METROLOGIC INSTRUMENTS, INC.

IS4120 ScanQuest™
Laser Scan Engine

Programming Guide

MLPN 2343
Printed in USA
March 1998

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Scope of the IS4120 Programming Guide

Not all hardware versions of the laser scan engine support all of the features universally. PC Keyboard Wedge units **do not** use baud rates. Light Pen emulation scanners **should not** try to drop UPC/EAN check digits. Some features will deliver different results based upon the primary interface selected.

Version 17 Keyboard Wedge units default to Keyboard Wedge communications. Version 41 defaults to RS-232 communications.

Programming the Scanner

The IS4120 is shipped from the factory programmed to a set of default parameters. Defaults are noted in the following pages by double asterisks ** next to the bar code labels. Modifications to the default program to match the host system are made using bar codes contained in this manual.

1. Connect the scanner to the host system or power source. (Refer to the Installation and User's Guide.)

2. Scan the ENTER/EXIT PROGRAM MODE bar code. (The unit will beep three times.)

3. Scan by positioning the output window within two inches of each code. (When you scan the first menu selection, the laser will stay on until you scan the ENTER/EXIT PROGRAM MODE code again. If no scanning occurs for 30 seconds while the scanner is in program mode, the unit will beep three times and all changes made will be lost. If this occurs, return to Step 1.)

4. After completing the scanning of the appropriate configuration options, scan the ENTER/EXIT PROGRAM MODE bar code again. (The new options will be saved and the scanner is ready for normal operation.)

Enter/Exit
Program Mode

* *

Enter/Exit Program Mode

Enter Program Mode

****Ability to Enter Program Mode After Any Scan**

When this option is selected, enter programming by scanning the ENTER/EXIT PROGRAM MODE bar code after power up or during normal scanning operation.

Enter Program Mode Only on First Scan

When this option is selected, the scanner will only enter program mode after power-up. Scan the ENTER/EXIT PROGRAM MODE bar code immediately after the scanner first receives power. This option prevents the scanner from accidentally entering program mode during normal scanning operation.

Recall Defaults

If during programming of the scanner, there is a need to return the scanner to the original factory settings, scan the RECALL DEFAULTS bar code. Any settings selected during that session or any previous session will be lost.

Recall Defaults

HandSet® Program Mode

An IBM compatible PC-based menu driven program called HandSet is available to configure the IS4120. Please contact Metrologic or the HandSet documentation for details.

Recall Defaults

D F 1

Serial Program Mode

The MS4120 can be configured via a serial command set from a host system. This works as long as the baud rate of the scanner is always known. The host system simply transmits all of the ASCII representations of all bar codes scanned to configure a scanner for a given application. This is especially useful when an IS4120 will be used as an embedded component in a system. A maintenance/ setup screen may be included so that when a new scan engine is installed in the system, it can automatically be configured to match site specific requirements.

A sample configuration process is listed below. Here the scanner is being configured to activate the laser when it receives a "DC2" character.

Action	**Command**	**Hexadecimal Form**
Enter Program Mode	**	2AH, 2AH
Recall Defaults	*DF1*	2AH, 44H, 46H, 31H, 2AH
Enable DC2 Activation	*R40*	2AH, 52H, 34H, 30H, 2AH
Exit Program Mode	**	2AH, 2AH

These are the data and framing characters from the bar codes normally used to configure the scanner via scanning.

Note: The "*" (asterisk) characters are used to frame each command. If the scanner misses a character or has another problem it may interpret the trailing "*" of one command and the leading "*" of the next command as an exit program mode. This is usually only a problem when the initial configuration code is being written for the host software. To help detect this problem, it is recommended that the external beeper be connected at least for development purposes. The scanner beeps 3 times when exiting program mode. It does not beep when entering program mode.

General Flow of the serial program mode process:

Host		Scanner
**	➜	(**NO** scanner beeps)
	←	ACK (06H)
wait 150 milliseconds		(.15 seconds)
DF1	➜	
wait 150 milliseconds		(.15 seconds)
R40	➜	
wait 150 milliseconds		(.15 seconds)

.

.

If > 20 seconds between characters/commands the scanner sends an NAK (15H) to the host, exits program mode and recalls the previous scanner configuration. (DOES NOT beep in this case)

**	➜	
		scanner beeps three times to indicate exiting program mode (if equipped with a beeper)

Recall Defaults

D F 1

Laser Activation Range

Short Range Activation
Out of the Stand

R S 1

When this option is selected, the IR sensor guarantees to activate when the scanning window is positioned three inches from the object.

Short Range Activation
In the Stand

R S 3

When this option is selected, the IR sensor guarantees to activate when an object is presented three inches from the scanning window.

****Long Range Activation**
Out of the Stand

R S 2

When this option is selected, the IR sensor guarantees to activate when the scanning window is positioned eight inches from the object.

****Long Range Activation**
In the Stand

R S 4

When this option is selected, the IR sensor guarantees to activate when an object is presented eight inches from the scanning window.

Enter/Exit Program Mode

Laser Operation

****Normal Scan**

This option is the default setting. When the laser activates by the IR sensor, the laser beam will emit from the output window. It will also display a constant, horizontal line until it senses a bar code or until the scanner timeout elapses.

