

# **MS146 Bar Code Slot Reader**

Rev.A

**unitech**



# General Advisory

Improper handling, storage, environmental influences and /or product modification can lead to problems during use.

This is particularly true if repairs and maintenance work are not performed by trained personnel.

We reserve the right to make technical modifications in accordance with technological advancements as they occur.

## FCC Information

This device has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the device is operated in a commercial environment. This device generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his or her own expense.

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# INTRODUCTION

The MS146 is a family of bar code slot readers specifically designed for reading ID, membership, or other types of cards that contain bar codes. The MS146 comes in four interfaces: PS/2, RS232, USB, and TTL Wand. The MS146 also comes in two different optical types: Visible Light (660nm) for reading normal bar codes, and Infrared Light (930nm) for reading bar codes hidden behind an opaque security film.



MS146

## Normal Operation

### **MS146A and MS146IA**

The Undecoded (or TTL, or Wand) MS146A requires an external decoder in order to communicate with your computer. Decoders are built into Wedge devices and many POS (Point of Sale) keyboards, such as the Unitech KP3700.

The MS146A cannot be configured via Scanner Configuration Manager. Any modification of the output data must be done in the external decoder.

### **MS146-2 and MS146I-2**

The RS232 (Com Port) interface should only be used when your software is designed to accept com port input. The MS146-2 has a built-in decoder and outputs the scanned data in ASCII Code. MS146-2 input requires special software such as HyperTerminal (Bits per second: 9600, Data bits: 8, Parity: None, Stop bits: 1, Flow control: None) in order to view the output.

The MS146-2 will require an optional power supply unless your computer's com port supplies power (unlikely).

### **MS146-3 and MS146I-3**

The MS146-3 AT keyboard wedge interface has a “Y” interface cable with an AT male plug on one end and an AT female plug on the other. The cable end with the male plug is inserted into your computer’s keyboard port and your keyboard is plugged into the female plug.

The MS146-3 operation should be “plug and play”. The MS146-3 has a built-in decoder that outputs the scanned data in Scancode keyboard format. Your computer will treat your MS146-3’s input as it would normal keyboard input.

**Note:** If you are using a laptop computer or a USB keyboard (ie. you are not using an AT keyboard), then your MS146-3 will need to be configured as a “Keyboardless Wedge” (see “Device” in the “Scanner Configuration Manager” section).

### **MS146-3PS2 and MS146I-3PS2**

The PS/2 Keyboard Wedge interface is the most popular and straightforward. The MS146-3PS2 has a “Y” interface cable with a PS/2 male plug on one end and a PS/2 female plug on the other. The cable end with the male plug is inserted into your computer’s keyboard port (not the mouse port!) and your keyboard is plugged into the female plug.

The MS146-3PS2 operation should be “plug and play”. The MS146-3PS2 has a built-in decoder that outputs the scanned data in Scancode keyboard format. Your computer will treat your MS146-3PS2’s input as it would normal keyboard input.

**Note:** If you are using a laptop computer or a USB keyboard (ie. you are not using a PS/2 keyboard), then your MS146-3PS2 will need to be configured as a “Keyboardless Wedge” (see “Device” in the “Scanner Configuration Manager” section).

### **MS146-4 and MS146I-4**

The USB interface is becoming popular and relatively foolproof. Your MS146-4 uses the standard USB driver that has been included in the Windows Operating System since Windows 98 SE.

The MS146-4 operation should be “plug and play”. The MS146-4 has a built-in decoder that outputs the scanned data in HID keyboard format. Your computer will treat your MS146-4’s input as it would normal keyboard input.

**Note:** Mac OS10 users might need to update their USB driver.

# SCANNER CONFIGURATION MANAGER

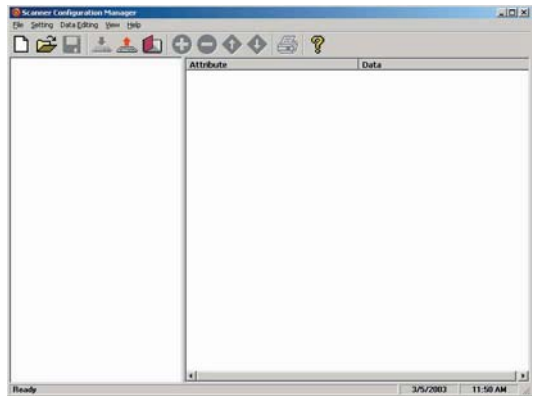
Scanner Configuration Manager software is the simplest and most foolproof way to configure your scanner settings.

## Start it Up

After loading and starting SCMSSetup.exe the icon to the left will appear on your desktop:



Click on the SCM icon and the following screen will appear:



As you can see, you are presented with a blank work area and a row of icons across the top. Following is an explanation of each of the icons:



Above, from left to right, are the standard Windows icons for “New Document”, Open File”, and “Save File”.

Scanner Configuration Manager saves scanner settings in .cfg files, so you can have access to a variety of different scanner configurations that you’ve set up.

To reset the scanner back to **factory default**, click on the “New Document” icon and download the unmanipulated setting to the scanner (see below).



The above icons, from left to right, represent download settings (from computer to scanner), and upload settings (from scanner to computer). The third icon opens a Test Pad where you can view the actual scanner output.



The above four icons are used in the “Data Editing” feature of SCM. From left to right they are the “Add a Formula” icon, the “Remove a Formula” icon, and the right-hand two are the “Move Formula” icons that move selected formulas up or down in relation to each other. For information on data editing, see page 22.



Click this icon to print a series of bar codes that you can scan in order to configure your scanner to the current SCM settings. This option is especially useful if downloading to the scanner is not an option, like when using an interface adaptor or if Windows NT is your operating system.

If you can produce PDF files via Acrobat, your SCM configuration can be sent via e-mail to remote locations where they can be scanned from a printed PDF file (without having to run SCM).



Help is just a click away.

