

LT5X50H TriCoderTM

Portable Data Collector

Worth Data®
A Battery-Operated
Portable Data
Collection Bar Code
Scanner with Voice
Messages for Windows
PC's or Mac

TriCoder Models:
LT5150H & LT5250H

WORTH
data
www.worthdata.com



Owner's Manual

**This Manual is for the following models:
LT5150H & LT5250H**

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 in a 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.

WARNING: Cables, Cable Assemblies, and Printed Circuit Boards can expose you to chemicals including lead and lead compounds which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov

WARNING: Lithium-ion Batteries and/or products that contain Lithium-ion Batteries can expose you to chemicals including cobalt lithium nickel oxide, and nickel, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov

WARNING: Electrical cords, cables, product cords, wire assemblies, and carrying cases made with PVC can expose you to chemicals including DEHP, which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov

WARNING: Plastic cases and product plastic housings made from polycarbonate or other plastics can expose you to chemicals including bisphenol A (BPA), which are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov

Certain models of this product have a laser scanner integrated with it as one unit. The laser used is a CDRH IEC Class II Laser Product and has a 1.2 Milliwatt Maximum Output. To operate the laser scanner, aim the top of the case at a bar code and press the "Scan Key" on the keyboard of the TriCoder™, or the Trigger on the Handle. 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 "Scan Key" or the Trigger depressed; avoid direct eye contact with the laser light source.



Warning labels to **CAUTION LASER LIGHT – DO NOT STARE INTO BEAM** are located as shown on the right:

Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

There are no user adjustments or maintenance operations to be performed on the integrated laser scanner. ***Opening the Unit Will Void the Warranty.***

Limited Warranty. (A) The TriCoder Products have a LIMITED WARRANTY of two years. Such warranty is against defects in materials and workmanship for the applicable warranty period which starts from the date of shipment, provided the hardware product remains unmodified and is operated under normal and proper conditions. The sole obligation of Seller for defective Hardware Products is limited to repair or replacement (at Seller's option) on a 'return to factory' basis with prior Seller's authorization. Shipment to Seller will be at Buyer's expense, unless it is within 30 days after the initial shipment of the Product to a U.S. location, in which case the Seller will offer to have the equipment sent back with a call tag at Seller's expense. Seller will return replaced or repaired equipment within warranty at Seller's expense. No charge will be made for repair or replacement parts for Products under warranty. (B) The aforementioned provisions do not extend the original warranty period of any Product that had either been repaired or replaced by Seller. (C) the above warranty shall not apply to any Product (i) which has been repaired or altered, except by Seller; (ii) which has not been maintained in accordance with any operating or handling instructions supplied by Seller, or (iii) which has been subjected to unusual physical or electrical stress, misuse, abuse, negligence or accident. EXCEPT FOR THE WARRANTY OF TITLE AND THE EXPRESS WARRANTIES STATED ABOVE, SELLER DISCLAIMS ALL WARRANTIES ON PRODUCTS FURNISHED HEREUNDER INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE. The stated express warranties are in lieu of all obligations or liabilities on the part of Seller for damages including but not limited to special or consequential damages arising out of or in connection with use or performance of the Product. Seller's liability for damages to Buyer or others resulting from the use of any Product or Service furnished hereunder shall in no way exceed the purchase price of said product or the fair market value said service, except in instances of injury to persons or property. Products for which warranty period has expired will be repaired at the price of materials plus the hourly rate for labor applied. For warranty question or support contact Worth Data at 831-458-9938.



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Table of Contents

Chapter 1: How to Use this Manual.....	6
Chapter 2: TriCoder QuickStart.....	7
Program #0 QuickStart	7
Getting into Data Collection Mode	7
Collecting Data	8
Uploading Data	8
Program #1 QuickStart	9
Collecting Data	9
Reviewing and Editing Data.....	10
Uploading Data	11
Tips on choosing a program for Data Collection	11
Chapter 3: Uploading by WinUSB (Default Mode).....	13
Installing Hardware Utilities 3.0 for Windows	13
Chapter 4: Uploading into Excel using KwikCount/EX.....	17
Uploading into Excel®	17
Chapter 5: Uploading by USB HID Keyboard – Windows or macOS users.....	20
Uploading in USB HID Keyboard Mode	20
USB Keyboard Upload - Windows PC Users	20
USB Keyboard Upload - macOS Users	22
Chapter 6: Uploading Other File Formats.....	24
Upload File Formats	24
Carriage Return Separated Files.....	24
Comma Separated Files	24
Flat File Formats	25
Chapter 7: Non-Portable Mode.....	27
Getting in and out of NON-PORTABLE mode.....	27
Establishing communication in NON-PORTABLE Mode	27
Chapter 8: TriCoder Setup	29
Using the keypad to setup the TriCoder	29
Using the Hardware Utilities 3.0 to change Setup Parameters	30
TriCoder Setup Parameters.....	31
Bar Code Setup	32
1D Bar Code Setup	32
2D BAR CODE SETUP	36
BAR CODE ID's	36
I/O SETTINGS	37
SPEAKER OPTIONS	40
Scan Engine Options LT5150H	41
Scan Engine Options LT5250H	42
Date & Time Settings.....	43
LCD Options.....	44
Other Settings	45
System Tools.....	47
Chapter 9: Using the Hardware Utilities 3.0.....	48
Installing the Hardware Utilities 3.0	48
Running the Hardware Utilities 3.0 program.....	50
Uploading from TriCoder to your Computer.....	51
Downloading from the computer to your TriCoder	54

WinUSB Downloads.....	54
Using the Table Editor.....	55
<i>Chapter 10: Creating a Custom Program</i>	<i>56</i>
Program Statements	56
Program Name	57
Programming	58
Parts of the TriCoder programming screen.....	58
Finishing and checking your program	72
Reviewing and Modifying programs	73
<i>Chapter 11: Creating TriCoder Programs on your Windows PC.....</i>	<i>74</i>
<i>Chapter 12: Voice Messages.....</i>	<i>75</i>
Why Use Voice Messages and Prompts?.....	75
Tips for Using Voice Prompts	75
TriCoder Voice Message Mapping.....	75
Accessing Voice Message Operations	75
Recording and Playback of Voice Messages	76
Voice Message Options	76
Default Voice Messages	77
Cloning Voice Messages from TriCoder to TriCoder.....	77
<i>Chapter 13: Tables.....</i>	<i>79</i>
Why Use Tables?.....	79
Downloading a table to the TriCoder	82
<i>Chapter 14: Troubleshooting.....</i>	<i>83</i>
Display and Error Messages	83
General Troubleshooting.....	86
USB troubleshooting (for Windows Users).....	88
Program troubleshooting	89
Error messages for special consideration	89
Planning for success... ..	90
If you have a problem... ..	90
<i>Chapter 15: System Reset Procedure.....</i>	<i>91</i>
<i>Chapter 16: Powering the TriCoder.....</i>	<i>92</i>
Turning the TriCoder ON and OFF.....	92
Battery Power and Wall Power	92
<i>Chapter 17: Firmware Upgrades.....</i>	<i>94</i>
<i>Appendix A: How to scan a bar code</i>	<i>96</i>
<i>Appendix B: Laser Scanner Options.....</i>	<i>97</i>
Special Laser Settings	97
<i>Appendix C: Optional Features.....</i>	<i>98</i>
<i>Appendix D: USB Driver Installation Recovery</i>	<i>99</i>
Resolving incomplete, aborted, or incorrect WinUSB driver installation	99
Windows 11 & 10:	99

Resolving incomplete, aborted or incorrect HID driver installation	100
Windows 11 & 10:	100
macOS Hid Keyboard Installation:	100
<i>Appendix E: Specifications for Code 39.....</i>	<i>101</i>
Code 39 Advanced Features and Functions.....	101
Special key sequences for USB	104
<i>Appendix F: Code 128 Specifications</i>	<i>106</i>
<i>Appendix G: Interleaved 2 of 5 Code</i>	<i>108</i>
<i>Appendix H: UPC Specifications</i>	<i>109</i>
ISBN Specifications.....	109
The UPC/EAN checksum character	110
Checksum calculation for UPC-A, EAN-13 and EAN-8.....	110
UPC-E Checksum Calculation.....	111
<i>Appendix I: Codabar Specifications.....</i>	<i>112</i>
Codabar start/stop transmission	112
<i>Appendix J: MSI/Plessey Specifications</i>	<i>113</i>
The MSI Mod 10 check digit is calculated as follows:	113
The MSI Mod 11 check digit is calculated as follows:	113
<i>Appendix K: Code 93 Specifications</i>	<i>114</i>
<i>Appendix L: ASCII Code Equivalent Table.....</i>	<i>115</i>
<i>Appendix M: Firmware Release Notes.....</i>	<i>116</i>

Chapter 1: *How to Use this Manual*

The TriCoder is an extremely versatile bar code reader. It functions as both a portable data collection device as well as a fixed on-line bar code reader. Although the TriCoder can perform complex data collection functions, its true value is in its simplicity. With very little instruction, a user can collect data using one of the built-in programs, upload it and process the data.

This manual is provided with the intention of acting as a guide or reference. Sometimes the best way to learn to use the TriCoder is to simply turn it on and start following the prompts. Other times, more guidance is desired, especially if the user wants to get up and running quickly.

Two data collection tutorials are provided as well as detailed instruction on using the TriCoder as a fixed reader using NON-PORTABLE mode. The first [QuickStart Tutorial](#) uses the built-in Program #0, a simple one prompt (ITEM) data collection program that is useful for simple inventory applications. The second [QuickStart Tutorial demonstrates Program #1](#), an editable program that by default, prompts the operator for an item number, then a quantity. To get started quickly, we suggest using one of the *QuickStart Tutorials*, then move on to the [PROGRAMMING section](#) if you find that neither Program #0 nor Program #1 offers exactly what you need.

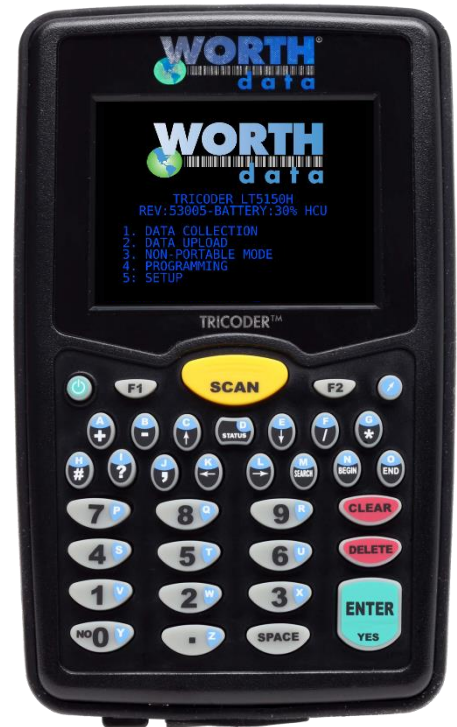
Although most people use the TriCoder as a portable data collector, it is frequently used in **NON-PORTABLE** mode as a fixed reader for library and POS applications. **NON-PORTABLE** mode is also useful for testing HID USB communication. [Chapter 7: Non Portable Mode](#) covers all areas of fixed use.

If you need use some of the advanced programming features of the TriCoder, Chapters [9](#) and [10](#) of the manual detail usage of the Hardware Utilities, creating custom Programs for the unit and popular features such as Xtra Statements, Voice Messaging, and Data Identifiers.

Chapters 11-13 of the manual describe Voice Messaging, Transmitting and Receiving programs, and uploading Lookup Tables.

The [TROUBLESHOOTING](#) section provides reference for error messages, solving problems and details on how to reach Worth Data.

The [APPENDIXES](#) offers bar code specifications and other useful information.



Chapter 2: TriCoder QuickStart

As powerful as the TriCoder is, its basic operation is quite simple. Many people can use Program #0 or Program #1 to satisfy their data collection needs. This Chapter helps you get started quickly using Program #0 or Program #1. It also will refer you to the correct place if you want to customize or expand on Program #1. We highly recommend going to [Chapter 3; Setting Up Hardware Utilities](#) for help on downloading and installing the **Hardware Utilities 3.0** program which is the best way of establishing communication between the TriCoder and the PC *before* you continue with either of the tutorials. It is easier to establish communication with one data item in the TriCoder rather than trying to do so during a massive batch upload. The Tutorials in this section are:

Program #0 Tutorial

Uses the fixed Program #0 to collect and upload data for a single ITEM prompt to your computer. If you need a program that prompts for an item number and then a quantity, go to the Program #1 Tutorial. If Program #0 works for you except that you have trouble with the upload (you need delays), see Program #2. It is identical to program #0 but allows editing of the Upload Prefix and Suffix. [See Chapter 10; Creating A Custom Program](#) for information on the Upload Prefix and Suffix.

Program #1 Tutorial

Uses the editable program #1, which prompts for *Item Number*, then *Quantity*. The tutorial includes collecting, reviewing, and uploading data as well as providing outlines for different file formats and voice messaging. Since Program #1 is editable, the tutorial also discusses use of the following popular features:

Data Security

Restricts use to Data Collection mode or to data collection in one program only.

Xtra Statement

Automatically enter a quantity of 1 without the user having to input any data. Program #3 is identical to Program #1 but has the Xtra Statement enabled for the Quantity Field – This allows the user to scan individual bar code items without having to stop to enter a quantity of 1 each time. More information on the Xtra statement can be found in [Chapter 10; Xtra Statement](#).

Program #0 QuickStart

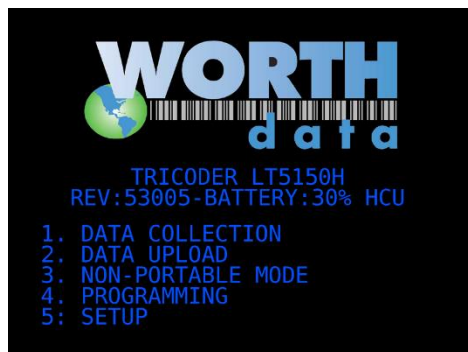
Step 1

The default data collection program, Program #0 – DEFAULT PROGRAM, is a simple program, repeatedly prompting the operator for data entry of the same type. This TriCoder program works well for a simple inventory where each item is scanned. This chapter is in the form of a tutorial. Even if you don't intend to use Program #0, working through the tutorial will prepare you for creating your own programs and learning the basics of data collection.

Getting into Data Collection Mode

The first step involves turning on the TriCoder (make sure your unit is fully charged), getting into DATA COLLECTION mode and choosing **Program #0**.

1. Turn on the TriCoder by pressing the power key. 
2. The TriCoder will power up and display its opening screen:



3. Press the number  on the TriCoder keypad to select **DATA COLLECTION MODE**.

4. Press  on the TriCoder keypad to select the Default Program #0.

PROGRAM NAMES
DEFAULT PROGRAM ----- 0
SAMPLE PROGRAM ----- 1
ENTER DATA ----- 2
SAMPLE PROG. X ----- 3

SELECT PROGRAM # 0-3: _

Step 2

Collecting Data

The second step involves collecting data in the TriCoder. This is a good time to practice scanning – it is really easy with the built-in scan engines – you just point at the bar code and pull the trigger, or press the scan button on the keypad, to turn the scan beam on and read a bar code. If you are not familiar with scanning bar codes, see [Appendix B: How to scan a bar code](#) for details and suggestions. If you don't intend on using bar codes later, you can just enter the same data from the keypad.



Pressing “0” at the SELECT PROGRAM # 0-3 prompt begins the data collection process by displaying this prompt for the operator:

ENTER DATA —

For the purposes of this tutorial, we will use the 4 sample UPC bar codes below as our data. Upon scanning, the TriCoder will beep once and display the following:

ENTER DATA (← original prompt)
751063305402 (← bar code #1)
ENTER DATA (← new data entry prompt)

After scanning, the TriCoder displays the original prompt, then the data just entered, then the new data entry prompt. For the tutorial, our second piece of data will be 02. Go ahead and scan sample bar code #2 or key in 02:

751063305402 (← original data)
ENTER DATA (← 2nd data entry prompt)
751063305501 (← 2nd piece of data entered)
ENTER DATA (← new data entry prompt)



Continue to scan the sample bar codes below or enter the data from the keypad. The TriCoder display will scroll with each entry as shown immediately above. As soon as you are finished entering all 4 bar codes, press the **END** key to exit **DATA COLLECTION**.



Uploading Data

Step 3

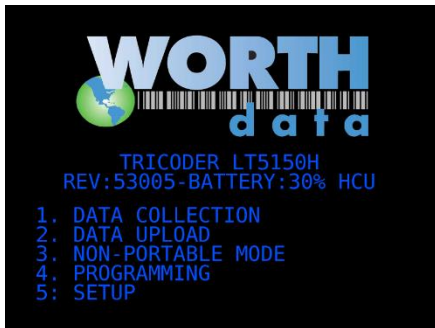
Once you have collected your data in Program #0, uploading that data to the computer is the final step. For the tutorial, we assume that you have successfully established communication between the computer and the TriCoder. If you are ready to upload, go to [Chapter 4: Uploading Data](#) and proceed with your upload.

Program #1 QuickStart

Step 1

Program #1 – SAMPLE PROGRAM - prompts the operator for "*Item*" and then "*Quantity*". What makes this program different from Program #0 (other than the additional "*Quantity*" prompt) is that Program #1 is editable. It can be customized to allow for additional prompts, voice messaging and file formatting. The tutorial for Program #1 includes collecting data, reviewing and editing data, using popular uploaded file formats and finally, uploading the data

1. Turn on the TriCoder by pressing the power key. 
2. The TriCoder will power up and display its opening screen:
3. Press the number  on the TriCoder keypad to select **DATA COLLECTION MODE**.



5. Press  on the TriCoder keypad to select the Default Program #0.

PROGRAM NAMES

DEFAULT PROGRAM ----- 0
SAMPLE PROGRAM ----- 1
ENTER DATA ----- 2
SAMPLE PROG. X ----- 3

SELECT PROGRAM # 0-3: _

Collecting Data

Step 2

Collecting data in Sample Program #1 requires two pieces of data; an **item** and a **quantity**. By default, Sample Program #1 is set up to accept data from either the scanner or the keypad for the item, but only from the keypad for the quantity.

Program #1 also features voice messaging. By default, Program #1 plays a voice prompt of "Item" for the visual "ENTER ITEM NO." prompt and a voice prompt of "Quantity" for the visual "ENTER QUANTITY" prompt. Program #1 only plays each voice message the first 5 times the prompt is displayed. The TriCoder can be programmed to play the voice message every time the visual prompt is displayed if desired. See [Chapter 10: Creating a custom program](#) or [Chapter 12: Voice Messaging](#) for details.

Using the bar code samples below, scan an item number bar code, then enter the quantity of "123" on the TriCoder keypad.



Continue to scan bar codes and enter quantities until you have at least 10 records.

You can check to see how many times you have scanned an item number by pressing the following keys while at the ENTER ITEM prompt:

Press **SHIFT** 
Press **F1**
Press **T**

Remember, the only thing SHIFT F1 T can do is simply tell you how many times you have entered data for a particular prompt.

You can use the same key sequence to check the number of times you have entered data for *any* prompt.

 To end data collection in Program #1, simply press the END key. If you forget to exit Data Collection and simply turn the TriCoder off, do not panic – the TriCoder has saved your data. Pressing the **F1** key while in Data Collection also exits data collection and returns you to the Mode Menu. Using the END key to end Data Collection is the preferred method.

Step 3

Reviewing and Editing Data

During or after collecting data, it is possible to review and edit the data while it is still in the TriCoder. You can also delete data entirely. *Data Review Mode* is a handy tool – especially if you know you’ve made a mistake and want to correct it before you upload your data.

For the tutorial, let's say that we just wanted to take a break from collecting data, exited DATA COLLECTION (by pressing the END key), turned off the TriCoder and went to lunch. We're back now and want to resume our data collection. Turn the TriCoder back on and just as in step 1; get into DATA COLLECTION mode. Since there is already data in the TriCoder, instead of simply displaying the prompt, the TriCoder plays the “DATA FILE EXISTS” voice message, and displays the same message on the TriCoder screen:

**DATA FILE EXISTS
HIT ANY KEY_**

Then immediately displays the prompt:

ENTER DATA

 Say we want to review the data already in the TriCoder - maybe we made a mistake or think we missed some data. To review data already in the TriCoder, press the “UP ARROW” key on the TriCoder keypad. The TriCoder will beep – 2 low beeps then 2 high beeps and display:

**Data Review Request
Press <BEGIN> key to
Start or <F1> for
Data Collection_**

 If we just wanted to go into DATA COLLECTION, we would simply press **F1** and start scanning again, but we want to review the data already collected so press the BEGIN key to get into DATA REVIEW mode. Once in DATA REVIEW mode, the TriCoder displays the last data collected. To get to the beginning of your data file, press the BEGIN key. The TriCoder displays:

**ENTER QUANTITY
XXX (last quantity data entered)
BEGIN OF FILE
HIT ANY KEY_**

 Press any key on the TriCoder keypad. The TriCoder displays the first record of data. To scroll through the data record by record, press the RIGHT ARROW key.

 To immediately go to the end of the data, press the END KEY. At the END OF FILE prompt, hit any key to get to the last record of data in the file.

 To scroll backwards through the data record by record, press the LEFT ARROW key. To edit individual characters in a data record, use the right and left arrow keys to find the data you want to edit.



If you know what data you are looking for (or want to look for all data that has certain characters) you can use the SEARCH key. After pressing the SEARCH key, the TriCoder displays the SEARCH PATTERN prompt. Enter the data you want to search for (ie. 22) then press ENTER. The TriCoder begins its search at the beginning of the file and moves forward until a match is found. If using our example of 22, the TriCoder would find all data that contains 22, regardless of its position in the data (ie. 22345, 32245, 34522).



Pressing the DELETE key deletes characters to the left. Replace characters simply by pressing a key. To replace an entire data entry, use the right and left arrow keys to find the data, then press the CLEAR key to delete the entry. You can re-enter data at this point by entering data from either the keypad or by scanning. If you enter data from the keypad (when either editing single characters or replacing an entire entry) you must press ENTER on the keypad for the change to take place. If you want to completely delete the data, after pressing CLEAR, the TriCoder will prompt you with **DELETE THIS FIELD?** If you are sure you want to delete the data, press ENTER.



You can use the STATUS key at any time during data collection to check the amount of memory you have left as well as the battery levels:

```
mm/dd/yy hh:mm:ss
BATTERY: ||||| xx%
xxxxK BYTES FREE
```

If during data collection, the TriCoder displays the following message:

```
WARNING 2K LEFT
HIT STATUS KEY_
```

it means that the TriCoder has only 2K of memory left to collect data. This is a good time to go and upload your data. You can continue to collect data but you will eventually get this message:

```
OUT OF MEMORY
HIT ANY KEY_
```

Pressing a key will take you out of Data Collection mode and back to the Main Menu. You will have to upload your data before you can collect any more.

When you are ready to go back to collecting data, press the F1 key at any time to begin appending data to the existing data file. The F1 key also backs you out of any mode you are in; for example, if you are in Non-Portable mode, pressing F1 takes you back to the Main Menu.

Uploading Data

Step
4

Once you have collected your data in Program #1, uploading that data to the computer is the final step. For the tutorial, we assume that you have successfully established communication between the computer and the TriCoder.

If you are ready to upload, go to [Chapter 3: Uploading Data](#) and proceed with your upload.

Tips on choosing a program for Data Collection

The TriCoder comes with 4 programs pre-installed. **DEFAULT PROGRAM #0** is a simple un-editable program prompting repeatedly for an "ENTER DATA". Program #2 - **ENTER DATA** is identical to Program #0 except that it allows for customization (ie. the Upload Prefix and Upload Suffix). See [Chapter 10: Creating a custom program](#) for details on what the *Upload Prefix* and *Upload Suffix* can do for you.

Sample Program #1 differs from Program #0 and #2 in that it has two prompts - "ENTER ITEM NO." and then "ENTER QUANTITY". Sample Program #1 is also fully editable and lends itself well to the use of several features in particular. Two of these features are there to protect your data.

Program #3 is identical to Program #1 except that has the Xtra statement enabled. This programming feature, the [Xtra Statement](#), works with the "ENTER QUANTITY" prompt by automatically entering a quantity of "1" if the user enters another ITEM number instead of a quantity. See [Chapter 10: Creating a custom program](#) for details on the Xtra program statement.

The first safety feature, *Data Security*, confines the user to data collection mode ONLY. The user is not allowed into any mode other than DATA COLLECTION mode. In addition to using *Data Security* to restrict the user to DATA COLLECTION mode, you can use the second security feature, *Program Restriction*, to confine the user to one particular program in the TriCoder. For details on how to use these *Data Security* features, see [Chapter 8: TriCoder Setup](#).

Program #1 is extremely versatile. Use it if you can, making modifications to fit your application. If you require a customized program, these are just a few of the options and features offered by custom programming:

- Additional user prompts for other types of data
- Program timing delays to facilitate uploading directly into an application
- Branching to different areas in the program, depending on the input from the user
- Downloading tables of data to validate or edit into the TriCoder
- Recording customized Voice Messages

If any of the above features (or anything *not* offered by Program #1) appears to be something you are interested in, move on to the *PROGRAMMING* section of the manual. [Chapter 10: Creating a custom program](#) covers all aspects of creating and maintaining custom programs in the TriCoder.

Chapter 3: Uploading by WinUSB (Default Mode)

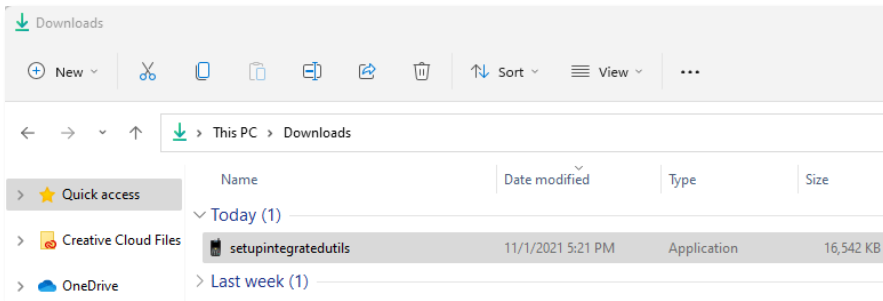
By default, the TriCoder is set to WinUSB for the USB upload interface – This is what we call *Host Controlled USB* and is the recommended operating mode for the TriCoder on Intel or AMD x86 PC's running Windows. You will need to use the **Hardware Utilities 3.0** software. In **WinUSB** mode, data uploads and program transfers are up to 40 times faster than serial, and 1000 times faster than HID keyboard uploads.

You will need to download and install the **Hardware Utilities 3.0** Program to download the data file from your TriCoder in WinUSB mode. The **Hardware Utilities 3.0** software program is available for download from our website at:

<https://www.barcodehq.com/downloads.html> under 5150 TriCoder Downloads.

Installing Hardware Utilities 3.0 for Windows

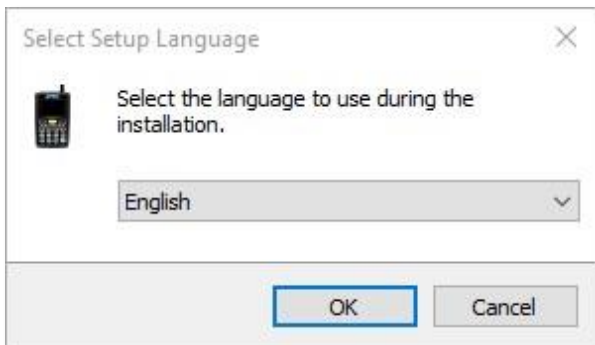
Once you have downloaded the program you will need to install it on your computer. Locate the **setupintegratedutils.exe** file and double click, or alt click and Open to start the installation. Note: You need to be the Administrator on the machine to install the software and drivers properly.



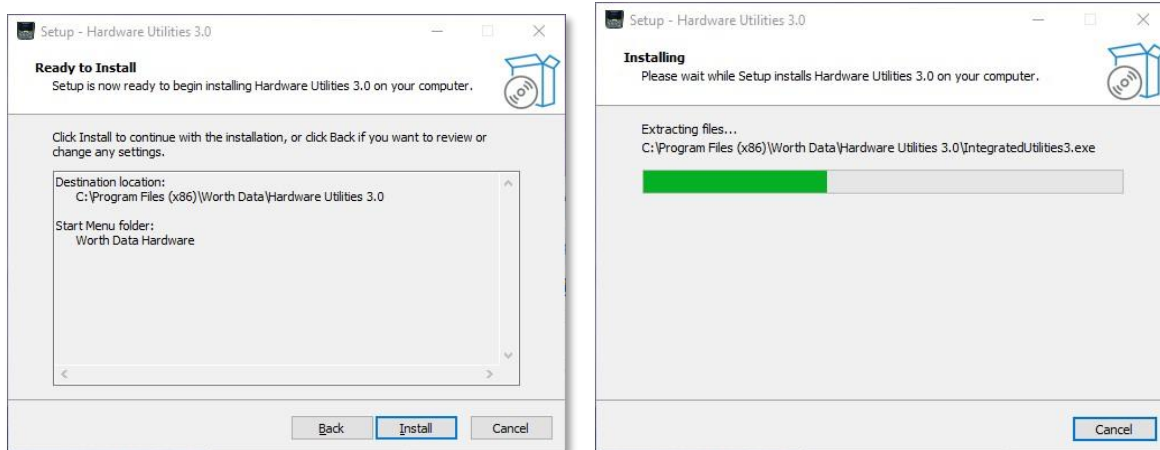
You should see the messages as shown below during the installation. Click on “Yes” to install the Hardware Utilities Setup



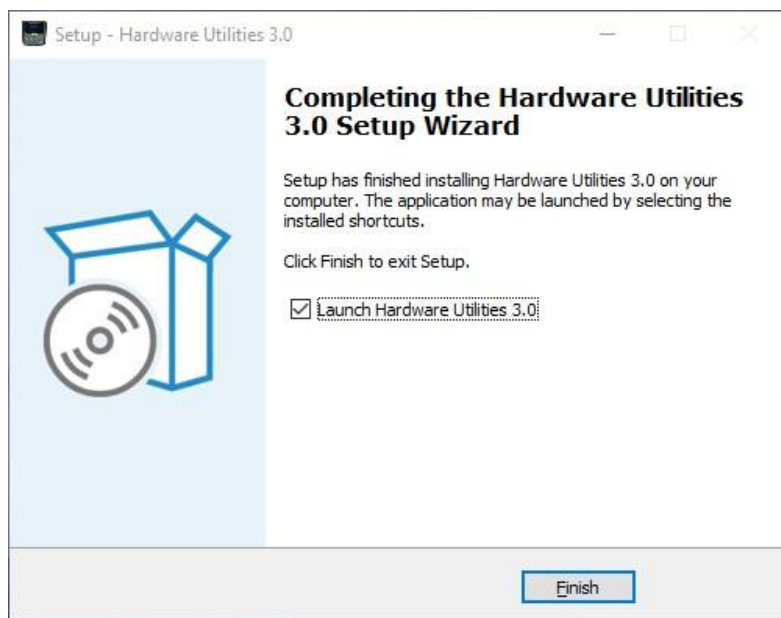
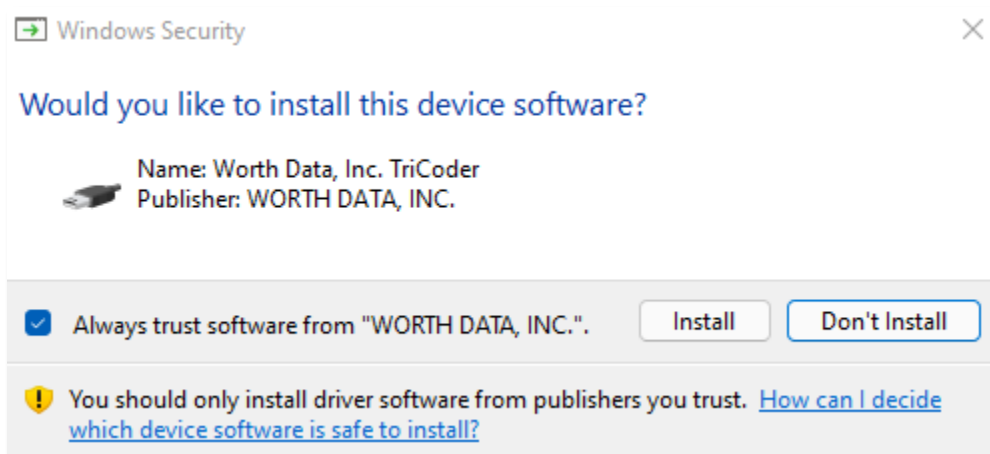
Select the language and click OK,



Click the Install button to install the software. The program will then install on your system.

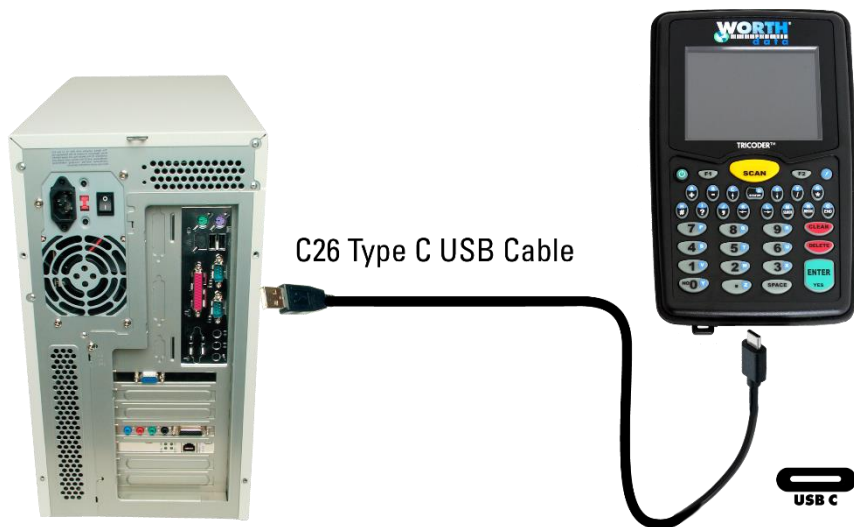


During the installation, you will see also see a dialog for installing the USB drivers. You will not see this message if you have already installed the latest drivers. Click on **Install** and continue.



Once it completes the installation you should then Click on the “**Finish**” button, and it will Launch the **Hardware Utilities 3.0** - at this point you can connect the TriCoder to an available USB port on your Windows PC using the **C26 USB cable**. You can connect to either of the USB ports on the bottom of your TriCoder.

For USB connection problems see [Appendix D: Resolving WinUSB connection problems](#).

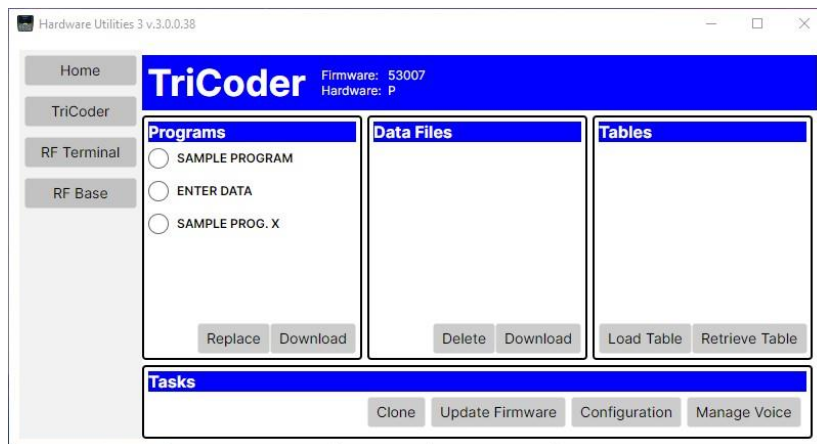


Once you have established the USB connection you can easily download the data file using the **Hardware Utilities 3.0**.