Pulsing Scan

When the laser activates by the IR sensor, the laser beam will emit from the output window. It will also display a pulsing, horizontal line until it senses a bar code or until the scanner timeout elapses.

Custom Scan

This option is available for special applications. **Do not** scan the CUSTOM SCAN bar code unless instructed by a Metrologic representative.

Sleep Mode

Sleep Mode will cause the scanner to go into low power (approx. 12 milliamps) standby mode after approximately 5 seconds of no activity. Activating the infrared (IR) sensor will “wake” the scanner up.

Enable Sleep Mode

Disable Sleep Mode

Recall Defaults

RS-232/Serial related activation methods

There are several optional means of activating a scan cycle with scan engine products using an RS-232 type interface. They are generally intended to be used in OEM and industrial applications. It is expected that they will be used in fixed and controlled environments where host system software will be developed to manage the scanner operation.

"DTR" Activation of Scanning

Enable DTR Activation

When the DTR (Data Terminal Ready) activation is enabled, the scan cycle is controlled by the level of the DTR input to the scanner instead of the IR sensor.

****Disable DTR Activation**

A +12 volt RS-232 type level on the DTR input activates the scanner.

A -12 volt RS-232 type level on the DTR input will leave the scanner inactive.

Enable DC2 Activation

When the scanner receives an ASCII DC2 (012H, control R, Tape Punch On command) a scan cycle will be started. This will activate the scanner instead of the IR sensor. Disable this feature by recalling defaults.

Enter/Exit Program Mode

Enable Address based Activation

****Disable Address based Activation**

A "address" character can be programmed into the first programmable prefix character location of the scanner. Then, if addressed based activation is enabled, the scanner will start a scan cycle when it receives that character/address via its serial receive pin. The "address" will also be transmitted in front of any data sent from the scanner.

Transmit: "NOREAD" message following a scanner timeout with no successful decode

****Disable "NOREAD" message transmission**

When Enabled, the scanner transmits: "NOREAD" to the host system after a scan cycle timeout without a successful decode.

****Turn On Green LED during "NOREAD" message transmit**

Do NOT Turn on Green LED during "NOREAD" transmit

The scanner normally turns on the "green Good READ" LED during all

data transmissions. This feature can be disabled for "NOREAD" messages by adding "RC5" to the scanner configuration sequence.

Recall Defaults

Same Symbol Re-Scan

The scanner is programmed with a same symbol timeout. For SHORT SAME SYMBOL RE-SCAN, the time delay is ½ second, while the LONG SAME SYMBOL RE-SCAN delay is 1 second. These numbers represent the amount of time that a bar code must be out of the scan field before it can be scanned again.

Short Same Symbol Re-Scan

**** Long Same Symbol Re-Scan**

Identical Symbol Re-Scan Indicator

During the same symbol timeout, the LED's do not provide an indication of when the unit is ready to begin scanning the same symbol again. To program a LED to flash when the preset delay is over, configure the scanner to Green LED Enabled.

**** Disable Green LED**

Enable Green LED

Enter/Exit Program Mode

1 vs 2 Scan Buffers

This feature controls the number of bar codes considered for the purposes of the same symbol re-scan. The default, 1 scan buffer only compares new scanned data against the last bar code scanned. 2 scan buffers allow the scanner to test the last 2 bar codes scanned for same symbol re-scan purposes.

Enable 2 Scan Buffers

****Enable 1 Scan Buffer**

Decode Options

Enable 2X Redundancy (MECCA)

***Disable 2X Redundancy (MECCA)**

The following bar codes are very useful when working with Code 39 and Codabar applications.

Enable Double Border Requirement (large intercharacter space requirement)

****Disable Double Border Requirement (large intercharacter space requirement)**

Recall Defaults

Beeper Tones

Program the scanner to emit a certain tone.

Alternate Tone 1 . . . . . Low Tone
Alternate Tone 2 . . . . . High Tone (Default)
Alternate Tone 3 . . . . . Medium Tone
No Tone

Alternate Tone 1

****Alternate Tone 2**

Alternate Tone 3

No Tone

Enter/Exit Program Mode

* *

Audible Indicators for Communication Timeouts

Two Second Timeout

O C 5

When this option is selected, the scanner will timeout if it does not transmit its data to the host after two seconds during communication. This is only valid in modes where some type of hand-shaking is involved.

****No Two Second Timeout**

O C 6

Razz Beep on Timeout

O C 7

When this option is selected, The scanner will produce an audible razzberry tone when communications timeout.

**** No Tone After Timeout**

O C 8

Three Beep on Timeout

O C 9

When this option is selected, the scanner will beep three times when communications timeout.

**** Beep Before Transmit**

R 5 0

When this option is selected, the scanner will beep before each label transmits.

Beep After Transmit

R 5 1

When this option is selected, the scanner will beep after each label transmits.

Recall Defaults

D F 1

RS-232 Interface

**** Enable RS-232 Interface**

L P 2

RS-232 Parameter - Baud Rate

A baud rate is a unit that measures the speed with which information transfers. The baud rate of the scanner must equal the baud rate of the host device. The available baud rates range from 300 to 38400.

