

LZ400RF Laser User Manual B78 Base User Manual and Setup Menu

Worth Data Inc.

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The LZ400-RF and the B78 Base Station have been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

Shielded cables and I/O cords must be used with this equipment to comply with the relevant FCC regulations. Changes or modifications not expressly approved in writing by Worth Data may void the user's authority to operate this equipment.

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

This device complies with RSS-210 of Industry Canada. Operation is subject to the following two conditions: 1) this device may not cause interference, and 2) this device must accept any interference, including interference that may cause undesired operation of the device.

The laser used is a Class II Laser Product and has a 1.2 Milliwatts Output. To operate the laser scanner, aim the scanner at the bar code, and pull the trigger. The light source will turn off, once a successful scan has occurred or 2.5 seconds has elapsed, whichever is first. Do not look directly into the laser light source with the trigger depressed; avoid direct eye contact with the laser light source.

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Introduction

The Worth Data RF Laser has the following features:

- 1) The **LZ400-RF Laser Scanner** for the USA and Canada. This laser has a range of up to 500 feet (open area) and has collision detect and retry logic built within. The LZ400-RF Laser communicates with the B78 Base Station. The Base Station communicates with a host PC through the USB port or a RS-232 Serial Port. Up to ten LZ-400 RF Lasers can communicate with one B78 Base Station.
- 2) If you use the USB interface, data is transmitted as keyboard data. If you use the serial interface instead, serial data is transmitted to one of the computer's COM ports.
- 3) The USA LZ400-RF Laser and Base operate in the 902MHz band. The laser and base radios operate by "frequency hopping" spread spectrum. The radios hop from one frequency to another every 400ms. The radio goes through 25 different frequencies and then repeats the sequence – all in the 902 MHz band at 15 milliwatts (10 dBm) of power. Different sequences define the channels. It is possible to have up to ten RF Lasers/Base Stations in the same area, providing each pair is on separate channels to avoid interference and general confusion. The RF Laser can also operate in the same room as the 701 RF Terminal.
- 4) The R/F Laser can read and discriminate between Code 39, Full ASCII Code 39, Interleaved 2 of 5, Codabar, Code 128, EAN-13, EAN-8, UPC-E, UPC-E1, UPC-A, MSI, LabelCode4, LabelCode5, Code 93 and Plessey.
- 5) The RF Laser has a rechargeable lithium ion battery. The battery is recharged with the included F10 5v power supply. Recharge time on fully discharged batteries is 3 hours. Do NOT use any other power supply to charge your laser.

Installation

Components of RF Laser Readers

In the event the shipping box shows damage on arrival, please note the damage on the carrier's receipt log.

The supposed contents of your Reader shipment is the following:

1. An B78 RF Base Station with 1-10 LZ400-RF Lasers.
2. A Worth Data regulated 5V power supply with each LZ400-RF Laser Scanner ordered, and if you ordered a serial cable with the B78 Base Station, you will receive a power supply for the Base also. **TO PREVENT DAMAGING the Base Station or RF Laser, DON'T USE ANY OTHER BRAND OF POWER SUPPLIES.**
3. Either a serial cable (F36) or USB cable (C21), depending on which one you ordered.
4. A plastic barpad for entering variable quantity information and performing the *Link Test* without data transmission.

Scanner Beeps and LEDs (what they mean)

When you scan, you will get one beep when you get a successful decode and a high-pitched beep. The data is then transmitted to the Base Station (as it is being transmitted, the LED flashes yellow). When the Laser receives the acknowledgement from the Base Station that the data has been received, the Laser emits a lower pitched beep and turns on a green LED for three seconds.