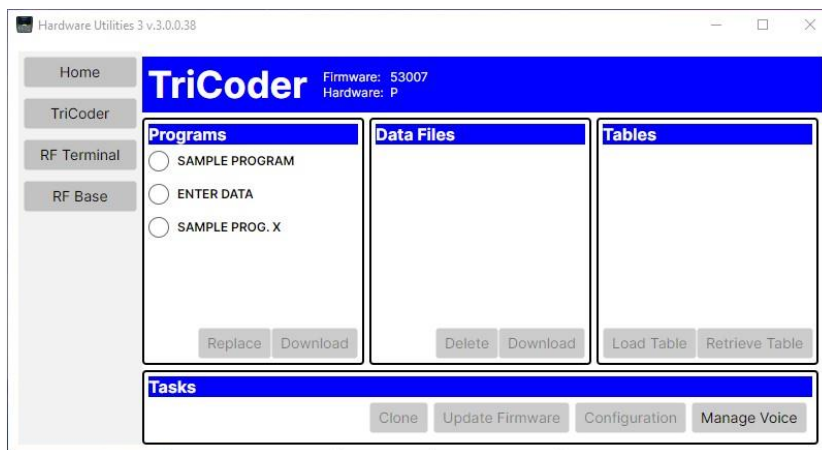
Make sure your TriCoder is connected and turned on and at the opening screen, then run the **Hardware Utilities 3.0** program by clicking on the **Worth Data Hardware** folder and the **Hardware Utilities 3.0** icon in your Windows Start Menu.



If you are connected to the USB port, the **Hardware Utilities** will detect the USB and no other configuration parameters are required.

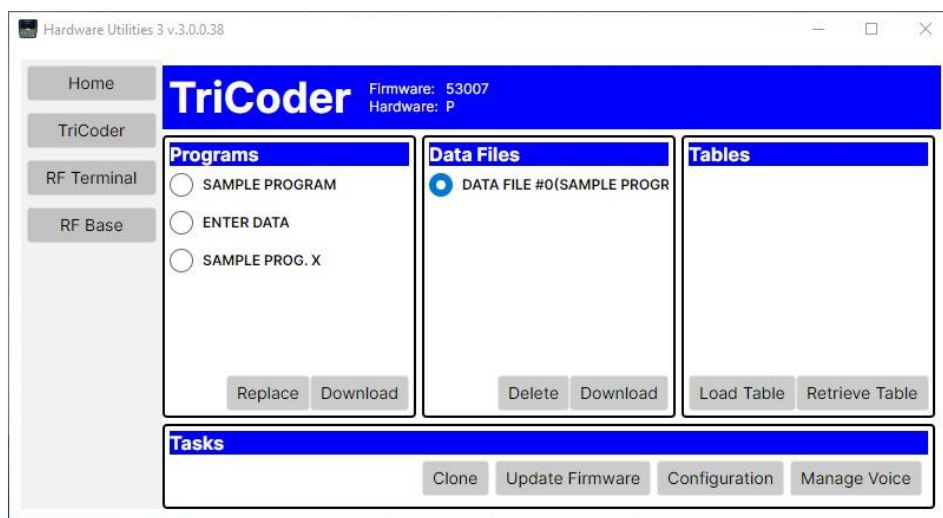


If you are not connected you will not see any buttons to use on the TriCoder Tab except for the Manage Voice button – all other buttons will be grayed out. Make sure you are connected by USB and the TriCoder is on the Main Menu – also make sure your TriCoder I/O Port settings for USB are set to “WinUSB” in the setup.

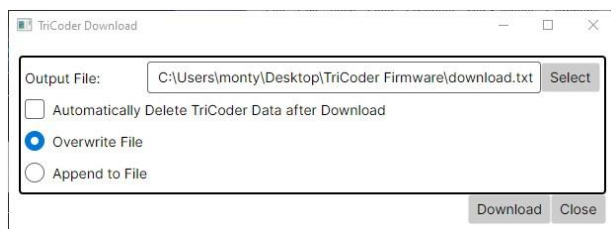


By default, the TriCoder is set to WinUSB for the interface – This is the recommended operating mode for the TriCoder on a PC running Windows. Once you have established the USB connection you can easily download the data file.

To Save the Data file from the TriCoder to your computer you can click the radio button next the DATA FILE you want to download, and then click the “Download” button.



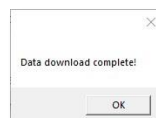
Type in the name of the file you want to save in the Output File: box – or click on the Select button to choose the file location or file you want to overwrite. You can name the file anything you want – in the example below we have called it download.txt



Then click the **Download** button and the data will be downloaded. You can select the options to Overwrite, Append, and Automatically Delete TriCoder Data after Download.

When it is done you will see the following message

Click OK – That's it! You don't have to do anything on the TriCoder!



For alternative upload options and the more advanced features available in the *Hardware Utilities 3.0* please refer to the other chapters in this manual for more detailed information.

Chapter 4: Uploading into Excel using KwikCount/EX

Uploading into Excel®

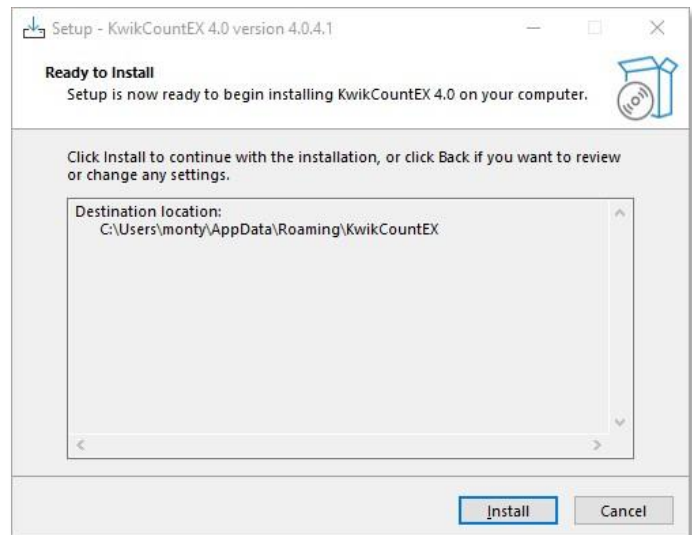
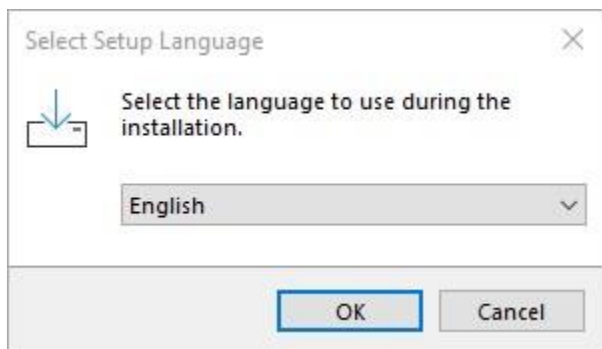
If you are planning to upload your data into an Excel worksheet, you should consider using our **KwikCount/EX™** program. **KwikCount/EX** is an Excel add-in that makes updating worksheets faster and easier. If you are trying to update several columns of data, need accumulation or subtraction functions, or are using the TriCoder for physical inventory, you should definitely look into using **KwikCount/EX**.

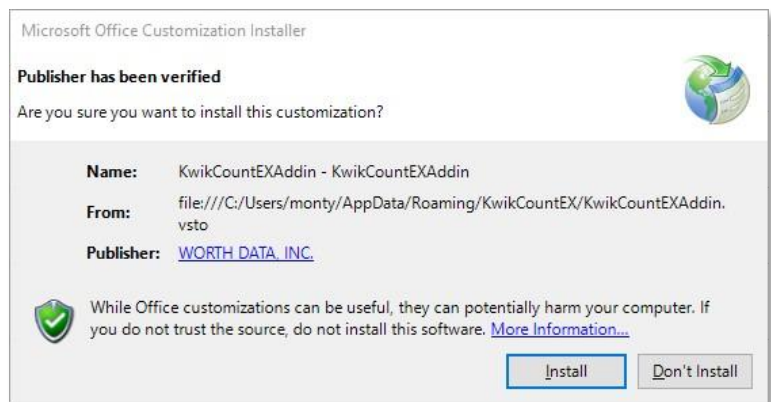
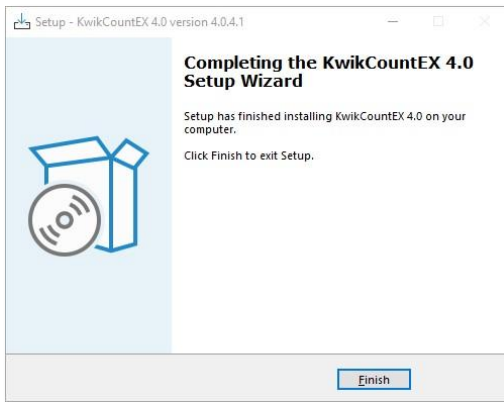
The screenshot displays an Excel spreadsheet with a table of inventory items. The table has columns for Item Name, Barcode, Sales Description, Cost, Sales Price, Qty on Hand, and As of Date. The data includes various hardware items like screws, washers, and nuts. To the right of the spreadsheet, the KwikCountEX 4.0 add-in interface is visible, showing a 'TriCoder Status: CONNECTED' and a 'Data Files' section with a 'DEFAULT (PGM 1)' button. The interface also includes a 'Number of Rows' dropdown set to 2, a 'Row Range' input field, and a 'Column' dropdown set to 'B'. The 'Behavior' dropdown is set to 'ADD'.

	A	B	C	D	E	F	G
	ITEM NAME	BARCODE	SALES DESCRIPTION	COST	SALES PRICE	QTY ON HAND	AS OF DATE
208			Final Assembly Hardware:				12/31/2019
209	2921-0001-00	2921-0001-00	4-40 thread, 1/4" pph ms st bo (4) Tri	0.01		663	12/31/2019
210	2950-0001-00	2950-0001-00	#4 standard split lockwasher (2) LT70	0.01		1400	12/31/2019
211	2920-0002-00	2920-0002-00	#4x1/4 #B ph fl battery compartment	0.04		2361	12/31/2019
212	2920-0003-00	2920-0003-00	#4x1/4 pph HiLo switch plate screw	0.02		4900	12/31/2019
213	2920-0004-00	2920-0004-00	#4x5/16 pph HiLo black case screw	0.03			12/31/2019
214	2920-0007-00	2920-0007-00	#4, 5/8" HiLo pph black case screw	0.04		4000	12/31/2019
215	2923-0002-00	2923-0002-00	M1.6x.35x4MM ph fl ss patch (2) SE	0.05			12/31/2019
216	2923-0008-00	2923-0008-00	M1.6x.35x3MM ph fl ss patch (2) SE	0.05		1000	12/31/2019
217	2925-0001-00	2925-0001-00	M1.4x0.35x3.5mm ph (2) SE2707	0.01		500	12/31/2019
218	2931-0002-00	2931-0002-00	HST3-M2X3.00-SS-P 3mm hexstand	0.09		6208	12/31/2019
219	2923-0003-00	2923-0003-00	M2x8mm ph fl patch 2mm (4) Radiot	0.03		301	12/31/2019
220	2948-0001-00	2948-0001-00	M2HX-NU-SS 2mm hex nut (4) Radi	0.01		2979	12/31/2019
221	2950-0002-00	2950-0002-00	Nylon M2 flat nylon washers (2) /Rad	0.01			12/31/2019
222	2931-0005-00	2931-0005-00	Nylon Standoff/Support (4) B557M Ra	0.15		600	12/31/2019
223	2923-0004-00	2923-0004-00	M2-4x4MM ss pph patched XL/Opti	0.12		4770	12/31/2019
224	2923-0005-00	2923-0005-00	M2-4x5MM ss pph patched (3) SE12	0.03		336	12/31/2019
225	2923-0006-00	2923-0006-00	M2-4X4MM ss ph flat patched (2) 1	0.03		1387	12/31/2019
226	2923-0007-00	2923-0007-00	M2-4X6MM ss ph fl patched (2) Tri	0.06		3486	12/31/2019
227	2920-0005-00	2920-0005-00	#4, 1-1/4 " B pph steel black oxide (1) i	0.08		952	12/31/2019
228	2920-0006-00	2920-0006-00	#4, 5/8 " B pph steel black oxide (1) Ls	0.02		664	12/31/2019
229	2921-0003-00	2921-0003-00	4-40 thread, 1" pph ms st black oxide (	0.02		364	12/31/2019
230	2928-0001-00	2928-0001-00	Screw 1/2" 8-32 thread, pph ms st bo	0.03		100	1/1/2020
231	2998-0002-00	2998-0002-00	Clear molded bump-on .312"x.085"	0.05		864	12/31/2019

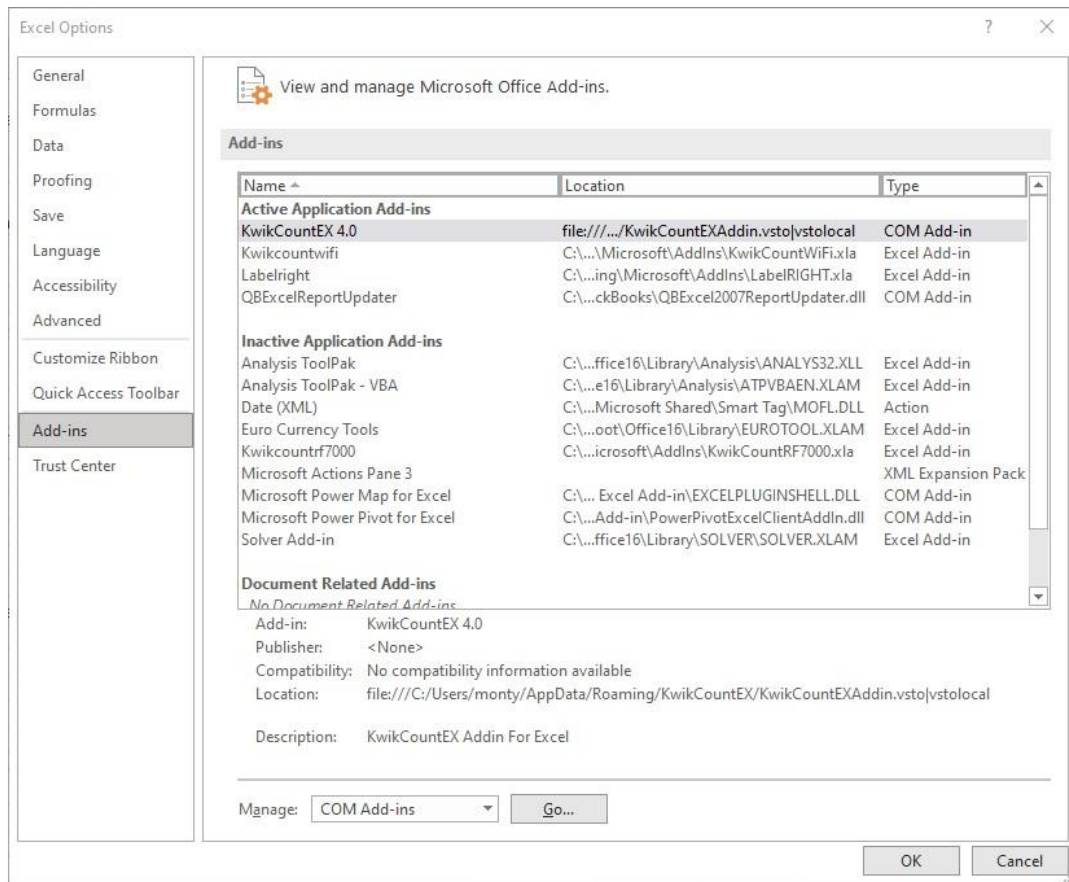
KwikCount/EX is free with any TriCoder purchase. You can also find more information, or download, **KwikCount/EX** at <https://www.barcodehq.com/kwikcountex.html>.

Download the software to your computer. Unzip the file to a folder and launch the installer to install KwikCount/EX.

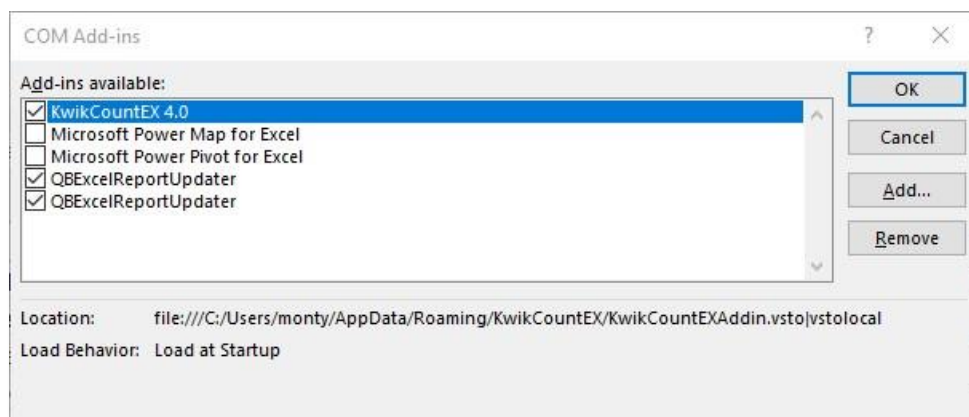




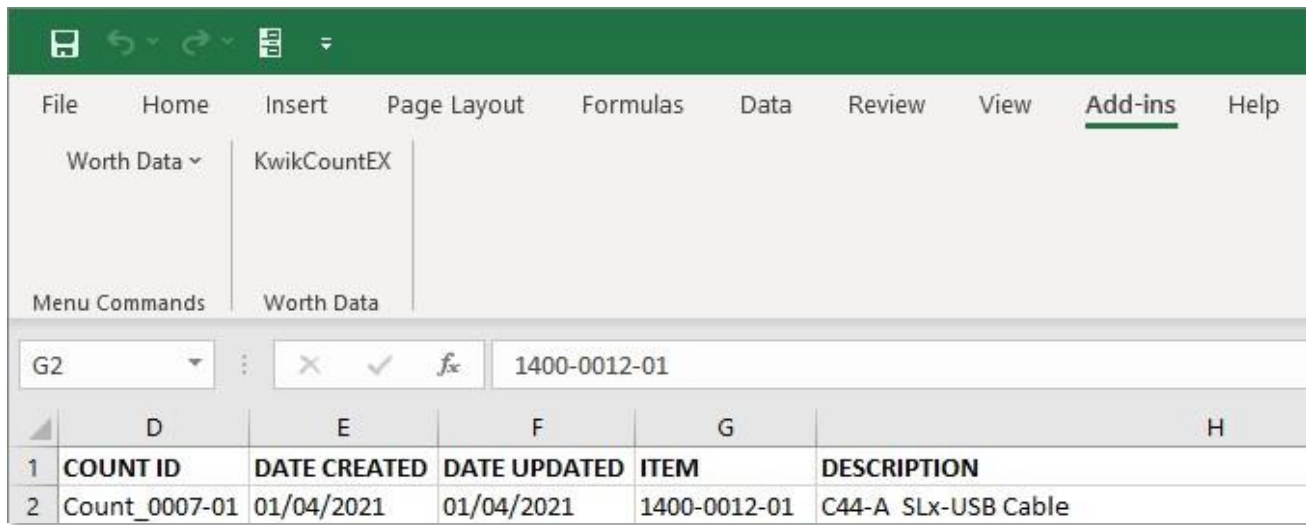
Once you have downloaded, and installed the program, you will need to enable the Add-in. This is done in the Excel Options screen – you will need to select Add-ins on the Left Column, and then at the Manage drop down field at the bottom select the COM Add-ins.



This will bring up the “COM Add-ins” screen – check the KwikCountEX 4.0 box to enable the software in Excel.



Once you have the add-in active you will need to turn it on in Excel. First click on Add-ins in the Menu, then click on the “KwikCOUNTEX” above the Worth Data as shown below:



This will bring up the Add-in on the right of your spread sheet (as shown to the right).

After you have collected inventory transactions in the TriCoder Portable Bar Code Reader, attach the TriCoder to your PC and start Excel. Using the KwikCount/EX add-in, you can identify which worksheet columns you wish the TriCoder data to be flowed into. To update existing Excel worksheets, simply designate which field sequence (i.e. the stock number) is the controlling “key” or “**Index**” field and then link it to the appropriate column in the worksheet. On the right we are using the SAMPLE PROGRAM #1.

When the data is downloaded from the TriCoder to Excel, the field identified as the “Index” field is read and that column is searched until matched. Once the “Index field” is matched, KwikCountEX searches that row and updates the additional field columns according to your linking specifications.

When the data is flowed into the corresponding columns for each field in the same row as the “Index” field, the data is accumulated (ADD), subtracted (SUBTRACT), or overwritten (REPLACE) according to the linking instructions you have specified. Receipts can be added, shipments can be subtracted, new physical counts can be overwritten, or data can be written into a new row.

KwikCountEX 4.0
TriCoder Status: CONNECTED v. 4.0.4.0

Current Profile: Load Profile

Create From TriCoder Pgm: SAMPLE PROGRAM (PGM 1) Create

Data Files:
DEFAULT (PGM 1) Get Data

Number of fields: 2

Row Range: 209-231 Get From Selection

Column	Prompt/Desc	Index	Behavior
B	ENTER ITEM NO.	☒ Index Field	REPLACE
F	ENTER QUANTITY	☐ Index Field	ADD

Sync Bluetooth New Profile Save Profile Refresh

Chapter 5: Uploading by USB HID Keyboard – Windows or macOS users

Uploading in USB HID Keyboard Mode



DATA UPLOAD using the USB HID mode is used to extract the data collected while you were in **DATA COLLECTION** mode and upload the data as a USB HID Keyboard. In this mode the data will appear wherever your cursor is placed and active. You can use the HID Keyboard mode on a PC running Windows or macOS.

Before collecting and uploading large amounts of data, try a small amount of data to make sure your HID USB upload works correctly. Data can be uploaded either into a separate file, that is then merged or processed by your application, or it can be uploaded into your application directly. Before you upload directly into an application, back up any files that will be altered by the upload – work only with copies, not with your actual data, until you know your upload works correctly.

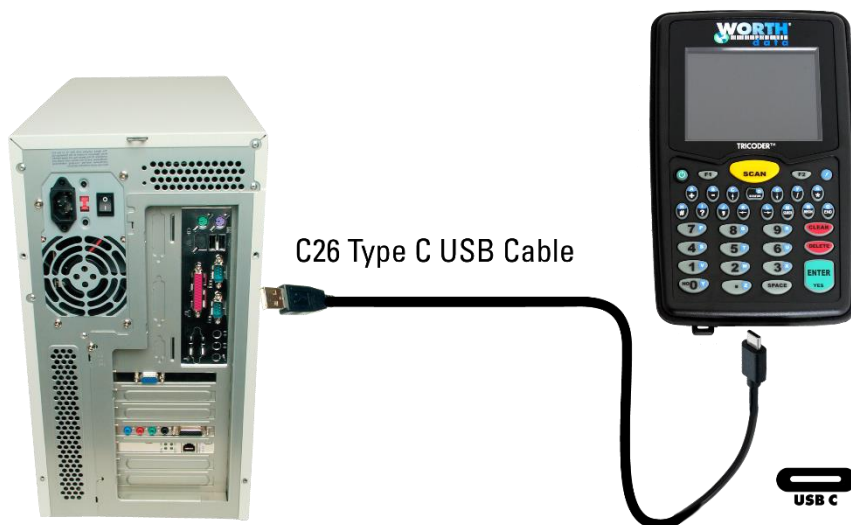
For this tutorial, we will describe a USB HID keyboard upload using Windows. **DATA UPLOAD** is accessed from the **Main Menu** (opening Screen): Do NOT press **2** until you have your PC ready for the data upload to begin.



USB Keyboard Upload - Windows PC Users

To upload in Windows, for purposes of the Tutorial we will use **Windows Notepad**. If you want to use another Windows text editor or Word Processor, the specifics may vary but the basic upload will be the same.

In Windows, open **Notepad** (or program of your choice). Plug in your **C26** Type C USB Cable to the TriCoder and to a free USB port on your PC.



As shipped from the factory the I/O Setting or *Host Interface* on the TriCoder is set for WinUSB.

If you have a Mac, or you want to upload as an HID Keyboard in Windows, you must choose 2. You are then limited to NON-PORTABLE Mode and Data Upload as USB **HID Keyboard**.

If you want to change the I/O Settings you need to do that in the Setup Mode - from the Main Menu Option 5. You then select **I/O SETTINGS** - #2

```
TRICODER SETUP
BAR CODE OPTIONS ----- 1
I/O SETTINGS ----- 2
DATE & TIME SETTINGS ----- 3
SPEAKER SETTINGS ----- 4
LCD SETTINGS ----- 5
OTHER SETTINGS ----- 6
SYSTEM TOOLS ----- 7
DONE/EXIT ----- 0
```

PLEASE SELECT OPTION: _

At this screen press the **NUMBER** key on the TriCoder keypad that corresponds to the *Setup Parameter* you want to change (i.e. **I/O SETTINGS** = #2). You will then go to another screen with the following options:

```
I/O SETTINGS
HOST ----- HID KEYBOARD 1
TERMINATOR CHARACTER CR 2
SINGLE CYCLE UPLOAD --- OFF 3
HID PACKET SIZE ---- (00-99) 00 4
HID PACKET DELAY (00-99) 00 5
USB HID ALT OUTPUT -- OFF 6
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

By default, the *Terminator Character* in the TriCoder is set to **CR**, which means the TriCoder will insert a *Carriage Return* (like pressing the **ENTER** key on your PC) after each record of data it uploads. If you have changed the *Terminator Character* to a setting other than the default and are uploading data collected in the Tutorials, change it back to the default now.

After verifying the setup of your TriCoder, at the opening screen press 2 for **DATA UPLOAD**. If you are ready to upload your data, press the **YES** key on the TriCoder. Watch the PC screen to see your data appear - one piece of data per line. When the TriCoder is done uploading your data it will display the following message:



END OF TRANSMIT
DEL FILE [Y/N]?_



If all of your data appears correct on the PC screen, you can press the **YES** key on the TriCoder to delete the data in the TriCoder. If you need your data in a different format (e.g. *Comma delimited* or *Flat File* formats) go back to the beginning of this chapter and read the section on **File Formats**. If deleting the data, the TriCoder will display:

ARE YOU SURE?



Press **YES** again to delete the file from the TriCoder.



If your data does not appear on the PC screen or is incorrect, press the **NO** key on the TriCoder, check your TriCoder setup and try the upload again. If you still have problems, consult the *USB Troubleshooting* section of this manual.

You can use Notepad (or your program) to save the file if it is data you would like to keep. The file can be saved with any name you want and can have any extension you would like. Common file types saved from notepad are .txt and .csv files.

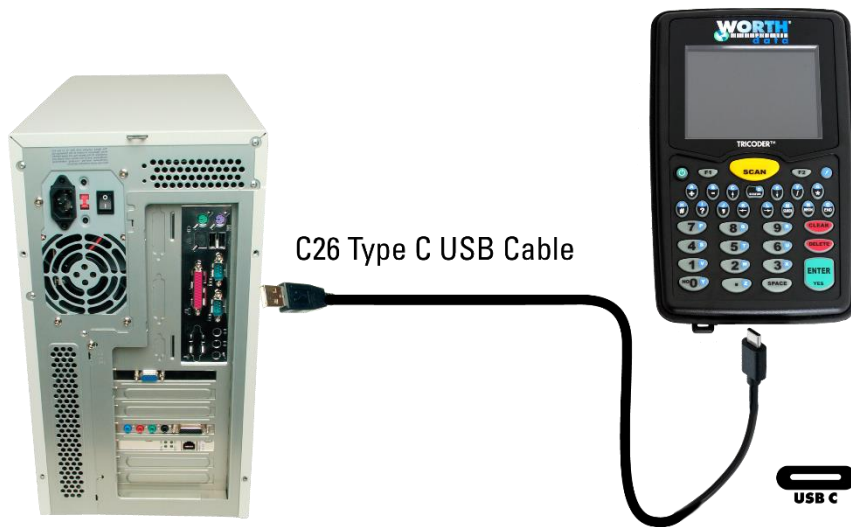
There is also a setting for foreign key support that sends all characters to the computer in their ascii key values or “ALT” key sequences. You can change the **USB HID ALT OUTPUT** from **OFF** to **ON** to switch this mode if you are using a foreign keyboard in your Windows setup and your data isn’t coming across correctly from the TriCoder in HID Keyboard data upload or Non Portable mode.

An example of this is if you scan a bar code, or key in “A” on the TriCoder, and upload it with your computer keyboard set as a “English - US Keyboard” you will always get an “A” sent to the computer. However, if you choose another language or country keyboard like “French (France)” you may get a different character (e.g. “Q”). By changing the **USB HID ALT OUTPUT** to **OFF** the TriCoder will send the correct “ALT” sequence to the computer regardless of your keyboard settings.

USB Keyboard Upload - macOS Users

To upload in macOS, for purposes of the Tutorial we will use **TextEdit** the default text editor on Macs. If you want to use another Mac text editor or Word Processor, the specifics may vary but the basic upload will be the same. In **TextEdit** make sure you are set to Plain Text in the Preferences section.

On your Mac, open **TextEdit**. Plug in your **C26** USB Cable to the TriCoder and to a free USB port on your Mac.



As shipped from the factory the I/O Setting or *Host Interface* on the TriCoder is set for **WinUSB** – *which only works on Windows systems*.

You must change the I/O setting to **HID Keyboard** for the Mac - I/O Settings are changed in the Setup Mode - from the Main Menu **Option 5**. You then select **I/O SETTINGS** - #2

```
TRICODER SETUP
BAR CODE OPTIONS ----- 1
I/O SETTINGS ----- 2
DATE & TIME SETTINGS ----- 3
SPEAKER SETTINGS ----- 4
LCD SETTINGS ----- 5
OTHER SETTINGS ----- 6
SYSTEM TOOLS ----- 7
DONE/EXIT ----- 0
PLEASE SELECT OPTION: _
```

At this screen press the **NUMBER** key on the TriCoder keypad that corresponds to the *Setup Parameter* you want to change (i.e. **I/O SETTINGS** = #2).

You will then go to another screen with the following options:

```

I/O SETTINGS
HOST ----- HID KEYBOARD 1
TERMINATOR CHARACTER CR 2
SINGLE CYCLE UPLOAD --- OFF 3
HID PACKET SIZE ---- (00-99) 00 4
HID PACKET DELAY (00-99) 00 5
USB HID ALT OUTPUT -- OFF 6
DONE/EXIT ----- 0

```



CHANGE SETTING #: _

By default, the *Terminator Character* in the TriCoder is set to **CR**, which means the TriCoder will insert a *Carriage Return* (like pressing the **ENTER** key on your keyboard) after each record of data it uploads. If you have changed the *Terminator Character* to a setting other than the default and are uploading data collected in the Tutorials, change it back to the default now.

After verifying the setup of your TriCoder, at the opening screen press 2 for **DATA UPLOAD**. If you are ready to upload your data, press the **YES** key on the TriCoder. Watch the Mac screen to see your data appear - one piece of data per line. When the TriCoder is done uploading your data it will display the following message:



```

END OF TRANSMIT
DEL FILE [Y/N]?_

```



If all of your data appears correct on the Mac screen, you can press the **YES** key on the TriCoder to delete the data in the TriCoder. If you need your data in a different format (e.g. *Comma delimited* or *Flat File* formats) go to [Chapter 6](#) and read the section on **File Formats**. If deleting the data, the TriCoder will display:

```

ARE YOU SURE?

```



Press **YES** again to delete the file from the TriCoder.



If your data does not appear on the Mac screen or is incorrect, press the **NO** key on the TriCoder, check your TriCoder setup and try the upload again. If you still have problems, consult the *USB Troubleshooting* section of this manual.

You can use **TextEdit** (or your program) to save the file if it is data you would like to keep. The file can be saved with any name you want and can have any extension you would like. You can change the file type you save in the Format Menu – Choose “Make Plain Text” – then you can save the file as .txt or .csv file.

If you are having problems uploading via HID Keyboard on your Mac make sure the HID driver is set correctly – you can also refer to the [USB Troubleshooting Section](#).

Chapter 6: *Uploading Other File Formats*

Upload File Formats

If you are ready to upload data, we assume you have established correct communication between your TriCoder and host and have collected some sample data, preferably using the Default Program #0 or Sample Program #1 Tutorials. By default, the TriCoder uploads using a *Carriage Return Separated* format. For many users, the default file format works fine, but others may require more complex or even custom upload file formats. By default, the TriCoder transmits data in the following order:

ID + Prefix + data + Checksum chs + Suffix + Terminator

You should keep the above order in mind when determining how to upload your data. Before we actually upload any data, let's discuss some of the most common file formats.

The program you are using to process your data will determine what format the uploaded file needs to use. There are several commonly used formats – *Carriage Return separated*, *Comma separated*, and *Flat File* formats. By default, the TriCoder uploads using the *CR (Carriage Return) separated* format. We will cover each format in order of ease of use, with the default uploading format first.

Carriage Return Separated Files

By default, the TriCoder uploads its data in the following format:

DATA(CR)		11111111
DATA(CR)	<i>data looks like:</i>	22222222
DATA(CR)		33333333

This format is called *Carriage Return separated*. Each piece of data is followed by a *Carriage Return* (or *Carriage Return/ Line Feed* if Serial Interface), causing each piece of data to appear on a separate line. The TriCoder does this by using the **Terminator Character**. The **Terminator Character** is the character that follows each piece of data either when the TriCoder is uploaded or when data is transmitted in NON PORTABLE mode. The default **Terminator Character** for a keyboard wedge is **CR** (carriage return) and **CR/LF** (carriage return/line feed) for a serial interface.

To upload the TriCoder with a *Carriage Return delimited* file, simply leave the **Terminator Character** set to the default settings and upload the TriCoder.

Comma Separated Files

Another common file format is a *Comma Separated File*. A TriCoder setup to upload in this format uploads data like this:

"DATA","DATA"(CR)	"111111","22"
"DATA","DATA"(CR) <i>data looks like:</i>	"222222","33"
"DATA","DATA"(CR)	"333333","44"

Each data item is surrounded by *double quotes*, creating a **field**. Fields of data are separated by commas. The *double quotes* allow commas to be used as actual data as well as separators (see the example below). At the end of all of the fields of data, a *Carriage Return* is added to create a complete **record**. Modifying Program #1 as an example, the data uploaded would look like this:

"ITEM NUMBER", "QUANTITY"	"0123456,12oz", "15"
"ITEM NUMBER", "QUANTITY"	"889384,8oz", "940"
"ITEM NUMBER", "QUANTITY"	"32834,20oz", "7"

Where ITEM NUMBER is the first **field**, QUANTITY is the second **field**, and both fields together make a **record**.

To program the TriCoder to upload in this format, the first thing we must do is set the **Terminator Character** to "None". The idea is first, to stop the TriCoder from automatically sending the same character after each field of data, then second, customize the program in the TriCoder to transmit a double quote before and after each data item, a comma after each field and a carriage return after each record. To customize the program in the TriCoder, we use the **Suffix** to specify which character we want to precede or follow each particular field. Using Program #1 as our example, we will walk through the steps required to upload Program #1 in a *Comma delimited* format:

1. Set the Terminator Character to NONE

To Change the *Terminator Character* in SETUP MODE.

Turn the TriCoder On

Select #5 for SETUP MODE

From the TRICODER SETUP screen choose 2 for I/O SETTINGS

Choose 2 to cycle through the **TERMINATOR CHAR** options
CR Is the default – The options are: **CR – TAB – NONE – CR/LF**
 Press 0 for **DONE/EXIT** When you have selected **NONE**
 Press 0 to exit **TRICODER SETUP**

The Terminator Character follows each piece of data in Non Portable Mode also. If you change it to **NONE** and still need a **CR** while in Non Portable mode, program the **POSTAMBLE** setup parameter (in **OTHER SETTINGS**) to be a **CR** (carriage return). Use the bar coded Full Ascii Menu to scan: **CR** (and **LF** if serial)

2. Program the Upload Prefix and Upload Suffix

After setting the **Terminator Character** to **NONE**, the next step is to enter **PROGRAMMING MODE** and program the **Upload Prefix** and **Upload Suffix** for each field of data. For Program #1, we will program the **Prefix** and **Suffix** as follows:

Statement Prompt	Prefix	Suffix
ENTER ITEM NO.	“ (double quote)	“, (double quote comma)
ENTER QUANTITY	“ (double quote)	“CR (double quote carriage return)

Put the TriCoder in **PROGRAMMING MODE**

Press 1 at the **PROGRAMMING MODE** screen (to edit program #1)

Press 2 at the **PROGRAM #1** screen

This will take you to the **< PROGRAM #1 PROMPT 01 >** screen

Press **ENTER** or the down arrow until you move the cursor to the line:

PREFIX -- _

If you have data collected in the TriCoder (assuming you are following the tutorial), you will only be able to change the **Upload Prefix** or the **Upload Suffix**. At the **PREFIX** prompt, scan the “double quote” bar code from the **Full Ascii Menu**:

PREFIX -- “ _

Press the **ENTER** key to complete the change. This will move the cursor to:

SUFFIX -- _

Scan the bar code for “double quote” then scan the bar code for the “comma”.

SUFFIX -- “, _

Press the **ENTER** key to complete the change.



Press the Right Arrow to go to **PROMPT 02**. At the prompt scan the “double quote” bar code.

PREFIX -- _



Press **ENTER** or the down arrow until you move the cursor to the line: Scan the “double quote” bar code, then, scan the “CR” bar code if using the TriCoder as a USB keyboard, or the “CR” and the “LF” if using the TriCoder as a Serial interface:

SUFFIX-- “? _



Press **ENTER** to complete the change. If you do not press **ENTER** after each change, the change will not be permanent. Press the **F1** key to exit the program, then **F1** again to exit **PROGRAMMING MODE**. The TriCoder is now programmed to upload its data in a *comma separated* file format.

Flat File Formats

Flat Files are the most complicated file format of the three we are covering in the tutorial. The format of a **Flat File** is mostly dependent upon the host program you will use to process the data you are uploading.

A **Flat File** uses what we call “**Refer-backs**”. Each record has at least one field that remains constant while other fields may contain variable data. “**Refer-backs**” allow the operator to enter the data for the constant fields only once, letting the TriCoder append the data to each record as it uploads. “**Refer-backs**” are specified in the **Upload Prefix** and **Upload Suffix** of each field. We will use a program that prompts for **operator name**, **item number** and finally a **quantity** to demonstrate how “**Refer-backs**” work.

Lets say that the data for the first field in every record must be the operators initials (3 characters). The second field in each record must be an item number and the third field is a quantity. It doesn't make sense to require the operator to enter their initials every time they scan an item number and enter a quantity. The solution is to create a program that uses a "Refer-back" to attach the data from prompt #1 (**operator name**) and the data for prompt #2 (**item number**) to the data for prompt #3 (**quantity**) every time. We do this by using the upload prefix or upload suffix.

Specifying these characters:

}xx

where **xx** is the *number of the statement* you want to take data from, in the *Upload Prefix* or *Upload Suffix* of the statement you want to attach the "Refer-back" data to. The following *TriCoder Coding Form* shows the program we have described above (only the relevant entries on the form are shown):

Stmt #	Entry Type	Prompt	Yes/Next Stmt	No/End Stmt	Upload Prefix	Upload Suffix
01	D	Operator Name	02	99	~0	
02	D	Enter Item No.	03	99	~0	
03	D	Enter Quantity	02	99	}01}02	CR

Refer-back programming example

The above program would prompt for *Operator Name* once, then repeatedly prompt for *Item*, then *Quantity*, attaching the *Operator Name* data and the *Item* data to the front of every quantity upon upload.

If the data for *Operator Name* entered is **WDS**, and variable data is entered at each *Item* and *Quantity* prompt, the uploaded file would look like this:

Operator Name	Item #	Quantity	Uploaded data looks like:
WDS	123456	124	WDS123456124
	892938	880	WDS892938880
	345890	3	WDS3458903
	99540	75	WDS9954075

Flat File sample data

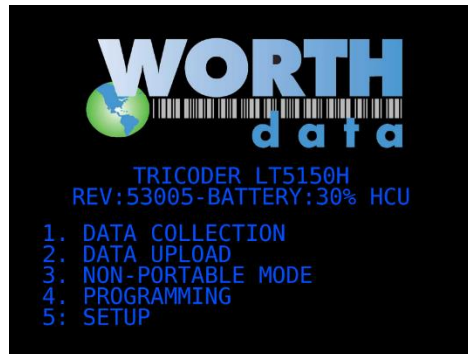
The TriCoder is not limited to uploading using only the three file formats - *Carriage Return delimited*, *Comma delimited* and *Flat File* - described above. By using different characters in the **Upload Prefix** and **Upload Suffix** of each program statement, you can create a file in just about any format – the three described above are simply the most commonly used. For more information on using the **Upload Prefix** and **Upload Suffix**, see [Chapter 10: Creating a custom program](#) in this manual. For the tutorial, use either the *Carriage Return separated* or *Comma delimited* formats.

Chapter 7: Non-Portable Mode

NON-PORTABLE mode allows the user to transmit data directly from the TriCoder to the host computer immediately without saving the data in the TriCoder memory. Once data is entered via scanning a bar code or using the keypad, it is transmitted immediately by the TriCoder to the host. This mode is primarily used with the USB interface connecting as a USB HID keyboard on a PC running Windows® or Mac OS. **NON-PORTABLE** mode is used to enter data directly into an application without storing it in memory. Common applications include library check in/out, document tracking and Point-Of-Sale. **NON-PORTABLE** mode can also be used to establish HID Keyboard USB communication between the TriCoder and host computer before HID Keyboard data uploads are attempted.

Getting in and out of NON-PORTABLE mode

When you turn the TriCoder on, the first screen you see is the TriCoder Main Menu. The Main Menu is your navigational tool for getting into and out of the different activities in the TriCoder. The **Main Menu** consists of the following prompts:



Answering 1-5 takes you to that Mode. If you are already in a particular Mode (i.e. NON-PORTABLE MODE) and want to get back to the **Main Menu**, simply press the **F1** key.

If you are in **NON-PORTABLE** mode and turn the TriCoder off, when you turn the TriCoder back on you will return to the Main Menu.

If you want to leave **NON PORTABLE** mode, simply press the **F1** key to return to the beginning of the MODE MENU.

Typically, the TriCoder is used in **NON-PORTABLE** mode while it's connected to the host computer by a USB cable. See [Chapter 5: Uploading by HID Keyboard](#), for more information and diagrams to help you correctly connect the TriCoder to your computer.

Establishing communication in NON-PORTABLE Mode

USB HID Keyboard Interface

To test communication as a USB HID keyboard, all you need is a program capable of accepting data from the keyboard – for example, Windows Notepad or WordPad. Typically, any application will accept data from this input mode, but for testing, a simple text editor (Notepad) or word processor is all that is needed. The key to testing communications is to keep it simple – you don't want to have to determine whether it's your software or the TriCoder causing a problem.

First Time USB Use

As shipped from the factory the I/O Setting or *Computer Interface* on the TriCoder is set for **WinUSB**. Unless you have changed it in the Setup. If you are connecting to a Windows x86 AMD or Intel PC then the WinUSB will use our Hardware Utilities only – we refer to this as Host Controlled Mode. If you connect a USB cable to a Windows ARM PC, or Mac OS, you will need to set the TriCoder to use USB HID Keyboard mode. You are then limited to NON-PORTABLE Mode and Data Upload as USB HID Keyboard.

If you are using Windows® and you wish to upload your files directly into your application through the keyboard, you must choose:

USB HID KEYBOARD.

After selecting HID Keyboard Mode in the Setup, depending on the version of Windows you have you may be asked to install the USB Keyboard HID driver, which is probably on your hard disk, but if not, is on your original Windows installation media; just keep clicking on NEXT until you are forced to supply the original Windows installation media (if the driver installation is aborted, see [Appendix D: USB Driver Installation Recovery](#) for more information). Most versions of Windows should install the HID Keyboard driver automatically.

Data uploads through the USB keyboard will be slower than WinUSB, but on compatible Windows x86 Intel or AMD PC's you will still be able to use the WinUSB for program uploads/downloads, firmware upgrades, voice updates, cloning, and table downloads; however the first time you attempt a WinUSB operation, you will be required to install the WinUSB driver for the Host Controlled support.

IMPORTANT: If you are installing the TriCoder in some versions, or configurations, of Windows, you may see a dialog box appear warning you that the installation may cause your system to be unstable. The TriCoder installation WILL NOT harm Windows or make your system unstable – go ahead and complete the installation. If you are installing on Windows 11, 10, 8 or 7 you may see a box that says “Unknown Hardware Found”. You must click on this balloon message to initiate the installation of the correct USB driver – **or you will have to go into your Control Panel and Device Manager to update the USB Driver manually.**

If you are using Windows and you wish to use the *Hardware Utilities 3.0* to upload data to a file, use the WinUSB mode. You will also be able to do program uploads/downloads, firmware upgrades, voice downloads, and table downloads. Once you have chosen this setting, you will be required to install the WinUSB drivers that are built into Windows. The Hardware Utilities 3.0 installation will also install these drivers during the if you follow those prompts. The first time you attempt to use Non-Portable Mode, you will be asked to install the USB Keyboard HID driver, which is probably on your hard disk, but if not, is on your original Windows installation media.

Whatever decision you make, the **TriCoder I/O Settings** parameter for *HOST* will be changed to reflect your choice. Your choice will remain until you change the *USB Interface*, (See [Chapter 8: TriCoder Setup](#)).

1. Start the software you are going to use to test the TriCoder. If it is a text editor or word processor, make sure to start with a new document. We suggest the use of the *Notepad* program (Windows or Mac).
2. Turn the TriCoder on and at the Main Menu (opening screen) press the 3 key to enter NON-PORTABLE mode. If you have already connected the TriCoder to your computer in the Full Speed USB mode, and this is the first time you have used the NON-PORTABLE mode, you will now be asked to install the USB Keyboard HID driver, which is probably on your hard disk, but if not, is on your original Windows installation media.
3. Type several numbers on the TriCoder keypad, then press the ENTER key. You should see the keyed data on the TriCoder screen AND on your computer screen.

The TriCoder now displays:

NONPORTABLE MODE
PRESS <F1> TO EXIT

and is ready and waiting for keypad input or scanner input.



Scan the TEST LABEL above. You should see the word TEST LABEL (or data you entered on the keypad) on the TriCoder screen AND on your computer screen.

If you do NOT see your data displayed on your computer screen, or you see partial data (letters or numbers missing), go to [Chapter 8: TriCoder Setup](#) and review the [Computer Interface](#) settings.

Chapter 8: TriCoder Setup

All of the Setup Parameters are changed via the TriCoder keypad using the **Setup Mode**. You can also send your setup from the **Hardware Utilities 3.0** via USB using the WinUSB Host Controlled USB mode, or by a Clone file, also sent from the **Hardware Utilities 3.0**.

Using the keypad to setup the TriCoder

You can change the Setup Parameters on the TriCoder by going into SETUP MODE from the Main Menu (opening screen option 5). When you enter setup you will see the following screen:

```
TRICODER SETUP
BAR CODE OPTIONS ----- 1
I/O SETTINGS ----- 2
DATE & TIME SETTINGS ----- 3
SPEAKER SETTINGS ----- 4
LCD SETTINGS ----- 5
OTHER SETTINGS ----- 6
SYSTEM TOOLS ----- 7
DONE/EXIT ----- 0
PLEASE SELECT OPTION: _
```

At this screen press the **NUMBER** key on the TriCoder keypad that corresponds to the *Setup Parameter* you want to change.

The setup parameters are distributed in the groups as follows:

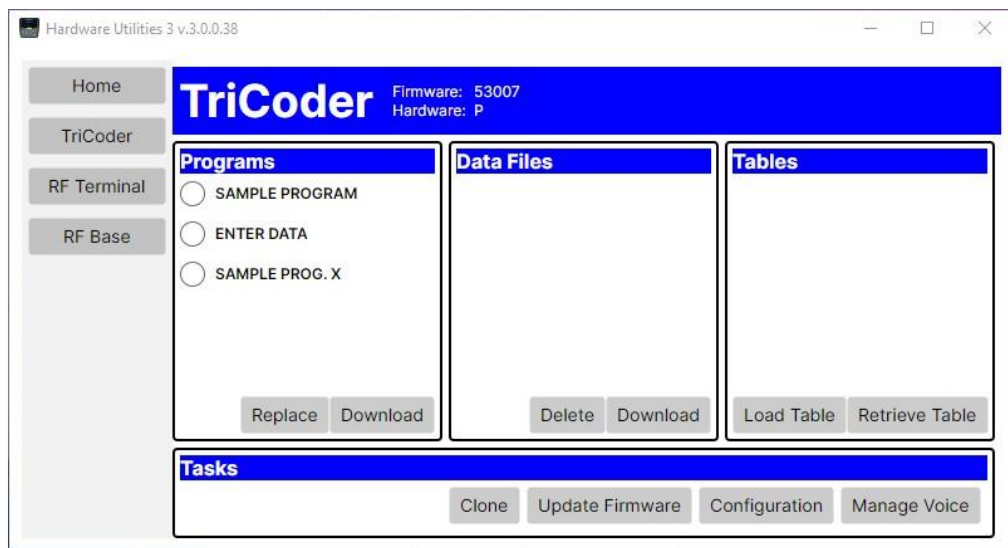
Menu Selection	Setup Parameters	Menu Selection	Setup Parameters
BAR CODE OPTIONS "1" Model LT5250H will have a 1D BAR CODE SETUP & 2D BAR CODE SETUP Selection	CODE 3 OF 9	LCD OPTIONS "5"	
	UPC-A EAN13		
	UPC-E EAN8		
	CODE 128		
	2 OF 5 CODES		MASTER BACKGROUND
	CODABAR		PROMPT BACKGROUND
	MSI/PLESSEY		PROMT TEXT COLOR
	CODE93/CODE11		DATA BACKGD COLOR
	DataBar/RSS/Others		DATA TEXT COLOR
I/O SETTINGS "2"	HOST (I/O Interface)	OTHER SETTINGS "6"	BRIGHTNESS
	TERMINATOR CHAR		BRIGHTNESS TIMEOUT
	SINGLE CYCLE		FULL SCREEN SCROLL
	HID PACKET SIZE		
	HID PACKET DELAY		
	USB HID ALT OUTPUT		
DATE & TIME SETTINGS "3"	TIME	SYSTEM TOOLS "7"	PREAMBLE
	DATE		POSTAMBLE
	DATE FORMAT		CHARACTERS
	YEAR OUTPUT		EOF STRING
	SHUT DOWN TIME		
SPEAKER SETTINGS "4"	DATE/TIME FORMAT		PLAY VOICE PROMPT
			LANGUAGE
	BEEP VOLUME		RESET SETUP TO DEFAULT
	BEEP TONE		RESET PROGS & DATA
	VOICE VOLUME		CLEAR DATA FILE(S)
	KEYPAD TONE		DATA SECURITY
	KEY AFTER ERROR		FIXED PROGRAM
			TABLE ALLOWED

To select a particular category, press the corresponding number key on the TriCoder keypad. Once you are in a category it will have a new screen with options for that particular setup for you to change. Some changes must be made by scanning bar codes from the FULL ASCII MENU. You can set a parameter back to the default settings by pressing the CLEAR key.

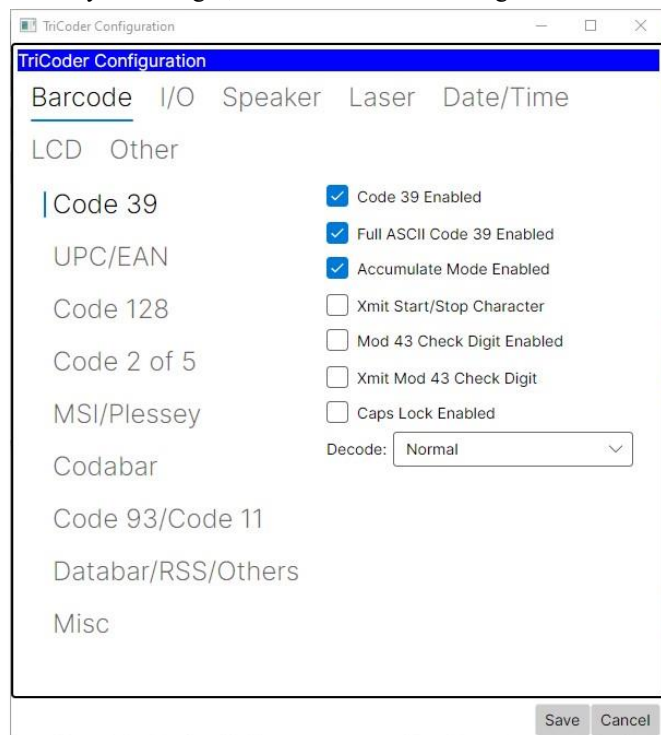
Press the **F1** key to go back to the category selection screen.

Using the Hardware Utilities 3.0 to change Setup Parameters

If you are using the **WinUSB** interface, you can use the *Hardware Utilities 3.0* program to change your setup parameters. To use the *Hardware Utilities*, you must make sure your TriCoder is turned on, plugged into the computer with a C26 Type C USB cable, and it is set for **WinUSB** interface. In the *Hardware Utilities 3.0* program, choose **TriCoder Button** on the left bar, and then click on the **Configuration** button in the Tasks menu on the bottom.

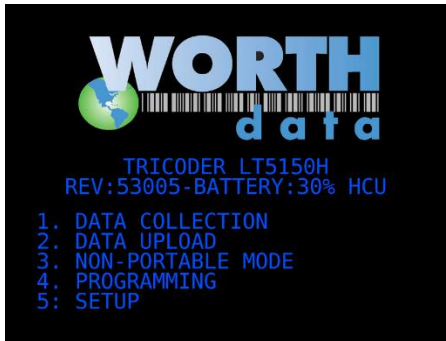


You will then see a screen offering the **TriCoder Configuration** options as shown below. Click on any of the tabs to change settings for that section. Once you have made your changes, click **Save** and the changes are automatically made in your TriCoder.



TriCoder Setup Parameters

All parameters are set by the TriCoder keypad by going into **SETUP** (Option 5) from the Main Menu or opening screen.



When you enter the Setup Mode you will see the TriCoder Setup screen with various options to change. Choose the option you would like to change by keying in the number that corresponds to the Setup parameters you would like to change, in that mode the Default settings are shown in bold print.

```
TRICODER SETUP
BAR CODE OPTIONS ----- 1
I/O SETTINGS ----- 2
DATE & TIME SETTINGS ----- 3
SPEAKER SETTINGS ----- 4
LCD SETTINGS ----- 5
OTHER SETTINGS ----- 6
SYSTEM TOOLS ----- 7
DONE/EXIT ----- 0
PLEASE SELECT OPTION: _
```

Bar Code Setup

On the **LT5150H** you will see the **Bar Code Setup** screen below - Key in the number that corresponds to the setup parameters you would like to change.

```
BAR CODE SETUP
1D BAR CODE SETUP ----- 1

SCAN ENGINE OPTIONS ----- 3
BAR CODE IDs ----- 4
DONE/EXIT ----- 0
```

Selecting 1 above will show the following options:

```
1D BAR CODE SETUP
CODE 3 OF 9 ----- 1
UPC-A EAN 13 ----- 2
UPC-E EAN 8 ----- 3
CODE 128 ----- 4
2 OF 5 CODES ----- 5
CODABAR ----- 6
MSI/PLESSEY ----- 7
CODE 93/CODE 11 ----- 8
DATABAR/RSS/OTHERS ----- 9
DONE/EXIT ----- 0
```

PLEASE SELECT #: _

Note: On the **LT5250H**, with the integrated 2D Scanner, you will see the screen below first:

```
BAR CODE SETUP
1D BAR CODE SETUP ----- 1
2D BAR CODE SETUP ----- 2
SCAN ENGINE OPTIONS ----- 3
BAR CODE IDs ----- 4
DONE/EXIT ----- 0
```

PLEASE SELECT #: _

Please go to the [2D Bar Code Setup](#) section for specific 2D Bar Code Setup options on the LT5250H units.

1D Bar Code Setup

In each section you select the Default settings are shown in bold print, and the other options are shown in standard text. You can toggle between settings by keying in the corresponding number that for the parameter you want to change.

Code 3 of 9 (Code 39)

```
CODE 39 OPTIONS
CODE 39 ----- ON/OFF 1
FULL ASCII ----- ON/OFF 2
ACCUMULATE MODE --- ON/OFF 3
TRANSMIT START STOP ON/OFF 4
MOD 43 CHECK DIGIT -- ON/OFF 5
TRANSMIT MOD 43 ----- ON/OFF 6
CAPS LOCK ----- ON/OFF 7
DECODE OPTION ----- 0/1/2 8
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

- The Start and Stop character for Code 39 is the * character. Setting 4 determines whether or not those characters are transmitted to the computer along with the data. For example, at setting ON, the data of 1234 would be transmitted as *1234*. Transmitting the start and stop characters can be useful if you need to differentiate between data that comes from a bar code versus data coming from the keypad.

- Enabling use of the Mod 43 check character requires that the last character of your bar code conform to the Mod 43 check character specifications. See [Appendix E: Code 39](#) for more information. Enable transmission (6) will send the check digit data along with the rest of the bar code data to your computer. To use 6, you must also be using 5.
- Caps Lock ON causes lower case letters read as data to be transmitted to the computer as UPPER CASE, and upper case letters to be transmitted as LOWER CASE. Numbers, punctuation and control characters are not affected. Caps Lock OFF means that letters will be transmitted exactly as read. This setting applies to all bar code types.
- See [Appendix E: Code 39 Accumulate Mode](#) for more information regarding Accumulate Mode.
- Decode Option is used to allow reading of Code 39 bar codes through a windshield. Setting this option to 1 will loosen up the decoder a little and option 2 will loosen up the decoder a bit more. This should be used with caution since using a looser decoder can cause substitutions.

UPC-A/EAN-13

UPC-A/EAN-13 OPTIONS

UPC/EAN ALL -----	ON/OFF	1
UPC/EAN SUPPLEMENT	ON/OFF	2
UPC-A NSC -----	ON/OFF	3
UPC-A CHECK -----	ON/OFF	4
EAN-13 1 ST 2 DIGITS -	ON/OFF	5
EAN-13 CHECK -----	ON/OFF	6
ISBN EAN-13 MODE ----	ON/OFF	7
UPC-A AS EAN-13-----	ON/OFF	8
DONE/EXIT -----		0

CHANGE SETTING #: _

- Use setting 2 to enable reading of the 2 and 5 digit UPC/EAN supplements commonly found on magazines and paperback books as well as the Extended Coupon Codes. Using this setting force left to right reading of UPC codes to assure that the supplement code is not missed.
- Use setting 3 to enable transmission of the NSC character to your computer. The Number System Character is the leading character in the bar code. For details, see [Appendix H: UPC/EAN](#).
- Use setting 4 to enable transmission of the check digit character to your computer. The check digit is the last character and is based upon a calculation performed on the other characters.
- Use setting 5 to enable the transmission of the EAN-13 country code (the first 2 digits).
- Use setting 6 to enable the transmission of the EAN-13 check digit.
- ISBN (International Standard Book Numbering) bar codes are EAN-13 with a 5-digit supplement. If the "Bookland" bar code uses 978 (books) or 977 (periodicals) as the first three digits, then the TriCoder can transmit it in the ISBN format. To enable transmission of the ISBN format, set option 7 to ON. To return to the default of normal EAN-13 transmission, set option 7 to OFF. For details on ISBN, see [Appendix H: UPC/EAN](#).
- UPC-A can be transmitted in EAN-13 format by adding a leading 0 (USA county code) to the UPC-A data. To transmit in EAN-13 format, set option 8 to ON.

UPC-E/EAN-8

UPC-E/EAN-8 OPTIONS

UPC-EAN FIRST CHAR -----	ON/OFF	1
EAN-8 FIRST CHAR -----	ON/OFF	2
UPC-E CHECK -----	ON/OFF	3
EAN-8 CHECK -----	ON/OFF	4
UPC-E EXPANDED TRANS	ON/OFF	5
UPC-E1 -----	ON/OFF	6
DONE/EXIT -----		0

CHANGE SETTING #: _

- Use setting 1 and 2 to enable or disable the UPC-E or EAN-8 first digit.
- Use setting 3 and 4 to enable or disable the UPC-E or EAN-8 check digit. The check digit is the last character and is based upon a calculation performed on the other characters.
- Use setting 5 to select UPC-E0 compressed or expanded. When set to ON (the default setting) UPC-E1 codes are transmitted as is, when set to OFF UPC-E1 codes are transmitted with inserted zero's to make them the same length as a UPC-A bar code. A NSC of 0 is assumed.
- Use setting 6 to enable the reading of UPC-E1 bar codes. Do not enable UPC-E1 if you plan on reading EAN-13 bar codes. You may experience partial reads when reading EAN-13.
- If you prefer to transmit UPC-E bar codes in a 6-digit format while EAN-8 is transmitted in its original 8-digit format, set option 7 to ON.

Code 128

CODE 128 OPTIONS

CODE 128 -----	ON/OFF	1
GS1-128 -----	ON/OFF	2
SEND FNC1=1 ST CHAR -----	YES/NO	3
SEPARATOR CHAR ----	NONE/GS/CUST	4
CUSTOM SEPARATOR -----	XXXX	5
DONE/EXIT -----		0

CHANGE SETTING #: _

- GS1-128 is a subset of Code 128 that follows certain specifications regarding character content, length and check digits. Enabling GS1-128 (2) causes the TriCoder to look for a Code 128 bar code that begins with the Code 128 FNC1 (Function 1) character. Regular Code 128 codes can still be read as well when GS1-128 is enabled.
- By default, the FNC1 is not transmitted if it is the first character as it is not considered part of the barcode data. You can send the first FNC1 by pressing the 3 Key on the TriCoder keypad to change the setting from NO to YES.
- All FNC1 characters after the first one in the code are used as field separators for any variable length fields in the code (unless the variable length field is the last field). The FNC1 character, or GS character, sent is the ^] ASCII 29 – this is the standard character, but is not a visible character in most programs. We offer the ability to change the output of the GS character from ^] to a different character such as a ~ or a CR (carriage return). This would enable the user to parse the data fields.
- See [Appendix F: Code 128](#) for more details.

2 of 5 Code

2 OF 5 CODE OPTIONS

INTERLEAVED 2 OF 5 -----	ON/OFF	1
CHECK DIGIT -----	ON/OFF	2
TRANSMIT CHECK DIGIT -----	ON/OFF	3
STANDARD 2 OF 5 -----	ON/OFF	4
2 OF 5 CHECK DIGIT LENGTH --	06	5
2 DIGITS FROM 00-98		
DEFAULT IS 06		
TEST MODE ONLY 00		
DONE/EXIT -----		0

CHANGE SETTING #: _

- Setting 2 requires that the last digit in your bar code conform to the specifications for the 2 of 5 check digit calculation. See [Appendix G: 2 of 5 Code](#) for more information.
- Transmission of the check digit (3) requires the use of setting 2 and will transmit the check digit along with the bar code data to the computer.
- 2 of 5 is so susceptible to misreads that the TriCoder adds an additional safeguard - it can be configured to look for fixed-length data only.
- The default setting of 06 causes the TriCoder to read **only** 2 of 5 codes that are 6 digits in length. To set the TriCoder to read a different length, enter any two-digit number. 2 of 5 code must always be an even number of digits so the length setting must always be an even number.
- Reading variable length I 2of5 or 2 of 5 codes is to be avoided if at all possible. The 00 setting is supplied for the purposes of reading codes of unknown length, counting the digits and setting the length to the proper number.

Codabar

CODABAR OPTIONS

CODABAR -----	ON/OFF	1
CODABAR CLSI -----	ON/OFF	2
START STOP CHAR -----	ON/OFF	3
DONE/EXIT -----		0

CHANGE SETTING #: _

- CLSI is a form of Codabar often used by libraries.
- Setting 3 will transmit the Codabar start and stop characters with the bar code data to your computer. If you are varying the start and stop characters to differentiate between different labels, transmitting the start and stop can be helpful. See [Appendix I: Codabar](#) for more information.

MSI/Plessey

MSI/PLESSEY
MSI/PLESSEY ----- ON/OFF **1**
TRANSMIT CHECK DIGITS 0/1/2 **2**
DONE/EXIT ----- **0**

CHANGE SETTING #: _

- The MSI/Plessey options are selected by pressing the **1** key to select the desired mode of operation.
- If you have enabled the Mod 10 or Mod 11 check digits, they will be transmitted along with your bar code data from the TriCoder to your host.
- For more information regarding MSI or Plessey Code, see [Appendix J: MSI Plessey Code](#).

Code 93 / Code 11

CODE 93/CODE 11
CODE 93 ----- ON/OFF **1**
CODE 93 FULL ASCII ----- ON/OFF **2**
CODE 11 ----- ON/OFF **3**
CODE 11 CHECK TRAN ----- 0/1/2 **4**
DONE/EXIT ----- **0**

CHANGE SETTING #: _

Code 93 is similar in character set to Code 39. See [Appendix K: Code 93](#) for more information. Code 93 is not a commonly used bar code symbology.

GS1-DataBar/ RSS-14 / Other Bar Codes

DATABAR/RSS-14 OPTIONS
DATABAR/RSS-14 ----- ON/OFF **1**
DONE/EXIT ----- **0**

By default, GS1-DataBar (RSS-14) is disabled. Press the 1 key to toggle through the DataBar options listed above. We support the standard and stacked version of GS1 DataBar. For more information on GS1 DataBar, see the GS1.org website at <https://www.gs1.org/standards/barcodes/databar>

For LT7202H models you will also have the following options in the 1D Bar Code Setup menu:

POSTNET

POSTNET ----- ON/OFF **A**

- The POSTNET ON/OFF is on the 1D BAR CODE SETUP Screen - Pressing the **A** key toggles POSTNET ON or OFF

INTELLIGENT MAIL

INTELLIGENT MAIL ---- ON/OFF **B**

- The INTELLIGENT MAIL ON/OFF is on the 1D BAR CODE SETUP Screen - Pressing the **B** key toggles POSTNET ON or OFF

2D BAR CODE SETUP

On the **LT5250H** with the integrated 2D Scanner you will see the screen below first. All of the 1D Bar Code Setup is the same as the LT5150H – (see the [1D Bar Code Setup](#) above for those options)

```
BAR CODE SETUP
1D BAR CODE SETUP ----- 1
2D BAR CODE SETUP ----- 2
SCAN ENGINE OPTIONS ----- 3
BAR CODE IDs ----- 4
DONE/EXIT ----- 0
```

PLEASE SELECT #: _

2D Bar Code Setup

```
2D BAR CODE SETUP
PDF17 ----- ON/OFF 1
Micro PDF 417 ----- ON/OFF 2
Codablock F ----- ON/OFF 3
Data Matrix ECC -140 ON/OFF 4
Data Matrix ECC -200 ON/OFF 5
Aztec Code ----- ON/OFF 6
Aztex Runes ----- ON/OFF 7
QR Code ----- ON/OFF 8
Micro QR ----- ON/OFF 9
Maxi Code ----- ON/OFF A
DONE/EXIT ----- 0
```

PLEASE SELECT #: _

The **LT5250H** will have these 2D Bar Code options only. If you need to scan 2D codes in your data collection program make sure you have the maximum length set to the largest code you will likely encounter. The TriCoder programs are limited to **99 character bar codes** for any single statement. You will be able to scan longer bar codes, however the data stored will *only* be the first 99 characters.

BAR CODE ID's

```
BAR CODE SETUP
1D BAR CODE SETUP ----- 1
2D BAR CODE SETUP ----- 2
SCAN ENGINE OPTIONS ----- 3
BAR CODE IDs ----- 4
DONE/EXIT ----- 0
```

PLEASE SELECT #: _

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. This applies only when the TriCoder is used in NON PORTABLE mode.

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 2of5	e	2 of 5	f
Code 128	g	Code 93	i
MSI	j	UPC-E(0)	n
UPC-E (1)	o	EAN-8	p
GS1 Data Bar RSS-14	r		
Plessey	x		

The ID character is transmitted in front of the bar code data.