300 Baud Rate

B R 2

600 Baud Rate

B R 3

1200 Baud Rate

B R 4

2400 Baud Rate

B R 5

Enter/Exit Program Mode

* *

4800 Baud Rate

B R 6

**** 9600 Baud Rate**

B R 7

19200 Baud Rate

B R 8

38400 Baud Rate
(Transmit Only)

B R 1

Recall Defaults

RS-232 Parameter - Parity

Parity is an additional digit that makes the number of bits in the ASCII code odd or even. The scanner's parity must match the host's parity.

****Space Parity**

Select this option to make the parity bit always 0.

Even Parity

Select this option to make the additional parity bit either a 0 or 1 to guarantee an even number of bits.

Mark Parity

Select this option to make the parity bit always 1.

Odd Parity

Select this option to make the additional parity bit either a 0 or 1 to guarantee an odd number of bits.

Enter/Exit Program Mode

* *

RS-232 Parameter - Data Bits

RS-232 serial communication requires ASCII data to transmit in either 7 or 8 data bits. In addition, one parity bit will transmit. If necessary, scan the appropriate bar code that matches your host device's requirements.

8 Data Bits

D B 1

**** 7 Data Bits**

D B 2

RS-232 Parameter - Hardware Handshaking

To prevent scanned information from being lost during transmission, your host device may require an RTS/CTS signal. When RTS/CTS (Ready To Send/Clear To Send) enables, the scanner will output an RTS signal and wait for a CTS signal before any data transmits. The default setting of RTS/CTS disables. If necessary, scan the ENABLE RTS/CTS bar code.

Enable RTS/CTS

HH1

**** Disable RTS/CTS**

HH2

Recall Defaults

**** Character RTS/CTS**

When this option is selected, the scanner will activate and deactivate its RTS signal on each character that it transmits.

Message RTS/CTS

When this option is selected, the scanner will activate and deactivate its RTS signal on each message that it transmits. This mode should normally enable for Sanyo registers.

RS-232 Parameter - Software Handshaking

For control of the data transmission process, use the following parameters instead of or in addition to the RTS/CTS hardware handshaking option.

ACK/NAK

When this option is enabled, the scanner will not scan again unless after transmission of a bar code it receives an ACK (ASCII 06H). The scanner will retransmit the bar code, if it receives an NAK (ASCII 15H).

Enable ACK/NAK

**** Disable ACK/NAK**

XON/XOFF

When this option is enabled, the scanner will stop transmission whenever it receives an XOFF (ASCII 13H). Transmission will resume after it receives an XON (ASCII 11H).

Enable XON/XOFF

****Disable XON/XOFF**

Enter/Exit Program Mode

* *

RS-232 Parameter - Intercharacter Delay

The time specified with an intercharacter delay bar code represents the interim of time between transmission of characters. Some host systems require this delay when receiving transmissions. If necessary, scan the appropriate bar code.

**** No Intercharacter Delay**

R 2 0

1 Millisecond Intercharacter Delay

R 2 1

5 Millisecond Intercharacter Delay

R 2 2

25 Millisecond Intercharacter Delay

R 2 3

Recall Defaults

D F 1

RS-232 Parameter - Scanning Control (DTR Signal)

When the DTR (Data Terminal Ready) input is enabled, the scanner will not transmit unless an active (+12V) DTR signal is present on the scanner's DTR input pin. You can disable the scanner by making DTR inactive (-12V) at the DTR input pin.

Enable DTR Input

H H 3

The DTR Scan Disable feature will prevent any scanning when the Enable DTR input feature is chosen. Before enabling the Enable DTR Scan Disable feature, scan the Enable DTR Input bar code. To turn off this feature, scan the Recall Defaults bar code.

**** Disable DTR Input**

H H 4

Enable DTR Scan Disable

R 3 2

"DE" Disable Command

When this option is enabled, the scanner will stop scanning when it receives an ASCII "D" from the host device. Scanning will resume when the scanner receives an ASCII "E". This feature will only work with RS-232 communication.

Enable "DE" Disable Command

R 9 4

When this option is chosen, the scanner will not stop scanning when it receives an ASCII "D" from the host device.

***Disable "DE" Disable Command**

R 9 5

Enter/Exit Program Mode

Longitudinal Redundancy Check (LRC)

A Longitudinal Redundancy Check (LRC) is an error checking character that is calculated across a sequence of data characters. It is determined by eXclusive ORing (XOR) the characters to be checked, starting with an initial value of 00H. The result, an "LRC byte" is then transmitted following the data stream and used by the receiving computer to determine if the information was received correctly. In the scanner's case, XOR is performed prior to adding parity bits.

Enable LRC Calc+ Transmit RS-232

****Disable LRC Calc+ Transmit RS-232**

When the LRC is enabled, the scanner defaults to starting the LRC on the second byte of information transmitted. Optionally, the calculation can start on the first byte transmitted.

Start LRC on First RS-232 Byte

****Start LRC on Second RS-232 Byte**

Record Header/Terminator Select

When this option is on, the scanner will transmit a Carriage Return after each bar code.

****CR On**

CR Off

Recall Defaults

D F 1

When this option is on, the scanner will transmit a Line Feed after each bar code.

**** LF On**

T R 4

LF Off

T R 3

When this option is on, the scanner will transmit a Start of TeXt (ASCII 02H) before each bar code.

STX Prefix On

T R 6

**** STX Prefix Off**

T R 5

When this option is on, the scanner will transmit an End of TeXt (ASCII 03H) after each bar code.