If the transmitted data fails to be acknowledged,

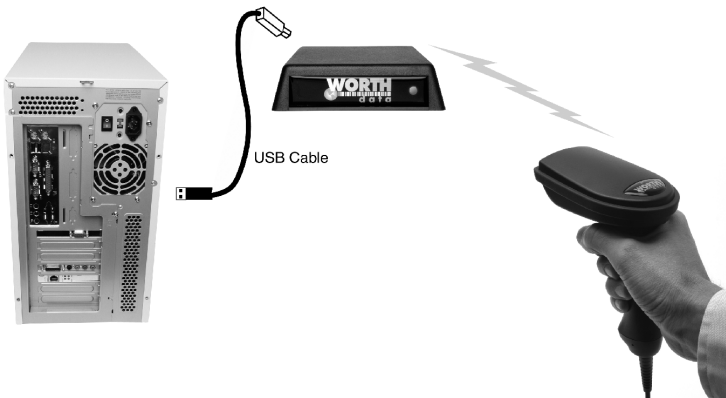
- 1) further scanning is prohibited. You can't pull the trigger again until the data reaches the base or until you clear the scanner.
- 2) The laser will retransmit three times, (the yellow LED will indicate retransmissions).
- 3) If it fails three times, it will emit a distinct 8 beep pattern and turn off. This is your clue to check out the Base Station.
- 4) You can pull the trigger to try transmission again. (the laser beam will not come on until the transmission is acknowledged or you hold the trigger down for 30 seconds to clear the data).

USB Installation

USB attachment *will not* work with the Worth Data F10 5v power supply for the B78 Base Station. If for some reason your USB port or hub does not have enough power to operate the Base Station correctly, you will need a powered USB Hub. The Base Station will power up with 3 more flashes than the channel setting; i.e. if it is set on Channel 0, it will flash green three times. If the Channel were set to 7, it would flash green 10 times.

Once you connect the B78 Base Station to the computer using the supplied USB cable, the Base Station should be sensed automatically by the computer and the driver installation will begin. Windows® usually finds the necessary driver on the hard drive under */Windows/System 32/Drivers*; occasionally you will have to insert the original Windows CD. The Mac always finds the driver. In either case, the driver used is the standard keyboard driver. No special drivers are required.

You should be connected as below:

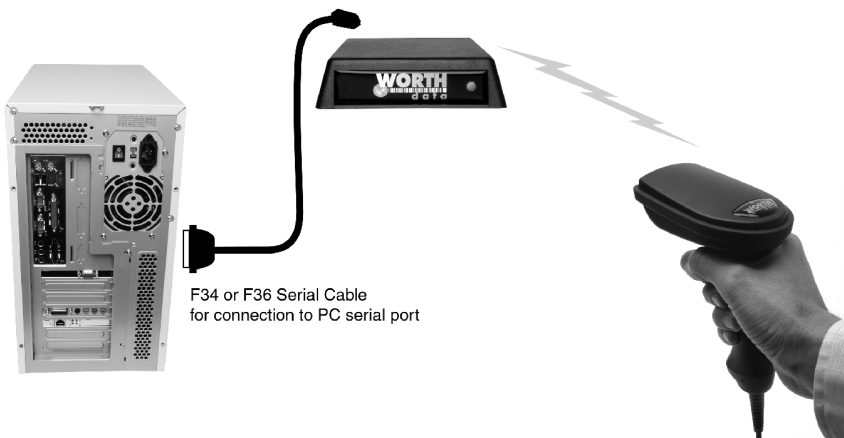


If you mistakenly abort your driver installation, see the **Trouble Shooting Section** of this manual.

For testing, bring up Notepad or WordPad on your computer and scan the TEST LABEL on *page 21*. Now turn to *page 7*.

Installing the R/F Reader with a dedicated serial port

The Base Station can be directly attached to a spare serial port as shown below. This configuration requires the Worth Data F10 5v power supply for powering the Base Station. Upon power-up, the Base Station LED will flash with 3 more flashes than the channel setting; i.e. if it is set on Channel 0, it will flash green three times. If the Channel were set to 7, it would flash green 10 times.



