding.

To **change** "multiple decode settings" :
    Scan **Start Setup**
    Scan **Code 128**
    Scan **4** to enable "single-scan decode mode"
    Scan **5** to enable "double-scan decode mode" **DEFAULT MODE**
    Scan **6** to enable "triple-scan decode mode"
    Scan **7** to enable "quadruple-scan decode mode"
    Scan **End Setup**

Stand Mode: Scanning the same bar code twice

This will work for the LZ165-USB and the LZ365-USB.
When using the scanner in "Stand Mode", you can scan the same bar code two times in a row by simple holding the bar code under the scanner for 3 seconds. To avoid accidental reading of the same bar code twice, you can lengthen the amount of time the scanner requires to read the bar code again. Setting the time to the maximum (9) should guarantee that you will not accidently scan the same bar code twice. Alternately, you can shorten the time (the default is 3) to reduce the amount of time you need to keep the bar code under the scanner.

    Scan **Start Setup**
    Scan **Preamble**
    Scan _ x, where x=1-9 seconds (the default is 3, the _ character is ASCII 095/HEX 5F on the Full ASCII Menu)
    Scan **SET**
    Scan **End Setup**

"Hands-Free" Scanning

A stand is available for the all of the Worth Data Lasers that allows for "hands-free" bar code reading. The stand is available in a mountable "goose neck" (S11) or in a free-standing version with a base (S21) pictured below. Just before placing the scanner in the stand, scan the "**Stand On/Off**" bar code on the stand or on the **USB Laser Setup Menu** to put the scanner into automatic-reading mode.

When using a Laser in "stand" mode, the important thing is to position the laser correctly in the stand for efficient scanning of your items. There is a sensor in the front of the scanner that will turn the laser beam on when an item is passed in front of the scanner. You will know the laser is angled or positioned correctly by observing how quickly the laser turns on when you pass an item under it - adjust as needed to get the best results for your situation.

The older LI50 and LI50-WDP CCD's, plus the LZ150, LZ150-XXX, LZ300, LZ310-XXX, LZ400, LZ410-XXX, LZ160-USB, & LZ360-USB lasers can be used with the stand also. As with the laser scanners described above, you must scan the bar code on the stand to put the reader into "stand" mode before placing it in the stand. Once in "stand" mode, the bar code can be presented anywhere from .5" to 7" (dependent upon density) away from the scanner and be read without having to pull the trigger.

The LI50 and LI50-WDP CCD's can also work in "triggerless" mode without the stand. Simply scan the "**Stand On/Off**" bar code and the CCD will always be scanning. This is useful in scanning columns of bar codes on a page. To return to "triggered" scanning, just scan the "**Stand On/Off**" bar code again.

Special Features

Function and Control Key Support

The USB Laser Scanners 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		PC Key	Mac Key	Full ASCII Menu Bar Code
F1	F1	SOH (f1)		Left Arrow*	Left Arrow+	DC3 ( )
F2	F2	STX (f2)		Rt Arrow*	Rt Arrow+	DC4 (→)
F3	F3	ETX (f3)		Dn Arrow*	Dn Arrow+	NAK ( )
F4	F4	EOT (f4)		Up Arrow*	Up Arrow+	SYN ( )
F5	F5	ENQ (f5)		Pg Up*	Pg Up+	VT (Pg Up)
F6	F6	ACK (f6)		Pg Dn*	Pg Down+	FF (Pg Dn)
F7	F7	BEL (f7)		Home*	Home+	ETB (Home)
F8	F8	SO (f8)		End*	End+	CAN (End)
Numpad 5*	Enter	LF		Shift ON	Shift ON	EM (Shift ON)
Enter	Return	CR		Shift OFF	Shift OFF	SUB (Shift OFF)
F9	F9	SI (f9)		Control On	Control On+	FS (Ctrl ON)
F10	Cmnd On	DLE (f10)		Control Off	Control Off+	GS (Ctrl OFF)
Del	Del	DC1 (Del)		Alt On	Option On	RS (Alt ON)
Insert	Cmnd Off	DC2 (Ins)		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		PC Key	Mac Key	Full ASCII Menu Bar Codes
Insert	Ins	NUL 0		Right Arrow	right arrow	NUL 6
Delete	del	NUL . (period)		Home	home	NUL 7
End	end	NUL 1		Up Arrow	up arrow	NUL 8
Down Arrow	down arrow	NUL 2		Page Up	page up	NUL 9
Page Down	page down	NUL 3		Windows ON	control ON	NUL C
Left Arrow	left arrow	NUL 4		Windows OFF	control OFF	NUL D
Line Feed	Line Feed	NUL 5		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 USB Laser Scanner 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 USB Laser Scanner 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).