ETX Suffix On

T R 8

**** ETX Suffix Off**

T R 7

Enter/Exit Program Mode

* *

When this option is on, the scanner will transmit a TAB (ASCII 09H) before each bar code.

Tab Prefix On

T B 2

**** Tab Prefix Off**

T B 1

When this option is on, the scanner will transmit a TAB (ASCII 09H) after each bar code.

Tab Suffix On

T B 4

**** Tab Suffix Off**

T B 3

Recall Defaults

RS-232 Parameter - UPC/EAN Identifiers

Prefix ID When this option is on, the scanner will transmit a prefix before any UPC/EAN bar code. The prefixes are A (UPC-A), E0 (UPC-E), F (EAN-13), and FF (EAN-8).

Prefix ID On

**** Prefix ID Off**

Suffix ID When this option is on, the scanner will transmit a suffix after any UPC/EAN bar code. The suffixes are A (UP C-A),E0 (UPC-E), F (EAN-13), and FF (EAN-8).

Suffix ID On

**** Suffix ID Off**

Enter/Exit Program Mode

Keyboard Wedge (KB) Interface

Scan the ENABLE KB WEDGE INTERFACE bar code if your communication requirement is keyboard emulation. The scanner will provide keyboard emulation by converting the scanned bar code data to the PC keyboard scan code equivalent. The keyboard settings will only work with a Version 47 (KBWEDGE) MS951 scanner.

Enable Keyboard Wedge Interface

KB Parameter - Keyboard Type

The following bar codes are used to define the type of keyboard in use. If necessary, scan the appropriate bar code.

**** AT Keyboard (includes IBM® PS/2: Models 50, 55, 60, 80)**

XT Keyboard

Enable IBM PS/2 Keyboard (Models 30, 70, 8556)

**** Disable IBM PS/2 Keyboard (Models 30, 70, 8556)**

Enable Single-Ended Keyboard Emulation

Recall Defaults

D F 1

KB Parameter - Keyboard Country Type

The following bar codes are used to define the keyboard country type.
If necessary, scan the appropriate bar code.

**** USA Keyboard**

B R 8

UK Keyboard

B R 2

France Keyboard

B R 3

Germany Keyboard

B R 4

Italy Keyboard

B R 5

Spain Keyboard

B R 6

Belgium Keyboard

B R 1

IBM KB4700 Financial Keyboard

B R 7

Swiss Keyboard

B R 9

Enter/Exit Program Mode

Reserved Codes

KB Parameter - Caps Lock Mode

When Caps Lock is used on the keyboard, choose ENABLE CAPS LOCK. Once enabled, the scanner will simulate Caps Lock keyboard input. This mode will not work with all keyboard types.

Enable Caps Lock

****Disable Caps Lock**

To detect automatically if Caps Lock is used, enable AUTODETECTION CAPS LOCK MODE. This will only work with an AT computer.

Enable Auto Detection Caps Lock Mode

****Disable Auto Detection Caps Lock Mode**

Recall Defaults

D F 1

KB Parameter - Alt Mode

When this option is enabled, the scanner will duplicate this keyboard sequence: Hold down the Alt key; type the decimal number that corresponds to the appropriate keyboard character. Caution should be observed when using Alt mode because a scanner to host application conflict may occur if the host software application uses the Alt key as a "Hot" key.

Enable Alt Mode

H H 3

****Disable Alt Mode**

H H 4

KB Parameter - Inter Scan Code Delay (AT and PS/2 Modes)

The time specified with an inter scan code delay bar code represents the amount of time between individual 9 bit scan codes. Each character of a bar code takes between two and twelve of these scan codes to be passed through to the PC via the keyboard interface. This parameter may need to be adjusted for operation with certain PC keyboard BIOS's. Network operating systems often use microprocessor time slices to service network information requests instead of the keyboard interface. While not an issue with manually entered key strokes, this timing can be critical with automatic scanner data entry. Inter-scan code delays can be a useful system tuning tool in these environments.

**** 800 Microsecond Delay**

O C 8

7.5 Millisecond Delay

O C 9

15 Millisecond Delay

O C 7

Enter/Exit Program Mode

* *

KB Parameter - XT - Clean-Up Bit

Some keyboard BIOS's require a "cleanup bit" to be transmitted prior to an actual scan code being clocked over to the motherboard. Enabling this feature will cause the scanner to send this extra bit to the host computer. More commonly found on older XT style BIOS's, and some AT BIOS's. (required by some NEC 80286 machines).

Enable Cleanup Bit

H H 1

**** Disable Cleanup Bit**

H H 2

Recall Defaults

D F 1

Light Pen Options

If the scanner is being used in place of a light pen, scan the ENABLE LIGHT PEN INTERFACE bar code. When this interface, is enabled the scanner can output a bar or space as the high signal. Enable the appropriate option for your specific application. When the TRANSMIT AS CODE 39 is enabled , the scanner will output the bar code's bar or space high signal as Code 39. These settings will only work with a Version 15 (LTPN) MS951 scanner.

Enable Light Pen Interface

L P 1

**** Bars High**

L P 3

Spaces High

L P 4

**** Transmit as Scanned**

L P 5

Transmit as Code 39

L P 6

Poll Light Pen 5 Volts

R 5 8

When this option is enabled, the scanner will wait for an active source voltage before trans-mitting the data.