## ***Download to your Scanner***

Once you have SCM configured just the way you want it, click the Download icon (see page 3). The pop-up box to the right should appear: Select your appropriate interface: USB, RS232, or PS/2, and then click “OK”.



The green LED on your scanner should blink and you should see the message “Download completed successfully”. Now your scanner is ready to use with its new configuration.

If you should get the message “Download to scanner failed”, don’t despair. You can still click the “Print” icon (see above) and scan in the resulting bar codes to configure your scanner.



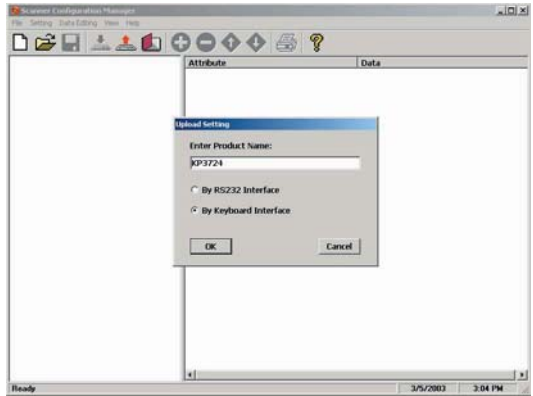
# First Look

Click the upload icon (see page 3) and the following pop-up screen will appear: (alternatively, you can click on the “New Document” icon, page 3, in which case the second screen will appear)

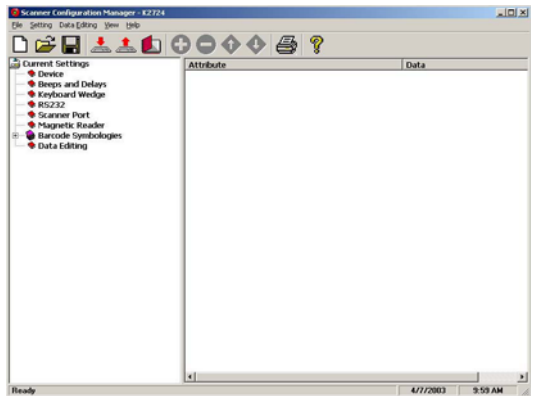
Enter the scanner product number (MS146, for example).

Make sure the “By Keyboard Interface” radio button is selected, and click “OK”.

The LED on the top of the scanner will flash during the upload process.

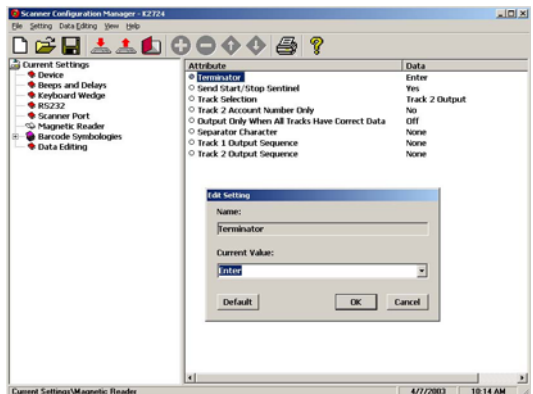


The screen to the left appears. Click on any of the selections under “Current Settings” to view its “Attributes”.



Double-click on any of the “Attributes” to edit that attribute. This is done via a drop-down menu.

After selecting your configuration settings, click on the Download icon (see page 3). The LED on the top of the scanner will flash during the download process. Afterwards, you will be prompted to do an optional “Quick Test”.



# Settings

Following is a detailed discussion of each of the settings, their attributes, and the effects each of these will have on data output from your Unitech scanner.

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## Device

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The only attribute for the “Device” setting is “Device ID”, which defines the device to which the scanner is connected (usually a computer or terminal). Select the setting that most closely describes your device.

The default selection is “01 - IBM PC/AT, PS/2 MOD 40, 60, 80, USB”, which is appropriate for most PCs.

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## Beeps and Delays

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The three attributes for “Beeps and Delays” are: “Beep Tone”, “Intercharacter Delay”, and “Interblock Delay”.

### Beep Tone

Select a value from “None” to “High” to set the loudness of the tone, or select “Low to High” or “High to Low” to set the characteristic of the tone.

Default is “Medium”.

### Interblock Delay

Interblock delay is the time duration that can be inserted between one block of data and another. This function is analogous to the time duration required between dialing a phone number’s country code and the phone number itself. The interblock delay can be inserted via SCM’s Data Editing function (see page 22).

Default is “10 ms”.

### Intercharacter Delay

Intercharacter Delay is the time duration between data characters sent from the scanner to the computer. Intercharacter delay is usually inserted when the data flow must be slowed down for the benefit of a slower computer.

Default is “1 ms”.

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## Keyboard Wedge

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Your Unitech keyboard contains a built in data decoder or “wedge” that translates raw bar code input into Keyboard Scan Code, with the result that bar code data exits the scanner as if you had typed the text.

Seven keyboard wedge parameters are listed below:

### Function Code

Function Code determines how function code characters from the scanner is output.

- If **Yes** is selected, then scanned function codes will output the same as if their corresponding function keys were pressed. Scanning an F1 label will pop-up a “Help” box, F3 a “Find” pop-up box, etc.
- If **No** is selected, the scanned function codes will output special character strings defined by Unitech for non-print character output.  
Default is “Yes”.

### Caps-Lock

The Caps Lock function determines how the Caps Lock key controls the case of alphabetical characters. The three options below are available:

- **Auto Trace** automatically determines the Caps Lock key status and informs the decoder accordingly.
- **Lower Case** manually coordinates the physical state of the Caps Lock key with the Caps Lock state of the decoder. For example, if the Caps Lock light is not on, then “Lower Case” should be selected.
- **Upper Case** is the same as Lower Case (above) except that it applies to the upper case state. If the Caps Lock is on, then Upper Case should be selected.  
Default is “Auto Trace”.

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## Keyboard Wedge, continued

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### Language

Your Unitech scanner can output characters using eleven different language sets, including:

Danish	French	Norwegian	Swiss
U.S. English	German	Swedish	Alt Key Mode
U.K. English	Italian	Spanish	

Default is "U.S."

### Wand Emulation Output

Wand emulation refers to raw, undecoded bar code data - 0s and 1s. The choice here is whether to assign a 1 (high) to the dark bar and a 0 (low) to the white space - or vice-versa.

Bar with High / Space with Low

Bar with Low / Space with High

Default is "Bar with High / Space with Low".

### Level Duration of Minimal Width

This adjustment refers to the amount of time the wand scanner requires to recognize an individual bar in a bar code. The choices are 200  $\mu$ s (microseconds) or 600  $\mu$ s.

Default is "200  $\mu$ s".

### Polarity of Idle Condition

The polarity of the idle condition (while it has no input) of the wand scanner can be either high or low.

Default is "Low".

### Use Numeric Keypad

The ASCII code for numeric input from the keypad part of the keyboard is different from that of the upper row of the keyboard proper. Some accounting programs require keypad input, and for that reason, the keyboard decoder can output scanned or read numbers as either keypad or keyboard (upper row) output.

Default is "No".

### **Baud Rate**

Baud Rate (bits per second) refers to the speed of the data through the RS232 port. If the data error rate is unacceptably high, setting the baud rate lower should help.

Default is “9600 Baud”.

### **Parity**

A technique used to detect data transmission errors by adding an extra bit to each character. This scheme has been supplanted in modern communication devices by “error correction”.

Default (and the current universal standard) is “No Parity”.

### **Data Bit**

Number of bits per byte that are dedicated to data (minus start/stop bits).

Default (and the current universal standard) is “8 Data Bits”.

### **Handshaking**

Handshaking is the mechanism that controls the speed of data flow so that a slower receiver of data is not overwhelmed by a faster sender of data. Selections are: “Ignore”, “RTS (request to send) Enabled at Power Up”, and “RTS Enabled in Communication”.

Default is “Ignore”

### **ACK/NAK**

Data characters that are sent from the receiver to the sender in order to “acknowledge” or “not acknowledge” the receipt of the data without error. Rarely used these days.

Default is “No”.

### **BCC Character**

Block Check Character. An error checking character added for data integrity.

Default is “No”.

### Time Out

The ACK/NAK function (see page 9) can be given a limited (ranging from 1 second to 10 seconds) or unlimited amount of time to operate. Default is "1 Second".

### Data Direction

Three options are available for data direction: "Send to Host", "Send to Host & Terminal", and "Send to Terminal". Default is "Send to Host".

### Receive Terminator

A user-definable Receive Terminator can be inserted at the end of bar code data. Pre-defined receive terminators include:

- <t>: Tab
- <r>: Carriage Return
- <n>: Line Feed
- <d>: Any Digit
- <a>: Any Letter
- <\*>: Interblock Delay
- <">: " (quotation marks)
- <dd>: character in hexadecimal notation
- <<>: <
- <>>: >

The above special characters must be bracketed by < > symbols as shown.

Function codes (F keys, cursor up, Enter, etc.) can also be inserted via hexadecimal code (accessible in a linked menu) and must include surrounding brackets (<>).

Letters and numbers should be entered directly by keyboard input without surrounding brackets (<>).

Default is "None".

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## Scanner Port

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Terminator, Use Code ID, Double Verification, Scanning Mode, Label Type, Aim Function for Long-Range Engine, Aim Time for Long-Range Engine, Preamble, and Postamble are the parameters for Scanner Port configuration.

### Terminator

The Terminator is a command that follows the input of bar code data. Four different terminators can be selected here: “Enter”, “Return (on numeric keypad)”, “Field Exit or Right Control”, or “None”. Alternative terminators (such as Tab) can be configured via the Postamble function (see page 13).

Default is “Enter”

### Use Code ID

The Code ID function can be used to identify the type of bar code that is being scanned by inserting an identifying letter (refer to chart at right) at the beginning of the bar code output.

For example, if the Code ID function is on, and a bar code string of “54321” was output as “M54321”, the bar code would thus be identified as type Code 39.

Default is “No”.

UPC-A	A
UPC-E	E
EAN-13	F
EAN-8	FF
I 2 of 5	I
S 2 of 5	H
Code 39	M
Codabar	N
Code 93	L
Code 128	K
UCC/EAN128	JC1
MSI	O
Code 32	T
Plessey Code	P
Label Code IV, V	B
Toshiba Code	C
Code 11 / Telpen	J
Delta Code	D

### Double Verification

Double Verification enables the scanner to verify the accuracy of the output by outputting only after a specified number (from 0 to 7) of identical results. For instance, if 3 is selected, the scanner will not output the bar code data until it's obtained 4 identical scan results.

Because the scanner normally scans at a rate of 33 scans per second (unless it's a wand), this process should take less than a fraction of a second, even for higher values.

Default is “0-Off”

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## Scanner Port, continued

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### Scanning Mode

Actual bar code scanning can occur in six different ways:

- **Trigger** scan causes the scanner light to remain on as long as the trigger is depressed, whether the bar code is recognized or not.
- **Flashing** causes the scanner to flash continuously after the trigger is pressed until it detects a bar code and outputs the data. The scanner light will remain on in anticipation of another bar code for approximately 12 seconds, after which it will begin flashing again. A second trigger press stops the scanning.
- **Multiscan** allows multiple scans while holding down the trigger.
- **One Press One Scan** causes the scanner light to remain on after the trigger is briefly depressed until a bar code is detected and output.
- **Test** is similar to the Flash setting except that the scanner outputs bar code data in a rapid-fire manner as long as a bar code is presented to the scanner.
- **Old Laser Flash** causes the scanner to flash continuously after the trigger is pressed and will scan each bar code only once per presentation. A second trigger press stops the scanning.
- **Continuous** causes the scanner light to remain on and scan bar codes as they are presented. Bar codes can be “double scanned” only after a short interval.

Default is “Trigger”

### Label Type

Toggle between reading only Positive and both Positive and Negative bar codes. Reading both positive and negative bar codes can be useful in the graphics industry when negative images must be proofed.

Default is “Positive”.

### Aim Function for Long Range Engine

The Aim Function causes a laser scanner to output a “pin-point” aiming aid for a specified period of time (see below) to enable the user to more easily scan distant bar code labels. This function can be toggled on or off.

Default is “No”.



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## Scanner Port, continued

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### Aiming Time for Long Range Engine

The Aiming Time function specifies the duration of the Aim Function (see previous page). Length of duration can be specified from 500ms to 2 seconds, in half-second increments.

Default is “1 second”.

### Preamble

Insert a string of characters prior to the actual scanned data.

Pre-defined characters include:

- <t>: Tab
- <r>: Carriage Return
- <n>: Line Feed
- <d>: Any Digit
- <a>: Any Letter
- <\*>: Interblock Delay
- <“>: “ (quotation marks)
- <dd>: character in hexadecimal notation
- <<>: <
- <>>: >

The above special characters must be bracketed by < > symbols as shown.

Function codes (F keys, cursor up, Enter, etc.) can also be inserted via hexadecimal code (accessible in a linked menu) and must include surrounding brackets (<>).

Letters and numbers should be entered directly by keyboard input without surrounding brackets (<>).

Default is “None”

### Postamble

Identical to Preamble (above), but characters are inserted after scanned data. A common postamble would be to insert a “Tab” in lieu of an “Enter” terminator (see page 11).

Default is “None”

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## Bar Code Symbologies

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Modify the output characteristics of 16 of the most popular bar code symbologies in current use. Following are the bar code symbologies and their modifiable parameters.

### Code 39

- **Enabled** toggles the ability for the keyboard/scanner to read Code 39 on or off. Default is “Yes”.
- **Code ID (Standard)** is a user-definable identification letter for Standard Code 39, which is referred to in the “Use Code ID” function (see page 11). Default is letter “M”.
- **Code ID (Full ASCII)** is the same as Code ID (Standard), above, except that the symbology is Full ASCII Code 39. Default letter is also the letter “M”.
- **Type** toggles Code 39 between Standard and Full ASCII. Default is “Full ASCII”.
- **Check Digit** defines whether or not a check digit (to insure data accuracy) is calculated, and if so, whether it should be sent or not. Default is “Not Calculate”.
- **Send Start/Stop** toggles sending or not sending start/stop sentinels (\* in the case of Code 39). Default is “No Send”.
- **Minimum Length** defines the minimum length the user will accept for a valid bar code. Default is “0”.
- **Maximum Length** defines the maximum length the user will accept for a valid bar code. Default is “48”.

### Interleaved 2 of 5

- **Enabled** toggles the ability for the keyboard/scanner to read I 2 of 5 on or off. Default is “Yes”.
- **Code ID** is a user-definable identification letter for I 2 of 5, which is referred to in the “Use Code ID” function (see page 11). Default is letter “I”.
- **Fix Length (by first 3 reads)** fixes the length of acceptable subsequent bar code reads from the first three bar codes read. Useful as a data verification if all bar codes are of a consistent length. Default is “No”.
- **Check Digit** defines whether or not a check digit (to insure data accuracy) is calculated, and if so, whether it should be sent or not. Default is “Not Calculate”.
- **Suppress Digit** suppresses the output of the first or last bar code digit. Default is “Not Suppressed”.
- **Minimum Length** defines the minimum length the user will accept for a valid bar code. Default is “10”.
- **Maximum Length** defines the maximum length the user will accept for a valid bar code. Default is “64”.

### Standard 2 of 5 / Toshiba Code (China Postal Code)

- **Enabled** toggles the ability for the keyboard/scanner to read S 2 of 5 / Toshiba Code on or off. Default is “No”.
- **S25 Code ID** is a user-definable identification letter for S 2 of 5, which is referred to in the “Use Code ID” function (see page 11). Default is letter “H”.
- **Toshiba Code ID** is the same as S25 Code ID (above), but instead applicable to Toshiba Code. Default is letter “C”.
- **Fix Length (by first 3 reads)** fixes the length of acceptable subsequent bar code reads from the first three bar codes read. Useful as a data verification if all bar codes are of a consistent length. Default is “No”.
- **Check Digit** defines whether or not a check digit (to insure data accuracy) is calculated, and if so, whether it should be sent or not. Default is “Not Calculate”.
- **Minimum Length** defines the minimum length the user will accept for a valid bar code. Default is “4”.
- **Maximum Length** defines the maximum length the user will accept for a valid bar code. Default is “48”.

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## Bar Code Symbologies, continued

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### Code 32

- **Enabled** toggles the ability for the keyboard/scanner to read Code 32 on or off. Default is “No”.
- **Code ID** is a user-definable identification letter for Code 32, which is referred to in the “Use Code ID” function (see page 11). Default is letter “T”.
- **Send Leading Character** toggles sending or not sending a leading (“start bar code”) character. Default is “Send”.
- **Send Tailing Character** toggles sending or not sending a tailing (“stop bar code”) character. Default is “Send”.

### EAN 128

- **Enabled** toggles the ability for the keyboard/scanner to read EAN 128 on or off. Default is “No”.
- **Code ID** is a user-definable identification letter for EAN 128, which is referred to in the “Use Code ID” function (see page 11). Default is “None”.
- **Enable Code ID** determines whether or not to assign a Code ID. Default is “No”.
- **Field Separator** is a user-definable character to insert between fields. Default is “None”.

### Code 128

- **Enabled** toggles the ability for the keyboard/scanner to read Code 128 on or off. Default is “Yes”.
- **Code ID** is a user-definable identification letter for Code 128, which is referred to in the “Use Code ID” function (see page 11). Default is letter “K”.
- **Minimum Length** defines the minimum length the user will accept for a valid bar code. Default is “1”.
- **Maximum Length** defines the maximum length the user will accept for a valid bar code. Default is “64”.