If you have an older Worth Data Reader (before 6/1999), you can also imitate the Command Key by keycodes in the Preamble/Postamble. To transmit Command N would be:`E01F'N`E0F01F'

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	

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 front of the Computer, try connecting to a USB port on the Computer Motherboard 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.

- Some Laptops do not provide the power required for our USB Scanners to operate - so you would need a USB Hub in that situation as well

The USB reader powers up and beeps when a bar code is scanned but no data is transmitted.
- Check your **HID** devices - Go to the **Control Panel**, then to **System**, then **Device Manager**. 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 attempting to read a bar code
- 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.

- If you have very poorly printed bar codes you may need to increase the length of time the scanner attempts to read. The default is a 2-second beam. To change to a 4-second beam, scan *Start Setup*, *2 of 5 Code*, **F**, then *End Setup*. Scanning **E** instead of F sets the beam back to 2 seconds.

- Make sure the Beeper Setting is not set to "None". This disables the beep on a good read.

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 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 **USB Laser Setup Menu**, disable Full ASCII Code 39.

- If you are reading poorly printed codes or scanning through a windshield, make sure "double-scan checking" is enabled (It is the default setting). "Double-scan checking" does take longer (it forces the reader to keep scanning until it gets two identical reads) but will eliminate mis-reads. "Double-scan checking" is set under the Code 39 setup parameter by scanning *Start Setup*, *Code 39*, **E**, then *End Setup*. Scanning **F** instead of **E** will disable this option.

Poor read rate
- Try reading the test label on page 3-2 (following the scanning instructions in **Chapter 3**) as an example of a known good bar code. 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.

Firmware Updates

The LZ165-USB & LZ365-USB scanners can be updated with the latest firmware in the field.
Firmware can be updated via USB by following the instructions below on a computer running Windows 11, 10, 8, 7, Vista or XP. Note this is a process that if not followed correctly could make the scanner in-operable and require the failsafe loading to complete the firmware update.

Step 1:
Download the latest firmware from www.barcodehq.com/downloads.html. The firmware will be in the **LZ165-USB & LZ365-USB** Section. Save the file in a location you can remember, and point to, when the **Integrated Hardware Utilities** software requests the firmware file.

Step 2:
Run the **Integrated Hardware Utilities** (available from our downloads page), click on the **USB Laser Scanners** Tab, then click on the **Update Firmware**. Point to the firmware file downloaded in **Step 1**.

Step 3:
Scan the "Firmware Update" Bar Code below:

FIRMWARE UPDATE

The Green LED will turn off and the scanner will beep 10 short times in 2 different tones.
The device will enumerate as a winUSB device (driver is built into Windows)

Step 4:
Press the "Start Firmware Update" button on the **Integrated Hardware Utilities** Screen.
The scanner firmware will start updating...

When complete it will power up with the standard 3 beeps and enumerate as an HID Device. At this point you are done updated the device and can continue to use the scanner.

Firmware Update Failure - The USB reader no longer powers up or beeps.
In the unlikely event that the firmware update fails, and/or is aborted part way through you will need to do the Failsafe Process below.

Remove the USB cable from the computer.
Press and HOLD the trigger while plugging the USB cable back into the USB port on the computer. This will put the scanner in the ready to update firmware mode. At this point go to **Step 4** above and complete your firmware update.