I/O SETTINGS

HOST (Computer Interface)

The TriCoder is shipped with the **HOST Computer Interface** set to **WinUSB** as the default.

```
I/O SETTINGS
HOST ----- WinUSB DEVICE 1
TERMINATOR CHARACTER CR 2
SINGLE CYCLE UPLOAD --- OFF 3
HID PACKET SIZE ---- (00-99) 00 4
HID PACKET DELAY (00-99) 00 5
USB HID ALT OUTPUT -- OFF 6
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

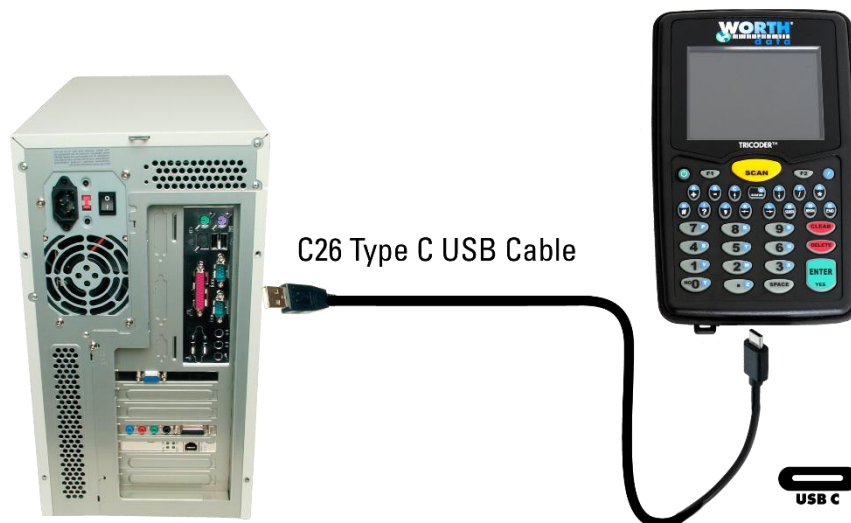
You have 2 choices for **HOST** Settings – pressing the **1** key at the **I/O SETTINGS** menu cycles through the 2 choices:

1. **WinUSB DEVICE**
2. **HID KEYBOARD**

HID KEYBOARD

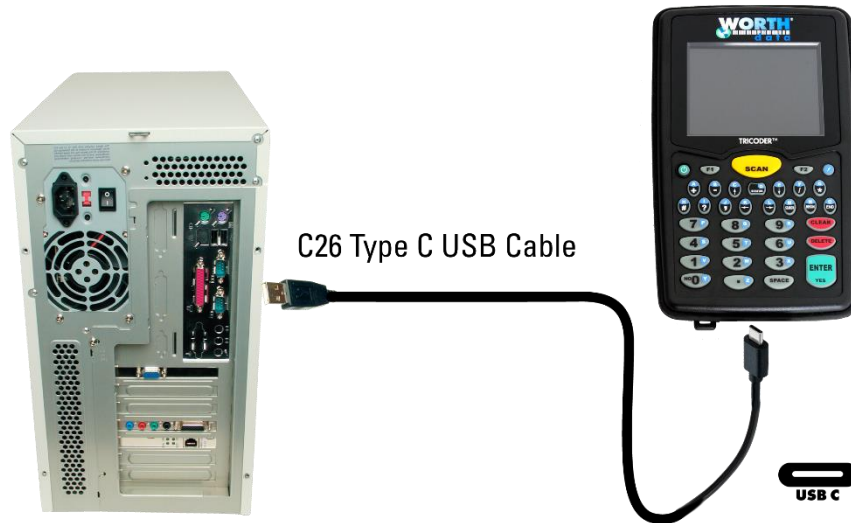
If you have a Mac, or Windows ARM PC, you must choose **HID KEYBOARD**. You are limited to Non-Portable Mode and Data Upload as a HID USB Keyboard to a Mac. There isn't support for full speed USB on a Mac or Windows ARM PC.

If you are using Windows 11, 10, 8, 7, Vista, & XP and you wish to upload your files **directly into your application** through the keyboard, you must choose **HID KEYBOARD**. After specifying **HID KEYBOARD**, the first time you plug in a USB cable to the TriCoder and host, you will be asked to install the USB Keyboard HID driver, which is probably on your hard disk, but if not, is on your original Windows installation media; just keep clicking on NEXT until you are forced to supply the original Windows installation media. Data uploads using **HID KEYBOARD** will be slower than **WinUSB**, but you will still be able to use the Fast program uploads/downloads, firmware upgrades, voice uploads, and table downloads; the first time you attempt a WinUSB operation, you will be required to install the WinUSB driver, this should be on your Windows machine by default. You can download the files from our website: <https://www.barcodehq.com/downloads.html> under *5150 TriCoder Downloads*.



WinUSB DEVICE

If you are using Windows on a x86 Intel or AMD PC, and you wish to use the *Hardware Utilities 3.0* software to upload data via USB, choose **WinUSB DEVICE** for the HOST interface. You will also be able to do program uploads/downloads, firmware upgrades, voice uploads, and table downloads. The first time you plug in a **C26 USB cable** between the TriCoder and a host, you will be required to install the WinUSB driver if it is not already installed with your version of Windows. The first time you attempt to use Non-Portable Mode, you may be asked by the operating system to install the USB Keyboard HID driver, which is probably on your hard disk, but if not, is on your original Windows installation media. While the TriCoder is set for **WinUSB** it *will* enumerate as an **HID KEYBOARD** in Non-Portable Mode automatically.



Terminator Character

```
I/O SETTINGS
HOST ----- HID KEYBOARD 1
TERMINATOR CHARACTER CR 2
SINGLE CYCLE UPLOAD --- OFF 3
HID PACKET SIZE ---- (00-99) 00 4
HID PACKET DELAY (00-99) 00 5
USB HID ALT OUTPUT -- OFF 6
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

- The **Terminator Character** is the character sent at the end of each data entry in NON PORTABLE mode and at the end of each field when uploading after data collection (Portable use). Your application will determine what Terminator Character (if any) you use. Options for Terminator Character Are: CR, TAB, CR/LF, NONE. Pressing the Number 2 on the TriCoder keypad will cycle through those options. In HID Keyboard, **CR** is the default. For Serial Interface, **CR/LF** is the default.

Single Cycle Upload

```
I/O SETTINGS
HOST ----- HID KEYBOARD 1
TERMINATOR CHARACTER CR 2
SINGLE CYCLE UPLOAD --- OFF 3
HID PACKET SIZE ---- (00-99) 00 4
HID PACKET DELAY (00-99) 00 5
USB HID ALT OUTPUT -- OFF 6
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

- **Single Cycle Upload** allows the TriCoder to upload one field at a time to the host, controlled by the pressing of any key (except **F1**) on the TriCoder each time the operator wants to transmit a field. **Single Cycle Upload** is set to OFF by default, but when set to ON it can be used to test complex upload prefix and suffix sequences. This is typically used when a TriCoder is used in **HID KEYBOARD** mode and you are uploading directly into an application. **Single Cycle Upload** allows you to test key sequences and delays before you collect a lot of data and try an upload. Pressing **F1** terminates the upload session.

HID PACKET SIZE

```
I/O SETTINGS
HOST ----- HID KEYBOARD 1
TERMINATOR CHARACTER CR 2
SINGLE CYCLE UPLOAD --- OFF 3
HID PACKET SIZE ---- (00-99) 00 4
HID PACKET DELAY (00-99) 00 5
USB HID ALT OUTPUT -- OFF 6
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

- The *HID PACKET SIZE* setting by default is set to **00** and offers the fastest un-interrupted upload. With some software applications, and large data file uploads, you may need to set a *HID PACKET SIZE* **along with** the *HID PACKET DELAY* to prevent data from being scrambled during the upload.
- Once the keyboard buffer fills up the computer needs to do a slight pause to write the data in the buffer to a file. However, with not delays set, the TriCoder keeps sending data, so the rest of the file may get scrambled. You can adjust the packet size, and the delay between packets, to give the Software application time to save the received data and not miss, or scramble, the additional data that is being uploaded.
- To Change the *HID PACKET SIZE*, press the 5 Key on the TriCoder Keypad and enter a 2-digit value for the desired packet size – 01 is 1 byte of data (or character), 99 would be 99 bytes of data (or characters).

HID PACKET DELAY

```
I/O SETTINGS
HOST ----- HID KEYBOARD 1
TERMINATOR CHARACTER CR 2
SINGLE CYCLE UPLOAD --- OFF 3
HID PACKET SIZE ---- (00-99) 00 4
HID PACKET DELAY (00-99) 00 5
USB HID ALT OUTPUT -- OFF 6
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

- The *HID PACKET DELAY* setting by default is set to **00**. The packet delay works with the *HID PACKET SIZE* to prevent scrambled data during large data file uploads.
- To Change the *HID PACKET DELAY*, press the **6** Key on the TriCoder Keypad and enter a 2-digit value for the desired packet delay time – 01 is .1 second between data packets set in the *HID PACKET SIZE* setting, 99 would be 9.9 seconds of delay.

SPEAKER OPTIONS

```
SPEAKER OPTIONS
BEEP VOLUME ----- 0-9 1
BEEP TONE ----- 1/2/3/4/5 2
VOICE VOLUME ---- HIGH/MED/LOW/OFF 3
KEYPAD TONE ----- ON/OFF 4
KEY AFTER ERROR ----- ON/OFF 5
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

Beep Volume

Press the **#1** key on the TriCoder to cycle through the **Beep Volume** settings. Options are 0-9 with 0 being OFF and 9 Being High - **5** for Medium is the Default volume.

Beep Tone

Press the **#2** key on the TriCoder keypad to cycle through the **Beep Tone** settings. Options include 1, 2, 3, 4, and 5. The default tone is 3. Cycling through this setting will change the pitch or tone of the beep from higher to lower.

Keypad Volume

Press the **#3** key on the TriCoder to cycle through the **Keypad Volume** settings. Options include High, Medium, Low, and OFF. Medium is the Default volume.

Keypad Tone

Press the **#4** key on the TriCoder keypad to cycle through the **Keypad Tone** settings. Options include On and Off. On is the Default setting.

Key After Error

Press the **#5** key on the TriCoder keypad to cycle through the **Key After Error** settings. Options include YES and NO. YES is the Default setting which required the operator to hit a key after receiving an error message during data collection. Turning this to NO will allow the user to skip pressing a key and will automatically go back to the question or statement that caused the error.

Scan Engine Options LT5150H

For the LT5150H models with a 1D Laser Engine you will see the following options when you select 2 at the BAR CODE SETUP Menu:

```
SCAN ENGINE OPTIONS
DOUBLE DECODE ----- ON/OFF  1
4.5 SECOND LASER BEAM ----- ON/OFF  2
FILTER MODE ----- 0/1/2/3  3
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

Double Decode

Press the #1 key on the TriCoder keypad to turn ON or OFF **Double Decode**. You can increase the strength of the decoder by enabling Double Decode. This makes the scanner do 2 identical decodes of the same bar code before accepting the result and entering the data. This is useful when there are very poorly printed codes and for codes that are out of spec and are giving miss-reads.

4.5 Second Laser Beam

Press the #2 key on the TriCoder keypad to turn ON or OFF the **4.5 Second Laser Beam**. You can increase the length that the laser beam stays on to improve the chance of getting a good decode in tough conditions or with poor bar codes. This makes the scanner stay on longer trying to decode before automatically shutting off.

Filter Mode

Press the #3 key on the TriCoder keypad to select the **Filter Mode**. This option is only available on the LT5150H.

If you are trying to read poorly printed bar codes, changing this setting may improve the performance of the decoder and improve the speed of reading your bar codes. When selecting mode 1 or 3 it you should also set **double decode** to **ON** to avoid any potential decode errors.

- Mode 0 is the default setting and works best with most bar codes.
- Mode 1 can help when reading codes printed with uneven levels of dark and light areas.
- Mode 2 can help when reading codes with poor print contrast (like a dark or colored background).
- Mode 3 can help when reading codes with holes or voids, such as damaged or dot-matrix printed bar codes.

Scan Engine Options LT5250H

For the LT5250H models with a 2D Scan Engine you will see the following options when you select 2 at the BAR CODE SETUP Menu:

```
SCAN ENGINE OPTIONS
Redundancy ----- 3/2  1
LCD Scanning ----- ON/OFF 2
RESET 2D SCAN ENGINE ----- 3
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

Redundancy

Press the #1 key on the TriCoder keypad to set the number of times the scanner decodes the bar code the same way before a “good read: The options are 2 for **Double Decode**, or 3 for **Triple Decode**. This makes the scanner do 2 or 3 identical decodes of the same bar code before accepting the result and entering the data. This is useful when there are very poorly printed codes and for codes that are out of spec and are giving miss-reads.

LCD Scanning

Press the #3 key on the TriCoder keypad to turn ON or OFF **LCD Scanning**. You can increase the readability of bar codes on LCD's, cell phones, monitors or other displays by turning this option on.

Reset 2D Engine

The LT5250H TriCoder with a 2D Scan Engine can be reset to default if you are experiencing unusual behavior or want to return the settings to the default. Pressing the 3 key on the TriCoder keypad will reset the 2D engine.

Date & Time Settings

```
DATE & TIME SETTINGS
TIME ----- 0907 1
DATE ----- 040325 2
DATE FORMAT ----- USA/EURO 3
YEAR OUTPUT ----- 2/4 - DIGIT 4
SHUT DOWN TIME ----- 05 5
DATE/TIME FORMAT - SHORT 6
DONE/EXIT ----- 0
```

CHANGE SETTING #: _

Time

Press the **#1** key on the TriCoder keypad to change the **Time**. This will take the cursor to the time setting. You can then enter the time in 4 digits using the keypad. The TriCoder uses a 24 Hour clock or military time format. For example, to enter a time of 3:35 p.m., key in **1535**, or key in **0907** for 9:07 a.m. Press ENTER to complete the change.

Date

Press the **#2** key on the TriCoder keypad to change the **Date**. This will take the cursor to the date value where you can enter the correct date 6-digit date in the *mmddyy* format. For example, to set a date of 04/03/2025, you would key **040325**. Press ENTER to complete the change. You can always press the STATUS key to view the current date and time in both NON PORTABLE mode and during Data Collection. To set the time in the TriCoder from a host computer, see *Hardware Utilities* for details.

Date Format

Press the **#3** key on the TriCoder keypad to change the **Date Format**. This can be changed from USA, which is *mmddyy* and is the default, or can be set to EUROPEAN, which uses the international date format of *ddmmyy*.

Year Output

Press the **#4** key on the TriCoder keypad to change the **Year Output**. This option allows you to output the date with a 2-Digit year or as a 4-Digit year. The default date format is USA setting would be *mmddyy* with a 2-Digit year. If you change this setting to 4-Digit then the date output would change to *mmddyyyy*.

Shut Down Time

Press the **#5** key on the TriCoder keypad to change the **Shut Down Time**. By default this is set to **05** and if the TriCoder is inactive for more than 5 minutes, it will shut itself down in order to conserve batteries. To resume operation, you must turn the TriCoder back on using the ON/OFF key. To change the amount of time the TriCoder waits before shutting down key in **5** from the TriCoder keypad. This will take the cursor to the **Shut Down Time** setting. Key in two digits - the default is 05 (5 minutes) - to correspond to the length of time in minutes. For example, **01** would be **1 minute**. If you want to prevent the TriCoder from shutting off automatically at all, set the **Shut Down Time** to **00**.

Date/Time Format

There are also alternative output options for the date and time on the TriCoder. The default is the **SHORT** format, which outputs the date and time as *mmddyy* and *hhmm* with no spaces between characters. The LONG format uses / separators for the date, and time uses : separator; so the uploaded date when set to LONG for date would be *mm/dd/yy* and for time *hh:mm*

LCD Options

LCD OPTIONS
MASTER BACKGD, COLOR --- 1 1
PROMPT BACKGD, COLOR --- 1 2
PROMPT TEXT COLOR ----- 2 3
DATA BACKGD, COLOR ----- 1 4
DATA TEXT COLOR ----- E 5
BRIGHTNESS --- LOW/MED/HIGH 6
BRIGHTNESS TIMEOUT ----- 05 7
FULL SCREEN SCROLL NO/YES 8
DONE/EXIT ----- 0

CHANGE SETTING #: _

Master Background Color

Keying **1** allows you to change the **Master Background Color** of the TriCoder LCD – The default is **1** which is BLACK background. Options are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F - See the Color Chart below for color options.

Prompt Background Color

Keying **2** allows you to change the **Prompt Background Color** of the TriCoder – The default is **1** which is a BLACK background. Options are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F - See the Color Chart below for color options.

Prompt Text Color

Keying **3** allows you to change the **Prompt Text Color** of the TriCoder – The default is **2** which is BLUE text. Options are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F - See the Color Chart below for color options.

Data Background Color

Keying **4** allows you to change the **Data Background Color** of the TriCoder – The default is **1** which is BLACK background for all entered data. Options are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F - See the Color Chart below for color options.

Data Text Color

Keying **5** allows you to change the **Data Text Color** of the TriCoder – The default is **E** which is WHITE text for all entered data. Options are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F - See the Color Chart below for color options.

LCD COLOR CODE CHART

0 = AQUA	1 = BLACK	2 = BLUE	3 = FUCHSIA
4 = GRAY	5 = GREEN	6 = LIME	7 = MAROON
8 = NAVY	9 = OLIVE	A = PURPLE	B = RED
C = SILVER	D = TEAL	E = WHITE	F = YELLOW

Brightness

Keying **6** allows you to change the **Brightness** of the LCD – The default is **MED**. Options are: LOW, MED, and HIGH. Changing this setting has some effect on battery life.

Brightness Timeout

Keying **7** allows you to change the **Brightness Timeout** of the LCD – The default is **05 Seconds**. Options are: 00-99. Changing this setting has some effect on battery life.

Full Screen Scroll

Keying **8** allows you to change the **Scrolling** of the LCD – The default is **NO** which allows faster refresh of the screen and moves the cursor and prompts back to the top of the screen when it reaches the bottom during data collection. **YES** will keep the screen scrolling which takes more time between scans as the entire LCD is always scrolled up.

Other Settings

OTHER SETTINGS

PREAMBLE -----	1
POSTAMBLE -----	2
CHARACTERS -----	3
EOF STRING -----	4
DONE/EXIT -----	0

CHANGE SETTING #: _

Preamble and Postamble

The **Preamble** and **Postamble** apply to data entered in **NON-PORTABLE MODE** only. **Upload Prefixes** are used in programs for portable data collection.

- **Preambles** are user-defined data that is transmitted at the beginning of data (bar code or keyed) that is entered in the TriCoder in **NON-PORTABLE** mode. For example, if you set a preamble of @@ and scanned bar code data of **12345**, @@**12345** would be transmitted to the computer.
- **Postambles** are user-defined data that is transmitted at the end of data (bar code or keyed) that is entered in the TriCoder in **NON-PORTABLE** mode. For example, if you set a preamble of @@ and scanned bar code data of **12345**, **12345**@@ would be transmitted to the computer.
- By default, the TriCoder has no preambles or postambles configured. Preambles and Postambles can each contain up to 15 characters scanned from the bar coded **FULL ASCII Menu**.

To set a preamble or postamble:

1. Press the **5** key at the **Main Menu** (opening screen)
2. Press the **7** key at the **TRICODER SETUP** screen
3. Select **1** for **Preamble** or **2** for **Postamble**.
4. Enter keys from the keypad or Scan any other desired characters (up to 15) from the **FULL ASCII Menu** (available on our website www.barcodehq.com/downloads.html).
5. Press the **ENTER** key on the TriCoder keypad to store the characters you want.
6. To clear the **Preamble** or **Postamble** and return to the default (no Preambles or Postambles defined), key **CLEAR** at step #4, then continue with your setup.

You can use the **Preamble** or **Postamble** to trim characters from the data you are entering into the TriCoder in **NON-PORTABLE** mode. The **Upload Prefix and Suffix** is used to trim data in **portable mode (data collection)**. You can trim from 1-15 characters from the data by creating a preamble or postamble of:

~x

where ~ is ASCII 126 and x is a single hex digit 1-F (corresponding to 1-15). Data that is shorter than the trim amount are transmitted without trimming. **Preambles** trim data from the front; **Postambles** trim characters from the end.

Here are some examples, with and without trimming included:

Data Scanned	Preamble Value	Data Transmitted
123	XYZ	XYZ123
12345678	~3XYZ	XYZ45678
12345678	~9	12345678
12345678901	~A	1
123456	~5	6

Preamble affects leading (high order) characters

Data Scanned	Postamble Value	Data Transmitted
123	XYZ	123XYZ
12345678	~3XYZ	12345XYZ
12345678	~9	12345678
12345678901	~A	1
123456	~5	1

Postamble affects trailing (low order) characters

Using the Bar Code ID feature and the **Preamble** or **Postamble**, you can trim data selectively, trimming characters only on the bar code type specified. To use selective trimming, enter:

~bx

where *b* is the Bar Code ID character (see the *DataBar/RSS-14/Other Bar Codes Setup parameter*) and *x* is the number of characters to trim from the front of the data. For example, **~b2~c1** says “trim 2 characters from Code 39 data and 1 character from UPC-A data”. Remember that the **Preamble** trims leading data and the **Postamble** trims trailing data.

The **Preamble** and **Postamble** can also be used to create “line feeds” on the TriCoder display before the data is displayed. To enter “line feeds” before or after your data enter:

}x

where *x* is 1-3, depending on how many lines you want to scroll. For example, if you wanted skip 3 lines, you would enter **}3**.

Lastly, the **Preamble** and **Postamble** can be used to check a minimum and maximum character length for data entered in NON PORTABLE mode. In portable data collection, min and max character lengths are set using the Max Data Len and the Min Data Len in the programming statements. To check for length in the **Preamble or Postamble**, enter:

|nnmm

where *|* is ASCII 124, *nn* is the two-digit minimum and *mm* is the two-digit maximum. **|0210** would check for a minimum of 2 characters and a maximum of 10.

Characters

The **Characters** setting allows the TriCoder to output chosen ASCII characters in place of the actual characters entered. For example, if you scanned the number **1** (*hex 31*) and wanted the TriCoder to output *hex 92* instead, you would enter **3192** for the **Characters** parameter. This would re-assign the output characters, with the TriCoder outputting *hex 92* every time it sees *hex 31*. To re-assign characters:

- Key in **3** at the OTHER SETTINGS MENU for **Characters**
- Key up to seven 4-digit pairings where the first 2 digits represent the hex number to replace and the second 2 digits represent the hex number to insert. You can have up to seven character re-assignments.
- Press ENTER when done to store the settings
- You can eliminate the output of a character by using **FF** as the hex number to insert. For example, if you wanted to eliminate all \$, following the above instructions, enter **24FF**.

EOF String

The **EOF String** setting allows you to choose up to 8 characters to be transmitted at the end of a TriCoder file upload. It is typically used to signal to the receiving host program that the TriCoder is done uploading its data and has transferred its last piece of data. The characters chosen are often characters not available on the TriCoder keypad; they are scanned from the FULL ASCII MENU. To program an **EOF String**:

1. Press **4** at the OTHER SETTINGS Menu for EOF String
2. Key or Scan up to 8 characters from the FULL ASCII MENU
3. Press the ENTER Key to store your settings
4. Press **0** when you are Done to Exit the OTHER SETTINGS Menu

If you do not program an **EOF String**, the TriCoder sends a **Ctrl Z** (ASCII 26). Undisplayable characters are displayed on the TriCoder as **?**. To view the ASCII equivalent (so you know what characters are there) press the **F2** key while in the **EOF String** parameter.

System Tools

```
SYSTEM TOOLS
PLAY VOICE PROMPT ----- 00 1
LANGUAGE ----- ENGLISH 2
RESET SETUPS TO DEFAULT 3
RESET PROGRAMS & DATA ---- 4
CLEAR DATA FILE (S) ----- 5
DATA SECURITY ----- OFF/ON 6
FIXED PROGRAM --- OFF/0/1/2/3 7
TABLE ALLOWED ----- YES/NO 8
DONE/EXIT ----- 0
```

PLEASE SELECT OPTION: _

The System Tools Menu is a Password Protected Setup: The password is **WDTRI**

Play Voice Prompt

Selecting **1** on the TriCoder keypad. This will take the cursor to the voice message value where you can enter the 2-Digit number of the voice file you want to play. This will play only that file when you hit ENTER. If no voice is saved for that number you will hear nothing.

Language

Pressing **2** on the TriCoder keypad will cycle through the language settings available for the TriCoder. The available languages are ENGLISH, FRENCH, and GERMAN.

Reset Setups to Default

Selecting **3** will allow you to reset all of the setup parameters to the factory defaults. This will remove any setup changes you may have made so do this with caution. You will be prompted with the message: ARE YOU SURE YES/NO?. Press YES if you want to reset, press NO if you don't.

Reset Programs & Data

Selecting **4** will allow you to reset the programs to the factory defaults and remove any data in the TriCoder. This is a complete memory reset so do this with caution. You will be prompted with the message: ARE YOU SURE YES/NO? Press YES if you want to reset, press NO if you don't.

Clear Data File(s)

Selecting **5** you will allow you to remove any stored data in the TriCoder. This will remove any data you have collected made so do this with caution. You will be prompted with the message: ARE YOU SURE YES/NO?. Press YES if you want to delete the data, press NO if you don't.

Data Security

Turning *Data Security* **ON** prevents the operator from editing data as well as not allowing them to exit Data Collection mode. When in this mode you can exit back to the Main Menu and bypass the *Data Security* by pressing **F1**  E

Fixed Program

The TriCoder can be set by this parameter to only work with one Program for security. By default, this is set to OFF, but you can set it to restrict the user to programs 0, 1, 2, or 3. When in this mode you can exit back to the Main Menu and bypass the *Fixed Program* by pressing **F1**  E

Table Allowed

The TriCoder can have the memory allocated by this parameter to allow a Table for data lookup and reference, or if you select NO to allow that memory space to be used entirely for the VOICE System for more Voice Files. By default, this is set to **YES** so Tables and Voice share the 2MB (1MB each) of flash memory.

Chapter 9: Using the Hardware Utilities 3.0

The **Hardware Utilities 3.0** for Windows program is a versatile application that gives you the ability to:

- Test communication (WinUSB)
- Upload data from TriCoder to computer
- Download Programs, Voice, and Tables from the computer to the TriCoder
- Change TriCoder Setup parameters
- Edit and Download Tables
- Edit and Download programs - Virtual TriCoder for editing

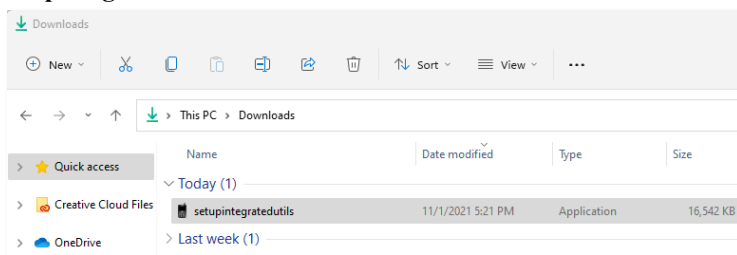
To download the latest version of the **Hardware Utilities 3.0** for Windows visit our website at:

<https://www.barcodehq.com/downloads.html>

Installing the Hardware Utilities 3.0

The Hardware Utilities 3.0 is for Windows ONLY. There is no version for any other operating system.

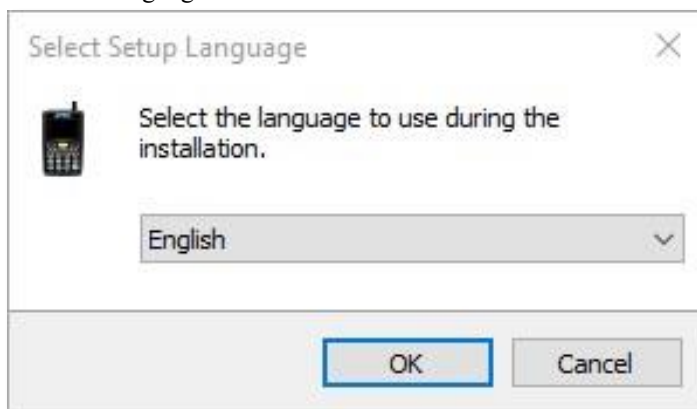
To install the **Hardware Utilities**; **Browse** to find where you downloaded the file from our website, then find the file named **setupintegratedutilities.exe**. – Double click on the file, or alt Click and select Open, to start the install.



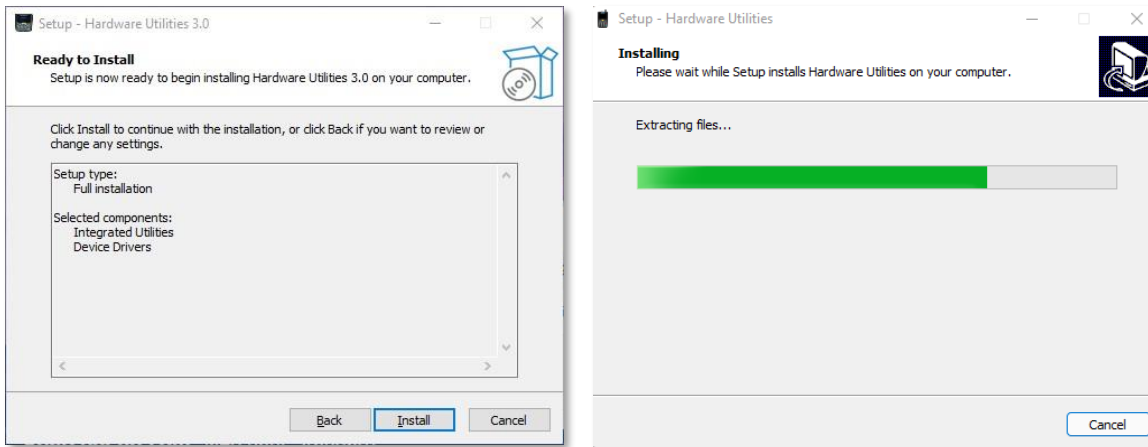
Click on “Yes” to install the **Hardware Utilities Setup**,



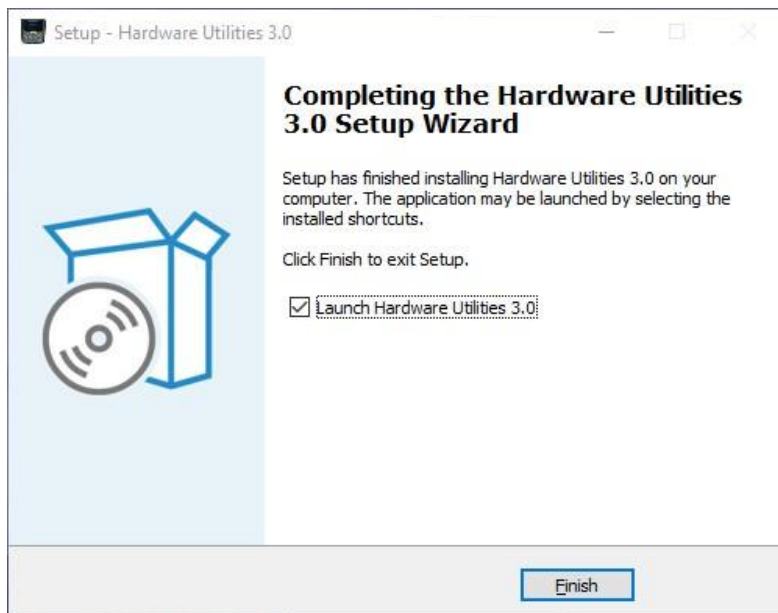
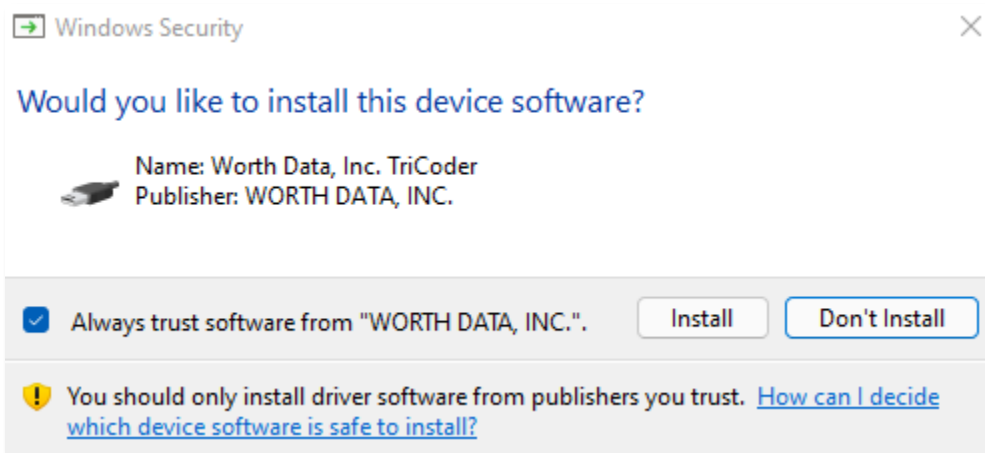
Select the language and click OK



Click the Install button to install the software. The program will then install on your system.



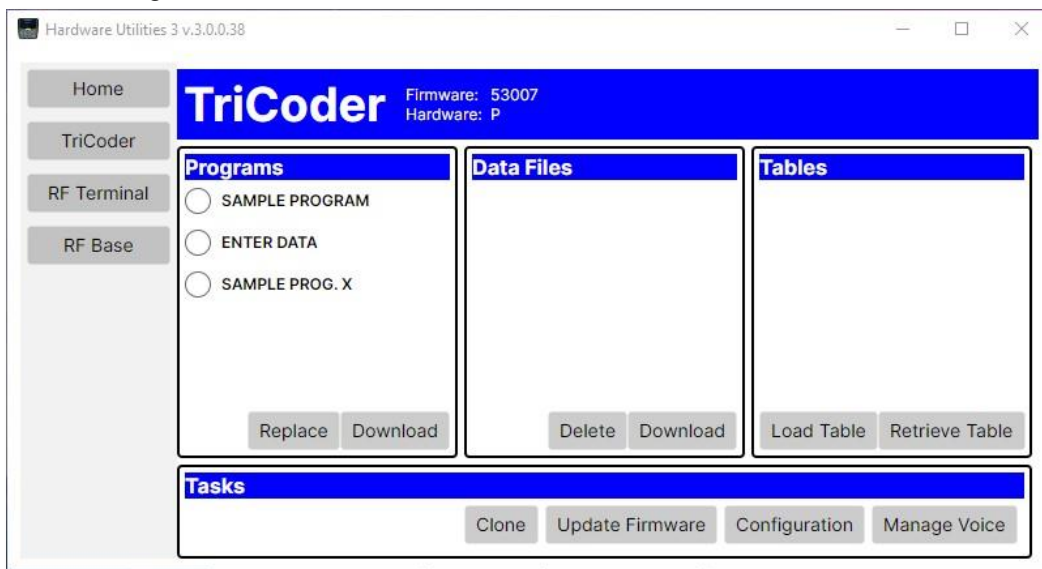
During the installation, you will see also see a dialog for installing the USB drivers. You will not see this message if you have already installed the latest drivers. Click on Install and continue.



Once it completes the installation you should then Click on the “Finish” button, and it will Launch the *Hardware Utilities 3.0*

Running the Hardware Utilities 3.0 program

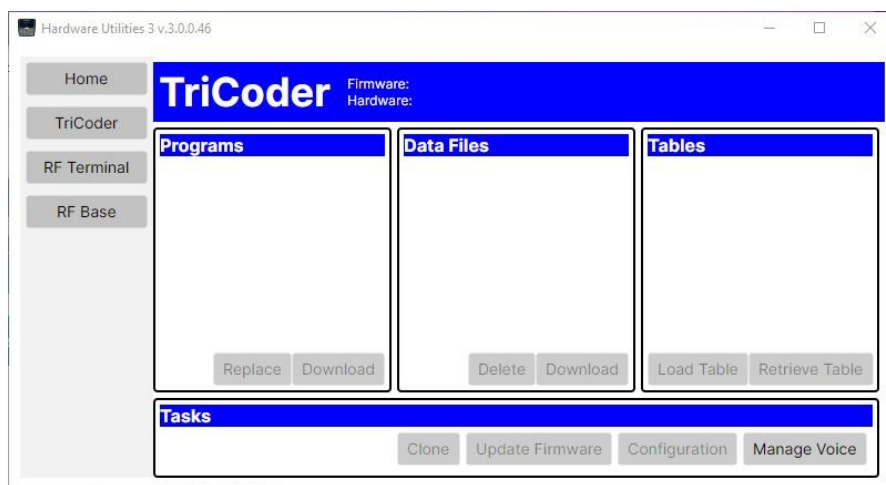
The first time you start the *Hardware Utilities 3.0*, you will need to select the TriCoder tab from the Left menu. It should automatically show this page when connecting to the TriCoder.



If you are physically connecting the TriCoder to the USB port for the very first time, see [Chapter 3: WinUSB Upload](#) for details on Windows USB driver installation.

If you are connected via USB, you should see TriCoder Firmware: 530xx in the blue bar as shown above.

If you **do not** have your TriCoder turned on and cabled up correctly, or the USB driver is installed incorrectly, most of the buttons will be grayed out and not clickable. No Firmware revision will show as well.