**** No Poll Light Pen**

R 5 9

Enter/Exit Program Mode

Enable Reverse Polarity Idle for Light Pen

Some light pen decoders require an extra toggle of the data line before they will recognize a border condition. Others require that while idle, the data line be the polarity of a bar instead of a space. Enabling this feature can satisfy these requirements.

****Disable Reverse Polarity Idle for Light Pen**

Code Type Selections

Use the following bar codes to program the scanner to read different types of bar codes. This will enable the default settings for all of the bar code types. To improve reliability, disable the code types that will not be used. This will not decrease the amount of time it takes for the scanner to scan a bar code. It will prevent the operator from accidentally scanning bar code types that are not included in your application.

**** Enable UPC**

Disable UPC

**** Enable EAN**

Disable EAN

Recall Defaults

D F 1

**** Enable Code 39**

C T F

Disable Code 39

C T E

**** Enable Codabar**

C T I

Disable Codabar

C T J

**** Enable Code 128**

C T G

Disable Code 128

C T H

**** Enable Code 93**

C T K

Disable Code 93

C T L

Enter/Exit Program Mode

* *

**** Enable Interleaved 2 of 5**

C T M

Disable Interleaved 2 of 5

C T N

Enable Matrix 2 of 5

R B M

***Disable Matrix 2 of 5**

R B N

Enable Code 11

R 4 1

**** Disable Code 11**

R 4 2

Enable Hong Kong Matrix 2 of 5

R B U

Disable Hong Kong Matrix 2 of 5

R B V

Recall Defaults

Enable Airline 2 of 5

**** Disable Airline 2 of 5**

Minimum Code Length for All Code Types

The minimum number of characters can be specified in the bar code that will be scanned by scanning one of the following bar codes. For example, when the minimum is 3, the scanner will not scan bar codes that have less than 3 characters.

Minimum 1 Character

**** Minimum 3 Characters**

Minimum 6 Characters

Enter/Exit Program Mode

* *

Code Length Minimum Feature

A custom minimum character length can be configured for non-UPC/EAN type bar codes. Scan RBA followed by the digits in the RB0-RB9 range (on page 57) that match the 3 digit decimal number for the minimum. (e.g. RBA, RB0, RB1, RB6 for a 16 character minimum) The scanner will not scan codes with fewer than the configured minimum of characters.

Set minimum character length

R B A

A custom character lock length can be configured for non-UPC/EAN type bar codes. Scan RBB followed by the digits in the RB0-RB9 range that match the 3 digit decimal number for the lock length. (e.g. RBB, RB0, RB1, RB2 for a 12 character lock length) The scanner will only scan bar codes with the number of characters that match the configured lock length.

Set character lock length

R B B

UPC/EAN Code

UPC and EAN are typical bar code types. These enable the default settings for UPC and EAN.

**** Enable UPC**

C T A

Disable UPC

C T B

Recall Defaults

D F 1

**** Enable EAN**

C T C

Disable EAN

C T D

UPC-A Options

When this option is selected , the scanner will transmit the UPC-A number system character. Metrologic strongly discourages the disabling of this feature because duplicate numbers may result in the database when the scanner is programmed not to transmit the UPC-A number system character.

****Transmit UPC-A Number Sys**

L Z 5

Do Not Transmit UPC-A Number Sys

L Z 6

When this option is on, the scanner will transmit the UPC-A check digit.

****UPC-A Check Digit On**

C K 4

UPC-A Check Digit Off

C K 3

Enter/Exit Program Mode

Convert UPC-A to EAN-13

When this option is selected , the scanner will convert UPC-A to EAN-13 by transmitting a leading zero before the bar code.

**** Do Not Convert UPC-A to EAN-13**

UPC-E Options

Expand UPC-E

When this option is selected, the scanner will expand UPC-E to the 12 digit equivalent UPC-A.

**** Do Not Expand UPC-E**

UPC-E Check Digit On

When this option is on, the scanner will transmit the UPC-E check digit.

**** UPC-E Check Digit Off**

UPC-E Leading 0 On

When this option is on, the scanner will output a zero before each UPC-E bar code.

**** UPC-E Leading 0 Off**

Recall Defaults

D F 1

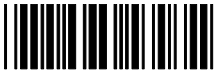
Disable EAN-8 Check Digit Transmission

R 3 6

**** Enable EAN-8 Check Digit Transmission**

R 3 7

Disable EAN-13 Check Digit Transmission



R 3 8

**** Enable EAN-13 Check Digit Transmission**

R 3 9

Convert EAN-8 to EAN-13

R 5 2

When this option is selected , the scanner will convert EAN-8 to EAN-13 by transmitting five zeroes before the bar code.

**** Do Not Convert EAN-8 to EAN-13**

R 5 3

Enable "$" Prefix ID for UPC/EAN

R 7 0

**** Disable "$" Prefix ID for UPC/EAN**

R 7 1

Enter/Exit Program Mode

* *

Supplemental UPC Options

Enable 2 Digit Supps

S P 1

When this option is enabled, the scanner will scan 2 digit supplementals.