Specifications for Code 39

123ABC

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 USB Laser Scanner 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	$	
39							
7	7	I	18	T	29	/	
40							
8	8	J	19	U	30	+	
41							
9	9	K	20	V	31	%	
42							
A	10	L	21	W	32		

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 charac-ters 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

a29934567a

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 **USB Laser 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 Laser Scanner and data coming from the keyboard. If neither of these situations apply, you'll probably want to disable it.

AB123456

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 USB Laser Scanner 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 Scanner 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 *USB Laser 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 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

(00) 1 0028028 300055004 6

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

Many of the specifications are available online at:

http://www.gs1us.org

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.

123456

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 USB Laser Scanner to look for one length of I 2 of 5 code only. By default, the USB Laser Scanner is set to look for a **6 digit** I 2 of 5 code but you can set the length to something different using the **USB Laser Setup Menu**. Setting the length to 00 digits allows variable length bar codes scanning. Using the 00 setting is not recommended as you will easily get misreads with different length I 2 of 5 codes.

- 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:

$$(7 + 9) \times 3 = 48$$

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

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 **USB Laser 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 Scanner 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:

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

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

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:

<div align="center">

82345
</div>

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

<div align="center">

835
</div>

2. Multiply the new number by 2

<div align="center">

(835) x 2 = 1670
</div>

3. Add the digits of product

<div align="center">

1 + 6 + 7 + 0 = 14
</div>

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

<div align="center">

2 + 4 + 14 = 20
</div>

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

<div align="center">

20 - 20 = 0
</div>

6. New Check Digit

<div align="center">

0
</div>

7. Data with check digit is:

<div align="center">

823450
</div>

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

<div align="center">

943457842
</div>

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:

<div align="center">

2,3,4,5,6,7,2,3,4,5,6,7...
</div>

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

<div align="center">

4 + 12 + 32 + 35 + 30 + 28 + 6 + 12 + 36 = 195
</div>

3. Divide the sum by 11

<div align="center">

195/11 = 17 remainder 8
</div>

4. Subtract remainder from 11

<div align="center">

11 - 8 = 3
</div>

5. New Check Digit

<div align="center">

3
(If the remainder is 10, no check digit is added.)
</div>

6. Data with check digit is:

<div align="center">

943457823
</div>

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 ⑨ ⑨ ⑨ and ⑨ .

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 ⑨ 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.

ASCII Code Equivalent Table

The 128 ASCII codes and their 3 digit decimal equivalents are detailed in the table below.
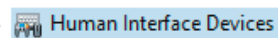
Char	hex	ASCII	Char	hex	ASCII	Char	hex	ASCII	Char	hex	ASCII
NUL	00	000	SP	20	032	@	40	064	'	60	096
SOH	01	001	!	21	033	A	41	065	a	61	097
STX	02	002	"	22	034	B	42	066	b	62	098
ETX	03	003	#	23	035	C	43	067	c	63	099
EOT	04	004	$	24	036	D	44	068	d	64	100
ENQ	05	005	%	25	037	E	45	069	e	65	101
ACK	06	006	&	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	0F	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
ETB	17	023	7	37	055	W	57	087	w	77	119
CAN	18	024	8	38	056	X	58	088	x	78	120
EM	19	025	9	39	057	Y	59	089	y	79	121
SUB	1A	026	:	3A	058	Z	5A	090	z	7A	122
ESC	1B	027	;	3B	059	[	5B	091	}	7B	123
FS	1C	028	<	3C	060	\	5C	092			7C	124
GS	1D	029	=	3D	061	]	5D	093	}	7D	125
RS	1E	030	>	3E	062	^	5E	094	~	7E	126
US	1F	031	?	3F	063	_	5F	095	DEL	7F	127

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 11 & 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**   › 🖭 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 fails to find the driver on the computer's hard disk, you may have to insert and point to the original Windows installation media 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 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 *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. In order to install new hardware in Windows 8 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 7 or Vista CD-ROM 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 7 or Vista installations problems can be solved by logging in as the **Administrator** of the computer with Hardware Installation Rights. In order to install new hardware in Windows 7 or Vista 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 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 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**.

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.

macOS USB Installation Issues

The Worth Data USB Laser Scanners use the generic USB HID class (Human Interface Device) keyboard driver that is standard with Mac OS 9.0, Mac OS X, and macOS. All of these versions of the Macintosh operating system already include necessary files in the Mac System folders, so driver installation is easy if not automatic, and no downloads are required.

Because our scanners mimic keyboard input, your Mac may display a Keyboard Setup Assistant when plugging the scanner in for the first time.

If you do see a dialog like this appear, there is no configuration needed for the scanner, and no need to hit any keys on the keyboard. Simply close the Assistant window, and start scanning!
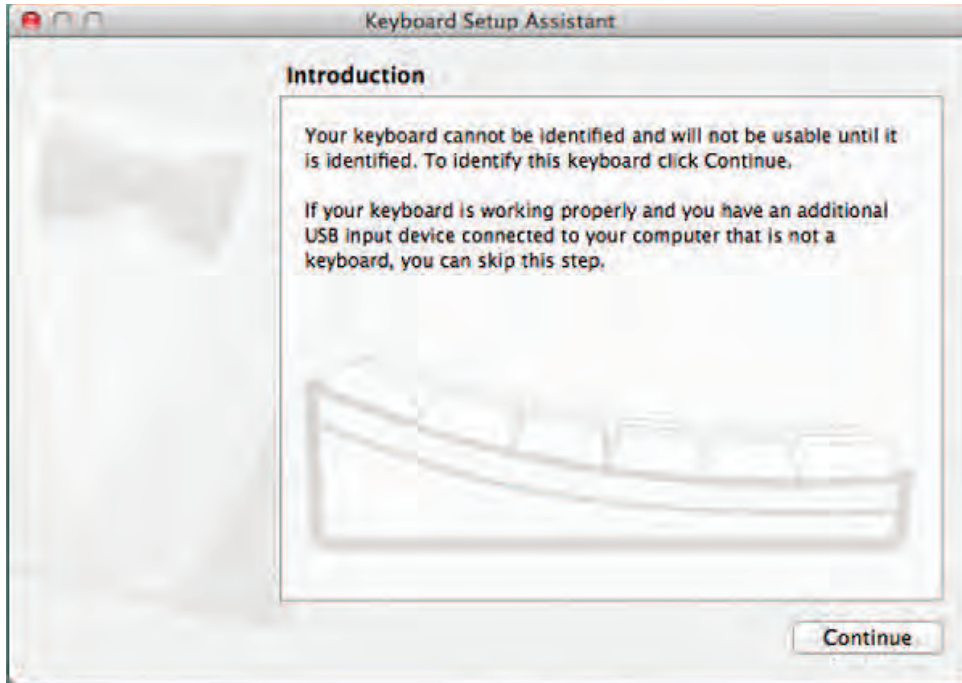
USB Laser Setup Menu

START SETUP

END SETUP

1. Scan **START SETUP** to put reader into Setup Mode
2. Scan the bar code of the parameter to change, (i.e. Code 3 of 9)
3. Scan bar codes from Barpad Table on right (0-9,A-F) to change settings
4. When all parameters and changes have been scanned, scan **END SETUP**
   (For Preamble and Postamble, Use Full ASCII Chart)

Barpad Table

0
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F

Code 3 of 9

* 0) Enable Code 39
  1) Disable Code 39
* 2) Enable Full ASCII
  3) Disable Full ASCII
* 4) Enable Accumulate Mode
  5) Disable Accumulate Mode
  6) Transmit Start/Stop
* 7) Don't Transmit Start/Stop
  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

UPC and 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 and EAN-8 Flag Ch
* 9) Don't Transmit UPC-E NSC or 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

2 of 5 Code

  0) Enable I 2of5
* 1) Disable I 2of5
  2) Enable Check Digit
* 3) Disable Check Digit
  4) Transmit Check Digit
* 5) Don't Transmit Ck Dg
  6) Enable 2 of 5
  7) Disable 2 of 5

Codabar

  0) Enable Codabar
* 1) Disable Codabar
  2) Enable CLSI Codabar
* 3) Disable CLSI Codabar
* 4) Suppress Start/Stop
  5) Enable Start Stop

2 of 5 Length

Scan 2 digit length
(Default is 06)

Code 128

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

Code 93

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

MSI/Plessey

* 0) Disable MSI
  1) Enable MSI 1 Mod 10
  2) Enable MSI 2 Mod 10
  3) Enable MSI Mod 11/10
  7) Enable Plessey
  8) Enable Labelcode 5
  9) Enable Labelcode 4
* 4) Transmit No Check Digit
  5) Transmit 1 Check Digit
  6) Transmit 2 Check Dig

GS1 DataBar RSS-14

* 0) Disable
  1) Standard 14 digits
  2) 14 + Identifiers
  3) 14 + UCC-128 Emul.

Terminator Character

* 0) Enter
  1) None
  2) Tab

Preamble

Scan up to 15 Characters from Full ASCII Menu. Scan SET when finished.

Postamble

Scan up to 15 Characters from Full ASCII Menu. Scan SET when finished.

SET

CLEAR

Clears Preamble and Postamble. Resets individual parameters back to Default setting

Beep Tone

  0) Lowest
  1) Low
* 2) Medium
  3) High
  4) Highest
  5) None

Characters

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

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.

Future Code 2

Future Code 1

RESET

WARNING scanning RESET after scanning START SETUP resets ALL parameters back to Default settings, eliminating any setup changes for all parameters.

STAND MODE ON/OFF

Scan this bar code to put Laser into and out of "hands-free" stand mode when using the S21 and S11 Stands. **DO NOT SCAN START SETUP and END SETUP.**

* denotes default setting   11/2016

Full ASCII Menu

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

NUL	DLE(f10)	SP	0	@	P	`	p
000 00	016 10	032 20	048 30	064 40	080 50	096 60	112 70
SOH(f1)	DC1(Del)	!	1	A	Q	a	q
001 01	017 11	033 21	049 31	065 41	081 51	097 61	113 71
STX(f2)	DC2(Ins)	"	2	B	R	b	r
002 02	018 12	034 22	050 32	066 42	082 52	098 62	114 72
ETX(f3)	DC3(←)	#	3	C	S	c	s
003 03	019 13	035 23	051 33	067 43	083 53	99 63	115 73
EOT(f4)	DC4(→)	$	4	D	T	d	t
004 04	020 14	036 24	052 34	068 44	084 54	100 64	116 74
ENQ(f5)	NAK(↓)	%	5	E	U	e	u
005 05	021 15	037 25	053 35	069 45	085 55	101 65	117 75
ACK(f6)	SYN(↑)	&	6	F	V	f	v
006 06	022 16	038 26	054 36	070 46	086 56	102 66	118 76
BEL(f7)	ETB(Home)	'	7	G	W	g	w
007 07	023 17	039 27	055 37	071 47	087 57	103 67	119 77
BS	CAN(End)	(	8	H	X	h	x
008 08	024 18	040 28	056 38	072 48	088 58	104 68	120 78
HT	EM(Shift ON)	)	9	I	Y	i	y
009 09	025 19	041 29	057 39	073 49	089 59	105 69	121 79
LF	SUB(Shift OFF)	*	:	J	Z	j	z
010 0A	026 1A	042 2A	058 3A	074 4A	090 5A	106 6A	122 7A
VT(Pg Up)	Esc	+	;	K	[	k	{
011 0B	027 1B	043 2B	059 3B	075 4B	091 5B	107 6B	123 7B
FF(Pg Dn)	FS(Ctrl ON)	,	<	L	\	l	|
012 0C	028 1C	044 2C	060 3C	076 4C	092 5C	108 6C	124 7C
CR	GS(Ctrl OFF)	-	=	M	]	m	}
013 0D	029 1D	045 2D	061 3D	077 4D	093 5D	109 6D	125 7D
SO(f8)	RS(Alt ON)	.	>	N	^	n	~
014 0E	030 1E	046 2E	062 3E	078 4E	094 5E	110 6E	126 7E
SI(f9)	US(Alt OFF)	/	?	O	_	o	DEL
015 0F	031 1F	047 2F	063 3F	079 4F	095 5F	111 6F	127 7F