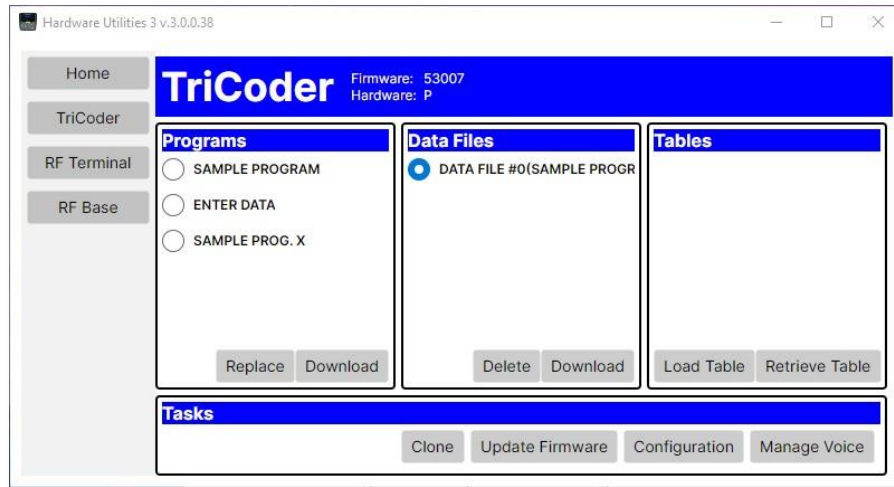
Uploading from TriCoder to your Computer

You can upload programs, data, voice and cloned setup information to your computer from your TriCoder via a USB port.

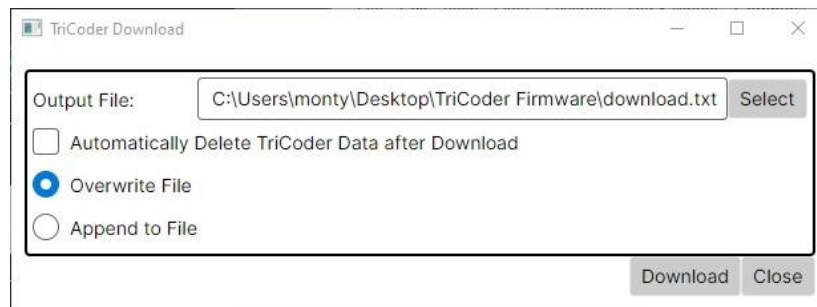
Data Files

1. Make sure you are connected with a C26 Type C USB cable and your TriCoder is on.
2. Start the *Hardware Utilities 3.0* program from your Windows Start Menu
3. Click the **TriCoder** Tab

In the **Data Files** Panel, you will see what is currently in your TriCoder. You can select the Radio button next to the Data File you want to download (or delete).



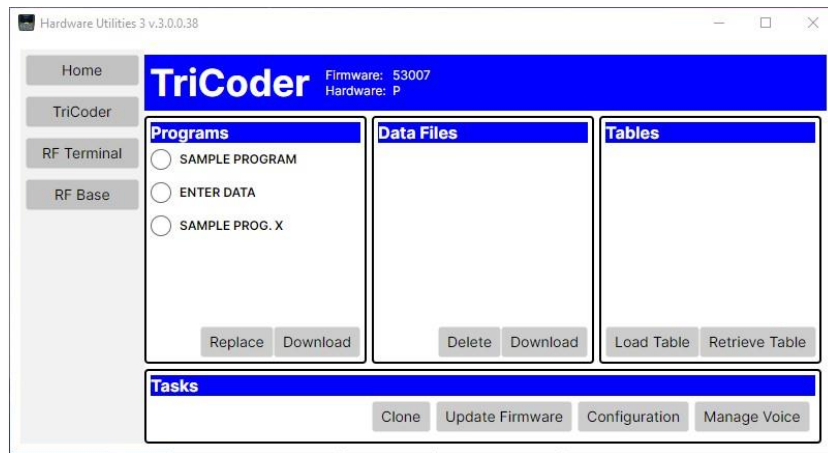
To Save the Data file from the TriCoder to your computer you can click the Download button which will bring up the following dialog box.



Type in the name of the file you want to save, or use the default name as shown and click Download. That's it! You don't have to do anything on the TriCoder!

Programs

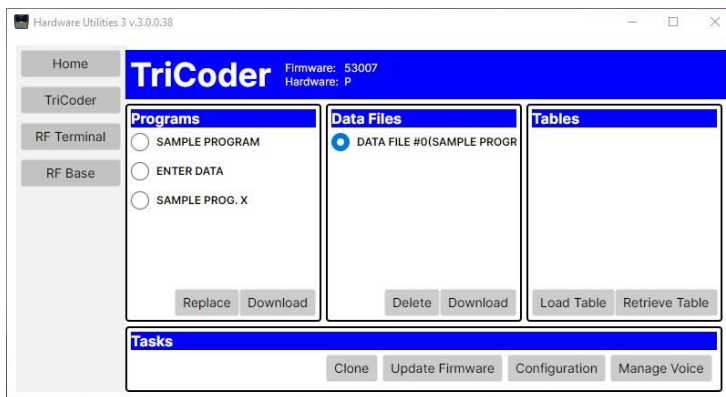
1. Again, make sure you are connected with a C26 Type C USB cable and that your TriCoder is on opening screen.
2. Start **Hardware Utilities 3.0** if it isn't already running.
3. Click the **TriCoder** button on the Left
4. Click on the Radio Button of the program you want to upload in the **Programs** panel
5. Click on the Download button to save the Program from the TriCoder to your computer
6. Choose the directory, or folder, you want to upload your file to. You can change the name of the file as well (e.g. ENTER DATA.pgm)
7. Click on the **Save** button. That's it



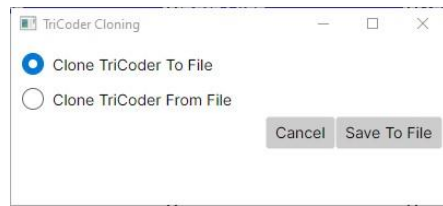
8. To Replace or Update a TriCoder Program from a file on your computer, Click on the Radio Button of the program you want to update, or replace, and then Click the Replace button
9. Choose the directory, or folder, and select the .pgm file you want to use to update the program. (e.g. INVENTORY.pgm)
10. Then Click on the **Open** button. It will send the program to the TriCoder. When you see the Click on the OK button. That's it

Cloning your TriCoder

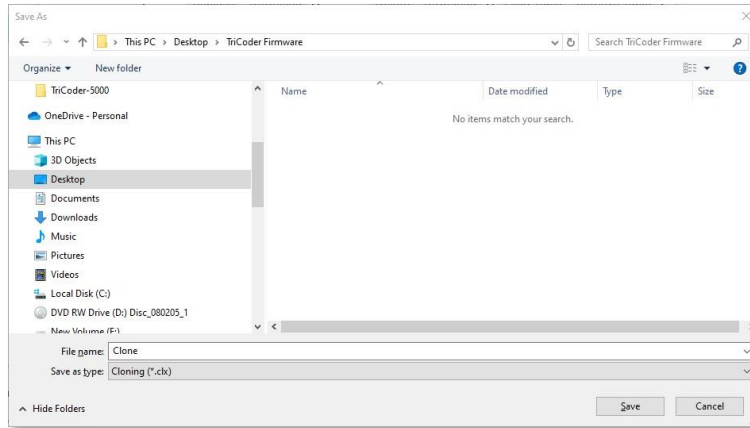
1. Make sure you are connected to the USB cable and that your TriCoder is turned on.
2. Start the **Hardware Utilities3.0** if it isn't already running.
3. Click on the **TriCoder** button on the Left
4. Click on **Clone** button in the **Tasks** section on the bottom of the screen



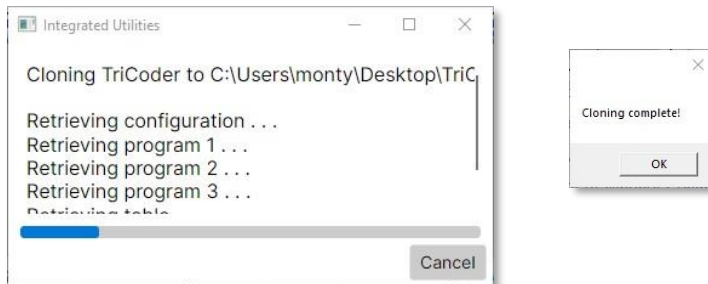
5. To Clone from a TriCoder to a file on your computer click on the Radio Button: **Clone TriCoder To File**



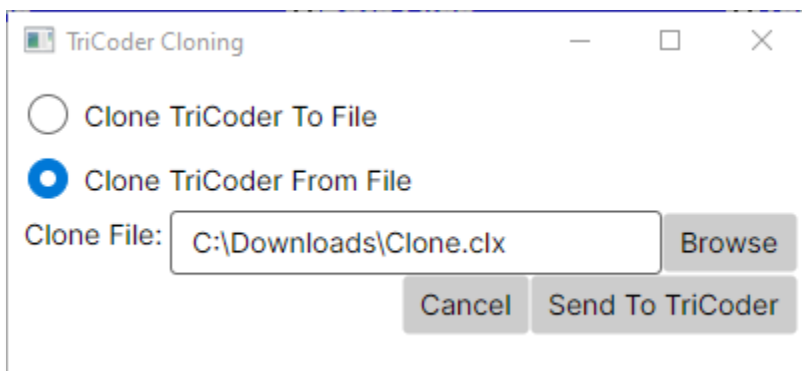
6. At the **Save As** screen select the Directory, or Folder, you want to save the Clone file to – in this example we are saving the file as Clone.clx



7. Click the **Save** button, you will see the following screens – Click on the **OK** button when it is done.



8. To Clone *from an existing clone file* to a TriCoder Select the **Clone TriCoder From File** Radio Button, and then type or browse to the directory, or folder, you want to upload your cloning file from to the TriCoder. The file name will be in the **Clone File:** box.
9. Type in the name of the file (e.g. C:\DOWNLOADS\Clone.clx)



10. Click the **Send To TriCoder** button. The clone file is sent over to the TriCoder and you are finished!

Downloading from the computer to your TriCoder

You can download saved files on your computer back into your TriCoder using the TriCoder Manager in the Hardware Utilities in WinUSB mode. The files must be valid TriCoder programs, tables or clone files. TriCoder programs can be created on your computer using the Virtual TriCoder or created on the TriCoder itself. Tables must conform to the table format required by the TriCoder (see **Chapter 13: Tables**). Also, you will not be allowed to download anything to your TriCoder if there is currently data stored in your TriCoder. Before you download anything to your TriCoder, make sure you upload any data files and delete them from your TriCoder. If there is data in your TriCoder and you try to download a file to it, you will see the message:

**NOT ALLOWED TO RECEIVE
HIT ANY KEY_**

Select the type of file you will be downloading - a Program (for collecting data), a TriCoder Clone file (complete setup information including setup parameters and programs) or a Table (for reference while collecting data).

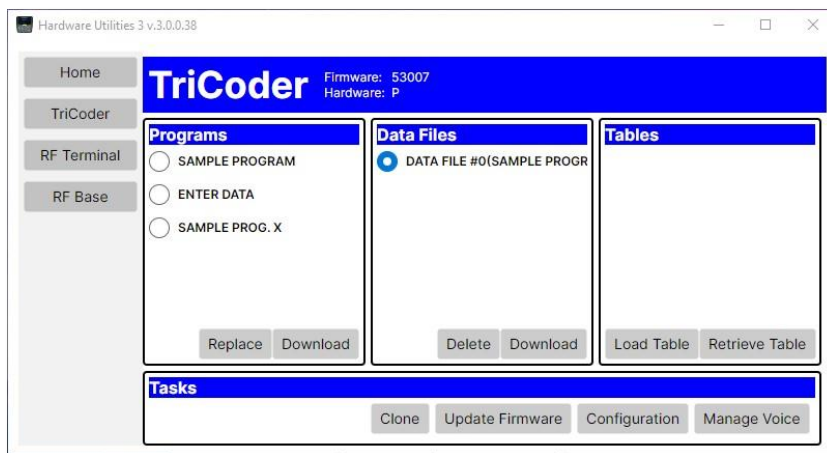
Select the file you want to download. We suggest using different file extensions for different types of files, for example, **.pgm** for program files, **.cln** for clone files and **.tbl** for table files. The TriCoder Utilities uses these file extensions by default.

WinUSB Downloads

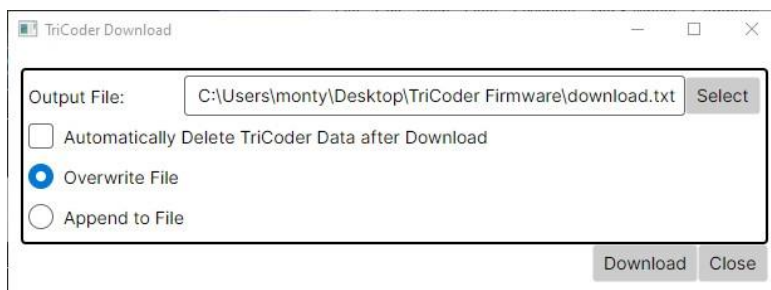
If you are downloading from your computer to your TriCoder via the WinUSB interface, the only thing you need to do on your TriCoder is make sure it is set for WinUSB and turn it on! The **Hardware Utilities 3.0** program will take care of the rest!

Program File Downloads

1. Make sure you are connected to the C26 USB cable and that your TriCoder is on.
2. Start **Hardware Utilities 3.0** if it isn't already running.
3. Click the **TriCoder** button on the Left



4. The **Data Files** panel will show any data file(s) on the TriCoder.
5. Click on the Radio Button of the Data File you want to download, and then click the **Download** button.



6. Choose the location and name of the program file in the right panel (these are the programs already in your TriCoder) that you want to replace
7. Click on the left arrow between the panels. That's it!

Using the Table Editor

The **Table Editor** allows you to:

- Load and edit existing tables that are on your computer and download them into your TriCoder and
- Create new tables and download them to your TriCoder

Once you have the table open in the **Table Editor**, you can change any of the parameters and fields and then download the table back into your TriCoder.

The standard data format for correct importing into the **Table Editor** is a common .CSV file type.

The file would be formatted as follows:

```
"ST-RX810-L","STI SHIFTER GRX LEFT","BIN1","$300"  
"BR-RX810","GRX DISC CALIPER F","BIN3","$129"
```

For more information on using a Table, see [Chapter 13: Tables](#). One thing to remember when using a table is that your TriCoder programs must be configured before you can access the table data on your TriCoder. For more information on programming for tables, see [Chapter 10: Creating a Custom Program](#).

Table Downloads

1. Again, make sure you are connected to the USB cable and that your TriCoder is turned on.
2. Start the **Hardware Utilities** if it isn't already running.
3. Your TriCoder program must already be configured to look up data in a table file.
4. Click the **TriCoder Manager** tab. The middle panel is showing you the files on your computer. Find the folder and file name
5. of the table you want to download in the middle panel and click to highlight it (we recommend using the file extension **.tbl** for table files).
6. Click on the table in the right panel
7. Click on the right arrow between the panels and you are done!

Chapter 10: *Creating a Custom Program*

You can create a program in the TriCoder to prompt the operator for anything. You can tell the operator what to do next, notify them of errors, date and time stamp the data or review and edit previous data. The TriCoder has room for 4 programs; program #0 is fixed and cannot be changed or deleted, program #1 is editable and prompts for item and quantity, program #2 is based on Program #0 but with some editing allowed and #3 is not pre-set and can be programmed by the user as desired.

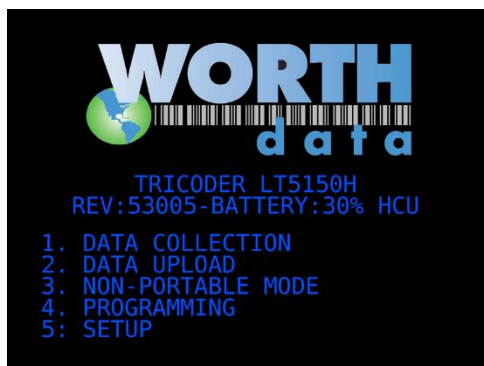
Programs are constructed of statements, with each program capable of containing up to **60 statements**. Statements determine what happens at each step of the program - one statement might prompt the user to enter data, another statement may add a date stamp. Statements in turn are constructed of fields, each one determining certain properties of the statement.

Programs can be created on the TriCoder itself or created on your computer (if you have Windows) and downloaded to the TriCoder via Serial or USB. The remainder of this chapter is directed towards programming the TriCoder itself; if after completing this chapter you decide you want to create programs on your PC, go to [Chapter 11: Creating TriCoder programs on your Windows PC](#) for details.

We have provided a form to help you chart out programs before they are entered into the TriCoder. *TriCoder Coding Forms* can be found at the very back of the manual. We will also use sections of the *TriCoder Coding Form* to illustrate coding of certain features. You may find it helpful to have a *TriCoder Coding Form* in front of you while using this section of the manual.

Program Statements

The following information is provided in the order in which it is referenced in the TriCoder when creating a program. To create a program in the TriCoder, the first thing that has to happen is to get the TriCoder into **PROGRAMMING** mode. After turning on the TriCoder you will see the following screen:



Press **4** at the **MAIN MENU** (opening screen), then when prompted enter the password **WDTRI** to get to the Programming Menu. Entering the password incorrectly generates the message:

INVALID PASSWORD
HIT ANY KEY

Entering the password incorrectly 2 times generates the same message, but when you hit a key you will return to the opening screen.

If you have entered the password correctly, you see the **PROGRAMMING MODE** menu:

PROGRAMMING MODE
PROGRAM #1 ----- **1**
PROGRAM #2 ----- **2**
PROGRAM #3 ----- **3**
MULTI PROGRAM MODE --- **OFF 4**
DONE/EXIT ----- **0**

PLEASE SELECT OPTION: _

Program Name

Press the number of the program you wish to create or edit; **1**, **2**, or **3**. For this example we will key in **1**. The TriCoder then displays:

```
PROGRAM #1
PROGRAM #1 NAME ----- 1
SAMPLE PROGRAM
EDIT PROGRAM #1 ----- 2
DONE/EXIT ----- 0
```

PLEASE SELECT OPTION: _

By pressing key **1** on the TriCoder keypad you can change the program name, in this case it is named **SAMPLE PROGRAM**. The program name is what is displayed in the Data Collection Menu and will be the name you will see in the Hardware Utilities program. When you have changed the name you hit the enter key to store the new program name. The PROGRAM NAME can consist of alphanumeric data and can be up to 20 characters.

The PROGRAM NAME prompt has another function besides simply naming the program. When collecting data, programs usually start with statement #1, or if data has already been collected, it starts at the statement number where the user left off. You can force the TriCoder to ALWAYS start at a particular statement number whether starting a new data file or resuming collection in an existing one. This is done using the first 3 characters in the PROGRAM NAME prompt. The first character must be ~, followed by the *two digit statement number* you want to start with. You can then follow with an actual program name if you want to. This feature can cause partial data records since resuming data collection after some data has been collected may start at a statement number other than where you left off. Because of possible partial records, the host program that processes this data needs to handle the partial records in a special way or ignore them completely. The following example shows a program named INVENTORY that always starts at statement #4:

```
PROGRAM #1
PROGRAM #1 NAME ----- 1
~04INVENTORY
EDIT PROGRAM #1 ----- 2
DONE/EXIT ----- 0
```

PLEASE SELECT OPTION: _

This example shows a program named RECEIVING:

```
PROGRAM #1
PROGRAM #1 NAME ----- 1
RECEIVING
EDIT PROGRAM #1 ----- 2
DONE/EXIT ----- 0
```

PLEASE SELECT OPTION: _

This program starts with statement #1 if the data file is empty. If you are resuming a previous data collection and you still have data present (you didn't upload and delete your data file), the program will resume at the statement number **following** the statement at which the user last entered data.

Programming

To edit Program #1 press the **2** key. This will enter you into the editing section and show you programming prompts and allow you to edit each section of the prompt on one screen. The text below is an example of what you see on the TriCoder screen when creating a program.

```
< PROGRAM #1 PROMPT 01 >
ENTRY TYPE ----- D
PROMPT TEXT:
ENTER ITEM NO.
VOICE FREQ: E --- MSG#: 0100
DATA ID: --- DATA TYPE:
DATA LENGTH MAX: 13 MIN: 04
INPUT DEVICE -----
YES/NEXT STATEMENT ----- 02
NO/END STATEMENT ----- 99
PREFIX --
SUFFIX --

ARROW TO SELECT OPTIONS:
F1 EXIT, < PREV, NEXT > _
```

Parts of the TriCoder programming screen

Before you start programming the TriCoder, it helps to know what the TriCoder is asking you at each step.

Prompt

```
< PROGRAM #1 PROMPT 01 >
```

The word **PROMPT** describes what prompt in Program #1 you are working on; in the example above we are at the first prompt. The **01** tells us what prompt number we are working on. If we were working on prompt **03**, the text would look like this:

```
< PROGRAM #1 PROMPT 03 >
```

The fields beneath **< PROGRAM #1 PROMPT 01 >** are where the individual parameters of the program are defined.

To navigate through the program you use the down arrow  key or the Enter key to move down.



To move from prompt to prompt you use the right arrow  and left arrow  keys.

Entry Type

The first line on the program screen is the **ENTRY TYPE** prompt. This prompt determines what type of data is entered for this statement. This is the most important prompt as it determines exactly what happens at this step in the program.

< PROGRAM #1 PROMPT 01 >
ENTRY TYPE ----- D

These are the *Prompt Statement Entry* types available:

Statement Entry Type	Code used for TriCoder Coding Form
Data	D
Branch	B
Question	Q
Date and Time Stamp	S
Time Stamp only	T
Date Stamp only	Y
Xtra	X
None	N
Data AND Immediate Output	O
Compare	C
Printer Output	P
Arithmetic	A
Copy Table Data To Prompt	c

Details on each *Statement Entry Type* are as follows:

Data

Data entry prompts are program statements that prompt the operator to enter data for storage in memory. A typical *Data Statement* would be prompting the operator for an Item Number or a Quantity. This is the most commonly used statement type.

A program statement used to enter data looks like this:

< PROGRAM #1 PROMPT 01 >
ENTRY TYPE ----- D

The previous example indicates a *Statement Entry Type* of **Data** for prompt 01.

Branch

A *branch statement* allows the program to jump to anywhere between 1 and 15 different statements depending on the character entered at the branch prompt. The data entered at a *branch statement* is not saved to memory; it simply acts as a pointer, directing the program to the appropriate statement. When creating a *branch statement*, the programmer will only see 3 program statement fields; ENTRY TYPE, PROMPT and STMT TO BRANCH.

The ENTRY TYPE for a branch statement should look like this:

< PROGRAM #1 PROMPT 01 >
ENTRY TYPE ----- B

The next field is the PROMPT field. This field is the prompt text that the user will see when executing the *branch statement*. This is an example of a PROMPT field for a branch statement:

ENTRY TYPE ----- B
PROMPT TEXT:
TRANSACTION?

The final field for a *branch statement* is the STMT TO BRANCH field. This field tells the program what statements to go to when particular characters are entered. At this point you can enter up to 15 groups of 3 digit codes for a total of 45 characters.

The first character in each 3 digit code is the conditional character; this is the character that determines the branch when entered. The * character is used to mean any character other than the conditional characters already specified.

The next 2 characters in the 3 digit code determine which statement to go to when the conditional character is entered.

For example, lets say you wanted the following branches to happen:

Go to statement 18 if an R is keyed/scanned

Go to statement 34 if a 5 is keyed/scanned

Go to statement 02 if anything else is keyed/scanned

The STMT TO BRANCH field would look like this:

ENTRY TYPE ----- B
PROMPT TEXT:
TRANSACTION?

STATEMENT TO BRANCH
R18534*02_

Question

A *question statement* creates a program prompt that the user answers YES or NO to. Data is not stored to memory for this type of statement; a YES answer directs the program to one statement number while a NO answer directs the program to another statement number. The question statement is answered by pressing the YES or NO key on the TriCoder keypad.

When creating a question statement, the programmer will only see 5 program statement fields; ENTRY TYPE, PROMPT, VOICE MESSAGES, YES/NEXT STMT and NO/END STMT. The ENTRY TYPE prompt for a question statement looks like this:

ENTRY TYPE ----- Q

The PROMPT TEXT field determines what the user sees on the display screen for this field. Here is an example of a PROMPT TEXT field for a question statement:

ENTRY TYPE ----- Q
PROMPT TEXT:
DAMAGED GOODS?

The MESSAGE NUMBER field defines the voice messages you want to play for this statement.

VOICE FREQ: E --- MSG#: 0100

The next field prompt, the YES/NEXT STMT prompt, determines which statement the YES key takes the program to. For example, if we wanted the program to jump to statement #05 if we answer YES to statement #01, the prompt should look like this:

YES/NEXT STATEMENT ----- 02

The NO/END STMT prompt determines where the program goes if the question is answered with the NO key. If we wanted the NO key to take us to statement #03 in the example above, our NO/END STMT prompt should look like this:

NO/END STATEMENT ----- 03

Date and Time Stamp

The *Date and Time Stamp* statement requires no action from the user. By specifying S as the statement ENTRY TYPE, the TriCoder accesses its internal real-time clock and writes the current date and time information to memory when the program statement is executed. By default, this information is not displayed by the TriCoder when the statement is executed, but it can be displayed simply by entering DIS in the DATA ID field of the program statement.

The default format of the date and time stamp is

MMDDYYHHMM (if USA)

The format can be changed using the *Date & Time Formats* setup parameter.

If you want to add seconds to the time portion of the *Date and Time stamp*, use s instead of S.

ENTRY TYPE ----- s

The *Date and Time Stamp* statement uses only 3 programming statement fields; ENTRY TYPE, DATA ID and YES/NEXT STMT.

Time Stamp

The *Time Stamp* statement type records only the time information to memory in the HHMM format. Just as with the *Date and Time Stamp* statement, using DIS in the DATA ID field will display the time information on the TriCoder screen when the statement is executed. Use **t** instead of **T** to record seconds in addition to the hours and minutes:

ENTRY TYPE ----- t

The *Time Stamp* statement uses the same program fields as the *Date and Time Stamp* statement.

Date Stamp

The *Date Stamp* statement stores only the date information in a **MMDDYY** format. As in the other Date/Time stamp statements, using DIS in the DATA ID field will display the Date information on the TriCoder when the statement is executed. The date format can be changed using the Alternative Date Format settings in the TriCoder setup.

ENTRY TYPE ----- Y

The *Date Stamp* statement uses the same program fields as the other *Date and Time Stamp* statements.

Xtra

The *Xtra Statement* works with the **"ENTER QUANTITY"** prompt by automatically entering a quantity of "1" if the user enters another *Item number* instead of a quantity. The user has the option of entering an actual quantity if it is more than "1". Using this feature in Program #3 is a good way to demonstrate its value. The **XTRA Statement** is enabled in Program#3 "SAMPLE PROG. X" – this program asks for **"ENTER ITEM NO."** and then **"ENTER QUANTITY"**:

The *statement type* for the **"ENTER QUANTITY"** is set as **"X"** (Xtra)

The *maximum data length* of the **"ENTER QUANTITY"** statement must be *less* than the *minimum data length* for the *next* statement to be executed - in Program #3, the next statement to be executed is the **"ENTER ITEM NO."** statement.

The length of the data entered at the **"ENTER QUANTITY"** prompt must be *between* the *minimum data length* and the *maximum data length* of the next statement to be executed (**ITEM** in program #3).

Using Program #3 as the example:

If the number of characters entered at the **"ENTER QUANTITY"** prompt is less than the *minimum data length* of the **"ENTER ITEM NO."** prompt, then the data entered is stored as the quantity.

If the number of characters entered at the **"ENTER QUANTITY"** prompt is between the *maximum data length* and the *minimum data length* for the **"ENTER ITEM NO."** prompt, then a "1" is stored as the data for the **"ENTER QUANTITY"** and the data entered at the **"ENTER QUANTITY"** prompt is stored as the data for the **"ENTER ITEM NO."** prompt. If it seems confusing, use the following *TriCoder Coding Form* as an example:

Stmnt #	Entry Type	Prompt	Min Data Len	Max Data Len	Next Stmnt
01	D	ENTER ITEM NO.	04	13	02
02	X	ENTER QUANTITY	01	03	01

While collecting data using the program shown above, if data between 4 and 12 digits in length is scanned, or keyed, at the **"ENTER QUANTITY"** prompt, data of "1" is automatically entered. In other words, **if you continually scan your item numbers** (as long as they are all between 4 and 12 digits in length) **you will automatically enter a quantity of 1 for each item**. To enter a quantity other than 1, simply enter the quantity by using the keypad, making sure the length of the quantity data does not exceed the *maximum data length* for the quantity field (3 digits).

The very last quantity entered at the end of data collection must be keyed in from the TriCoder keypad, even if it is **1** – The TriCoder will prompt you to enter the Quantity if you forget to enter the quantity for the last item number and either press the END key or F1 key is pressed.

ENTER QUANTITY TO EXIT HIT ANY KEY

If the operator turns off the TriCoder at this question there will be no quantity entered for the last item scanned.

Also, in order to either scan an item or enter a quantity at this statement, you must change the “Input Type” statement to be blank instead of K or W. This is especially important if you are creating your own program, or editing the default Program #1.

If you are using the “**selective bar code trimming**” feature with the XTRA Statement, the trimming must be specified in both the “DATA Statement” and the “XTRA Statement”. For example, if you wanted to eliminate the leading character on all UPC codes, you would have to specify:

{c1

in both the upload prefix for the DATA Statement (Statement 1 on the example above) and the upload prefix for the XTRA Statement (Statement 2 on the example above). If you do not specify the trimming in both upload prefixes, the trimming will not happen correctly.

None

The *None statement* entry type is used as a “dummy” statement, recording no data and transmitting only the *Upload prefix* and *suffix*. It is typically used as a destination for a *branch statement*, allowing you to record what action the operator took without recording any data. The program goes on without any input from the operator.

To illustrate it’s use, lets say that a *branch statement* (statement #3) goes to statement #04 (*None statement*) if the operator enters the letter A.

ENTRY TYPE ----- N

Even though the operator enters the letter A at statement #3, the A will not be written to memory and uploaded because *branch statements* record no data. What if your application requires the A as part of its data? By making statement #04 a *None statement* and entering an A as the *upload prefix* or *suffix*, an A will upload as the data for statement #04.

UPLOAD PREFIX _

The None statement can also be used to add more than 15 characters to an upload prefix or upload suffix when using refer-backs – many times 15 characters is not enough. See Upload Prefix in this chapter for more information on refer-back (appending data to another field) programming.

Data AND Immediate Output

The *Data AND Immediate Output* statement entry type is used when you want to create a regular Data entry prompt (see *Data*) where the data is stored in memory but also want the data to be output immediately (like NON PORTABLE mode) as well. The TriCoder must be connected to the computer for the *Immediate Output* portion of this statement type to work. An example of using this type of statement would be if you want to collect sales invoice data in the TriCoder (to later upload and update your inventory) but want to also transmit data immediately to the computer to create the actual invoice itself. You would be scanning directly into your invoice software while saving the same data in the TriCoder to upload later for inventory management.

Compare

The *Compare* statement will compare the data collected in that statement against data collected in a previous statement and take you to a new statement dependent upon whether the data in the two compared statements matched. The statement to compare to is referenced in the Data ID field. For example, you could enter data in statement 1, then in statement 2, enter new data. then compare that data to the data in statement 1. If the data matches, you could move on to statement 3; if it doesn't match, you could have it take you back to statement 1. An example of an application might be a pharmacy - where you would want to verify that the correct drug is being dispensed into the correct customer vial. Coding for this statement might look like this:

Stmnt #	Type	Prompt	Freq.	Voice Msg.	Data ID	Min. Len	Max Len.	Yes/Next	No/End
1	D	Scan 1st Item	A	41				02	99
2	C	Scan 2nd Item	A	42	01			01	03
3	D	Not Equal, HIT ENTER	A	62		00	01	01	00

According to the example, data scanned in statement 2 is compared to the data scanned in statement 1. If the two items match, the operator is taken back to statement 1 to scan the next item. If the items do **not** match, the operator is taken to statement 3, where a voice error message is played and the operator is instructed to press the ENTER key. Upon pressing the ENTER key, the operator is taken back to statement 1 and it starts over.

Even if compared data is wrong, it is still written to the data file for upload, so an audit trail is available to see where errors occurred.

Arithmetic

The TriCoder has the ability to act as a simple calculator, performing addition, subtraction and multiplication (no division). The "A" statement allows the user to input data (numeric only), press +(add), -(subtract) or *(multiply) and then input another piece of data (again, numeric only). The sum is displayed and the user has two choices; press +, - or * again and enter another number and get a new sum, or press the ENTER key to accept the sum as the final result. Here is an example of data entry for someone who is adding 2 numbers, subtracting a number and accepting a final result:

TriCoder Display	User Action
ENTER QUANTITY (program prompt)	press 5 + 8, then press ENTER
13 (intermediate sum)	press - 4, then press ENTER
9 (final sum)	if accepting result as final, press ENTER

There are several restrictions when using the "A" statement:

You cannot have a "negative" result - in other words, you cannot enter 100 - 115 (expected sum would be -15).

You cannot start an entry with a "negative number" - i.e. you cannot enter -100.

You can use whole numbers only - no decimals or fractions.

Only 1 calculation is allowed per sum; for example, you can enter 10 + 5 and press ENTER, but you cannot type 10 + 5 + 3 for one entry. You would have to enter 10 + 5, press ENTER (sum displayed would be 15), and then type + 3, then ENTER (sum displayed would be 18).

The maximum sum (intermediate or final) is 65,000.

Copy Table Data to Prompt

The TriCoder has the ability to lookup data from a table and display that data on screen (See [Chapter 15: Tables](#) for more details). You can also use the "c" data type to enter data from that lookup table as the default data for a prompt. This feature is perfect for doing tasks like price verification, updating fixed asset locations, conditions, quantity on hand, or any other data that you would like to verify and change

Here is how the "c" statement works:

- You must have already looked data up in your table using **L1L** in the previous prompt in your program
- You can then display record **2**, **3**, or **4** from the same table and accept the looked up data or change the data. This is done by placing a **L12**, **L13** or **L14** respectively in the Data ID field for the prompt.
- This will place the table data in the new prompt as default data allowing you to change it.
- To accept the data as it is displayed you would simply hit enter
- To change the data you would hit the clear key or the delete key and re-enter the data you now want.

Here is an example of using this statement type:

```
< PROGRAM #1 PROMPT 01 >
ENTRY TYPE ----- D
PROMPT TEXT:
SCAN ITEM NO:
DATA ID ----- L1L
```

This will place the contents of the additional Table data for the item number scanned below the scanned entry. The table can have up to 4 fields. All fields in the table will then display – As an example if you table is formatted as shown below:

```
XXXXXX
ITEM DESCRIPTION
PRICE
QUANTITY ON HAND
```

Then the user would see the Prompt SCAN ITEM NO: and then the “Item Description”, “Price” and “Quantity On Hand” from the Table as shown below:

```
SCAN ITEM NO:
69-1894ES-1
Honeywell VisionPRO TH8000 Thermostat
$125.99
23
```

You can then display individual data from the table to change by doing the following in the next statement:

```
< PROGRAM #1 PROMPT 02 >
ENTRY TYPE ----- c
PROMPT TEXT:
ENTER NEW PRICE:
DATA ID ----- L13
```

This will place the following on screen:

```
ENTER NEW PRICE:
$125.99_
```

You can accept the current price shown by pressing Enter, or you can hit clear or delete to remove or change the stored price and enter a new price. This new price will be stored in your data file and can update your database when you upload the TriCoder data file.

You can then display additional data from the table to change by continuing in the next statement:

```
< PROGRAM #1 PROMPT 02 >
ENTRY TYPE ----- c
PROMPT TEXT:
ENTER NEW QUANTITY:
DATA ID ----- L14
```

This will place the following on screen:

```
ENTER NEW QUANTITY:
23_
```

You can accept the current quantity shown by pressing Enter, or you can hit clear or delete to remove or change the stored quantity and enter a new quantity. This new quantity will be stored in your data file and can update your database when you upload the TriCoder data file. The Table will not be modified.

This is just one example of how to use **Copy Table Data to Prompt** to modify data in a stored Table, you can also use it to modify things like locations, conditions, asset value, items to be returned etc...

Prompt Text

The next field in the TriCoder programming is the PROMPT text. This prompt is asking you to enter the text you want displayed to the user. If you have chosen D (Data) for the STATEMENT ENTRY TYPE, typical PROMPT text might be something like "ENTER DATA" or "SCAN BARCODE". A "Q" (Question) statement might display text such as "DAMAGED GOODS?"

In our example above, we would then type the text we want to use for our user prompt for statement #01. To move to this field you can use the down arrow or the ENTER key. The cursor will appear in **color** as you move through the fields.

PROMPT TEXT:
ENTER ITEM NO. _

To enter different text for this field you key it in directly from the TriCoder keypad. The new prompt text will appear wherever the cursor is. If you would like to clear the existing prompt text, and enter new text, you can hit the clear  key or press the delete  key several times.

The PROMPT Text statement has other uses besides just displaying an operator prompt. By using an @ as the first character in the statement text, you can display the last data entered for this prompt as the default data. To accept this displayed data as the data you want to enter for the prompt, press the ENTER key. For example, if the PROMPT text is "ENTER ITEM NO.", and the data entered for the prompt is 1234, then the next time the PROMPT text is displayed, it would display as follows:

ENTER ITEM NO.
1234 _

To accept 1234 as the actual data (instead of entering new data), simply press the ENTER key on the TriCoder. Entering ! as the first character for the PROMPT text field will cause the TriCoder to increment the last data entered for the statement by 1. To accept this data, the user simply presses the ENTER key on the TriCoder. To enter different data, press CLEAR, then enter the new data via the scanner or the TriCoder keypad. Here is an example of how this works:

PROMPT TEXT:
!ENTER ITEM NO. _

Lets say that while collecting data in our program, we enter the number 12345 at the ENTER ITEM NO. Prompt when it is displayed on the TriCoder. By using the ! as shown above, the next time we see the ENTER ITEM NO. Prompt, the TriCoder will increment the last data entered and display it as the input data:

ENTER ITEM NO.
1236 _

To accept the data, press ENTER. To enter different data press CLEAR, then the new data.

Voice Message Frequency

The next programming field is the FREQUENCY field. This field determines how often the voice messages for this statement are played.

VOICE FREQ: E

There are two choices for the FREQUENCY field:

- E** Exception - the voice message is played the first five times that the prompt for this statement is displayed. If the Frequency field is left blank, E is the default.
- A** Always - the voice message is played every time the prompt for this statement is displayed.

Voice message prompts can be turned off while in data collection using the following key sequences:

- press 
- press 
- press **P**

For total silence, including prompts and error messages, use this key sequence:

- press 
- press 
- press **S**

Voice Message Numbers

The MSG# field is where the voice messages are specified for the current statement. Up to 2 voice messages can be specified for each statement:

MSG#: 0100

Each voice message is identified using a 2-digit number. If two messages are specified, the first message is played, followed immediately by the second message. For example, the following program field would play message #5 (ENTER), then message #7 (ITEM):

MSG#: 0507

To play no voice messages, specify **0000**.

For complete details and information on Voice Messages and their uses, see *Chapter 13; Voice Messaging*.

Data ID

The next field in the programming is the DATA ID field.

DATA ID: _

The DATA ID field has 6 different functions, depending on what is entered at the prompt:

Data Identifiers

UPC/EAN Check Digit verification

Table Access

Display Date/Time

Prevent Duplicate Entry

Compare Data

1. Data Identifiers

The first function of the DATA ID field is to specify *Data Identifiers* for the data entered for the current statement. *Data Identifiers* are commonly used by the Automotive and Retail industries and are used to make sure the correct type of data is entered. For example, to make sure the TriCoder only accepts data for this prompt that starts with 1A1, put 1A1 in the Data ID field:

DATA ID: 1A1

Data Identifiers can be up to 3 characters long and can be position specific. To only accept data where the second character is “S”, put S in the second character position in the Data ID field:

DATA ID: _S_ (data is “space” “S” “space”)

In this example, the data in positions 1 and 3 can be anything; but position 2 must be an “S”.

2. UPC/EAN Check digit verification for keyed-in data

The second function of the Data ID field is to have the TriCoder verify the check digit on an UPC or EAN bar code when the data has been entered on the TriCoder keypad (not scanned). This scenario happens often when bar codes are damaged or missing and the data has to be entered by hand. To avoid errors when the data is keyed in, the TriCoder will calculate a check digit for the data and compare it to the check digit that was keyed in. If the two digits do not match, the TriCoder generates the following error message:

**INVALID INPUT
HIT ANY KEY_**

To use this feature, enter the following characters at the DATA ID prompt:

U10 - Use this to verify UPC 12 or 8 digit entries

E10 - Use this to verify EAN 13 or 8 digit entries

B10 - Use this to check for both UPC and EAN 13, 12 or 8 digit entries.

UPC/EAN 2 and 5 digit supplements are not supported.

3. Table Access

The TriCoder can access a downloaded table during data collection to help aid in the data collection process. Tables are lists of data that can be either **Validated** - the TriCoder compares the scanned or keyed data to see if it exists in the table and if that number has been already entered, or data in the table can be placed on screen based on data **Lookup** from the table - displaying other fields associated with that record e.g. price, quantity on hand, description etc... The TriCoder has room for **1 Table** of **1MB** in size.

Table Validation:

Table Validation uses data records that consist of a single field. The user enters a piece of data into the TriCoder and the TriCoder checks the table to see if there is matching data. If so, the TriCoder writes the data to the data file and goes to the next program statement. To use Table Validation enter the following characters at the DATA ID prompt:

A1A, (validates data from table)

Not only can the TriCoder validate the data exists in the Table, but it can also prevent the user from entering the same data twice by entering these characters at the DATA ID prompt:

D1D

Table Lookup:

For table lookup functions the TriCoder can display additional fields associated with the 'key' field displaying up to 3 additional fields from that record in the table. If you have a part number, or the key field, and 1-3 additional fields with data such as description, price, quantity on hand - or any other data, then you can display those fields on the TriCoder screen by using the DATA ID prompt:

L1L

4. Display Date and Time

Normally, a date or time stamp statement does not display any data when executed but sometimes you may want the user to see the data being written to the data file. To display the date and or time, use:

DIS

in the DATA ID field.

5. Prevent duplicate entry of data

To prevent the duplication of data entered at a particular statement, use

DUP

in the DATA ID field. During Data Collection, if data is entered at a statement prompt that had been entered previously for the same statement prompt, the user will see the message:

**Duplicate Data Entry, (F1)
to Accept, Other Key:Reject**

Press ENTER to discard the data and repeat the statement prompt. To accept the data and write it to the data file, press the **F1** key. The program will then advance to the next statement prompt.

6. Compare Data

The Data ID field is used to compare entered data when the **Compare** statement type C is used. Enter the statement number you want to compare the currently entered data to. For example, if you wanted to compare the data you scanned in statement 2 to the data you scanned in statement 1, you would choose the statement type C for statement 2 and enter **01** for the Data ID. See the example under the **Compare** statement for a programming example.

Data Type

The **DATA TYPE** field determines what kind of data - alphabetic, numeric or both - is accepted for a particular statement. There are five options for the DATA TYPE field:

- D** Digits Only; digits are 0-9
- N** Numeric Only; numeric data is 0-9, SPACE + - / \$, .
- A** Alphabetic Only; alphabetic data is A-Z a-z SPACE - , .
- ENTER** Allow input of *all characters*
- S** Start the data entry Shifted for *all characters*

If the data is alphabetic (A), data entry is started with the cursor shifted to allow for entry from the TriCoder keypad.

The DATA TYPE field is intended to work in a manner similar to the DATA ID field - it is meant to minimize operator data entry errors. For example, if the statement prompt text is QUANTITY, and you want only digits entered at this statement, use D in the DATA TYPE field.

Maximum Data Length

The next field in the TriCoder programming is the **DATA LENGTH MAX:** field. This field determines the maximum number of characters allowed for a statement.

The TriCoder reserves memory for a data field based on the *Maximum Data Length*. If you specify a maximum data length longer than you know you'll need, you will be able to collect less data due to the extra memory. For example, specifying 10 characters instead of 12 would allow for almost 100 more pieces of 10-character data.

Maximum Data Length can be between 01 and 99 and should include Data Identifiers if your data uses them.

DATA LENGTH MAX: 13_

To clear the **DATE LENGTH MAX:** and enter a new value, press CLEAR on the TriCoder keypad and enter the new value.

The **DATE LENGTH MAX** is important when using the Xtra Statement. See the section on the XTRA STATEMENT for more information.

Minimum Data Length

The **DATE LENGTH MIN:** field tells the TriCoder the fewest number of characters to accept for a particular program statement. Specifying a *Minimum Data Length* can reduce data entry errors and is particularly important when using an Xtra Statement. The *Minimum Data Length* should take into consideration Data Identifiers if your data uses them.

DATA LENGTH MAX: 13_ MIN: 04

The minimum data length can be anywhere from 00 to 99. 00 would be used if you wanted the user to be able to simply press the **ENTER** key without actually entering any data for the statement. To enter a minimum data length, press the **CLEAR** key (or use the **DELETE** key) to clear the current setting and enter the new value using the TriCoder keypad.

Input Device

The **INPUT DEVICE** field tells the TriCoder where the data will be coming from. There are 3 valid entries for this field:

K TriCoder keypad entry only

W Scanner input only. This includes any bar code scanner attached to, or built into the TriCoder.

R Serial device input. Use for scales or other serial interface instruments. Data must be terminated by carriage return (CR).

Upload prefix /suffix and max/min data length are not supported.

Leaving **INPUT DEVICE** blank allows for both keypad and/or scanner input.

Yes/Next Statement

The **YES/NEXT STMT** field allows you to tell the TriCoder which statement to go to next or, in the case of a Question statement, where to go if the question is answered by the YES key.

YES/NEXT STMT ----- 02

Make sure the statement number you specify is a valid statement. If your program is a simple one statement program (assuming it is statement #01), you would specify statement #01 as the **YES/NEXT STMT**.

When editing a program, you cannot delete or remove statements, but you can simply not go to them. For example, let's say statement #01 is the item number, statement #02 is the bin number and statement #03 is the quantity. Maybe you decide you don't need to prompt for the bin number anymore and want to remove the statement. Change the **YES/NEXT STMT** field for statement #01 to go to statement #03. See the coding form example below to see how this would work.

Stmt #	Prompt Text	Yes/Next Stmt
01	ITEM NUMBER	03
02	BIN NUMBER	03
03	QUANTITY	01

No/End Statement

The **NO/END STMT** field determines where the program goes if the **END** key is pressed, or in the case of a question statement, where the program goes if the **NO** key is pressed.

NO/END STMT ----- 99

For a question statement, this field simply tells the TriCoder where to go next when the question is answered with NO. In the instance of the **END** key, what can happen next can vary.

Pressing the **END** key can have a different effect; depending on what statement you go to next:

- Go to any valid statement by specifying that statement number in the **NO/END STMT** field. Besides simply going to another statement, this allows you to use the **END** key to break out of complex data collection loops. For example, say you have a program that prompts for (1)BLDG., then (2)AISLE, then (3)ITEM, then (4)QUANTITY, with a loop that goes back to ITEM after QUANTITY. To break out of the loop at ITEM and go back to BLDG, use 01 in the **NO/END STMT** for ITEM. To break out of the loop at QUANTITY and go to AISLE, use 02 in the **NO/END STMT** for QUANTITY.
- If you want to exit data collection when the **END** key is pressed, specify 99 in the **NO/END STMT** field.
- If you want to disable the **END** key (have it do nothing), specify statement #00 in the **NO/END STMT** field.

Upload Prefix

The **PREFIX** field allows you to specify a unique 1-15 character string to be uploaded BEFORE the data for this statement, every time the statement is executed. The Upload Prefix is an extremely useful tool, as it has more uses than simply adding characters to a field of data. Here are the six functions of the **Prefix** field:

1. **Identification of a field**
2. **Adding key sequences for uploading into an application**
3. **Timing Delays**
4. **Appending data to another field**
5. **Trimming data from the front of a field**
6. **Padding data with spaces or zeros at the front of a field**

1. Identification of a field

By specifying particular characters in the Upload Prefix, you can help the host computer program identify or distinguish one field of data from another. For example, if your software identifies part numbers by seeing the letter P before each part number, specify P in the Upload Prefix. Think of it as a way to add Data Identifiers when they aren't already part of your bar code.

PREFIX -- P_

2. Adding key sequences for uploading into an application

If you are uploading your data directly into an application, the upload prefix (and suffix) can add any keystrokes necessary for your program to accept the data. You would have to get the application to the point where you would normally type the data in, then upload the TriCoder and let it type it for you. For example, if you are uploading into a program that requires that you press the F1 key before you enter a particular field of a data, you would program an "F1" into the Upload Prefix for that statement by scanning the correct bar codes on the TriCoder FULL ASCII MENU.

If you use the *Upload Prefix* or *Upload Suffix* to emulate keystrokes, the first thing you must do is carefully note (we suggest writing it down) which keys must be pressed at what point in your application to get the data in the TriCoder to go into the right spots in your program. The SINGLE CYCLE TRANSMIT feature can help you with this process by uploading one piece of data at a time, allowing you to check each field as it uploads.

3. Timing Delays for this field only

Timing delays of .10 seconds to 9.9 seconds can be programmed into the *Upload Prefix* (and *Suffix*). This inserts a time delay before or after a field of data, allowing your application to keep up with the data coming from the TriCoder. This is especially important when uploading directly into an application using the TriCoder as a USB HID Keyboard. As well as giving your application time to process the data coming from the TriCoder, delays also allow you to keep pace with screen changes and avoid overloading the keyboard buffer. Delays are often required when uploading into spreadsheet programs such as EXCEL. Timing delays are programmed by scanning the DEL (ASCII 127) from the *Full ASCII Menu*, then entering two characters - use any combination between 01 (.10 seconds) and 99 (9.9 seconds). Use as small a delay as possible to avoid a slow upload.

PREFIX -- ?05

The previous example shows a . 5 second delay.



4. Appending data to another field

A very common use of the *Upload Prefix* (or *Suffix*) is to append data to a field every time that field is uploaded. Use the characters:
}xx

where **xx** is the number of the statement you want to attach. To save space (you are allowed only 15 characters in a prefix or suffix), a single digit can be used when the statement number is a single digit - }2 is the same as }02 - as long as it is not followed by another valid digit.

As an example, let's say you wanted to attach an aisle number as a prefix to every item number you entered. Assuming the aisle number is statement #02, entering }02 in the Upload Prefix of the item number statement would attach the aisle number to every item number. Only the data in statement #02 would be attached; any *Upload Prefix* or *Upload Suffix* characters for statement #02 will not be uploaded.

The field that is appended (#02 in our example) is typically not uploaded by itself - it is only uploaded in conjunction with another field. To suppress the transmission of a field entirely upon uploading, use:

~0

in the *Upload Prefix* or *Upload Suffix* (either will work) for that field.

PREFIX -- }01

The example above would upload the data in statement #01 attached in front of the data for statement #03 every time it is uploaded.

5. Trimming data from a field

The *Upload Prefix* can be used to trim 1-15 leading characters from the specified statements data. Trimming can happen in 3 ways:

~x

where x is a single hex digit corresponding to the number of characters you want to remove from the data. Valid entries are 1 - F (corresponding to 1-15). Trimming characters using the ~ waits to trim the data until it is uploaded.

PREFIX -- ~A

The example above would trim 10 characters from the front of the data for statement #01. The data is not trimmed until it is uploaded; the TriCoder displays and stores the data in its original form. If the data in statement #01 was less than 10 characters, no trimming would occur and the data would be transmitted in its entirety.

{x

where x is a single hex digit corresponding to the number of characters you want to remove from the data. As above, valid entries are 1-F. Trimming characters using the { character trims the data BEFORE displaying it on the TriCoder screen and before checking data lengths and data ID's.

PREFIX -- {4

The example above would trim 4 characters from the front of the data in statement #01. The trimming would occur immediately, displaying the trimmed data on the TriCoder screen. If the data is less than 4 characters, no trimming would occur and the data would display in its entirety. Because the data is trimmed BEFORE it is checked for its data length and data ID's, remember to take those fields into consideration when trimming your data.

{zx

where z is the bar code ID character and x is a single hex digit corresponding to the number of characters you want to remove from the data. As above, valid entries are 1-F. This type of trimming is called "selective" trimming. It only trims characters from the specified bar code type if it is scanned. See [Chapter 10: TriCoder Setup – Bar Code ID](#) for the correct bar code ID characters for each bar code type.

PREFIX -- {b3

The example above would trim 3 characters off of a Code 39 bar code scanned for statement #01. If you scanned a UPC bar code instead, no trimming would occur.

6. Padding data with zeros or spaces

The *Upload Prefix* can be used to add zeros or spaces before the data up to the *Maximum Data Length* specified for the statement. Padding and Trimming are mutually exclusive; trimming always takes precedence. To pad data with zeros, use:

^0

To pad data with spaces, use:

^S

For example, if statement #01 has a *Maximum Data Length* of 10 and you scan the number 12345, the following *Upload Prefix* for statement #1 would produce data of 0000012345.

PREFIX -- ^0

When programming an *Upload Prefix*, you must press the **ENTER** key on the TriCoder to terminate the entry, whether you have entered data from the keypad or scanned it from the *Full ASCII Menu*. If you try to scan **ENTER** from the *Full ASCII Menu*, the TriCoder will think you want to add an **ENTER** (carriage return) to the *Upload Prefix*.

When entering unprintable characters from the *Full ASCII Menu* as *Upload Prefix* data, each character will display on the TriCoder as ?. If you want to know what ASCII character is there, press the **F2** key and the three-digit ASCII equivalent of your entry will appear. For example, if you scanned the **CR** from the *Full ASCII Menu*, it would display on the TriCoder as ?. Pressing **F2** will display the **CR** as **013** (the ASCII for CR). See [Appendix L: ASCII Code Equivalent Table](#) for a chart of all ASCII characters.

Upload Prefixes and *Upload Suffixes* are the only program statement fields that can be edited after data has already been collected in the TriCoder. All other statement fields are not editable until the current data file is deleted.

Upload Suffix

The **SUFFIX** is just like the *Prefix*; only it is appended **AFTER** the data for the statement.

All of the properties of the *Prefix* apply to the *Suffix* also:

Identification of a field

Simulating keystrokes

Timing Delays

Appending data to another field

Trimming Data (from the END of the data)

Padding Data (padding at the END of the data)

For details on any of the above uses, see the previous section on *Upload Prefixes*.

By default, **Suffix** data is transmitted AFTER the data but BEFORE the *Terminator Character*. The default transmission format when using *Prefixes* and *Suffixes* is as follows:

(ID)(Prefix) DATA (Checksum Chs)(Suffix) (Terminator Ch)

To transmit the **Suffix** after the Terminator, change the *Terminator Character* to **OFF** (the default is ON).

Finishing and checking your program

When you have finished entering your program, press the **F1** key to have the TriCoder check your program for errors. If you have referenced a statement number that doesn't exist or hasn't been defined properly, you will see the message:

```
INVALID STMT. #  
HIT ANY KEY_
```

Pressing a key will take you to the prompt statement number where the TriCoder found the problem. Make the appropriate corrections then press the **F1** key again. If the TriCoder finds no other problems, you will see the Programming Mode Screen:

```
PROGRAMMING MODE  
PROGRAM #1 ----- 1  
PROGRAM #2 ----- 2  
PROGRAM #3 ----- 3  
MULTI PROGRAM MODE --- OFF 4  
DONE/EXIT ----- 0
```

PLEASE SELECT OPTION: _

You can now create another program by pressing 1-3, or exit PROGRAMMING MODE entirely by pressing the **F1** key to return to the Main Menu.

If you don't press the **F1** key when you are finished creating your program and the TriCoder shuts off (goes to sleep in the middle of programming – maybe you were interrupted and left to do something else), when you turn the TriCoder back on, you may get the following message:

```
PROGRAM X INCOMPLETE  
HIT ANY KEY_
```

Press any key to get past this prompt – You will need to enter the Programming Mode from the Main Menu where you will be prompted for the password:

ENTER PASSWORD: _

Enter the password (WDTRI), then choose the number of the program you were working on, or the program that is giving you an error, when you see the PROGRAM MODE menu:

```
PROGRAMMING MODE  
PROGRAM #1 ----- 1  
PROGRAM #2 ----- 2  
PROGRAM #3 ----- 3  
MULTI PROGRAM MODE --- OFF 4  
DONE/EXIT ----- 0
```

PLEASE SELECT OPTION: _

Press the number of the program you were working on. Press **2** to EDIT PROGRAM 2. Once inside the program, press the **F1** key to locate the problem. If the program doesn't resemble what you were working on before, it is possible you have had some kind of memory problem. See *Chapter 14; Troubleshooting* for more information. Otherwise, fix the problem, and then press **F1** to check and exit.

Reviewing and Modifying programs

You can review or modify a program at any time. If you have data collected for that program, the only portions you can review or modify are the *Prefix* and *Suffix*. This is a safeguard to make sure you do not damage data already collected before it is uploaded. If you need to modify a program field other than the *Prefix and Suffix*, upload your data then proceed.

To review or modify your program, get in to **PROGRAMMING MODE** just as you did when you originally created your program. Enter the number of your program **1-3**, then press **2** at the **PROGRAM #X** screen.

Use the arrow keys (down, up, right, left) to move through your program. The DOWN and UP arrows move you to each section of the same prompt; the RIGHT and LEFT arrows move to the next/previous statement/prompt.

 You can use the SEARCH key to search for a particular pattern of data (i.e. all prompts starting with ENTER). Press the SEARCH key and enter the data you want to search for at the **SEARCH PATTERN** prompt. The search begins at the beginning of the file and moves forward until a match is found. Once you press the SEARCH key, you will stay in *Search* mode until you press the SEARCH key again. While in *Search* mode, use the arrow keys as follows:

		Right Arrow	next matching field
		Left Arrow	previous matching field
		Down Arrow	next matching statement numbers' matching field
		Up Arrow	previous matching statement numbers' matching field

 The BEGIN key takes you to the first statement in your program file. Pressing END takes you to the END OF FILE - the last statement filled out with an *Entry Type*. You may have unused statements in a program; maybe you deleted a statement (remember that it reserves the statement number even though you have cleared all prompts) or you may have left gaps on purpose, to insert new statements later.

If you attempt to edit a program but can only see the *Prefix* and *Suffix*, you have data collected in the TriCoder and need to upload before you can edit other fields in your program.

Chapter 11: *Creating TriCoder Programs on your Windows PC*

Coming Soon:

Chapter 12: Voice Messages

The TriCoder's exclusive use of voice prompts allows you to overcome problems such as literacy, language and lighting. With proper planning, voice prompting can make data collection significantly faster and simpler.

Why Use Voice Messages and Prompts?

- Voice messages can be in *any* language.
- The operator does not have to be able to read to perform some jobs.
- Audible instructions can be heard in poor lighting where it is difficult to read a LCD screen.
- MOST IMPORTANTLY, the data collection process is faster because the operator does not have to continually look at the screen for instructions. This is especially useful when you do not want or need to enter data from the keypad. Scanning bar coded numbers from a Quantity BARPAD can make keying unnecessary.
- Voice messages and prompts are a good way to keep the operator's attention focused on the job at hand. Audible error messages and warnings also help to limit mistakes and downtime.

Tips for Using Voice Prompts

Voice prompts can make data collection easier and faster, but only if used wisely. Here are some tips on making your voice prompts user-friendly:

Short messages are preferable for prompts; most English prompts can be stated in ½ second. Instead of saying, "Enter the Item Number" say "Item". During data collection, the typical TriCoder operator does not want to hear long messages thousands of times. Error messages are typically longer because they are the exception and need to provide more precise instruction to the user.

Record your voice prompts calmly. A frantic sounding voice can become irritating, especially when heard repeatedly.

Speak clearly. Correct pronunciation will make the voice prompts easier to follow for all users. Use common words that all users will understand.

Vary the tone of your voice for different prompts. For example, the pre-programmed prompts for Program #1; "*Item*" and "*Quantity*", are recorded in a female voice while all error messages are recorded in a male voice. Using a different tone of voice or even a different voice for consecutive prompts or error messages will make it easier for the user to distinguish between them.

Consider using the "Data Security" option to prevent the operator from accidentally exiting "Data Collection" by pressing the **F1** key instead of the intended **F2** key (the **F2** key replays the current voice message).

Be sure to record error messages for all possible problems that the user may encounter during a data collection session. Once the operator becomes accustomed to listening to the voice prompts, it may become easy to overlook a "display only" error message.

Use a barpad table and Accumulate Mode to enter numeric data. This allows the operator to scan everything and avoid using the keypad. Data collection becomes a simple "listen and scan" operation. This has the potential to greatly speed up the entire data collection process.

TriCoder Voice Message Mapping

The TriCoder is shipped with approximately 50 seconds of total recording time with 1MB allocated exclusively to Voice Messages. You can record any length message in the Hardware Utilities and send them to your TriCoder. We recommend that you use short messages for clarity. If you need more than the Default 1MB of space for Voice messages and you are not going to use Tables you can set *TABLE ALLOWED* to **NO** in the *SYSTEM TOOLS* and it will double the amount of memory to 2MB for voice storage.

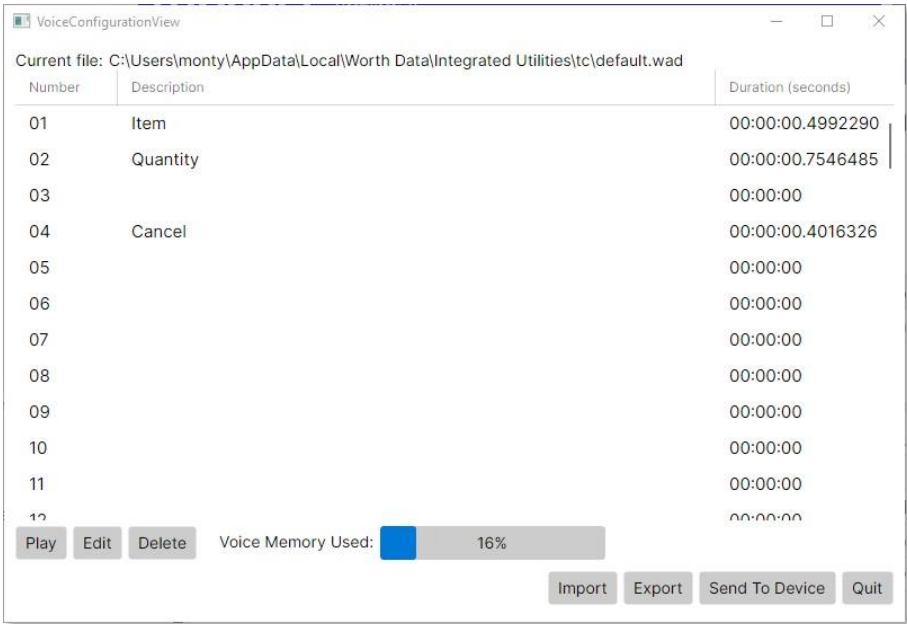
Accessing Voice Message Operations

Voice Operations are accessed from the *SETUP MODE: SYSTEM TOOLS: PLAY VOICE PROMPT # XX* menu.

- Enter the **Setup Mode** by answering "5" at the Main Menu (opening screen)
- Enter **8** for **SYSTEM TOOLS**
- **PLAY VOICE PROMPT # XX:** This enables you to play an individual Voice Prompt that is stored in the TriCoder.

Recording and Playback of Voice Messages

Voice Messages are recorded only in the *Hardware Utilities3.0* Program. You can record, manage, and sort voice files using the Voice option in the TriCoder Manager. Below is a screen shot of this process. It is fairly easy to follow and the help files can guide you if you need more help.



Voice Message Options

To play back the voice messages you have recorded, they must be designated for use when creating a data collection program in the TriCoder. Once the programming is complete, the operator has the following options available from the TriCoder keypad:

Operation	Keypad Sequence
To turn OFF all voice messages	Press the SHIFT key Press the F1 key Press the S key
To turn ON all voice messages	Press the SHIFT key Press the F1 key Press the V key
To turn OFF prompt Messages but not error messages	Press the SHIFT key Press the F1 key Press the P key
To replay the current voice message	Press the F2 key

Default Voice Messages

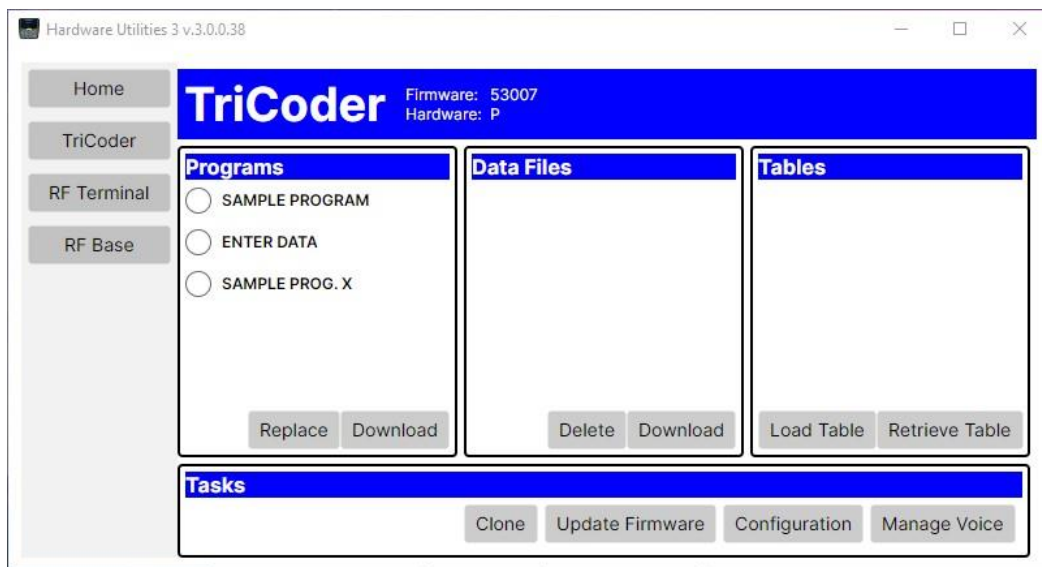
The TriCoder comes from the factory with some voice prompts and error messages pre-recorded. You can change any of these messages but keep in mind that the error conditions that the voice error messages are linked to are fixed. For example, the “**Change Batteries**” message is located at message #20. Whenever the TriCoder detects very low batteries, it will play message #20, regardless of what is recorded there. You could record “Happy Birthday” and the TriCoder would broadcast it any time it detected the low battery condition. To avoid confusion, try to keep the error messages somewhat related to the error condition they represent. Here are the default messages and the message numbers they are recorded under:

Message Recorded	Message #
Prompts	
ITEM	#01
QUANTITY	#02
Error messages	
CHANGE BATTERIES	#20
DATA FILE EXISTS	#21
DATA TOO LONG	#22
DATA TOO SHORT	#23
DATA TYPE ERROR	#24
DUPLICATE ACCESS	#25
IDENTIFIER ERROR	#26
ITEM NOT FOUND	#27
OUT OF MEMORY	#28
WRONG INPUT DEVICE	#29
WARNING 2K LEFT	#30

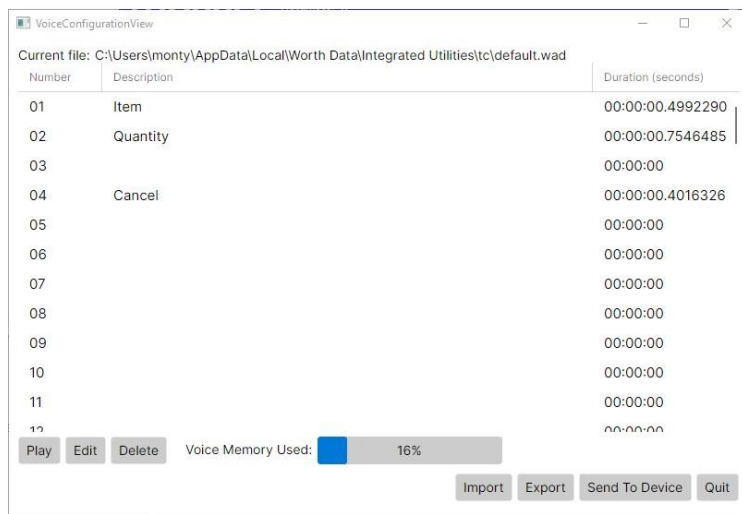
Cloning Voice Messages from TriCoder to TriCoder

If you have several TriCoder’s, you can record all of your voice messages on the *Hardware Utilities 3.0* and upload the Voice file to your other TriCoder’s. Cloning can also copy programs, tables, voice files and the TriCoder setup from an existing TriCoder to your Host computer and then to another TriCoder using the *Hardware Utilities*. The Cloning file could even be emailed to a user and they could use the *Hardware Utilities 3.0* to update their TriCoder’s.

To manage the Voice Files Click on the **Manage Voice** button in the **Tasks** section.

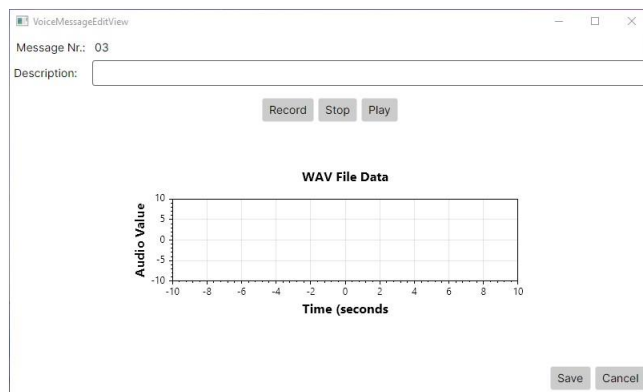


That will bring up the Voice Configuration Screen:



From this screen you can edit the existing messages, add new messages, move messages, delete messages, import & export .wav files, and finally send the Voice files to the TriCoder.

To record new messages, if you have a microphone on your PC, Click on the **Edit** button to bring up the voice message edit screen.



Chapter 13: Tables

The TriCoder allows you to download a lookup table for verifying data and/or displaying data from a table to complement the data collection process. In addition, you can use tables to update things like prices descriptions and other data that you have stored in a file but may be different in the field. The TriCoder has a 5MB storage file exclusively reserved for a table (equivalent to 350,000 14 digit GS1 numbers or SKU's).

Why Use Tables?

- Data Validation - Make sure that the items scanned by the user are valid times by validating them in the table
- Data Validation with Duplicate Access Checking – Prevent entry of the same item again
- Lookup and display of 1-3 additional data fields in a record
- Enter data from the table into the prompt as default data – This allows you to use the table data as a reference and change or update that data in the data file

Data Validation using Tables

Lets say you have a warehouse application where you want to use the TriCoder to record items being loaded onto a truck. You can use a table of data downloaded into the TriCoder to validate what is being loaded on the truck. When the worker scans the item to be loaded, the TriCoder checks the item number against the item numbers in the table; if they match, the item number is written to the data file and he moves on to the next item. If the item number he scans is not found in the table, the TriCoder would alert the worker that the item he is loading is not on the list, avoiding a possible miss-shipment or loss.

Data Validation validates a single field of entered data against a table constructed of single pieces of data. The TriCoder uses the DATA ID field to specify which table you want to use to validate the data entered for that statement.

Data ID entry	Description
A1A	Validate data using Table
D1D	Validate data using a Table Prevent Duplicate Items

When the operator enters an item found in the table, the TriCoder writes the item to the data file and goes to the next statement in the program. If the item is not found in the table, the TriCoder displays:

**ITEM NOT FOUND
HIT ANY KEY_**

and displays the statement prompt over again.

Data Validation table file format

The file format used to create a table for Data Validation is a simple CSV formatted ASCII file with a " surrounding each field, and each record on one line in the file. The CSV file is then imported into the Table Editor in the Integrated Hardware Utilities and uploaded to the TriCoder. The only constraint on the file size is the amount of memory you have allotted for the table data. The data file can be created in Excel or Google Sheets and saved as a .CSV file. A sample file using might look like this (*each line terminated by a CR*) :

```
"111111"  
"222222"  
"333333"  
"324211"  
"365667"
```

In the example above, all data entries are 6 characters long, (specified this length in the "Field #1" box in the Table Editor as well). If you want to be able to use variable length data, you must set your length in the Table Editor to the longest number required (say your longest number is 8 digits long) and then any data shorter than 8 characters long, will be padded with TRAILING spaces by the Table Editor:

```
"11111111"  
"22"  
"33333"  
"44444444"
```

EXAMPLE2 above would accept a scan or entry of 22 when **EXAMPLE1** would not.

Preventing duplicate entry of data

Sometimes you might want to make sure that an item in your table is not scanned or entered twice. You can prevent duplicate data when using a data validation table by specifying the following in the DATA ID field:

Data ID entry	description
D1D	Prevent duplicate entry for Table

If you have specified **D1D** in the DATA ID field and happen to enter the same data twice, the TriCoder will respond with the following error message:

**DUPLICATE ACCESS
HIT ANY KEY_**

Hit any key to return to the statement prompt again.

The file format to prevent duplicate access for table data validation is identical to the above example for simple data validation. The data in the Table is NOT updated – so if data is uploaded from the TriCoder and then the same program is used again, then duplicate data from the table could be entered. Once uploaded the duplicate check is essentially reset. If you want to continue to check for duplicate access you would have to re-download an updated table to the TriCoder.

Data Lookup & Display 1-3 Fields of Table Data

Sometimes you might want to make scan an item from your table and then display 1-3 additional fields of data that correspond to this “key” field.

Data ID entry	description
L1L	Lookup and display data from table

If you have specified **L1L** in the DATA ID field it will display the additional fields from the table. It will display the additional fields from the table. You can also enter the Data ID as **L11**, **L12**, **L13** to display individual fields of additional data (e.g. Price, Description, Quantity On Hand). This allows you to then change or update a value and store the new data in the data file to update a database

Here is an example of using this statement type:

```
< PROGRAM #1 PROMPT 01 >
ENTRY TYPE ----- D
PROMPT TEXT:
SCAN ITEM NO:
DATA ID ----- L1L
```

This will place the contents of the additional Table data for the item number scanned below the scanned entry. The table can have up to 4 fields. All fields in the table will then display – As an example if you table is formatted as shown below:

```
XXXXXX
ITEM DESCRIPTION
PRICE
QUANTITY ON HAND
```

The file format used to create a table for **Data Lookup** is also a simple CSV formatted ASCII file with " surrounding each field, and a comma delimiter. Each record is on one line in the file and each line must have the same number of fields as you have specified in the Table Editor. The CSV file is imported into the Table Editor in the **Hardware Utilities**. The only constraint on the file size is the amount of memory you have allotted for the table data. The data file can be created in Excel or Google Sheets and saved as a .CSV file. A sample CSV might look like this:

```
"111111","#4 Stainless Washer","$.45","9"
"222222","4-40 Stainless Hex Screw 1.5","$1.29","24"
"333333","#4 Stainless Jam Nut","$1.25","55"
"324211","4-40 Stainless PPH Screw 1","$.95","19"
"365667","4-40 Stainless Nut","$.15","2000"
"69-1894ES-1","Honeywell VisionPRO TH8000 Thermostat","$125.99","23"
```

Then the user would see the Prompt SCAN ITEM NO: and then the “Item Description”, “Price” and “Quantity On Hand” from the Table as shown below:

```
SCAN ITEM NO:  
69-1894ES-1  
Honeywell VisionPRO TH8000 Thermostat  
$125.99  
23
```

You can then display individual data from the table to change by doing the following in the next statement:

```
< PROGRAM #1 PROMPT 02 >  
ENTRY TYPE ----- c  
PROMPT TEXT:  
ENTER NEW PRICE:  
DATA ID ----- L13
```

This will place the following on screen:

```
ENTER NEW PRICE:  
$125.99_
```

You can accept the current price shown by pressing Enter, or you can hit clear or delete to remove or change the stored price and enter a new price. This new price will be stored in your data file and can update your database when you upload the TriCoder data file.

You can then display additional data from the table to change by continuing in the next statement:

```
< PROGRAM #1 PROMPT 02 >  
ENTRY TYPE ----- c  
PROMPT TEXT:  
ENTER NEW QUANTITY:  
DATA ID ----- L14
```

This will place the following on screen:

```
ENTER NEW QUANTITY:  
23_
```

You can accept the current quantity shown by pressing Enter, or you can hit clear or delete to remove or change the stored quantity and enter a new quantity. This new quantity will be stored in your data file and can update your database when you upload the TriCoder data file. The Table will not be modified.

This is just one example of how to use **Table Data** to modify data in a stored Table, you can also use it to modify things like locations, conditions, asset value, items to be returned etc...

Downloading a table to the TriCoder

The screenshot shows the 'Table Editor' window. On the left, there are buttons for 'Open Table File', 'Save Table File', 'Send To TriCoder', and 'Close'. The 'Table Configuration' section includes 'Table Type' with radio buttons for 'Data Validation', 'Duplicate Data Prevention', and 'Lookup' (selected). Below this is a 'Number Of Fields' spinner set to 4, and four 'Field # Length' inputs: Field #1 Length: 12, Field #2 Length: 38, Field #3 Length: 7, and Field #4 Length: 5. A 'Table Name' input field is also present. The 'ASCII File Import' section shows an 'ASCII Text File' path 'C:\Users\WDS\Desktop\samp' with a file icon, and an 'Import' button. The 'Table Data' section on the right displays a table with 4 columns: Field 1, Field 2, Field 3, and Field 4. The table contains 6 rows of data, with the 5th row highlighted in blue.

Field 1	Field 2	Field 3	Field 4
111111	#4 Stainless Washer	\$.45	9
222222	4-40 Stainless Hex Screw	\$1.29	24
333333	#4 Stainless Jam Nut	\$1.25	55
324211	4-40 Stainless PPH Screw	\$.95	19
365667	4-40 Stainless Nut	\$.15	2000
69-1894ES-1	Honeywell VisionPRO TH8	\$125.99	23

At the bottom right of the 'Table Data' section, there are buttons for 'Clear All', 'Delete', and 'Add'.

Tables are downloaded to the TriCoder using the *Hardware Utilities* on a Windows PC by Full speed USB. Before you can download a table, you must have:

- Programmed the TriCoder to work with Tables
- Setup the TriCoder I/O Settings as Full Speed USB (Windows)
- Have a properly formatted .CSV file

See [Chapter 9: Using the Hardware Utilities](#) for instructions and details on downloading a table using the *Hardware Utilities*.

Chapter 14: Troubleshooting

Display and Error Messages

The following is an alphabetical list of all messages the TriCoder can display. Some describe an error state; others are simply instruction.

Message	Meaning	Operator Action
APPEND DATA FILE KEY [YES/NO]?	Using Multiple Data files selected and already have data in a file it will ask this. Do you want to append data to it?	Press YES or NO.
ARE YOU SURE? KEY [YES/NO]?	You have asked to delete a file or change a setup option. Are you sure? Just checking.	YES to confirm NO to cancel
BATTERY TOO LOW TO OPERATE HIT ANY KEY TO POWER DOWN	The battery is too low to continue. The TriCoder automatically shuts down.	Charge the battery and resume operation.
BEGIN OF FILE HIT ANY KEY	You are at the beginning of a data file or program file.	PRESS ANY KEY to view the beginning of the file.
CHARGING BATTERY PLEASE WAIT...	The battery is being recharged - The	Charge the battery and resume operation.
Data File Exist Delete Data File? KEY [YES/NO]?	Firmware download had been requested, and a data file exists.	YES generates "ARE YOU SURE?" Deletion occurs with YES/YES. NO exits to <i>Main Menu</i> .
DATA FILE EXISTS PRESS ANY KEY_	You are trying to edit a program or enter Data Collection with data already in memory.	Upload data file and delete it if you need to edit program other than prefix and suffix, or if you want to start new data file.
DATA NOT FOUND HIT ANY KEY_	You either hit BEGIN to review data and no data was found or you attempted to upload and no data was found.	HIT ANY KEY to resume
Data Review Request Press <BEGIN> key to Start or <F1> for Data Collection	You pressed the UP ARROW key.	Press the BEGIN key to enter Data Review Mode or press F1 to resume data collection.
DATA TOO LONG PRESS ANY KEY_	Too many characters were entered.	Enter fewer characters or increase your Maximum Character Length.
DATA TOO SHORT HIT ANY KEY_	Too few characters were entered.	Enter more characters or decrease your Minimum Character Length.
DATA TYPE ERROR HIT ANY KEY_	Alphabetic character entered when numeric is expected or vice versa.	Re-enter data or change Data Type in program.
DELETE PROGRAM? KEY [YES/NO]?_	Upon entering Programming Mode, you selected a program and answered NO to EDIT PGM? Do you want to delete?	Press YES to delete program. Press NO to go back to menu.
Downloading Firmware Please Wait	Firmware Download has started.	Wait 1.5 minutes for serial. Wait 0.5 minutes for USB.
DUPLICATE ACCESS HIT ANY KEY_	In a table where you have specified NO DUPLICATE ACCESS you have accessed a record twice.	HIT ANY KEY. Enter a different piece of data.
END OF FILE HIT ANY KEY_	You are at the end of a data file or a program file.	Press any key to see last record.
END OF TRANSMIT DELETE FILE [Y/N]?_	A data file has been successfully uploaded. Do you want to delete the file?	Press YES to delete the file Press NO to keep the file.
ENTER PASSWORD?_	You are trying to enter Programming Mode or the SYSTEM SETUP and need to enter the password. The password prevents programming and setup accidents.	Key in the password - WDTRI
ENTRY TYPE ERROR HIT ANY KEY_	In Programming Mode, you have entered a character other than DQTYSX at the ENTRY TYPE prompt.	HIT ANY KEY and re-enter character.
FATAL ENTRY TYPE CANNOT CONTINUE CYCLE POWER	An invalid <i>Entry Type</i> has been detected in your program. Cycle power & see if it clears the error. This can be caused by the TriCoder turning off during programming.	UNIT MAY NEED TO BE RESET TO CLEAR ERROR – RESET PROGRAMS & DATA IN SYSTEM SETUP & RESET SETUPS TO DEFAULT - Call for support if condition continues.
FATAL PROMPT #. CYCLE POWER_	An invalid <i>Prompt Number</i> was detected. Cycle Power and see what happens. The Program was not completed before turning the unit off, or the memory is not reset after a firmware update.	UNIT MAY NEED TO BE RESET TO CLEAR ERROR – RESET PROGRAMS & DATA IN SYSTEM SETUP & RESET SETUPS TO DEFAULT - Call for support if condition continues.

FILE USED BY P_n HIT ANY KEY_	You have selected a data file # with data in it, HIT ANY KEY. Select collected by another program. n=1-3. Select another data file #.	
IDENTIFIER ERROR HIT ANY KEY_	You have entered data that doesn't match the DATA ID specified.	Re-enter your data or change the DATA ID.
PROGRAM n INCOMPLETE HIT ANY KEY_	Unit was shut off or went to sleep during programming.	Check program for errors. UNIT MAY NEED TO BE RESET TO CLEAR ERROR – RESET PROGRAMS & DATA IN SYSTEM SETUP & RESET SETUPS TO DEFAULT - Call for support if condition continues
INVALID DATA LENGTH HIT ANY KEY_	You have tried to enter 00 for Max Data Length. Entry must be at least 01.	HIT ANY KEY. Re-enter data length.
INVALID INPUT DEVICE HIT ANY KEY_	You have specified a character other than K W or ENTER for the INPUT DEVICE.	HIT ANY KEY. Enter a valid character.
INVALID FILE # HIT ANY KEY_	You have entered a character other than 0,1,2,or 3 at the Data File No. Prompt.	HIT ANY KEY. Enter a valid number.
INVALID HEADER HIT ANY KEY_	The Header Record in a table has an invalid format.	Check header record, fix and retry.
INVALID PASSWORD HIT ANY KEY_	You have not entered the correct password.	HIT ANY KEY. Enter the correct password - WDTRI.
INVALID PROGRAM # HIT ANY KEY_	You have entered something other than 0,1,2, or 3 in Programming Mode or 1,2, or 3 for Data Collection Mode	HIT ANY KEY. Enter the correct number.
ITEM NOT FOUND n HIT ANY KEY_	An item entered in the TriCoder has not been found in table n.	HIT ANY KEY. Enter another item number or check table data.
NONPORTABLE MODE PRESS <F1> TO EXIT	You are operating in Non Portable mode - the TriCoder transmits data immediately to the host computer without saving in memory.	Continue to enter data. Press F1 to get to Mode Menu.
OUT OF MEMORY HIT ANY KEY_	You have filled the memory and must upload before you can collect any more data.	HIT ANY KEY. Upload data and continue with data collection.
PLEASE ENTER DIAG COMMAND_	TriCoder is in diagnostic mode, waiting for a command.	Enter the correct diagnostic code or press F1 to exit.
Possible Data Loss Press Any Key_	Slight memory error. Cycling Power on the TriCoder may fix the problem. Watch TriCoder closely. Can occur after removing the battery	UNIT MAY NEED TO BE RESET TO CLEAR ERROR – RESET PROGRAMS & DATA IN SYSTEM SETUP & RESET SETUPS TO DEFAULT - Call for support if condition continues.
PROGRAM n INCOMPLETE HIT ANY KEY_	Unit was shut off or went to sleep during programming or the program is bad.	Check program for errors. UNIT MAY NEED TO BE RESET TO CLEAR ERROR – RESET PROGRAMS & DATA IN SYSTEM SETUP & RESET SETUPS TO DEFAULT - Call for support if condition continues
PROGRAMMING MODE --- 4	Do you want to write, edit, review or delete a program?	Press 4 at the Main Menu for PROGRAMMING MODE.
PROGRAM NO.? KEY [0-3]?_	You are in Data Collection mode and need to select a program to use.	Key 0, 1,2 or 3.
SEARCH PATTERN _	The SEARCH key was pressed.	Enter data to search for or press ENTER key to exit.
Start Host USB Firmware Download Program First and Then Hit Any Key.	Firmware download has been requested. USB enumeration has been completed. Now TriCoder is requesting the user to start PC TriCoder Firmware Downloader.	Start the Windows program, TriCoder Firmware Downloader. Available on Utilities CD-ROM, or on www.barcodehq.com .
TABLE FORMAT ERROR PRESS ANY KEY_	The table header is in an invalid format or EOF Ctrl Z (ASCII 26) is missing.	Check table file for format errors. Try again.
TABLE NOT FOUND HIT ANY KEY_	A table referenced in a data collection program does not exist.	Download table or correct program to reference correct table.
UPLOADING DATA PLEASE WAIT_	Collected data is being uploaded to host.	Wait for upload to finish.
USB Enumeration Please wait...	At power on or when a cable is plugged in, TriCoder must enumerate as a USB device. Also happens when changing modes.	Just wait a few seconds. There is nothing to do. Advisory only.

USB not Connected Connect Cable, Then Press a Key Or F1 to Exit	Computer Interface is set to USB. A mode has been selected to transfer data. The USB cable is not plugged in.	Connect USB cable and press a key or F1 to Exit to Mode Menu.
USB not Connected Connect, Hit any Key or F1 – Exit or F2 – Display Only	You have answered YES to Non Portable Mode when the TriCoder is configured for USB interface and NOT connected to the USB port on the computer.	If you want to see the data on the computer, connect to the USB port, then press any key. Press F1 to exit Non Portable Mode or press F2 to simply display the data on the TriCoder screen without transmitting to the computer.
USB not Connected Connect, Hit any Key or F1 – Exit or F2 – Delete File	You have answered YES to Data Upload Mode when the TriCoder is configured for USB Interface and is NOT connected to the USB port on the computer.	If you want to upload via the USB port, connect the TriCoder to the USB port and press any key. Press F1 to exit Data Upload Mode or press F2 to delete the data file from the TriCoder without transmitting it to the computer.
WARNING: 2K OF MEMORY LEFT HIT ANY KEY_	You are close to filling the memory and should upload before you can collect any more data.	HIT ANY KEY. Upload data and continue with data collection.
WARNING: LOW BATTERIES HIT ANY KEY TO CONTINUE	The battery charge level is getting low. If you continue to use the TriCoder it will automatically shut down when the battery is depleted.	Charge the battery and resume operation.
WRONG INPUT DEVICE HIT ANY KEY_	The input device you are using is not what is specified in your program.	Use the correct input device or change the specification in your program.

General Troubleshooting

If you want to what the settings in the TriCoder are, you can enter **Setup Mode**, key in the number that corresponds to the **Parameter(s)** in which you are interested, and then read the display settings referring to the **TriCoder Manual** for an explanation of the options.

You can return the TriCoder to the default shipped settings by going into Setup Mode: **SYSTEM TOOLS: RESET SETUPS TO DEFAULT:**

The TriCoder Will Ask: **ARE YOU SURE Y/N?**

Press the Enter Key (YES) if you are Sure

You can then reconfigure the TriCoder for your system by entering into the parameter you want to change in **TRICODER SETUP MODE** or by using the setup mode from the *Hardware Utilities*

USB won't upload

- In Windows 11, 10, 8 & 7 you will have to manually update the USB Driver for the TriCoder. Do this by clicking on the New Hardware Found Balloon when you first plug the TriCoder into the computer, or alternatively by going to the Control Panel and Device Manager and Updating the driver there: See [Appendix D: USB Driver Installation Recovery](#)
- Be sure you are **not** trying to use USB with Windows 95, 98, or NT. There is no support for USB devices in these older operating systems.
- Be sure you are set to HID Keyboard if you are connected to a Macintosh Computer running macOS or Mac OS X, or a Windows ARM PC – WinUSB is only supported on Windows x86 AMD & Intel computers.
- When you first plug your TriCoder into a USB port, Windows will sense new hardware and attempt to install driver(s) for the TriCoder. If you fail to complete the driver(s) installation, the TriCoder will not upload or transfer programs, etc. See [Appendix D: USB Driver Installation Recovery](#) for how to recover from a failed driver installation.

Strange Behavior

- Low batteries that are not detected can exhibit some bizarre TriCoder symptoms, including laser beams that shut off, continuous beeping, shutting off when you scan, etc. Try the power supply to see if the battery needs to be recharged. It is possible that the battery has died or is close to dying – You could try a new battery.

The TriCoder won't read your bar codes...

- Recheck all hardware connections using [Chapter 2: TriCoder QuickStart](#) as a guide. Try reading a bar code you know is valid and readable – try the Test Label on the next page.
- If you are reading Code 39 bar codes with leading spaces (see the Barpad in [Appendix F: Code 39, Accumulate Mode](#)) and you have enabled **Accumulate Mode** in the setup, the reader will beep twice upon reading a bar code and will not transmit data to the computer until it reads a bar code **without** a leading space.
- Recheck the TriCoder setup and make sure you have **enabled** the bar code type you are trying to read.
- If you are having problems reading **Interleaved 2 of 5** codes, make sure the data length of the bar code is the same as the **2 of 5 Length** set on the TriCoder.
- Make sure you have not enabled **check digits** for Code 39 or Interleaved 2 of 5 if your bar codes do not have check digits.

The TriCoder transmits extra characters at the start or end of bar code data...

- Clear the **preamble** and **postamble**.
- Check to make sure you have not setup the TriCoder to transmit **start/stop characters, check digits, NSC characters or terminator characters** that you don't want transmitted.
- For UPC-E, select **compressed** transmission if you don't want your data padded out with extra zeroes.

Poor read rates...

- Try reading the bar code below as an example of a known “good” bar code. This bar code is a Code 39 bar code and is readable by the TriCoder set to its default settings.



- Make sure *your* bar codes have clearly defined dark bars and clean white spaces. If the bars are so light that they are gray instead of black or are so dark that they “bleed” into the white spaces, the printing of the bar codes is the problem. Whoever is printing the bar codes needs to make the necessary corrections.
- The bar code should also have a “quiet zone” of at least $\frac{1}{4}$ ” to the left of the first bar and to the right of the last bar. Make sure to start your scanning to the left of the bar code in the “quiet zone”, moving the scanner quickly and smoothly as if drawing a line through the bar code. If using a the 1D laser scanner models make sure the beam extends beyond the bar code on both sides. For the 2D scanner models make sure the aiming dot is near the bar code and it is the entire bar code is illuminated
- Make sure you are using the correct type of scanner for the type of bar code you are reading. If you are using a LT7150H with the 1D laser scanner make sure you are only scanning bar codes with vertical lines like the test label above.
- Check the laser exit window to make sure it is clean. You can clean the window of the scanner with a soft cloth or lens cleaning kit.

Sometimes I get long beeps and sometimes short beeps...

- When the TriCoder is in NON-PORTABLE MODE it uses a longer beep that can vary in tone – see [Chapter 8: TriCoder Setup](#) for details on changing the beep tone. If the TriCoder is in a “portable” mode (i.e. Data Collection), it uses a shorter beep to conserve power.

USB troubleshooting (for Windows Users)

The bulk of USB problems are due to driver(s) installations not being completed and the data transfer(s) won't work. Whether you have selected WinUSB Data Upload, or HID Keyboard Data Upload you will be required to install a driver for Human Interface Device (HID) keyboard emulation as well as the WinUSB drivers for fast data transfers with the *Hardware Utilities 3.0* program.

If the driver(s) are not completely installed, when you plug the TriCoder into a USB port, two things can happen:

Windows will recognize the device but flag it in the Windows Device Manager with a "!" icon (if you cannot find a HID entry for the TriCoder - double click on Human Interface Devices - or an entry for the TriCoder after double clicking on the Universal Serial Bus Controllers, the device has been disabled). Assuming you find the device with the "!", right click on the device, look at properties, and then click on the Update Driver button – only this time being sure Windows finds the driver files it needs. For the HID driver on older versions of Windows, you may have to insert the original Windows installation media; for the Full Speed driver, you will have to download the driver from our website and point the installer to the file location on your local drive.

The device will not show up in the Windows Device manager and the hardware will not be recognized when it is plugged in, because Windows has marked the device as "Disabled". To fix this, you will have to go into the **Device Manager - Control Panel**, go to "**Add Hardware**" and search for new devices, (with the TriCoder plugged into a USB port). When the TriCoder device is found, you need to uncheck the "Disabled" box and then proceed to click on "Update Driver", this time furnishing the original Windows installation media for the HID or WinUSB drivers. The driver can be downloaded from our website: <https://www.barcodehq.com/downloads.html>. See [Appendix D: USB Driver Installation Recovery](#) for additional details. Once the all the drivers are installed correctly, there should not be any further problems.

The TriCoder reads one bar code and stops reading after that...

Double-check the **I/O Interface** setting in the SETUP MODE. Selecting **HID Keyboard** as the interface when you are not physically connected to a USB may hang up the TriCoder if you try to upload in Data Upload or Non Portable Mode.

During HID Keyboard Data Upload all the data is coming out garbled or bad...

Double-check the **USB HID ALT OUTPUT** in the **I/O Interface** setting in the **SETUP MODE**. Selecting **ON** for this will eliminate this problem if you are using a Foreign Keyboard for your Windows keyboard.

During HID Keyboard Data Upload the data is good for a short time and then gets garbled...

This can also be caused by larger data uploads which will overrun the keyboard buffer. With Keyboard Buffer overloads the computer pauses to save the data that has been uploaded – but the TriCoder keeps sending data which gets scrambled from that point on in the file upload.

You can setup a [HID PACKET SIZE](#) from 01-99 character along with a [HID PACKET DELAY](#) between .10 seconds to 9.9 seconds for the HID data upload. This will allow the software application to save the already uploaded data, and not have scrambled data from the rest of the upload.

Timing delays of .10 seconds to 9.9 seconds can also be programmed into the [Upload Prefix](#) (and [Suffix](#)). This inserts a time delay before or after a field of data, allowing your application to keep up with the data coming from the TriCoder. This is especially important when uploading directly into an application using the TriCoder as a USB HID Keyboard. As well as giving your application time to process the data coming from the TriCoder, delays also allow you to keep pace with screen changes and avoid overloading the keyboard buffer. Delays are often required when uploading into spreadsheet programs such as EXCEL. Timing delays are programmed by scanning the DEL (ASCII 127) from the Full ASCII Menu, then entering two characters - use any combination between 01 (.10 seconds) and 99 (9.9 seconds). Use as small a delay as possible to avoid a slow upload.

Program troubleshooting

The following examples have to do with programming the TriCoder.

When editing a program, all I can see are the upload prefixes and suffixes...

If there is a data file currently in the TriCoder, you cannot edit any part of the programs except for the **Upload Prefix** or **Upload Suffix**. This is to protect the integrity of the data that is currently still in the TriCoder. You will know if you still have a data file in the TriCoder if you see the

**DATA FILE EXISTS
PRESS ANY KEY_**

message when you enter PROGRAMMING MODE and enter the password. To edit or create a program, upload and delete the data from the TriCoder.

I can't delete a programming statement while editing a program in the TriCoder...

You cannot actually “remove” a statement from a program when editing a program in the TriCoder. You can clear all of the program prompts for the statement but the statement number will remain “occupied” by a blank programming statement. The best thing to do is simply not “go to” that statement in your program. If that bothers you, the alternative is to delete the entire program and re-enter it without the offending statement. See [Chapter 10: Creating a custom program](#) for details.

My uploaded data has the old data followed by my new data...

If you upload your data and fail to delete it from the TriCoder, when you enter DATA COLLECTION mode again, the TriCoder assumes you want to collect more data and append it to the end of the data file that already exists. To avoid this, be sure to press YES when the TriCoder asks if you want to delete the data file. When it asks ARE YOU SURE?, press YES.

I want to read more than one length I 2of 5 bar code...

To scan any length, I 2of 5 bar code, use 00 when setting the **2 of 5 Length**. If you are going to do this, you must check the length in DATA COLLECTION to minimize the possibility of partial reads. I 2 of 5 is very susceptible to misreads so using 00 to read all lengths is risky and not recommended.

I need more than 15 characters for upload prefix and suffix to upload multiple operator entered fields that I want outputted with my main field...

When using **Refer-backs**, use {2 instead of {02 to refer back to a particular statement. Substitute your statement numbers for the 2 in the example above. You can also use the “None Statement” for additional refer-backs. See [Chapter 10: Creating a custom program](#) for details on **Refer-backs**.

Error messages for special consideration

The error messages below relate to problems that can either be solved by resetting the TriCoder or may require repair:

INCOMPLETE PROGRAM #x

This may not necessarily be bad news. This error can occur by not completing the writing of a program - maybe you were interrupted while writing a program and the TriCoder went into sleep mode after 5 minutes of inactivity. If this happens, the program should be checked by pressing the **F1** key while in the program itself. This causes the TriCoder to check the program for valid statement numbers and their references. If you are referencing a statement number that does not exist or is incomplete, trying to power up the TriCoder will result in the INCOMPLETE PGM message. You can check programs quickly by:

- Going into PROGRAMMING MODE and choosing to edit the program.
- Once in the program, scroll through the statements to see if the program makes sense and still looks reasonable.
- Press the **F1** key to have the TriCoder validate and check the program.
- Follow the instructions for correcting the program in [Chapter 10: Creating a custom program](#).
- If the program looks scrambled or not even close to what you expected, you need to reinitialize the TriCoder to its original factory shipped settings as described on the next page.

Planning for success...

Before you set out on your first big inventory or other data collection event, there are a few things you can do to better your chances for success. Planning and testing before the big day can help you avoid headaches as well as numerous calls to tech support. The whole point of using the TriCoder is to reduce data entry errors and speed up the data collection process. Here is a list of things you can do to make sure both of these things actually happen:

Establish communication in non-portable mode first.

Don't collect data and try to upload it without having thoroughly tested your computer interface settings. Keyboard wedge interface users can set their computer interface and test using *Non-Portable Mode* in any text editor such as Notepad or WordPad. Serial interface users will need to use the Windows *Integrated Hardware Utilities* program.

Use the Default Program #0 or Sample Program #1 if you can. These programs require no special programming and can greatly cut down on the amount of time you will spend getting your application to work correctly.

If you create a custom program, collect and upload a small amount of data before you go for the whole thing. If you have problems with a small amount of data, think of the disaster you would have uploading your entire inventory without proper testing first.

Stop data entry errors at the source by using the TriCoder's data integrity features.

Using data identifiers, data type checking, minimum and maximum data lengths and table validation and maintenance can greatly reduce operator error. See the section on Programming for details on each of these features.

Use Voice Messages to speed up data entry.

With proper planning, voice prompts and error messages can reduce the amount of time the operator has to look at the display, making data collection faster and more efficient.

Use outside help when you need it.

You don't have to be a programmer to write programs for the TriCoder, but if you are a computer novice and are stuck, save time by asking for help. Borrowing a little of a knowledgeable colleagues time or buying a few hours worth of help from a consultant will save you time and money in the long run. If you have technical problems with the TriCoder itself and cannot remedy the problem using the troubleshooting guide in the manual, call your Dealer or Worth Data.

If you have a problem...

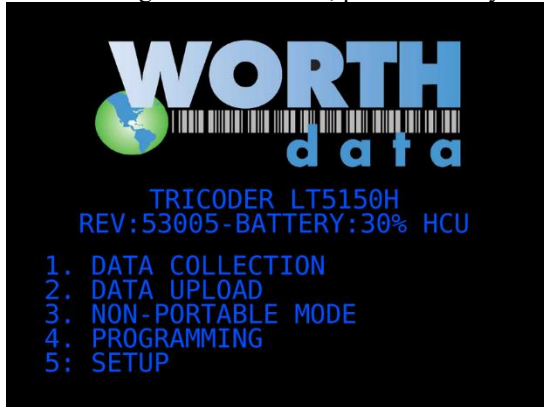
- If you have a problem with your TriCoder, **consult the troubleshooting section of this manual FIRST**. If you cannot find the answer here, call your Dealer or Worth Data for help.
- Before you call your dealer or Worth Data for technical support, have your TriCoder and related equipment in front of you and **be prepared to explain your problem in detail to the Technical Support Engineer**.
- The Engineer may ask you to go through some troubleshooting procedures while on the telephone. This will help them determine what is wrong and what the course of action should be. **Many problems can be resolved over the telephone and will not require that you return the equipment to us**. If you *do* need to return the TriCoder to Worth Data, the Engineer will issue an RMA number.
- If you do need to return the TriCoder for ANY reason, **you MUST have an RMA number** first. Write the RMA number on the outside of the original shipping box and make sure to insure the shipment. All RMAs should be shipped back to the following address unless directed otherwise:

**RMA #XXXXXX
Worth Data Inc.
623 Swift St., Suite B
Santa Cruz, CA 95060
831-458-9938**

Chapter 15: System Reset Procedure

Here is a fail-safe way to re-initialize the TriCoder and set it back to the factory defaults: (also useful for deleting a data files and programs no longer needed).

- After turning on the TriCoder, press the 5 key at the Main Menu (opening screen)



- Press the 7 key for **System Tools**
- You will be prompted for a password: Key in **WDTRI**, then press **ENTER**

SYSTEM TOOLS
PLAY VOICE PROMPT ----- 00 1
LANGUAGE ----- ENGLISH 2
RESET SETUPS TO DEFAULT 3
RESET PROGRAMS & DATA ---- 4
CLEAR DATA FILE (S) ----- 5
DATA SECURITY ----- OFF/ON 6
FIXED PROGRAM --- OFF/0/1/2/3 7
TABLE ALLOWED ----- YES/NO 8
DONE/EXIT ----- 0

PLEASE SELECT OPTION: _

- Press the 4 key to **RESET PROGRAMS & DATA**. After pressing the 4 key, you should see the prompt:

ARE YOU SURE? [YES/NO]_

Press YES  To Reset Programs & Data in the Unit

- Press the 5 key to **CLEAR DATA FILE(S)**. After pressing the 5 key, you should see the prompt:

ARE YOU SURE? [YES/NO]_

Press YES  To Clear the Data Files in the Unit

Press the **F1**  key to go back to the opening screen.

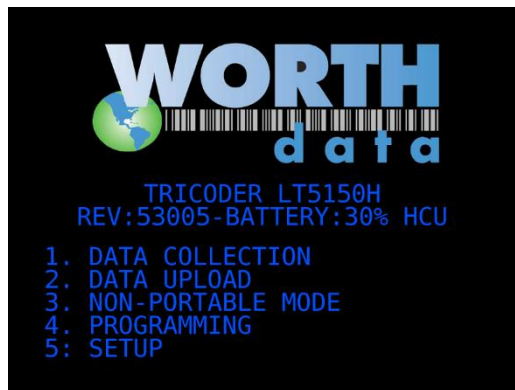
Chapter 16: Powering the TriCoder

The TriCoder can be powered by the internal Li-ion battery, or by the Worth Data USB power adapter included with the unit. The TriCoder also has a programmable automatic shutoff intended to conserve power. The following information explains how to turn the TriCoder ON and OFF, the differences between battery power and wall power, the battery the TriCoder uses and how to change it. The final section of this chapter provides details on both short and long term storage of the TriCoder.

Turning the TriCoder ON and OFF

 The ON/OFF key on the TriCoder keypad powers the TriCoder ON and OFF whether the TriCoder is using battery power or accessing wall power with the USB power adapter.

To use the USB power adapter, plug the F17 Power adapter into the wall outlet, then plug the C26 Type C USB cable into the one of the ports on the bottom of the TriCoder (you can use either port). The TriCoder should automatically turn on when connected to the USB power adapter if the power adapter is plugged into a working AC outlet. Whether using battery power or wall power, upon power up the TriCoder displays the following screen:



Where: **LT50H** the X changes depending on what model TriCoder you have

LT150H is for a TriCoder with a 1D Laser Built In

LT250H is for a TriCoder with a 2D Imaging Scanner Built In

REV: 530XX is the firmware version (i.e. 53005)

BATTERY: XX% is the current Battery charge level

Hxx: is the USB Mode the TriCoder is set to//

HCU is for Host Controlled USB using the WinUSB driver

HID is for HID Keyboard USB

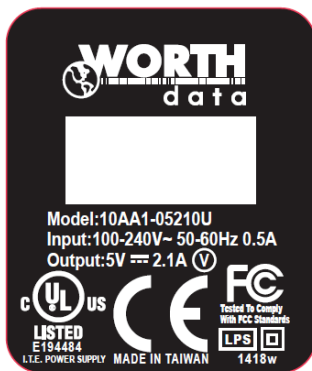
Battery Power and Wall Power

For portable use, the TriCoder is operated using battery power. Non-portable applications where the TriCoder is stationary still use battery power, unless you are attached by USB, where the unit can get its power from the USB port.