**** Disable 2 Digit Supps**

S P 2

Enable 5 Digit Supps

S P 7

When this option is enabled, the scanner will scan 5 digit supplementals.

**** Disable 5 Digit Supps**

S P 4

Enable Bookland

S P 5

When this option is enabled, the scanner will require that a 5-digit supplement be scanned whenever an EAN-13 code begins with 978.

**** Disable Bookland**

S P 6

Supplement Required

S P 3

When this option is selected, all UPC/EAN labels that are to be scanned must have a supplement.

**** Supplement Not Required**

S P 8

Recall Defaults

D F 1

Supplemental ISBN Options

These features convert Bookland bar codes to a variety of International Standard Book Number (ISBN) formats.

Enable Bookland to ISBN

R A F

****Disable Bookland to ISBN**

R A G

Enable Transmit ISBN CD

R A H

****Disable Transmit ISBN CD**

R A I

Enable ISBN Reformatting

R A J

****Disable ISBN Reformatting**

R A K

Coupon Code 128

Supplemental scanning - perform in program mode - up to 80 numeric characters is automatic.

Enable Coupon Code 128

R A 3

***Disable Coupon Code 128**

R A 4

Enter/Exit Program Mode

Enable] C1 Transmit Coupon C128

***Disable] C1 Transmit Coupon C128**

Disable Coupon 128 Group Separator

Enable Coupon 128 Group Separator

Code 39

****Enable Code 39**

When this option is enabled, the scanner will scan Code 39 bar codes.

Disable Code 39

Enable Mod 43 Check Digit

When this option this enabled, the scanner will only scan Code 39 bar codes that have a Modulo 43 check digit.

**** Disable Mod 43 Check Digit**

Recall Defaults

D F 1

Enable Italian Pharmaceutical

R 4 3

**** Disable Italian Pharmaceutical**

R 4 4

****Transmit Mod 43 Check Digit**

M D 3

When this option is selected, the scanner will transmit to the host the Modulo 43 check digit of Code 39.

Do Not Transmit Mod 43 Check Digit

M D 4

Enable Full ASCII Code 39

R 1 0

When this option is enabled, the scanner will scan full ASCII Code 39 bar codes.

**** Disable Full ASCII Code 39**

R 1 1

Enable Reserved Feature

R 7 4

Disable Reserved Feature

R 3 3

Enter/Exit Program Mode

Codabar

****Enable Codabar**

When this option is enabled, the scanner will scan Codabar bar codes.

Disable Codabar

Transmit Start/Stop

When this option is selected, the scanner will transmit Codabar's start and stop characters before and after each bar code.

**** Do Not Transmit Start/Stop**

Enable CLSI Editing

When this option is enabled, the scanner will perform CLSI library type editing before the information transmits to the host. This editing only works with 14 digit Codabar type labels.

**** Disable CLSI Editing**

Recall Defaults

D F 1

Interleaved 2 of 5 (ITF)

**** Enable ITF**

C T M

When this option is enabled, the scanner will scan Interleaved 2 of 5 (ITF) bar codes.

Disable ITF

C T N

Enable ITF Check Digit

I T 2

When these options are enabled, the scanner will scan ITF bar codes that have a Modulo 10 check digit.

**** Disable ITF Check Digit**

I T 1

Transmit MOD 10 ITF

R 5 4

When the transmit option is chosen, the scanner will transmit the ITF MOD 10 check character. This feature works with the ITF check digit option. In order for this feature to work both must be enabled.

**** Do Not Transmit MOD 10 ITF Check Digit**

R 5 5

Enter/Exit Program Mode

Interleaved 2 of 5 (ITF) Symbol Lengths

Specify the number of ITF digits in the bar codes that will be scanned by scanning the appropriate bar codes. Specify a maximum of two bar code lengths. If all of the bar codes that will scan are variable lengths, program the scanner to VARIABLE LENGTH.

**** Variable Length**

2 Digits

4 Digits

6 Digits

8 Digits

10 Digits

12 Digits

Recall Defaults

D F 1

14 Digits

I 1 4

16 Digits

I 1 6

18 Digits

I 1 8

20 Digits

I 2 0

22 Digits

I 2 2

24 Digits

I 2 4

26 Digits

I 2 6

28 Digits

I 2 8

Enter/Exit Program Mode

30 Digits

32 Digits

34 Digits

36 Digits

38 Digits

40 Digits

42 Digits

44 Digits

Recall Defaults

46 Digits

48 Digits

50 Digits

ITF Minimum Symbol Length Test

A custom minimum character length can be configured for only ITF bar codes. This leaves shorter minimum lengths for other code types possible. The scanner will not scan codes with fewer than the configured minimum of characters. To activate, first scan an ITF character lock length. Then scan RBC-enable minimum test. This feature overrides ITF character locking.

Enable ITF Minimum Symbol Length Test

Disable ITF Minimum Symbol Length Test

Enter/Exit Program Mode

Matrix 2 of 5

Enable Matrix 2 of 5

***Disable Matrix 2 of 5**

Transmit Matrix 2 of 5 Check Digit

Do Not Transmit Matrix 2 of 5 Check Digit

Enable Hong Kong Matrix 2 of 5

Disable Hong Kong Matrix 2 of 5

Recall Defaults

MSI - Plessey Check Digit

Enable MSI - Plessey

When this option is enabled, the scanner will scan Plessey bar codes.