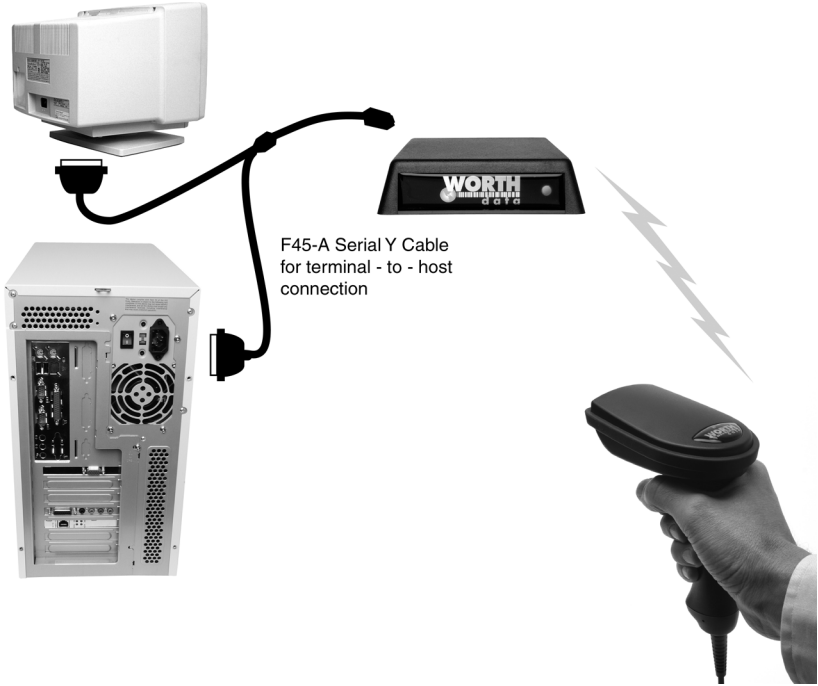
Your software will need to read the serial port as a separate device, unless you're using an IBM-compatible computer and Worth Data's PortKey software, which makes serial-port data appear as though it had been typed at the keyboard. You can also use the WDR Test Utility to test communication with your com port.

If you specified a 25-pin null-modem cable (part number F34) or a 9-pin cable (part number F36) when you placed your order, you can cable directly from the RF/Reader's Y-Cable port to your computer's serial port. Refer to *page 6* for the details of the pin-outs of the cables.

Turn to *page 7* to configure the RF Laser Reader using the Setup Menu.

Installing the R/F Reader between a computer and terminal

If you attach the s Base between your computer and a terminal, as shown below, using Cable Selection F45-1, bar code data will be sent to the computer as if it had been typed on that terminal. Refer to *page 8* for the details of the pin-outs for each connector on the cable. You will also need to change jumpers (JP2 on the RF Base) on the board inside the case from the "S" position to the "Y" position.



This configuration requires the Worth Data F10 5v power supply for powering the Base Station. Upon power-up, the Base Station LED will flash with 3 more flashes than the channel setting; i.e. if it is set on Channel 0, it will flash green three times. If the Channel were set to 7, it would flash green 10 times.

Cables may require modification, depending on the genders and pin-outs of your serial ports and cables. You may require "gender changers" (available at most computer stores) for the two 25-pin connectors. Refer to *page 6* for the details of the pin-outs of the dual port serial cable.

Turn to *page 7* to configure the reader using the **RF Laser Reader Setup Menu**.

R/F Laser Serial Model Pin-outs

F34, DB25 Null Modem Cable

These are the pin-outs for Cable F34, a DB25 Female, with pins 2 and 3 crossed, used for connection directly to a DB25 male host COM.

	Mod 8	DB25F
Function	Pin	Pin
Frame Ground	1	1
Transmit Data	2	3
Receive Data	3	2
Signal Ground	4	7

F36, DB9 Straight Cable Pin-outs

These are the pin-outs for the DB9 Female Straight Cable, F36, used for connection of the Base directly to a DB9 Male host COM.

	Mod 8	DB9F
Function	Pin	Pin
Shell (Chassis Ground)	1	Shell
Transmit Data	2	2
Receive Data	3	3
Signal Ground	4	5

F45-1, Dual Port Serial Cable

If you want to install the Base between a serial terminal and a host computer, (as with Unix, PICK, VM, etc.), you need the Dual Port Serial Port Cable, F45-1. This cable has three connectors: 1) Host, 2) Terminal, and 3) Scanner. This cable is configured so that the Terminal End connects directly into the female main port of the Terminal; the female Host End connects into the DB25 male cable end (a cable with pins 2 and 3 crossed is assumed to have been connected between the host terminal).

Dual Port Cable's

Host Connector

Frame Ground
Transmit Data
Receive Data
RTS
CTS
DSR
Signal Ground
DTR, CD

Pin Number

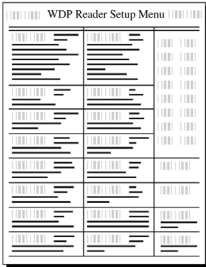
1
2
3
4
5
6
7
8,20

Dual Port Cable's

Terminal Connector

Frame Ground
Receive Data
Transmit Data
RTS
CTS
DSR
Signal Ground
CD, DTR

Configuring the RF Laser Reader for your computer and application



The RF Laser Setup Menu is located in *Appendix J* of this manual. This simple menu lets you easily configure the RF Laser to work with almost any computer system, and to tailor its bar code reading and data format characteristics.