### MSI / Plessey Code

- **Enabled** toggles the ability for the keyboard/scanner to read MSI / Plessey Code on or off. Default is “Yes”.
- **MSI Code ID** is a user-definable identification letter for MSI Code, which is referred to in the “Use Code ID” function (see page 11). Default is letter “O”.
- **Plessey Code ID** is the same as MSI Code ID (above), but instead applicable to Plessey Code. Default is the letter “P”.
- **Send Check Digit** toggles whether or not to send a check digit. Default is “No Send”.
- **Check Digit Formula** defines the formula to calculate the check digit. Options are: “Double Module 10”, “Module 11 Plus 10”, and “Single Module 10”. Default is “Double Module 10”.
- **Minimum Length** defines the minimal length the user will accept for a valid bar code. Default is “1”.
- **Maximum Length** defines the maximum length the user will accept for a valid bar code. Default is “16”.

### Code 93

- **Enabled** toggles the ability for the keyboard/scanner to read Code 93 on or off. Default is “Yes”.
- **Code ID** is a user-definable identification letter for Code 93, which is referred to in the “Use Code ID” function (see page 11). Default is letter “L”.
- **Minimum Length** defines the minimal length the user will accept for a valid bar code. Default is “1”.
- **Maximum Length** defines the maximum length the user will accept for a valid bar code. Default is “48”.

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## Bar Code Symbologies, continued

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### Codabar

- **Enabled** toggles the ability for the keyboard/scanner to read Codabar on or off. Default is “No”.
- **Code ID** is a user-definable identification letter for Codabar, which is referred to in the “Use Code ID” function (see page 11). Default is letter “N”.
- **Send Start/Stop** toggles sending or not sending start/stop sentinels. Default is “No Send”.
- **Check Digit** defines whether or not a check digit (to insure data accuracy) is calculated, and if so, whether it should be sent or not. Default is “Not Calculate”.
- **CLSI Format** deletes the start and stop sentinels and outputs the data with spaces inserted after the 1st, 5th, and 10th characters. Default is “No”.
- **Minimum Length** defines the minimum length the user will accept for a valid bar code. Default is “3”.
- **Maximum Length** defines the maximum length the user will accept for a valid bar code. Default is “48”.

### UPC-A

- **Enabled** toggles the ability for the keyboard/scanner to read UPC-A on or off. Default is “Yes”.
- **Code ID** is a user-definable identification letter for UPC-A, which is referred to in the “Use Code ID” function (see page 11). Default is letter “A”.
- **Send Leading Digit** toggles sending or not sending a leading (“start bar code”) digit. Default is “Send”.
- **Send Check Digit** toggles whether or not to send a check digit. Default is “Send”.

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## Bar Code Symbologies, continued

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### UPC-E

- **Enabled** toggles the ability for the keyboard/scanner to read UPC-E on or off. Default is “Yes”.
- **Code ID** is a user-definable identification letter for UPC-E, which is referred to in the “Use Code ID” function (see page 11). Default is letter “E”.
- **Send Leading Digit** toggles sending or not sending a leading (“start bar code”) digit. Default is “Send”.
- **Send Check Digit** toggles whether or not to send a check digit. Default is “No Send”.
- **Zero Expansion** adds 0s to the bar code output to change the output format to UPC-A. Default is “No”.
- **Enable NSC=1** allows the output of a UPC-E bar code with a first digit of “1”. Default is “No”.

### EAN-13

- **Enabled** toggles the ability for the keyboard/scanner to read EAN-13 on or off. Default is “Yes”.
- **Code ID** is a user-definable identification letter for EAN-13, which is referred to in the “Use Code ID” function (see page 11). Default is letter “F”.
- **Send Leading Digit** toggles sending or not sending a leading (“start bar code”) digit. Default is “Send”.
- **Send Check Digit** toggles whether or not to send a check digit. Default is “Send”.
- **Bookland EAN** toggles whether or not to send the EAN-13 bar code data in Bookland EAN (ISBN) format. Default is “No”.

### EAN-8

- **Enabled** toggles the ability for the keyboard/scanner to read EAN-8 on or off. Default is “Yes”.
- **Code ID** is a user-definable identification letter for EAN-8, which is referred to in the “Use Code ID” function (see page 11). Default is letters “FF”.
- **Send Leading Digit** toggles sending or not sending a leading (“start bar code”) digit. Default is “Send”.
- **Send Check Digit** toggles whether or not to send a check digit. Default is “Send”.

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## Bar Code Symbolologies, continued

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### Code 11

- **Enabled** toggles the ability for the keyboard/scanner to read Code 11 on or off. Default is “No”.
- **Code ID** is a user-definable identification letter for Code 11, which is referred to in the “Use Code ID” function (see page 11). Default is letter “J”.
- **Check Digit Number** defines the check digit correct result to be either “1” or “2”. Default is “2”.
- **Send Check Digit** toggles whether or not to send a check digit. Default is “No Send”.
- **Minimum Length** defines the minimum length the user will accept for a valid bar code. Default is “1”.
- **Maximum Length** defines the maximum length the user will accept for a valid bar code. Default is “48”.

### Delta Code

- **Enabled** toggles the ability for the keyboard/scanner to read Delta Code on or off. Default is “No”.
- **Code ID** is a user-definable identification letter for Delta Code, which is referred to in the “Use Code ID” function (see page 11). Default is letter “D”.
- **Calculate Check Digit** toggles whether or not to calculate a check digit. Default is “Yes”.
- **Send Check Digit** toggles whether or not to send a check digit. Default is “Send”.

### Supplement Code (for UPC-E, ISBN, EAN-13)

- **Two Supplement Code** toggles whether the two digit supplemental bar code is to be recognized. Default is “No”.
- **Five Supplement Code** toggles whether the five digit supplemental bar code is to be recognized. Default is “No”.
- **Must Present** toggles whether or not the supplemental bar code must be present in order to output data. Default is “Yes”.
- **Insert Space Separator** toggles whether or not to output a space between the main and supplemental bar codes. Default is “No”.



---

## Bar Code Symbologies, continued

---

### Label Code IV and V

- **Enabled** toggles the ability for the keyboard/scanner to read Label Code IV and V on or off. Default is “No”.
- **Code ID** is a user-definable identification letter for Code IV and V, which is referred to in the “Use Code ID” function (see page 11). Default is letter “B”.
- **Send Check Digit** toggles whether or not to send a check digit. Default is “Send”.

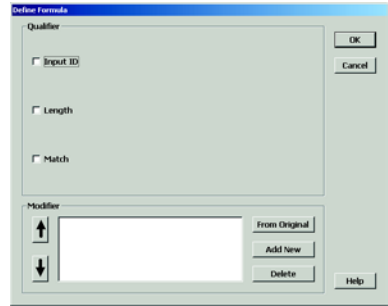
---

# Data Editing

---

Data Editing is a powerful function that can give you tremendous control over how data is exported from the scanner.

After clicking on “Data Editing” the data editing icons become active. Click on the icon with the blue circle and white plus sign.



The “Define Formula” pop-up box to the right appears, which is divided into two sections: “Qualifier” and “Modifier”.

## Qualifier

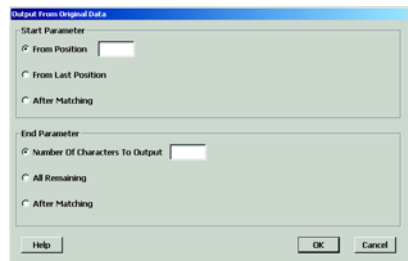
The Qualifier section defines the conditions that must be present for the bar code to be modified, such as what type of bar code it must be (Code 39, EAN-13, etc.), what length the bar code must be, or what characters (defined by a match string) the bar code must contain. When the conditions of the Qualifier are met, the bar code is then modified according to the rules defined in the “Modifier”, below.

## Modifier

The Modifier section contains three selections: “**From Original**”, “**Add New**”, and “**Delete**”.

**From Original** extracts the desired data from the existing bar code.

The **Start Parameter** defines the beginning of the string of data that is to be output. The start parameter can either be defined by position starting from the beginning (“From Position”), or a specific number of characters from the end of the string (“From Last Position”), or a specified number of characters before or after a user-defined character string (“After Matching”).



The **End Parameter** defines the end of the string of data that is to be output. Three options are available: “Number Of Characters To Output”, “All Remaining”, and “After Matching”. The first two are self-explanatory. “After Matching” defines the end as a specified number of characters before or after a user-defined character string.

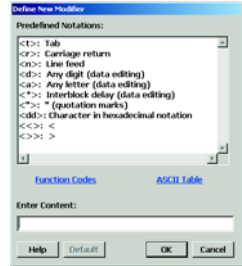
---

## Data Editing, continued

---

Even if the original bar code data is not modified, if additional characters are to be added (see “Add New”, below) the original Start Parameter must be defined as From Position “1” and the End Parameter defined as “All Remaining”, otherwise, none of the original data will be output.

**Add New** adds characters (printing and non-printing) to the data output from the scanner/reader. These characters can be added before and/or after the actual scanned data (see “Move Up / Move Down”, below). Pre-defined characters include:



- <t>: Tab
- <r>: Carriage Return
- <n>: Line Feed
- <d>: Any Digit (data editing)
- <a>: Any Letter (data editing)
- <\*>: Interblock Delay (data editing)
- <\">: “ (quotation marks)
- <dd>: character in hexadecimal notation
- <<>: < (less than)
- <>>: > (greater than)

Characters must be bracketed by < > symbols.

Letters and numbers should be represented in hexadecimal format (accessible in a linked menu). For instance, the lower-case letter “t” should be entered as <74> and the numeral 5 should be entered as <35>.

Function codes (F keys, Cursor up, Enter, etc.) can also be inserted via hexadecimal code (accessible in a linked menu).

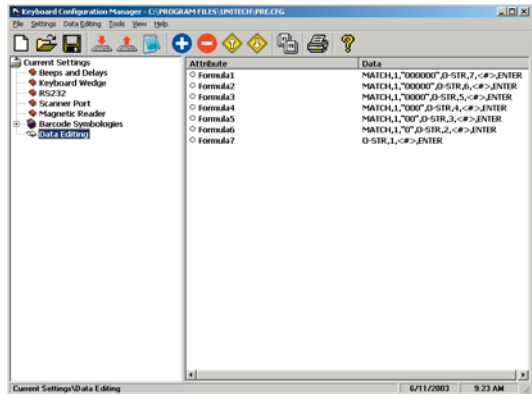
**Delete** deletes existing modifier strings.

**Move Up / Move Down** moves the modifiers up and down in relation to each other. The top modifier will be performed first and each one down the list will be performed in sequence. The original data (modified or unmodified) will be output according to its position in the modifier sequence.



## Arrange Formulas

After the formulas have been created, they must be arranged in the optimum sequence by selecting formulas and using the “Move Formula” icons (see page 4) This sequence is usually according to their qualifier - from least likely to occur to most likely to occur.



In the example pictured above, a series of formulas are designed to output all the data in a bar code that follows a series of “0”s. For instance, if the actual bar code is “000045678”, the desired output would be “45678” (the original minus all the 0s occurring at the beginning of the string). If there are six 0s (Formula 1), then the output starts at the seventh position. If there are five 0s (Formula 2), then the output starts at the sixth position, etc.

If, instead, we were to place the qualifier for two 0s above (before) the qualifier for six 0s, then the formula stipulating two 0s would activate even if there were six 0s in the bar code because the qualifier would stop looking for 0s after it had found two. In this case, all qualifiers with three or more 0s would be disregarded, which would not be a desirable result.

## The “Everything Else” Formula

If a formula is entered into the Data Editing area, then all scanned bar codes will be evaluated according to this formula. If the scanned bar code does not satisfy the requirements of the Qualifier (see page 22), then no data is output. Practically speaking, the scanner has been set up to scan only bar codes that are defined by the Qualifier. You will not be able to scan other types of bar codes. The answer to this problem is to end the sequence of formulas with a formula that has no Qualifier and whose Modifier includes all the scanned data (starts at position 1 and outputs “all remaining”). An example of this can be seen as Formula 7 above.

---

## Function Codes for PC (Code 39)

---

(Characters in parentheses represent Code 39 bar code printing)



F1 (%VA)



F2 (%VB)



F3 (%VC)



F4 (%VD)



F5 (%VE)



F6 (%VF)



F7 (%VG)



F8 (%VH)



F9 (%VI)



F10 (%VJ)



F11 (%VK)



F12 (%VL)



Esc (/FK)



Cursor Up (/FE)



Delete (/FX)



Tab (/FI)



Cursor Down (/FF)



Left Enter (/FL)



Back Tab (/FJ)



Cursor Left (/FD)



Right Enter (/FM)



Shift Make (/FP)



Cursor Right (/FC)



Page Up (/FG)



Shift Break (/FS)



Insert (/FW)



Page Down (/FH)



Ctrl Make (/FQ)



Alt Make (/FR)



Right Ctrl (/FO)



Ctrl Break (/FT)



Alt Break (/FU)

---

# ASCII Chart

---

(Characters in parentheses represent Code 39 bar code printing)



NUL (%U)



VT (\$K)



SYN (\$V)



SOH (\$A)



FF (\$L)



ETB (\$W)



STX (\$B)



CR (\$M)



CAN (\$X)



ETX (\$C)



SO (\$N)



EM (\$Y)



EOT (\$D)



SI (\$O)



SUB (\$Z)



ENQ (\$E)



DLE (\$P)



Escape (%A)



ACK (\$F)



DC1 (\$Q)



FS (%B)



BEL (\$G)



DC2 (\$R)



GS (%C)



BS (\$H)



DC3 (\$S)



RS (%D)



Tab (%I)



DC4 (\$T)



US (%E)



LF (\$J)



NAK (\$U)



Space

---

# ASCII Chart, continued

---

(Characters in parentheses represent Code 39 bar code printing)



! (/A)



, (/L)



7



" (/B)



-



8



# (/C)



.



9



\$



/



:/ (Z)



%



0



;/ (%F)



& (/F)



1



< (%G)



` (/G)



2



= (%H)



( (/H)



3



> (%I)



) (/I)



4



? (%J)



\* (/J)



5



@ (%V)



+



6

---

# ASCII Chart, continued

---

(Characters in parentheses represent Code 39 bar code printing)





---

# ASCII Chart, continued

---

(Characters in parentheses represent Code 39 bar code printing)



a (+A)



l (+L)



w (+W)



b (+B)



m (+M)



x (+X)



c (+C)



n (+N)



y (+Y)



d (+D)



o (+O)



z (+Z)



e (+E)



p (+P)



{ (%P)



f (+F)



q (+Q)



| (%Q)



g (+G)



r (+R)



} (%R)



h (+H)



s (+S)



~ (%S)



i (+I)



t (+T)



Delete (%T)



j (+J)



u (+U)



k (+K)



v (+V)

# SPECIFICATIONS

## PERFORMANCE

Light Source:	Visible Light: 660nm LED Infrared Light: 930nm LED
Depth of field:	2mm
Sensor:	Photo diode
Resolution:	6 mils (.015mm) min.
Print Contrast:	0.6 min.
Scan rate:	2" (50mm) to 30" (750mm) per second

## DECODER

Symbologies:	Codabar, Code 11, Code 32, Code 39 (Standard and Full ASCII), Code 93, Code 128, Delta Code, EAN-8, EAN-13, Label Code IV and V, MSI Code, Plessey Code, Standard 2 of 5, UPC-A, UPC-E
Interfaces:	PS/2, RS232, TTL, USB (see next page for pinouts)
Configuration:	Via Scanner Configuration Manager software (downloadable from <a href="http://www.ute.com">www.ute.com</a> )
Data Editing:	Almost unlimited (via Scanner Configuration Manager software - see above)

## MECHANICAL / ELECTRICAL

Dimensions:	3.75" L x 1.375" W x 1.1875" H (95mm L x 35mm W x 30mm H)
Weight:	6.7 oz. (190 grams) with cable
Max Card Thickness:	54 mils (.054", 1.37mm)
Scanning Area:	0.43" (11mm) from bottom of card
Voltage:	5 Volts DC
Power consumption:	Decoded: 70mA TTL (Undecoded): 35mA
Cord:	6' 0" (1.83m)

## ENVIRONMENTAL

Temperature:	Operating: 32° to 122° F (0° to 50° C) Storage: -4° to 140° F (-20° to 60° C)
Humidity:	0% to 95% RH non-condensing
Mechanical shock:	5 foot (1.5m) drop to concrete

# PINOOTS

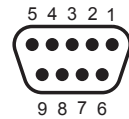
## Keyboard Interface (6 pin mini-DIN male)

Pin 1	Data (Connect to PC Data)
Pin 2	Reset (Connect to PC Reset)
Pin 3	Ground
Pin 4	+5V DC Input
Pin 5	Clock (Connect to PC Clock)
Pin 6	N/C



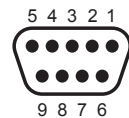
## RS232 Interface (DB9 female)

Pin 1	N/C
Pin 2	TXD (Transmit Data)
Pin 3	RXD (Receive Data)
Pin 4	N/C
Pin 5	GND (Ground)
Pin 6	N/C
Pin 7	CTS (Clear to Send)
Pin 8	RTS (Request to Send)
Pin 9	VCC (+5V DC Input)



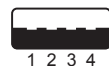
## TTL (Wand) Interface (DB9 female - squeeze release)

Pin 1	N/C
Pin 2	Data
Pin 3	N/C
Pin 4	N/C
Pin 5	N/C
Pin 6	N/C
Pin 7	Ground
Pin 8	N/C
Pin 9	+5V DC Input



## USB Interface (4 pin male)

Pin 1	+5V DC Input
Pin 2	Data -
Pin 3	Data +
Pin 4	Ground



# TROUBLESHOOTING

Most problems that you might encounter with your scanner can be solved using the following procedures:

- **Try scanning other bar codes.** If your scanner can scan other types of bar code symbologies, but cannot scan your bar codes, first check to see if your particular bar code symbology is enabled. If it is, try the scanner on the same bar code type in the Bar Code Test Chart in the back of this manual. Then, insure that your bar codes are crisp and clear.
- **Reset to Factory Default.** While the Scanner Configuration Manager program is active, click the “new file” icon (see page 3) and the “download to scanner” icon (see page 3) to reset your scanner back to factory default.  
Please note that the factory default interface is specified as PS2/AT/USB. If you have a different interface, then you will need to configure that also (see page 6) and then download to the scanner.  
**Caution:** This procedure will erase special configurations that you would have created.
- **Test the scanner on other ports.** Unitech scanners are built to the highest standards, and a perceived scanner malfunction may actually be a malfunction in the host computer.  
Test the scanner on the host’s other ports if possible or, in necessary, on other systems to verify that the problem is actually in the scanner and not in the host computer.

---

# Problems and Solutions

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## **Problem: Scanner doesn't light up.**

If the scanner does not emit a light when plugged in, check the interface.

If the scanner uses an RS232 interface, you will very likely need a power supply (5V, 300mA).

Unplug the scanner and plug it back in.

Try the scanner on another port if possible.

Re-boot the computer.

If the scanner still doesn't light up, try the scanner on another computer to insure that the fault isn't in the original computer.

## **Problem: Scanner lights up but doesn't beep.**

If the scanner emits a light, but doesn't beep when scanning a bar code, try bar codes of different symbologies. If other types of bar codes scan properly, then it might be that the scanner is not configured to scan your particular symbology.

If the scanner can scan other bar codes of the same symbology, then other parameters (such as minimum/maximum length, etc.) may have to be adjusted.

Insure that your bar code has been created properly, with crisp edges and start/stop sentinels. For instance, Code 39 bar codes require asterisk (\*) start/stop sentinels at the beginning and end of the data string (\*123ABC\*).

Avoid glossy surfaces or glossy inks for your bar codes. A glossy black surface may be indistinguishable from a white surface to your scanner. Try photocopying your bar code and scanning the copy to determine if glossiness may be a factor.

---

## Problems and Solutions

---

**Problem: No output from scanner.**

If the scanner appears to scan (emits a light and beeps), but does not output data, try scanning into a word processor application or Notepad session to see if it's a software problem.

Try the scanner on other ports to see if it's a computer port problem.

If your scanner is connected by RS232 interface, make sure that the correct com port is selected. If you're testing your scanner in HyperTerminal, make sure that "Bits per second" = 9600, "Data bits" = 8, "Parity" = None, "Stop bits" = 1, and "Flow control" = None.

**Problem: Scanner Configuration Manager cannot upload or download.**

Scanner Configuration Manager can currently upload and download only in the Windows operating system (NT excluded).

If you have a different OS, or the download function doesn't work, prepare your scanner's configuration in SCM in the usual manner, and then, instead of downloading, click the printer icon (page 4) to print a series of bar codes that you can then scan into the scanner to configure it.

# WARRANTY

## Limited Hardware Warranty

The Limited Warranty terms described below are solely applicable to the Customer of Unitech America, Inc's (afterwards simply referred to as Unitech) products. This warranty applies to equipment only. All consumables and accessories are exempted.

Unitech warrants its products to be delivered free from defects in material and workmanship, from the date of purchase. All equipment except for cables, batteries, power supplies, and RF cards are warranted for a period of twelve months (beginning from the month of delivery). Some products may have longer warranties, but all products (except for cables, batteries, power supplies, and RF cards) carry at least a one year warranty. All cables, batteries, power supplies, and RF cards external to dedicated Unitech products carry a ninety day warranty.

During this warranty period Unitech will, at its sole discretion, replace or repair free of charge any product(s) which, in its opinion, is/are defective. Any merchandise that is to be returned must have a valid Return Merchandise Authorization (RMA) number clearly indicated on the outside of the returned package and on the accompanying packing list. Unitech cannot be held responsible for any package returned without an RMA number. To obtain an RMA number, please contact Unitech's Customer Service Department or a Sale Representative, by telephone (562) 490-9550 or by facsimile (562) 490-0320.

The Customer is responsible for packing the defective product properly, and for the cost of shipping the defective product to Unitech. Unitech is responsible for the cost of shipping back the product which is repaired or replaced. If any charges are borne by the Customer, the invoice for the repaired or replaced product(s) will be sent to the Customer based on the Customer's payment terms.

In the event that the product has been modified without Unitech's consent or if the product failure is the result of misuse, abuse, willful neglect or misapplication, Unitech has no obligation to repair or replace the product.

Except as expressly mentioned above, the hardware and accompanying written materials (including the user's manual) are provided "as is" without warranty of any kind, including the implied warranties of merchant ability and fitness for a particular purpose, even if Unitech has been advised of that purpose. In no event will Unitech be liable for any direct, indirect, consequential or incidental damages arising out of the use of or inability to use such product(s), even if Unitech has been advised of the possibility of such damages.

# BAR CODE TEST CHART



A22357000599876B

**Codabar**



123456789-0

**Code 11**



AO23399013

**Code 32**



WEDGE

**Code 39**



UNITECHE

**Code 39 with Check Digit**



123ABC

**Code 93**



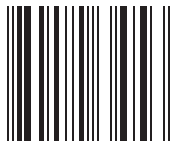
Unitech 128

**Code 128**



0123456

**Delta Code**



80123453

**EAN-8**



# BAR CODE TEST CHART