**** Disable MSI - Plessey**

****Enable MSI - Plessey Test of Check Digit**

When this option is enabled, the scanner will check the Plessey bar code for a proper check digit.

Disable MSI - Plessey Test of Check Digit

****Enable Plessey Mod 10 Check Digit**

When this option is enabled, the scanner will scan Plessey bar codes that have a single Modulo 10 check digit.

Plessey Mod 10/10 Check Digit

When this option is selected, the scanner will scan Plessey bar codes that have a double Modulo 10 check digit.

Enter/Exit Program Mode

* *

****Transmit Plessey Check Digits**

R 1 2

When this option is selected, the scanner will transmit Plessey's check digit(s) character. This option works with the Plessey Mod 10 and/or Plessey Mod 10/10 features. Enable this option and one or both of the Plessey Mod options in order for this feature to work.

Do Not Transmit Plessey Check Digits

R 1 3

UK Plessey Options

Enable UK Plessey

R 7 7

When this option is enabled, the scanner will scan UK Plessey bar codes.

**** Disable UK Plessey**

R 7 8

Transmit UK Plessey Check Digit(s)

R 8 1

When this option is selected, the scanner will transmit Plessey's check digit(s) character.

**** Do Not Transmit UK Plessey Check Digit(s)**

R 8 2

Recall Defaults

Enable UK Plessey Special Format

When this option is enabled, the scanner will output the data in the special format required by some UK libraries.

**** Disable UK Plessey Special Format**

Enable A to X Conversion (UK)

****Disable A to Z Conversion (UK)**

Test Modes

Scan Count

When scanning this option, the scanner will enter the scan count test mode. The firmware number of the scanner will also transmit to the host device. Do not enable this feature unless a Metrologic representative instructs you to do so.

Scannability

When this option is enabled, the scanner will enter the scannability test mode. Do not enable this feature unless a Metrologic representative instructs to do so.

Enter/Exit Program Mode

Normal Scan/Operating

When this option is selected, the scanner will exit from the scannability or scan count test modes.

Transmit Scanner Parameters

When this option is selected, the scanner will transmit (at 9600 baud) its current configuration.

Special Features

The special features options are for special applications. Do not enable any of the special features options unless instructed by a Metrologic representative.

Default to ScanPal Communication Parameters

When this option is selected, the scanner's parameters will automatically change to the default settings of the ScanPal data collector. The IS4120 is not completely hardware compatible with the ScanPal.

Transmit Code ID

When this mode is selected, the scanner will transmit a code type identifier before each bar code.

****Do Not Transmit Code ID**

**** Disable Sanyo 635 ECR Protocol**

Recall Defaults

D F 1

Enable Sanyo 635 ECR Protocol

R 0 1

Enable Post Software ID Characters

R 0 8

**** Disable Post Software ID Characters**

R 0 9

Enable "NEWCODE" Mode "A"

R 1 4

**** Disable "NEWCODE" Mode "A"**

R 1 5

Enable "NEWCODE" Mode "B"

R 1 6

**** Disable "NEWCODE" Mode "B"**

R 1 7

Enable SNI Beetle Mode

R 2 5

**** Disable SNI Beetle Mode**

R 2 6

Enter/Exit Program Mode

BIO DATA Mode

Recall Defaults to disable. Combines DTR and Special same symbol rescan handling.

Golden Bountiful Formatting

Enable Sineko Mode

Once Sineko mode is enabled, the only way to disable this feature is by scanning the Recall Defaults bar code.

Enable Caps Lock Mode
(for the MI951 external wedge)

Enable this option when Caps Lock is used on the keyboard. Once enabled, Metrologic's MS951 (RS-232) handheld scanner will simulate Caps Lock keyboard input when used with Metrologic's MI951 external keyboard wedge. This mode may not work with all applications.

**** Disable Caps Lock Mode**

Enable French Wyse 120V PC Term

**** Disable French Wyse 120V PC Term**

Enable Intermec Polling Mode D
(limited function)

Disable Intermec Polling Mode D
(limited function)

Recall Defaults

D F 1

Enable Rochford Thompson Mode

R A B

Disable Rochford Thompson Mode

R A C

Enable RTS Counter Toggle

R A L

When enabled, the RTS output line is pulsed high for approximately 15 milli-seconds following the transmission of the bar code data to the host computer.

Disable RTS Counter Toggle

R A M

Enable BEEP on BEL RS-232

R B E

The scanner will beep upon receiving an ASCII Bell character (07H) via the RS-232 port.

Disable BEEP on BEL

R B F

Enable Bancomer Mode

R 2 7

Locks on 16, 20, 23, 28 and 30 character bar codes.

Disable Bancomer Mode

R 9 8

Enable FedEx Parsing

R B I

This feature should be used with 32 character ITF Lock.

****Disable FedEx Parsing**

R B J

Enter/Exit Program Mode

Enable Retransmit of Same Code

****Disable Retransmit of Same Code**

User Programmable Prefix and Suffix ID Characters

User selected prefix/suffix characters can be programmed into the scanner by scanning the 3 digit decimal equivalent of the ASCII character into the appropriate character location with the RB0-RB9 bar codes. For example, scan RAT, RB0, RB0, RB7 (007 = decimal equivalent of an ASCII "BEL" character) and the scanner will transmit an ASCII "BEL" character before each bar code. For single character prefixes or suffixes always configure the "1st" position. Use the ASCII Reference Table on pages 58-62 for the decimal equivalents.

1st Programmable Prefix ID

2nd Programmable Prefix ID

1st Programmable Suffix ID

2nd Programmable Suffix ID

Clear All Programmable Prefixes and Suffixes

Recall Defaults

D F 1

RB0 - RB9 Bar Codes

A 3 digit decimal value must be entered for the desired ID Character.

RB0 - 0

R B 0

RB1 - 1

R B 1

RB2 - 2

R B 2

RB3 - 3

R B 3

RB4 - 4

R B 4

RB5 - 5

R B 5

RB6 - 6

R B 6

RB7 - 7

R B 7

RB8 - 8

R B 8

RB9 - 9

R B 9

ASCII Reference Table

HEX Value	Decimal value	Character	Control Keyboard Eqv
00	0	NUL	@
01	1	SOH	A
02	2	STX	B
03	3	ETX	C
04	4	EOT	D
05	5	ENQ	E
06	6	ACK	F
07	7	BEL	G
08	8	BS	H
09	9	HT	I
0A	10	LF	J
0B	11	VT	K
0C	12	FF	L
0D	13	CR	M
0E	14	SO	N
0F	15	SI	O
10	16	DLE	P
11	17	DC1	Q
12	18	DC2	R
13	19	DC3	S
14	20	DC4	T
15	21	NAK	U
16	22	SYN	V
17	23	ETB	W
18	24	CAN	X
19	25	EM	Y

HEX Value	Decimal value	Character	Control/Alternate Eqv
1A	26	SUB	Z
1B	27	ESC	[
1C	28	FS	\
1D	29	GS	]
1E	30	RS	^
1F	31	US	_
20	32	SP	space, blank
21	33	!	
22	34	"	
23	35	#	
24	36	$	
25	37	%	
26	38	&	
27	39	'	apostrophe
28	40	(	
29	41	)	
2A	42	*	
2B	43	+	
2C	44	,	comma
2D	45	-	minus
2E	46	.	period
2F	47	/	
30	48	0	number zero
31	49	1	number one
32	50	2	
33	51	3	

HEX Value	Decimal value	Character	Control/Alternate Eqv
34	52	4	
35	53	5	
36	54	6	
37	55	7	
38	56	8	
39	57	9	
3A	58	:	
3B	59	;	
3C	60	<	less than
3D	61	=	
3E	62	>	greater than
3F	63	?	
40	64	@	shift P
41	65	A	
42	66	B	
43	67	C	
44	68	D	
45	69	E	
46	70	F	
47	71	G	
48	72	H	
49	73	I	letter I
4A	74	J	
4B	75	K	
4C	76	L	
4D	77	M	

HEX Value	Decimal value	Character	Control/Alternate Eqv
4E	78	N	
4F	79	O	letter O
50	80	P	
51	81	Q	
52	82	R	
53	83	S	
54	84	T	
55	85	U	
56	86	V	
57	87	W	
58	88	X	
59	89	Y	
5A	90	Z	
5B	91	[	shift K
5C	92	\	shift L
5D	93	]	shift M
5E	94	^	↑, shift N
5F	95	_	←, shift O, underscore
60	96	`	accent grave
61	97	a	
62	98	b	
63	99	c	
64	100	d	
65	101	e	
66	102	f	
67	103	g	

HEX Value	Decimal value	Character	Control/Alternate Eqv
68	104	h	
69	105	i	
6A	106	j	
6B	107	k	
6C	108	l	
6D	109	m	
6E	110	n	
6F	111	o	
70	112	p	
71	113	q	
72	114	r	
73	115	s	
74	116	t	
75	117	u	
76	118	v	
77	119	w	
78	120	x	
79	121	y	
7A	122	z	
7B	123	{	
7C	124	|	vertical slash
7D	125	}	alt mode
7	126	~	(alt mode)
7F	127	DEL	delete,rubout

Reserved Codes

Metrologic has reserved the codes on the following pages for features that will be added at a later date. Do not assign a function for any of the reserved codes.


R 6 1


R 6 2


R 6 3


R 6 8


R 6 9


R 7 4


R 8 3


R 8 4


R 8 8


R 8 9


R 9 6


R 9 7


R 9 8


R A 7


R A 8


R A 9


R A A


R A D


R A E


R A R


R A S


R B K


R B L


R B Q


R B R


R B S


R B T


R B W


R B X


R B Y


R B Z


R C 6


R C 7


R C 8


R C 9


R C A


R C B


R C C


R C D


R C E


R C F


R C G


R C H


R C I


R C J


R C K


R C L


R C M


R C N


R C O


R C P


R C Q


R C R


R C S


R C T


R C U


R C V


R C W


R C X


R C Y


R C Z


R D 0


R D 1


R D 2


R D 3


R D 4


R D 5


R D 6


R D 7


R D K


R D 9


R D A


R D B


R D C


R D D


R D E


R D F


R D G


R D H


R D I


R D J


R D W


R D L


R D M


R D N


R D O


R D P


R D Q


R D R


R D S


R D T


R D U


R D V


R D X


R D Y


R D Z

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