Be sure to read the scanning instructions on the next page. To read *Reader Setup Menu* bar codes and configure your reader, you must know the right way to

scan bar codes.

These are the RF Laser Reader's default settings and are shipped configured to these settings; they can be reset to them at any time by scanning the **Start Setup** and **Reset** codes on the *RF Laser Setup Menu*.

Code 39	UPC/EAN
<ul style="list-style-type: none"> • Enabled • Check digit disabled • Accumulate Mode enabled • Caps Lock Off • Start/stop characters not transmitted 	<ul style="list-style-type: none"> • Enabled • UPC supplements disabled • UPC-E Compressed / NSC of 0 • UPC-A NSC and EAN-13 1st 2 characters and check digits transmitted • UPC-E NSC and EAN-8 1st 2 characters & check digits not transmitted
2 of 5 Code	RSS-14
<ul style="list-style-type: none"> • Disabled • 12 of 5 Code Disabled • 6-digit code length • Check digit disabled 	<ul style="list-style-type: none"> • Disabled
Code 128	General RF Laser configuration settings
<ul style="list-style-type: none"> • Enabled • UCC/EAN-128 options disabled 	<ul style="list-style-type: none"> • Channel 0 • CR for Terminator Character • No preamble or postamble • Low Power • No Aiming Dot
Codabar	RF Base Configuration
<ul style="list-style-type: none"> • Disabled • CLSI Format disabled • Start/stop characters not transmitted 	<ul style="list-style-type: none"> • 9600 Baud Rate • 8 Data Bits • 1 Stop Bit • Parity is None • Protocol is None
MSI/Plessey	
<ul style="list-style-type: none"> • Disabled • Check digit(s) not transmitted 	
Code 93	
<ul style="list-style-type: none"> • Disabled • Full ASCII disabled 	

Be certain to turn off any bases with common channels before setting up.

If you need to change any of the default settings, or would like to learn more about the RF Laser options, the next section will explain the different settings and how to set up your RF Laser.

Laser Scanning Instructions

Using a laser scanner is basically as simple and intuitive as "point and shoot" at a distance of 0-24", depending on the density of the bar code.

Basically, the laser scanner's beam must cross every bar and space on the bar code, without touching any other bar codes, as shown in the first example below. You'll need to hold the scanner further away to produce a wider beam for large bar codes, and closer for bar codes with bars very close together.

Even though momentary exposure to a laser's low-power, visible-light is not known to be harmful, **you should not aim the beam into anyone's eyes.**

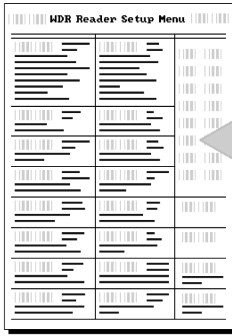


When you scan, you will get one beep when you get a successful decode and a high-pitched beep. The data is then transmitted to the Base Station (as it is being transmitted, the LED flashes yellow). When the Laser receives the acknowledgement from the Base Station that the data has been received, the Laser emits a lower pitched beep and turns on a green LED for three seconds.

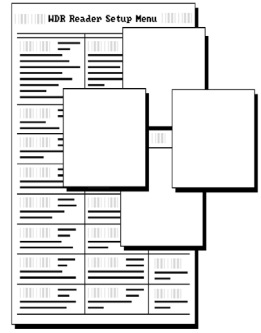
If the transmitted data fails to be acknowledged,

- 1) further scanning is prohibited. You can't pull the trigger again until the data reaches the base or until you clear the scanner.
- 2) The laser will retransmit three times, (the yellow LED will indicate retransmissions).
- 3) If it fails three times, it will emit a distinct 8-beep pattern and turn off. This is your clue to check out the Base Station.
- 4) You can pull the trigger to try transmission again. (the laser beam will not come on until the transmission is acknowledged or you hold the trigger down for 30 seconds to clear the data).

The important thing to remember about using a laser with the RF Laser Reader Setup Menu is that you need to make sure the scanner's beam covers only one bar code at a time. The laser scanner's beam is wide enough, and the configuration bar codes close together enough, that you will need to use your fingers, post-it notes, or the supplied Laser Setup Assist window, to "block off" bar codes adjacent to whatever configuration bar code you need to read.