Wall Power

 The ON/OFF key powers up the TriCoder from battery power only. Once the USB cable is connected to the F17 USB power supply the TriCoder will start charging the Li-ion battery and you will not be able to use the TriCoder for other purpose. It is best that you use **ONLY** the F17 USB power adapter that comes with the TriCoder. The Worth Data USB power adapter is 2.1Amp 10watt power supply which allows it to charge faster than plugging into a USB port, or other lower powered USB wall adapters. The power supply should have a label that is as shown below.

Icons on the screen will indicate the status of the charger during charge.



Charging from wall power



Charge complete

Battery Power

For portable use, there is a replaceable, built-in 5000mAh Li-ion battery in the HXX50 Handle used by the TriCoder. This battery provides the main power for the scanner, display and all electrical circuitry. The internal battery should provide approximately 30 hours of continuous scanning as well as providing for real-time clock operation for several months. Even though the battery can last for at least 6 months without use, and without recharging, we recommend not keeping valuable data in the TriCoder any longer than necessary. Upload your data to the computer. Once you have uploaded, back up your data file if the information is extremely critical. The TriCoder will detect low battery status. If the TriCoder detects low battery power it displays the following message for 20 seconds, then turns itself off:

**LOW BATTERY
UNIT SHUT DOWN**



The TriCoder also has a battery life indicator that can be accessed in NON PORTABLE mode or during Data Collection. To display the remaining battery life of the lithium-ion battery (as well as the date, time and remaining memory) press the STATUS key:



mm/dd/yy hh:mm
nnnk BYTES FREE
BATTERY: ||||| 80%

Press the STATUS key again to resume data collection.

Changing HXX50 Handle with the Li-ion battery:

1. Make sure you have uploaded any data.
2. Turn **OFF** the TriCoder and disconnect the USB cable.
3. Remove the Handle on the LT5150H or LT5250H models by unscrewing the 2 screws holding the handle to the back of the TriCoder.
4. Remove the old HXX50 Handle and disconnect the 7 pin connector that connects the handle to the TriCoder.
5. Install the new Handle first connecting the 7 pin connector which lines up only in one direction, and then inserting the handle back to the bottom of the TriCoder.
6. Replace the 2 screws to secure the handle and turn the TriCoder on using the ON/OFF switch.
7. You will may need to set the clock after the battery is changed.



Storing the TriCoder

Daily storage of the TriCoder does not require any special care. If the TriCoder is used on a daily basis or even monthly basis, the Li-ion battery should remain in the unit and be charged when low. If you are going to store the TriCoder for several months, **charge the battery to around 80% before putting the unit away.**

⚠ WARNING: LI-ION BATTERY CHARGING

- 1) Be sure to follow the rules listed below while charging the battery. Failure to do so may cause the battery to become hot, rupture, or ignite and cause serious injury.
 - When charging the battery use the Worth Data F17 power supply and the C26 Type C USB Cable.
 - Do not use or attempt to charge a battery that has been damaged from drops, has had contact with water or other liquids, or may have any other damage.
 - Do not place the batteries in or near fire, or into direct sunlight. When the battery becomes hot, the built-in safety equipment is activated, preventing the battery from charging further, and heating the battery can destroy the safety equipment and can cause additional heating, breaking, or ignition of the battery.
- (2) Do not continue charging the battery if it does not recharge within the specified charging time. Doing so may cause the battery to become hot, rupture, or ignite.

Chapter 17: Firmware Upgrades

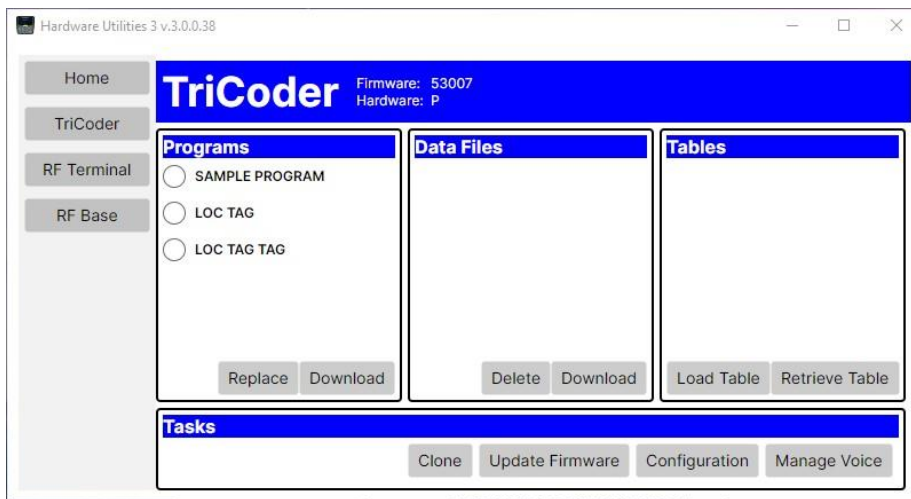
Occasionally it will be necessary for some users to update the TriCoder's firmware to fix a bug or take advantage of new capabilities added to the TriCoder. The TriCoder uses a Flash chip and can be updated by downloading a file using the **Hardware Utilities**. The latest firmware file can always be found on our website at: <https://www.barcodehq.com/downloads.html> or call us and we can send you the file by email.

How to Update

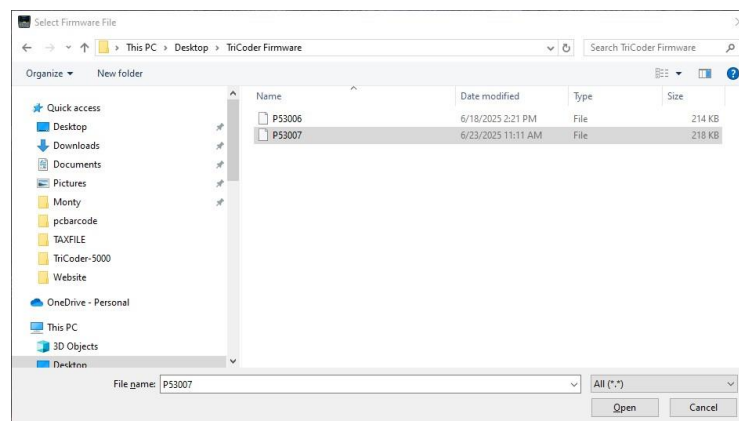
Once you have the new firmware file, be aware that you should first upload all data files and clone the TriCoder to a computer file before starting a firmware download. Data files and tables can be lost in firmware updates. Sometimes the *Setup* and the *Programs* in the TriCoder can also be lost, depending on the scope of the firmware change.

To initiate a firmware download to the TriCoder you need to use the **Hardware Utilities 3.0** program. Please follow these steps:

1. Power up the TriCoder via **battery power** first (do not plug in the TriCoder yet)
2. Start the **Hardware Utilities 3.0** Program
3. Plug the TriCoder into the USB cable
4. The **Hardware Utilities 3.0** Screen should come up as shown below – If not click on The **TriCoder** Button on the Left Side



5. Click on the “Update Firmware” Button
6. Browse your computer to find the firmware file you want to use. The latest firmware can always be downloaded from our website (<https://www.barcodehq.com/downloads.html>). The downloaded zip file will need to be unzipped to a folder you can locate. Click on the unzipped firmware file to select it, and then click “Open”



7. The next dialog you will see is as show:



8. On the TriCoder you need to press the following keys in order:

The F1 Key 
The Shift Key 
The L Key 

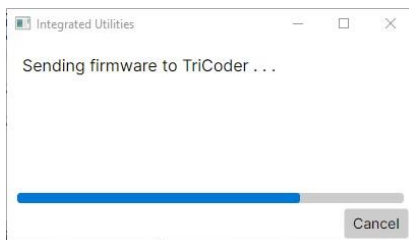
9. You will then see the following on the TriCoder Screen:

**START HOST USB
SOFTWARE DOWNLOAD
PROGRAM FIRST AND
THEN HIT ANY KEY**

10. Press the OK key on the dialog box on the computer



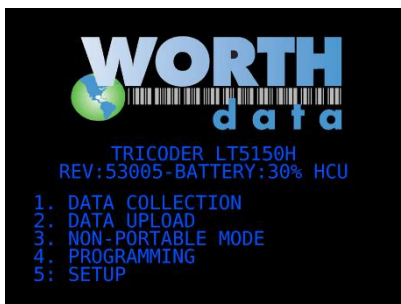
11. Press any key on the TriCoder and you will then see the following as the TriCoder Firmware is updated



WARNING: DO NOT DISCONNECT THE USB CABLE DURING THE FIRMWARE UPDATE – WAIT FOR THE TRIOCORDER TO RETURN TO THE OPENING SCREEN BEFORE DISCONNECTING THE USB CABLE

IMPORTANT! Make sure the firmware matches the version of the TriCoder. The LT5x50H units use firmware version starting at P530XX -- Older 5000 series TriCoders use firmware versions from 5000 to 5199 and the 5100 & 5200 series TriCoders use firmware versions from 5200 to 529x

When the Firmware update is complete the TriCoder will reset and you will see the opening screen of the TriCoder and should see the *new* version number on the Hardware Utilities screen and on the TriCoder Screen



Appendix A: *How to scan a bar code*

The TriCoder can be used with a variety of laser scanners. Which one you choose is dependent upon your application and the quality and density of your bar codes. This section will include information on different laser scanners as well as how to use each one.

Practice Scanning

To practice scanning, turn on the TriCoder and press 3 at the Main Menu (opening screen) to enter **NON-PORTABLE MODE**.

1D Scanning

Use the Test Label below to practice scanning with your laser scanner. You should hear an audible beep and see TEST LABEL displayed on the TriCoder screen after every scan. If you do not see TEST LABEL, check your technique, especially the angle and distance you are away from the bar code.



2D Scanning

The LT7250H models can scan the 1D codes like the Code 3 of 9 code above, as well as many types of 2D bar codes. Scan the Data Matrix code below and you should see the following on screen: LabelRIGHT Ultimate for Windows



Appendix B: Laser Scanner Options

The laser scanner is typically the easiest scanner to use, requiring less operator training. A particularly desirable feature of the laser scanner is that upon triggering the beam, the laser scans the bar code multiple times (100 scans per second) until it has a good read. This practically eliminates having to scan a bar code a second time because you didn't get a read the first time. The laser scanners also scan from a distance, allowing for less wear on the bar code as well as letting you scan bar codes you might not be able to get to with other types of scanners.

Different laser scanners have different scanning specifications. **Table L-1** describes the 1D laser scanners and 2D scanning options available from Worth Data and the scanning characteristics for each one.

Model	Bar Code Density	Range
LT5150H with 1D Laser Scanner	6 mil	1.5" - 7"
	10 mil	2" - 10"
	40 mil	3" - 32"
	100 mil – RETRO REFLECTIVE*	24" - 108"
LT5250H with 2D Scanning Engine	6 mil	1.5" - 7"
	10 mil	2" - 10"
	40 mil	3" - 32"
	100 mil – RETRO REFLECTIVE*	24" - 108"

Table L-1. Laser Comparison Chart

6 mil = high density
10 mil = medium density
40 mil = low density
100 mil = very low density * requires special retro-reflective label stock



To scan a bar code using your integrated laser point the scanner at the bar code, making sure you are within the distance range specified above. Pull the trigger (or push the scan button on an keypad) and line up the beam on the bar code. See the diagram above for proper beam positioning. Use the Test Label on the previous page to practice scanning with the laser scanner.

Special Laser Settings

There are several laser settings on the TriCoder. Go to the [Chapter 10: TriCoder Setup - Laser Options](#) section of the manual for details.

For laser scanning through automobile windshields of the VIN number, turn OFF **Double Decode** on the **LT5150H** for the best results.

Appendix C: *Optional Features*

The following are accessories and spare parts available for the TriCoder:

Item #	Description
F42	Leather Carry Case with Clear Keypad Cover
SIL-BOOT	Silicone Protective Boot
F17	USB Charger 110V-240V with USA plug
C26	Type C USB Cable 6' high current
HXX50	Replacement TriCoder Handle Assembly with 5000mAh Li-ion Battery Built-In (7-pin connector)

Appendix D: USB Driver Installation Recovery

The USB TriCoder uses two separate USB “drivers”: The **HID Keyboard** driver provided with Windows and macOS, and the **WinUSB** transfer driver provided with Windows only. Which driver is active depends on the operating mode of the TriCoder. Driver installation is initiated when the TriCoder device (HID or WinUSB) attempts to attach to the host computer and the driver is not present (or incorrectly installed) on the computer.

Incorrect driver installation is unlikely to happen; however:

WinUSB driver installation can be cancelled by the user and the WinUSB upload in the TriCoder will not function. The WinUSB driver installation is re-initiated the next time the TriCoder is attached, either before or after a Windows restart (depending on the version of Windows). Recovery from an error in installing the WinUSB driver can sometimes be solved by just rebooting the PC and re-attaching the TriCoder to redo the driver installation.

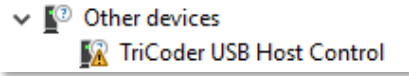
HID driver installation is usually automatic: A Windows, or macOS, pop up indicating that a new hardware device has been found will pop up and then shortly disappear. In some situations, the required files for the HID driver are not all found on the computer and the user may be prompted for their original Windows installation media. If the user **cancels** the HID driver installation at this point, the HID mode TriCoder will not function properly and Windows **does not** automatically initiate a re-install as it does with the Full Speed driver. Updating the driver in the Control Panel | Device Manager (varies with operating system) is required to re-install the HID driver.

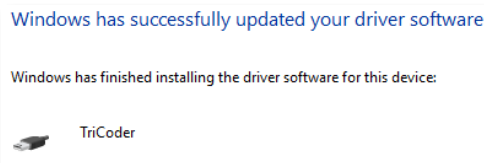
Resolving incomplete, aborted, or incorrect WinUSB driver installation

The correct WinUSB driver is available from our website at: <https://www.barcodehq.com/downloads.html>. Restarting Windows and re-attaching TriCoder will often re-initiate driver installation; if so, just follow the instructions and this time point the installer to the folder where you have downloaded the drivers and un-zipped the files.

Assuming the driver was partially installed, you will have to update the driver manually following the below procedures:

Windows 11 & 10:

1. Click the Windows  **Start Menu**
 2. Select **Settings** 
 3. At the **Windows Settings Window** Type: **Device Manager** into the “Search Box”
 4. Select **Device Manager** under the Search Box – You can also **alt Click** on the  **Start Menu** and select “Device Manager”
 5. Look for the **TriCoder USB Host Control** icon under **Other devices** as shown below
- 
6. **alt Click** on the **TriCoder** icon and select “**Update Driver Software...**”.
 7. Click on **→ Browse my computer for driver software** - **Don't click on Search automatically for updated driver software**
 8. In **Search for driver software in this location** click on the **Browse...** button
 9. Select the directory where you unpacked the files downloaded from <https://www.barcodehq.com/downloads.html>
 10. If you selected ☒ **Include subfolders** - then you should be able to just click “**Next**” - you can also browse to the “*trcdr.inf*” file and click “**Next**”
 11. Click “**Next**” on the “**Update Driver Software**” Dialog
 12. This should update your driver and you should see the following window



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.

Resolving incomplete, aborted or incorrect HID driver installation

The HID driver is built in to most versions of Windows as well as Mac OS 9.0, Mac OS X, and macOS systems, 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 problems.

For Windows HID Installation:

Restarting Windows and re-attaching the TriCoder does NOT initiate a re-installation. The TriCoder may hang with the message:

**USB Enumeration
Please Wait...**

When attempting to re-attach, or it may appear to attach correctly but not operate in keyboard mode. In either case, the user must physically attach the TriCoder, turn it on and press a key on the TriCoder to get past the startup prompt. If the TriCoder was initially configured as “Full Speed USB” then set it for “Non-Portable mode” to force HID keyboard enumeration. The user must then 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:

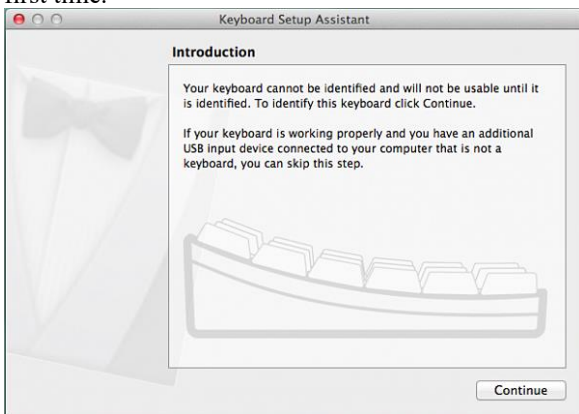
1. Click the Windows  **Start Menu**
2. Select **Settings** 
3. At the Windows Settings Type: **Device Manager** into the “Find a setting” Box
4. Select **Device Manager** under the Search Box
5. Double Click on **Human Interface Devices**
6. Locate the USB Human Interface Device with a  in the icon.
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, or DVD, to complete the installation. However, the HID Keyboard driver is a standard component of the Windows Operating System so you should just be able to select “Use Best Available Driver” and it will install the correct driver by default. Also make sure you have rights to add new hardware to your computer - many Windows 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.

macOS Hid Keyboard Installation:

The TriCoder, when set for HID Keyboard, uses 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.

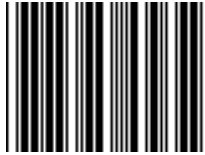
Because our scanners mimic keyboard input, your Mac may display a Keyboard Setup Assistant when plugging the scanner in for the first time.



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!

Appendix E: Specifications for Code 39

Code 39 (or Code 3 of 9) is the de facto standard of non-retail American industry. 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 TriCoder 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

Code 39 has several advanced features and functions that are discussed further in this appendix.

Code 39 Advanced Features and Functions

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		

Table A-1. Mod 43 Check character calculation for Code 39

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

1. Take the sum of the values assigned to each character:
1 + 2 + 3 + 33 + 34 + 35 = 108
1 2 3 X Y Z
2. Divide the sum by 43: (thus the name modulus 43)
108/43 = 2 with a Remainder of 22
3. Find the character corresponding with the remainder.
M (value 22) is the CHECK CHARACTER

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

Full ASCII Extension to Code 39

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

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

ASCII	Code 39	ASCII	Code 39	ASCII	Code 39	ASCII	Code 39
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

Table A-2. Full ASCII Table

Function/Control Key Support in HID Keyboard Mode

The TriCoder, when in HID Keyboard Mode, can transmit **Function, Control, Alt and Shift Keys** for use with software programs that use these keys for menus or commands. For example, when the TriCoder reads a bar code containing the Code 39 characters for SOH (Control-A), it will transmit the corresponding function key, F1 to your computer. These "keys" are created by combining two Code 39 characters. In order to read them and have them interpreted as the correct keystroke, the bar code reader must have "**Full ASCII Code 39**" reading enabled. The following chart shows the encoding scheme for both IBM and Macintosh computers.

Full ASCII Code	Code 39	IBM PC key transmitted	Mac key transmitted
SOH	\$A	F1	F1
STX	\$B	F2	F2
ETX	\$C	F3	F3
EOT	\$D	F4	F4
ENQ	\$E	F5	F5
ACK	\$F	F6	F6
BEL	\$G	F7	F7
SO	\$N	F8	F8
LF	\$J	Num Pad 5*	Enter
CR	\$M	Enter	Return
SI	\$O	F9	F9
DLE	\$P	F10	Command On
DC1	\$Q	Del	Del
DC2	\$R	Insert	Command Off
DC3	\$S	Left Arrow*	Left Arrow
DC4	\$T	Right Arrow*	Right Arrow
NAK	\$U	Down Arrow*	Down Arrow
SYN	\$V	Up Arrow*	Up Arrow
VT	\$K	Page Up*	Page Up
FF	\$L	Page Down*	Page Down
ETB	\$W	Home*	Home
CAN	\$X	End*	End
EM	\$Y	Shift On	Shift On
SUB	\$Z	Shift Off	Shift Off
FS	%B	Control On	Control On
GS	%C	Control Off	Control Off
RS	%D	Alt On	Option On
US	%E	Alt Off	Option Off
*Refers to the keys on the Number Pad on the far right side of a PC keyboard			

Table A-3. C39 Keyboard Support for IBM and Mac

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. If you are using **MAC AND USB**, in order to emulate the arrow keys, you **MUST USE THE COMMANDS AS SHOWN ABOVE**. You can scan them from the FULL ASCII MENU, for example, to emulate the "Left Arrow" key on the Mac (USB) scan the "NUL" (which represents "\$U") bar code and then the "4" bar code from the menu.

Code 39	IBM Key Sequence	Mac Key Sequence	Code 39	IBM Key Sequence	Mac Key Sequence
%U0	Insert	Ins	%U6	Right Arrow	right arrow
%U.	Delete	del	%U7	Home	home
%U1	End	end	%U8	Up Arrow	Up arrow
%U2	Down Arrow	down arrow	%U9	Page Up	page up
%U3	Page Down	page down	%UC	Windows ON	control ON
%U4	Left Arrow	left arrow	%UD	Windows OFF	control OFF
%U5	Line Feed	Line Feed	%UE	ENTER (num)	ENTER (num)



Ctrl C

The SHIFT, CTRL, & ALT (Command and Option for MAC) keys must use ON (key pressed) and OFF (key released) bar codes to properly emulate keyboard functions. For example, to encode a bar code sequence for Ctrl-C, you would create a bar code of Ctrl ON, C, and Ctrl OFF.



ASCII 250

You can also enter any value from ASCII 000 to 255. How you enter the actual ASCII value can vary by operating system. For example, to enter ASCII 2, encode **Alt On**, **Down Arrow** (number 2 on number pad), **LF** (for the unmarked 5 on number pad), **Insert** (number pad for 0) & **Alt OFF**.



F11

F11 and **F12** are created by encoding *NULLF1* and *NULLF2* as bar codes. Using the table on the previous page, the coding sequence for F11 would be **%USA** and F12 would be **%USB**

Special key sequences for USB

If you are using the TriCoder attached to a **USB** port, you can emulate the "*Windows*" key on a PC or the "*Command*" key on a Mac by encoding ON (key pressed) and OFF (key released) sequences. **%UC** is **ON**, **%UD** is **OFF**.

Accumulate Mode

Accumulate Mode is an option allowing the TriCoder 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.

Accumulate Mode works with Code 39, Code 93 and Code 128 only and can't be used with a check digit. When the TriCoder reads a bar code with a **space as the first character**, it beeps and buffers the data without transmission. It continues to read and buffer bar codes (up to 40 characters) until it reads a bar code **without a leading space**. Once it reads this last bar code, the entire buffer (including that last code) is transmitted as one long bar code. A “double-minus” sign (--) bar code clears the buffer. Scanning a “backspace” code (**SH** in Code 39) backspaces in Full ASCII mode. The **ENTER** code on this Barpad is a Code 39 *Start/Stop Character* only and assumes you have a *Terminator Character* specified. If you do not have a *Terminator Character* programmed in your TriCoder, substitute the bar code for **CR** from the **FULL ASCII MENU**.

Accumulate Mode must be turned on using the bar coded Setup Menu or by using the keypad and going into "Change Setup" while in PROGRAMMING MODE. *Accumulate Mode* is located in the Code 39 parameters. Choose **4** to *Enable* or **5** to *Disable* this feature.

This numeric Code 39 "Barpad" illustrates ACCUMULATE Mode. Scan **5, 3, 8**, and **Enter**. The TriCoder transmits a single message of "**538**".



0



1



2



3



4



5



6



7



8



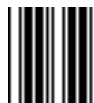
9



Clear



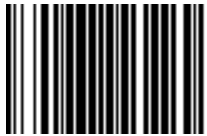
Backspace



Enter

Appendix F: Code 128 Specifications

Code 128 is a very powerful bar code, combining an extensive character set and variable length with compactness and error checking.



12345

The character set contains all 128 ASCII characters with each character made up of three bars and three spaces. (No double characters are required to make up lower case and special characters). 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.

GS1-128

GS1-128 Code is a subset of Code 128 adopted by the GS1 (UCC and EAN) council's product, container, and shipping label symbology. GS1-128 bar codes always start with a Function Code 1 character. Additional FNC1 Function Code 1 characters in the barcode terminates all variable length fields (unless they are the last field in the bar code). The TriCoder outputs the following for the special function codes and start sequences:

[C1 Start C/Function Code 1

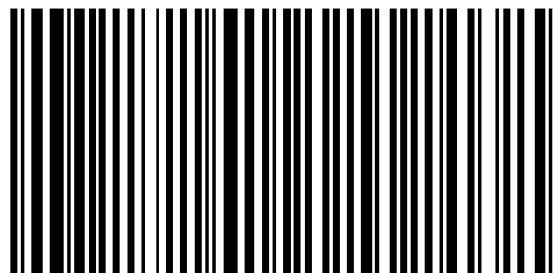
^] (GS) Function Code 1 as a variable string terminator

If **UCC/EAN 128** is *enabled*, the reader looks for the Function Code 1 as the leading character, and treats all such codes as GS1-128 bar codes. You can also change the GS ^] output to another character in the GS1-128 *CUSTOM SEPARATOR* option if you need to parse the data differently for your application.

A subset of GS1/UCC/EAN-128 is the **UCC or EAN Serial Shipping Container Code**; its specification calls for a 19 digit UCC/EAN 128 code with an additional Mod 10 Check digit (20 digits in all). The Mod 10 Check digit is calculated the same as the *Interleaved 2 of 5* example in **Appendix H**. It is the 20 digit data length (including the MOD 10 check digit) and the MOD 10 check calculation that distinguishes the *UCC Serial Shipping Container Code* from other UCC /EAN 128 bar codes.

GS1-128 is enabled in the *TriCoder Setup Mode: Bar Codes Section: Code 128*. If GS1-128 is *enabled*, you will be able to read standard Code 128 bar codes, any UCC/EAN 128 bar code, as well as the 19 digit GS1-128 bar codes with the *Function 1* character and the Mod 10 check character. (Any 19 digit UCC/EAN 128 code will not be read unless the 20th digit computes as a valid Mod 10 check digit).

(00) 1 0028028 300055004 6



Variable length GS1-128 Codes can also be read.

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, GS1-US at:

GS1-US (Formerly Uniform Code Council, Inc.)
7887 Washington Village Drive, Suite 300
Dayton, OH 45459
937-435-3870
937-435-7317
info@gs1us.org

8:00 a.m. to 6 p.m. EST

Many of the specifications are available online at:

<https://www.gs1us.org>

Appendix G: *Interleaved 2 of 5 Code*

Interleaved 2 of 5 Code is a numeric-only, even-number-of-digits bar code. It is widely used in warehouse and industrial applications.



123456

A combination of five elements, two wide and three narrow represent each character. Odd-number position digits are encoded in the bars, even-number positions in the spaces. Interleaved 2 of 5 Code is so susceptible to partial scans being interpreted as valid reads that we recommend only one length of I 2 of 5 to be read. Using one length of data allows the TriCoder to ignore any valid partial reads. As shipped, the TriCoder is set to look for a 6 digit I 2 of 5 code, but you can set the length to something different using the TriCoder Setup Menu. Setting the length to **00** digits allows variable length bar codes scanning. If you must use the **00** setting, you must use the “*Minimum/Maximum*” data length field when creating a program in the TriCoder to check each field for the proper length; otherwise, expect partial (bad data!) reads (misreads!). A Mod 10 Check Digit is optionally available for use with I 2 of 5. The exact check digit calculation is illustrated below.

Interleaved 2 of 5 Mod 10 check digit calculation

Assume that the bar code data is **1987**.

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

Take the sum of the odd digits: **8 + 1 = 9**

Multiply the sum of the even digits by 3: **(7 + 9) x 3 = 48**

Add the results of steps 3 and 4: **9 + 48 = 57**

Subtract the result of step 5 from the next highest multiple of 10:

$$60 - 57 = 3$$

The checksum becomes the low-order digit: **19873**

Because the data now has an odd length, a leading zero is added, for the final result of :

019873

Appendix H: *UPC 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 (Formerly Uniform Code Council, Inc.)
7887 Washington Village Drive, Suite 300
Dayton, OH 45459
937-435-3870
937-435-7317
info@GS1us.org
8:00 a.m. to 6 p.m. EST

Specifications are also available via the internet at:

<https://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 GS1 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 GS1 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 TriCoder 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.*

UCC/EAN Extended Coupon Code

Enabling supplements also allows reading of the Extended Coupon Codes, providing that the UPC's NSC is a 5 or the EAN's country code is 99. The supplement is a Code 128 bar code in an Extended Coupon Code.

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 TriCoder has the option of transmitting in the ISBN format.



ISBN 0-553-37062

ISBN specifications are available from:

American National Standards Institute

Customer Service

11 West 42nd St.

New York, NY 10036

<https://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

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

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

Multiply the result of step 1 by 3.

$$33 \times 3 = 99$$

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

$$3 + 9 + 5 + 1 + 8 = 26$$

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

$$99 + 26 = 125$$

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:

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

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

1234500006

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

01234500006

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

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

01234565

If the code ends in:	UPC-E Data	Insertion Digits	Insertion Position	10 digit code
0	abcde0	00000	3	ab00000cde
1	abcde1	10000	3	ab10000cde
2	abcde2	20000	3	ab20000cde
3	abcde3	00000	4	abc00000de
4	abcde4	00000	5	abcd00000e
5	abcde5	0000	6	abcde00005
6	abcde6	0000	6	abcde00006
7	abcde7	0000	6	abcde00007
8	abcde8	0000	6	abcde00008
9	abcde9	0000	6	abcde00009

Appendix I: *Codabar Specifications*

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.



a12345b

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 TriCoder Setup 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 TriCoder and data coming from the keyboard. If neither of these situations apply, you'll probably want to disable it.

Appendix J: 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 maximum length of 13 characters. This is how the MSI check digit(s) are calculated:

The MSI Mod 10 check digit is calculated as follows:

The example bar code data is:

82345

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

835

Multiply the new number by 2

(835) x 2 = 1670

Add the digits of product

1 + 6 + 7 + 0 = 14

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

2 + 4 + 14 = 20

Subtract the result from the next highest multiple of 10

20 - 20 = 0

New Check Digit

0

Data with check digit is:

823450

The MSI Mod 11 check digit is calculated as follows:

The example bar code data is:

943457842

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

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

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

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

Divide the sum by 11

195/11 = 17 remainder 8

Subtract remainder from 11

11 - 8 = 3

New Check Digit

3

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

Data with check digit is:

943457823

Appendix K: Code 93 Specifications

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

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

Code 93 uses M to produce the Carriage Return.

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

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

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 less space is required. Two space disadvantages of Code 93 are:

Code 93 **does not** have the numeric compression capability that 128 does, (compression results in 128's significantly less space for equivalent codes), and

Code 93 requires pairings to make all Full ASCII characters while 128 does not, (more space is required for lower case and upper case than Code 128).

Appendix L: ASCII Code Equivalent Table

The 128 ASCII codes and their 3 digit decimal equivalents are detailed in the below table. The RS232 Models use the ASCII; the keyboard wedge models have some of the unprintable ASCII characters reassigned to specific keys, (i.e. SOH is f1).

char	hex	3 digit ASCII	char	hex	3 digit ASCII	char	hex	3 digit ASCII	char	hex	3 digit 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

Table H-1. Full ASCII Equivalent Table

Appendix M: *Firmware Release Notes*

Version	Fixes	Date
P53001:	Original Release Firmware	6/5/2025
P53002:	Minor Fixes, Memory loss bug fixed	6/10/2025
P53003:	Minor Fixes, Added X-Statement Support	6/11/2025
P53004:	Minor Fixes, Added Refer Back Statement Support	6/13/2025
P53005:	Minor Fixes, END Statement fix	6/17/2025
P53006:	L1L statements & 5MB of Table space implemented	6/18/2025
P53007:	Minor Fixes	6/23/2025
P53008:	Added Battery Power Check for Firmware Updates	6/24/2025
P53009:	Minor Fix for Table Trailing Spaces	7/7/2025
P53010:	Fix for Table Uploads & Data Security Mode	7/16/2025
P53011:	Laser Decode Fix, Data ID Fix, LCD Color Adjust	7/29/2025
P53012:	Data Review Mode Implemented, Minor Fixes	8/13/2025
P53013:	Prefix & Suffix HID Mode Upload Bug Fixed	8/20/2025
P53014:	DID Duplicate Lookup Added, Minor Fixes	8/27/2025
P53015:	Reset Setup Changes for Tables & Data Files	8/30/2025

LEGEND:

Char (function)

BARCODE

Decimal Hex

Full ASCII Menu

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

NUL 000 00	DLE(f10) 016 10	SP 032 20	0 048 30	@ 064 40	P 080 50	` 096 60	p 112 70
SOH(f1) 001 01	DC1(Del) 017 11	! 033 21	1 049 31	A 065 41	Q 081 51	a 097 61	q 113 71
STX(f2) 002 02	DC2(Ins) 018 12	" 034 22	2 050 32	B 066 42	R 082 52	b 098 62	r 114 72
ETX(f3) 003 03	DC3(←) 019 13	# 035 23	3 051 33	C 067 43	S 083 53	c 099 63	s 115 73
EOT(f4) 004 04	DC4(→) 020 14	\$ 036 24	4 052 34	D 068 44	T 084 54	d 100 64	t 116 74
ENQ(f5) 005 05	NAK(↓) 021 15	% 037 25	5 053 35	E 069 45	U 085 55	e 101 65	u 117 75
ACK(f6) 006 06	SYN(↑) 022 16	& 038 26	6 054 36	F 070 46	V 086 56	f 102 66	v 118 76
BEL(f7) 007 07	ETB(Home) 023 17	' 039 27	7 055 37	G 071 47	W 087 57	g 103 67	w 119 77
BS 008 08	CAN(End) 024 18	(040 28	8 056 38	H 072 48	X 088 58	h 104 68	x 120 78
HT 009 09	EM(Shift ON) 025 19	) 041 29	9 057 39	I 073 49	Y 089 59	i 105 69	y 121 79
LF 010 0A	SUB(Shift OFF) 026 1A	* 042 2A	: 058 3A	J 074 4A	Z 090 5A	j 106 6A	z 122 7A
VT(Pg Up) 011 0B	Esc 027 1B	+ 043 2B	; 059 3B	K 075 4B	[091 5B	k 107 6B	{ 123 7B
FF(Pg Dn) 012 0C	FS(Ctrl ON) 028 1C	, 044 2C	< 060 3C	L 076 4C	\ 092 5C	l 108 6C	 124 7C
CR 013 0D	GS(Ctrl OFF) 029 1D	- 045 2D	= 061 3D	M 077 4D	] 093 5D	m 109 6D	} 125 7D
S0(f8) 014 0E	RS(Alt ON) 030 1E	. 046 2E	> 062 3E	N 078 4E	^ 094 5E	n 110 6E	~ 126 7E
SI(f9) 015 0F	US(Alt OFF) 031 1F	/ 047 2F	? 063 3F	O 079 4F	_ 095 5F	o 111 6F	DEL 127 7F

Program Name: _____

TriCoder Coding Form

Date: _____

[illegible]