For example, to read this "5" bar code on the Setup Menu, you would need to cover any adjacent bar codes with paper or a finger first, as shown.



Don't forget to take the R/F Laser Scanner of Setup Mode by scanning **End Setup**, otherwise the batteries will run down totally because the radio transmitter remains on.

Using The RF Laser Setup Menu

1. To configure your reader using the **Reader Setup Menu** found in *Appendix J* of this manual. 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 *RF Laser 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. If you've never scanned bar codes before, read the scanning instructions on *page 8* before continuing.
2. Next, choose the parameter you want to change an option for, and scan its code (i.e. *Code 3 of 9*, or *Postamble*). You should hear two beeps if you scanned correctly.
3. Then, choose the option you want to change from the list below the parameter bar code you just scanned, and scan the number on the barpad that corresponds to that option. For example, if you scanned the parameter "*Codabar*" and wanted to "*Enable Codabar*", you would scan the number **0** on the barpad.
4. Now scan **End Setup** (at the top-right corner of the Reader Setup Menu to complete the setup exercise. If you scanned correctly, you'll hear three beeps.

Continue scanning topics and options until you've made all the changes you desire, and then scan **End Setup** to complete setup. If you are planning to use several RF Laser scanners with one base station, pay attention to the *Set ID* parameter.

The next several pages will show you all of the various RF Laser options. Default settings are shown in **bold** in this manual and marked with an * on the *RF Laser Setup Menu*.

RF Laser Setup Parameters

Channel

- Default Channel **0**
- The default *Channel* is always shipped as **0**. There are 10 channels in the USA and Canada. The *Channel* for the RF Laser Reader is set by scanning the Setup Menu.
 - All Lasers and associated Base Station must be set to the same channel. If you have more than one RF Laser per Base Station, you must set a unique ID in each RF Laser. (See **SET ID**.)
 - The Laser channel must match the channel on the Base station. See *Appendix A* for information on changing the channel on the Base from the shipped default channel of **0**.

Code 3 of 9 (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 and Full ASCII Code 39, see *Appendix C*. See *page 23* for information about **Accumulate Mode** (this setting also controls Code 93 and Code 128).

Enabling Start/Stop character transmission means that the RF Laser Reader will transmit the * Start/Stop characters to your computer along with the data. For example, data of 1234 would be transmitted as ***1234***.

Enabling the Mod 43 Check Digit requires the units position of your data to match the calculation for the check digit explained in *Appendix C*.

If you've enabled the check digit, enabling Check Digit transmission causes the reader to transmit it to your computer along with the bar code data.

"**Caps Lock ON**" means that for all codes lower case letters read as data will be transmitted as upper case, and upper case as lower. Numbers, punctuation & control characters are not affected. This applies to Code 128 and Code 93 also.

"**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 1st 2	4
Disable transmission of UPC-A NSC and EAN-13 1 st 1 digits	5
Enable transmission of UPC-A and EAN-13 Check Digit	6
Disable transmission of UPC-A and EAN-13 Check Digit	7
Enable transmission of UPC-E NSC and EAN-8 1 st Digit	8
Disable transmission of UPC-E NSC and EAN-8 1st Digit	9
Enable transmission of UPC-E and EAN-8 Check Digit	A
Disable transmission of UPC-E and EAN-8 check Digit	B
UPC-E Compressed	C
UPC=E Expanded	D
EAN-8 observes 9 & A above	E
EAN-8 is forced to transmit 8 digits	F

For more information on UPC and EAN, see following page and *Appendix H*.

Enabling supplements allows you to read 2 and 5-digit supplemental codes used with magazines and paperbacks. **This disallows right-to-left reading** of UPC codes, to assure that the supplement doesn't get skipped.

Use setting **2** to enable reading of the 2 and 5 digit **UPC/EAN supplements** commonly found on magazines and paperback books. Use this setting to force left to right reading of UPC codes, assuring that the supplement code is not missed. This setting also allows for reading of the *UCC/EAN 128 Extended Coupon Code*. The *Extended Coupon Code* consists of a UPC code with a NSC of 5 or and EAN code with a country code of 99 along with a Code 128 supplemental code to the right. This setting allows you to read the Code 128 supplement with the UPC/EAN, providing the UPC has a NSC of 5 or the EAN code has a country code of 99. Without the correct NSC or country code, the Code 128 portion will be ignored; UPC code with an NSC of 5 or EAN codes with country code of 99 will not be read unless there is a readable Code 128 supplemental code read also.

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 is enabled** by scanning 2 of 5 Code and **8** (9 disables UPC-E1). It is very easy to partially read EAN-13 as UPC-E1, so **don't enable UPC-E1 if reading EAN-13.**

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

ISBN, International Standard Book Numbering, bar codes are EAN-13 codes with a 5 digit supplement. If the first three digits are the "Bookland" country codes of 978 for books or 977 for periodicals, then you can enable transmission of EAN-13 bar codes in the ISBN format. Suppose you scan an EAN-13 with 5-digit supplement which is a bar code of 978055337062153495. It would be transmitted in ISBN format as 0553370626 (as of Jan.1, 2006, the correct ISBN format is the EAN-13 bar code with the 5 digit supplement). 055337062 are the first nine digits of the ISBN format, and 6 is the newly calculated Mod-11 check digit.

To enable the transmission of the ISBN format, scan **Terminator Character** and **D**. Scanning **C**, the default, disables conversion to ISBN format back to regular EAN-13 format.

Code 128

Disable Code 128	0
Enable Code 128	1
Disable UCC/EAN-128	2
Enable UCC/EAN-128	3
Enable Storage Tek Tape Label Code	C
Disable Storage Tek Tape Label Code	D
Bar Code IDs transmitted	E
Bar Code IDs not transmitted	F

To enable a Bar Code ID character to be transmitted at the beginning of each bar code read, scan **E**. **The ID's are as follows:**

Codabar	a	I2of5	e	93	i	Plessey	x
Code 39	b	2of5	f	UPC-E0	n	LabelCode4	y
UPC-A	c	128	g	UPC-E1	o	LabelCode5	z
EAN-13	d	MSI	j	EAN-8	p	STK	s

To disable bar code ID characters, scan F. For information about Code 128, see *Appendix F*.

MSI and Plessey

Disable MSI	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 (mutually exclusive with MSI)	7
Enable LabelCode5	8
Enable LabelCode4	9

For more information about MSI code, see *Appendix I*.

Codabar

Enable Codabar	0
Disable Codabar	1
Enable CLSI Codabar	2
Disable CLSI Codabar	3
Enable Start/Stop Character Transmission	4
Disable Start/Stop Character Transmission	5

For information about Codabar, see *Appendix E*.

CLSI format is a form of Codabar often used by libraries.

Enabling Start/Stop character transmission means that the RF Laser will transmit start/stop characters to your computer along with data. If you're varying start/stop characters with different label types, you'll want to enable transmission.

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

For information about Interleaved and Standard 2 of 5, see *Appendix G*.

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

2 of 5 Data Length

2 of 5 Code is so susceptible to interpreting partial scans as valid reads that the RF Laser 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 an 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 the length to **00**, read a bar code, and count its digits and then set it to the actual length. **DO NOT PERMANENTLY SET THE 2 of 5 LENGTH TO 00 or you will get misreads!**

Code 93

Enable Code 93	0
Disable Code 93	1
Enable Full ASCII Code 93	2
Disable Full ASCII Code 93	3

For more information on Code 93 see *Appendix D*.

Terminator characters (This applies to the BASE only)

CR (Enter)	0
Tab	1
None	2

Depending on your application, you may wish your RF Laser 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 **TAB**, you can get it by specifying **None** here and then selecting your desired terminator character(s) specified in the **Postamble** (See *Page 15*).

Beep Options

Decode and Acknowledge	0
Acknowledge Only	1

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 *RF Laser 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, as part of the Preamble. (Bar codes that are shorter than the amount-to-trim are transmitted with no trimming.) Consider the examples in the following table to understand how trimming works:

<u>Bar Code Data</u>	<u>Preamble</u>	<u>Data Transmitted</u>
123	XYZ	XYZ123
12345678	~3XYZ	XYZ45678
12345678	~9	12345678
12345	~A	12345
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 preamble 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 parameter on *page 12* for a list of the ID character associated with each bar code type.

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.

The default is no postamble. To select a postamble, 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 postamble 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 hex digit, **1** through **F**. (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:

