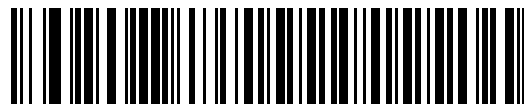


Chapter 9 IBM Interface

Introduction

This chapter provides instructions for programming the cradle to interface with an IBM 468X/469X host computer. Throughout the programming bar code menus, default values are indicated with asterisks (*).



* Indicates Default — ***Disable Convert to Code 39** — Feature/Option

Connecting to an IBM 468X/469X Host

- ✓ **NOTE** See [Chapter 4, Radio Communications](#) for information about digital scanner/cradle pairing and wireless communication

The digital scanner must be connected to the cradle for the host parameter setting to take effect. When the digital scanner is not connected to a cradle, and a host parameter bar code is scanned, a long low/long high beep sequence sounds.

This connection is made directly from the cradle to the host interface.

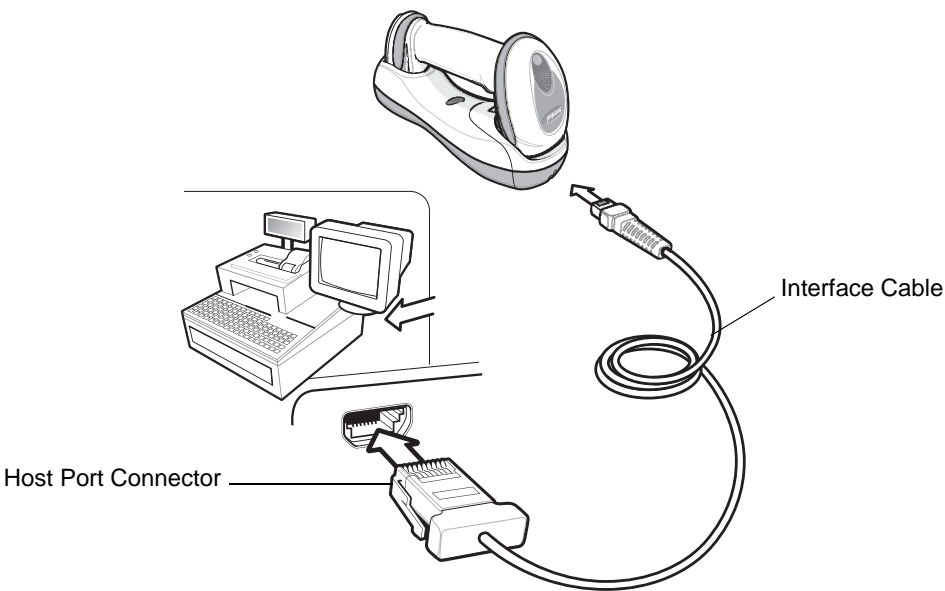


Figure 9-1 IBM Direct Connection

To connect the IBM 46XX interface:

1. Attach the modular connector of the IBM 46XX interface cable to the host port on the bottom of the digital scanner cradle (see *Connecting the Cables to the Cradle* on page 1-6).
2. Connect the other end of the IBM 46XX interface cable to the appropriate port on the host (typically Port 9).
3. Select the port address by scanning the appropriate bar code from *Port Address* on page 9-4.
4. To modify any other parameter options, scan the appropriate bar codes in this chapter.

- ✓ **NOTE** Interface cables vary depending on configuration. The connectors illustrated in [Figure 9-1](#) are examples only. The connectors may be different than those illustrated, but the steps to connect the cradle remain the same.

If a power supply is used, disconnect the power supply before changing host cables or the cradle may not recognize the new host.

The only required configuration is the port number. Other digital scanner parameters are typically controlled by the IBM system.

IBM Parameter Defaults

Table 9-1 lists the defaults for IBM host parameters. To change any option, scan the appropriate bar code(s) provided in the Parameter Descriptions section beginning on [page 9-4](#).

✓ **NOTE** See [Appendix A, Standard Default Parameters](#) for all user preferences, hosts, symbologies, and miscellaneous default parameters.

Table 9-1 *IBM Host Default Table*

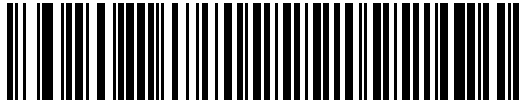
Parameter	Default	Page Number
IBM 468X/469X Host Parameters		
Port Address	None Selected	9-4
Convert Unknown to Code 39	Disable	9-5
Ignore Beep	Disable	9-5
Ignore Bar Code Configuration	Disable	9-6

IBM 468X/469X Host Parameters

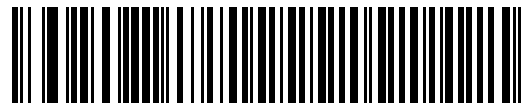
Port Address

This parameter sets the IBM 468X/469X port used.

✓ **NOTE** Scanning one of these bar codes enables the RS-485 interface on the digital scanner.



* None Selected



Hand-held Scanner Emulation (Port 9B)¹



Non-IBM Scanner Emulation (Port 5B)

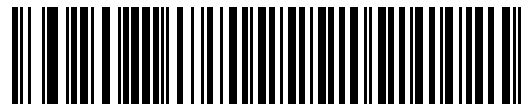


Table-top Scanner Emulation (Port 17)

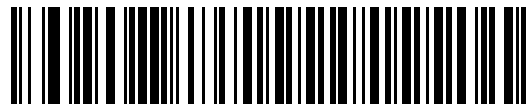
✓ **NOTE** ¹User selection is required to configure this interface and this is the most common selection.

Convert Unknown to Code 39

Scan a bar code below to enable or disable the conversion of unknown bar code type data to Code 39.



Enable Convert Unknown to Code 39



***Disable Convert Unknown to Code 39**

Optional IBM Parameters

If you configure the digital scanner and find the settings were not saved, or changed, when the system is restarted scan the bar codes that follow to override IBM interface defaults.

Scan a bar code below after setting defaults and before configuring the digital scanner.

Ignore Beep

The host can send a beep request to the digital scanner. When this parameter is enabled, the request is not sent to the attached digital scanner. All directives are still acknowledged to the IBM RS485 host as if it were processed.



***Disable**



Enable

Ignore Bar Code Configuration

The host has the ability to enable/disable code types. When this parameter is enabled, the request is not sent to the attached digital scanner. All directives are still acknowledged to the IBM RS485 host as if it were processed.



***Disable**



Enable

Chapter 10 Wand Emulation Interface

Introduction

This chapter provides instructions for programming the cradle to interface with a wand emulation host. This mode is used whenever wand emulation communication is needed. The digital scanner cradle connects either to an external wand decoder or to a decoder integrated in a portable terminal or Point-of-Sale (POS) terminal.

In this mode the digital scanner emulates the signal of a digital wand to make it “readable” by a wand decoder.

Throughout the programming bar code menus, default values are indicated with asterisks (*).



* Indicates Default — ***Transmit Unknown Characters** — Feature/Option

Connecting Using Wand Emulation

- ✓ **NOTE** See [Chapter 4, Radio Communications](#) for information about digital scanner/cradle pairing and wireless communication

The digital scanner must be connected to the cradle for the host parameter setting to take effect. When the digital scanner is not connected to a cradle, and a host parameter bar code is scanned, a long low/long high beep sequence sounds.

To perform Wand Emulation, connect the cradle to a portable data terminal, or a controller which collects the wand data and interprets it for the host.

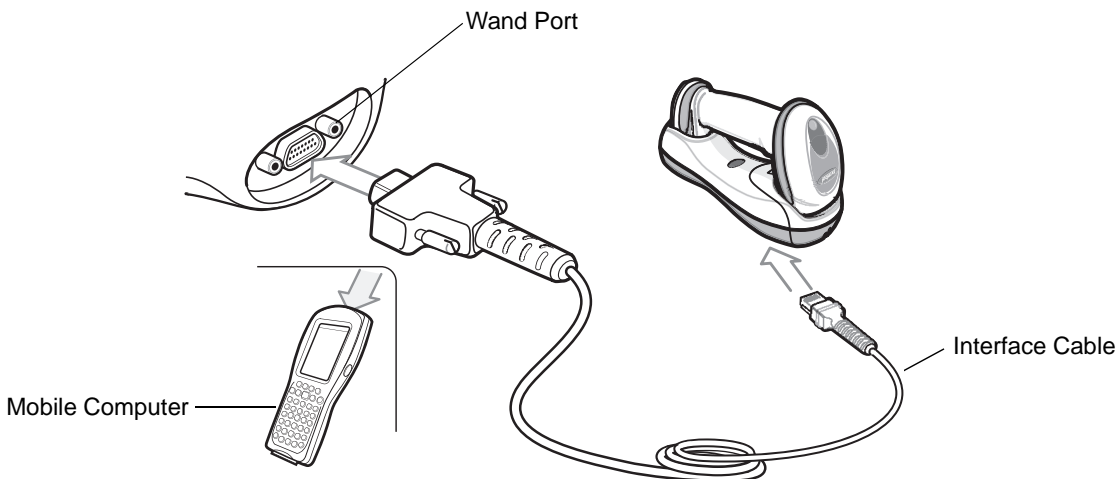


Figure 10-1 Wand Emulation Connection

To connect the Wand Emulation interface:

1. Attach the modular connector of the Wand Emulation interface cable to the host port on the bottom of the digital scanner cradle (see *Connecting the Cradle on page 1-6*).
2. Connect the other end of the Wand Emulation interface cable to the wand port on the mobile computer or controller.
3. Select the Wand Emulation host type by scanning the appropriate bar code from *Wand Emulation Host Types on page 10-4*.
4. To modify any other parameter options, scan the appropriate bar codes in this chapter.

- ✓ **NOTE** Interface cables vary depending on configuration. The connectors illustrated in [Figure 10-1](#) are examples only. The connectors may be different than those illustrated, but the steps to connect the cradle remain the same.

If a power supply is used, disconnect the power supply before changing host cables or the cradle may not recognize the new host.



CAUTION Connect the cradle to a 5 volt decoder only. Connecting the cradle to a 12 volt decoder can damage the digital scanner and invalidate the warranty.

Wand Emulation Parameter Defaults

Table 10-1 lists the defaults for Wand Emulation host types. To change any option, scan the appropriate bar code(s) provided in Wand Emulation Host Parameters beginning on page 10-4.

✓ **NOTE** See Appendix A, Standard Default Parameters for all user preferences, hosts, symbologies, and miscellaneous default parameters.

Table 10-1 Wand Emulation Default Table

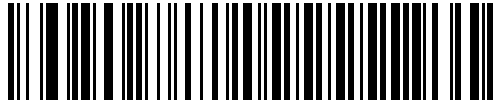
Parameter	Default	Page Number
Wand Emulation Host Parameters		
Wand Emulation Host Types	Symbol OmniLink Interface Controller ¹	10-4
Leading Margin	80 msec	10-5
Polarity	Bar High/Margin Low	10-6
Ignore Unknown Characters	Send	10-6
Convert All Bar Codes to Code 39	Disable	10-7
Convert Code 39 to Full ASCII	Disable	10-8

¹User selection is required to configure this interface and this is the most common selection.

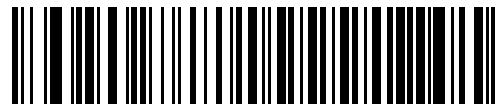
Wand Emulation Host Parameters

Wand Emulation Host Types

Select a Wand Emulation host by scanning one of the bar codes below.



Symbol OmniLink Interface Controller¹



Symbol PDT Terminal (MSI)



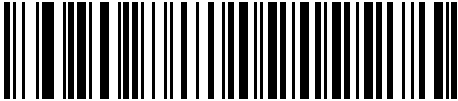
Symbol PTC Terminal (Telxon)

✓ **NOTE** ¹User selection is required to configure this interface and this is the most common selection.

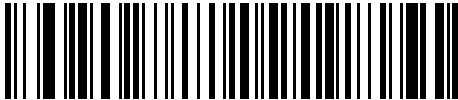
Leading Margin (Quiet Zone)

Scan a bar code below to select a leading margin duration. A leading margin is the time that precedes the first bar of the scan, (in milliseconds). The minimum allowed value is 80 msec and the maximum is 250 msec. This parameter accommodates older wand decoders which cannot handle short leading margins.

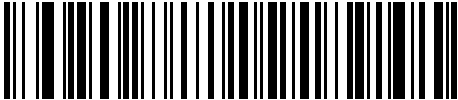
✓ **NOTE** 250 msec is the maximum value that this parameter can attain, however, 200 msec is sufficient.



*80 msec



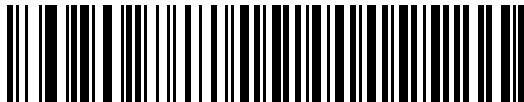
140 msec



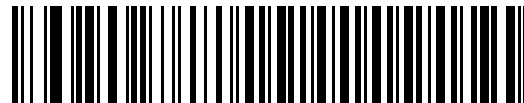
200 msec

Polarity

Scan a bar code below to select the polarity required by the decoder. Polarity determines how the cradle's Wand Emulation interface creates the Digitized Bar code Pattern (DBP). DBP is a digital signal that represents the scanned bar code. Different decoders expect the DBP to be in a certain format. The DBP either has the "highs" represent bars and the "lows" represent spaces (margins), or the "highs" represent spaces (margins) and the "lows" represent bars.



***Bar High/Margin Low**



Bar Low/Margin High

Ignore Unknown Characters

Unknown characters are characters the host does not recognize. When **Send Bar Codes With Unknown Characters** is selected, all bar code data is sent except for unknown characters, and no error beeps sound on the digital scanner. When **Do Not Send Bar Codes With Unknown Characters** is selected, bar codes containing at least one unknown character are not sent to the host, and the digital scanner emits an error beep.



***Send Bar Codes With Unknown Characters**



Do Not Send Bar Codes With Unknown Characters

Convert All Bar Codes to Code 39

By default, the Wand Emulation interface sends data to the attached host in the same symbology that was decoded. This can be a problem for customers with older systems that do not recognize newer symbologies (for example, GS1 DataBar).

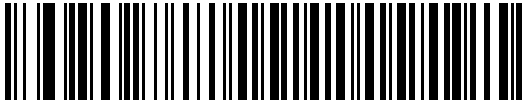
Enabling this parameter ignores the original symbology decoded, and outputs the data as if it were a Code 39 bar code. Any lowercase characters in the original data stream are transmitted as uppercase characters. This also allows ADF rules.

If **Ignore Unknown Characters** is enabled, any characters that do not have a corresponding character in the Code 39 symbology set are replaced by a space.

If **Ignore Unknown Characters** is disabled, if any characters that do not have a corresponding character are encountered, the digital scanner emits an error beep and no data is transmitted.



NOTE ADF Note: By default, the Wand Emulation interface does not allow scanned data to be processed by ADF rules. Enabling this parameter has the side effect of allowing the scanned data to be processed by the ADF rules (see [Chapter 15, Advanced Data Formatting](#)).



Enable Convert to Code 39 for Wand Host

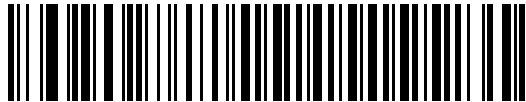


*Disable Convert to Code 39 for Wand Host

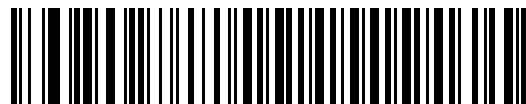
Convert Code 39 to Full ASCII

By default, any characters that do not have a corresponding character in the Code 39 symbology set are replaced by a space. If this parameter is enabled, the data sent to the wand interface is encoded in Code 39 Full ASCII. This setting requires that the host be able to interpret Code 39 Full ASCII data.

This setting applies only if **Convert to Code 39** is also enabled.



***Disable Code 39 Full ASCII Conversion**



Enable Code 39 Full ASCII Conversion

Chapter 11 Scanner Emulation Interface

This chapter provides instructions for programming the cradle to interface with a digital scanner emulation host. With digital scanner emulation, the cradle connects either to an external decoder or to a decoder integrated in a portable terminal or Point-of-Sale (POS) terminal.

Throughout the programming bar code menus, default values are indicated with asterisks (*).



* Indicates Default — ***Parameter Process and Pass-Through** — Feature/Option

Connecting Using Scanner Emulation

- ✓ **NOTE** See [Chapter 4, Radio Communications](#) for information about scanner/cradle pairing and wireless communication

The digital scanner must be connected to the cradle for the host parameter setting to take effect. When the digital scanner is not connected to a cradle, and a host parameter bar code is scanned, a long low/long high beep sequence sounds.

To perform Scanner Emulation, connect the cradle to a mobile computer, or a controller which collects the data and interprets it for the host.

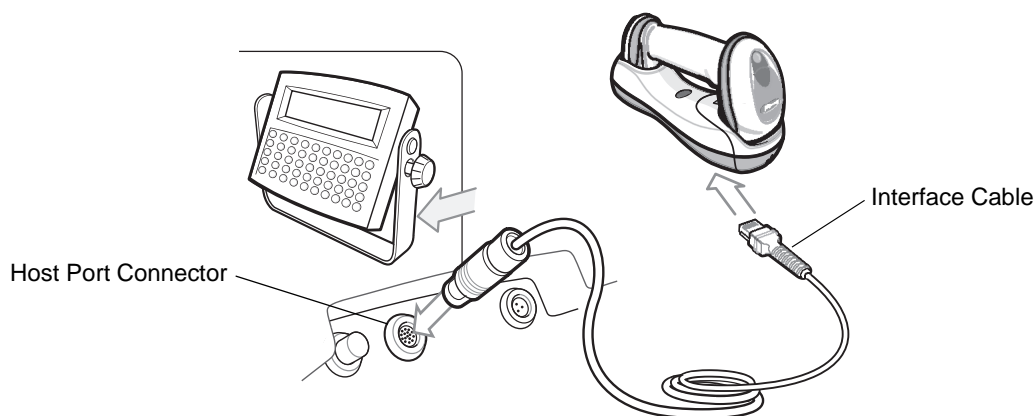


Figure 11-1 Scanner Emulation Connection

To connect the Scanner Emulation interface:

1. Attach the modular connector of the Scanner Emulation interface cable to the host port on the bottom of the digital scanner cradle (see *Connecting the Cables to the Cradle* on page 1-6).
2. Connect the other end of the Scanner Emulation interface cable to the digital scanner port on the mobile computer or controller.
3. Scan the Scanner Emulation host bar code from *Scanner Emulation Host* on page 11-3 to enable the Scanner Emulation host interface.
4. To modify any other parameter options, scan the appropriate bar codes in this chapter.

- ✓ **NOTE** Interface cables vary depending on configuration. The connectors illustrated in [Figure 11-1](#) are examples only. The connectors may be different than those illustrated, but the steps to connect the cradle remain the same.

If a power supply is used, disconnect the power supply before changing host cables or the cradle may not recognize the new host.



CAUTION Connect the cradle to a 5 volt decoder only. Connecting the cradle to a 12 volt decoder can damage the digital scanner and invalidate the warranty.

Scanner Emulation Parameter Defaults

[Table 11-1](#) lists the defaults for the Scanner Emulation host. To change any option, scan the appropriate bar code(s) provided in the Scanner Emulation Host Parameters section beginning on [page 11-4](#).

✓ **NOTE** See [Appendix A, Standard Default Parameters](#) for all user preferences, hosts, symbologies, and miscellaneous default parameters.

Table 11-1 Scanner Emulation Default Table

Parameter	Default	Page Number
Beep Style	Beep on Successful Transmit	11-4
Parameter Pass-Through	Parameter Process and Pass Through	11-5
Convert Newer Code Types	Convert Newer Code Types	11-6
Module Width	20 μ s	11-6
Convert All Bar Codes to Code 39	Do Not Convert Bar Codes to Code 39	11-7
Code 39 Full ASCII Conversion	Disable	11-7
Transmission Timeout	3 sec	11-8
Ignore Unknown Characters	Ignore Unknown Characters	11-9
Leading Margin	2 ms	11-9
Check for Decode LED	Check for Decode LED	11-10

¹User selection is required to configure this interface and this is the most common selection.

Scanner Emulation Host

Scan the bar code below to enable the Scanner Emulation host.



Undecoded Scanner Emulation Host

Scanner Emulation Host Parameters

Beep Style

The Scanner Emulation host supports three beep styles.

- **Beep On Successful Transmit:** The digital scanner beeps when the attached decoder issues the decode signal to the digital scanner, so the digital scanner and the attached decoder beep at the same time.
- **Beep At Decode Time:** The digital scanner beeps upon decode. This results in a double beep sequence from most decoders, since the digital scanner beeps, and the decoder beeps (at a different frequency) when it successfully decodes the output.
- **Do Not Beep:** Only the attached decoder issues the decode beep.



***Beep On Successful Transmit**



Beep At Decode Time



Do Not Beep

Parameter Pass-Through

The Scanner Emulation host can process parameter bar code messages and send them to the attached decoder. In this way, customers using Symbol compliant decoders can control the behavior of the entire system by scanning the necessary parameters only once.

For example, to enable D 2 of 5, scan the **D 2 of 5 Enable** parameter bar code. The digital scanner and the attached decoder both process the parameter.



*Parameter Process and Pass-Through



Parameter Process Only

Convert Newer Code Types

The digital scanner supports a variety of code types that are not decodable by attached decoder systems. To allow compatibility in these environments, the digital scanner converts these code types to more commonly decodable symbologies, as per the following chart. Symbologies not listed on this chart are transmitted normally.

Scan this code type:	Transmitted as:
Code 11	Code 39
Chinese 2 of 5	Code 39
GS1 DataBar (14, Limited, and Expanded)	Code 128
Coupon Code	Code 128

When decoding these code types with this parameter disabled, the digital scanner issues Convert Error beeps and transmits no data.



***Convert Newer Code Types**



Reject Newer Code Types

Module Width

The standard module width is 20 μ s. For an extremely slow decoder system, select **50 μ s Module Width**.



***20 μ s Module Width**



50 μ s Module Width

Convert All Bar Codes to Code 39

Scan the bar code below to enable or disable the conversion of all bar code data to Code 39.



***Do Not Convert Bar Codes To Code 39**



Convert All To Code 39

Code 39 Full ASCII Conversion

By default, any characters that do not have a corresponding character in the Code 39 symbology set are replaced by a space. If this parameter is enabled, the data sent to the Scanner Emulation host is encoded in Code 39 Full ASCII. The host must be able to interpret Code 39 Full ASCII data. This setting applies only if **Convert to Code 39** is also enabled.



***Disable Convert Code 39 To Full ASCII**



Enable Convert Code 39 To Full ASCII

Transmission Timeout

The Scanner Emulation host transmits bar code data to the attached decoder and waits for the decoder to assert the Decode signal, indicating successful transmission. If, after a specified amount of time, the Decode signal is not asserted (indicating that the attached decoder has not successfully received the bar code data), the digital scanner issues transmit error beeps.

Scan a bar code below to select the desired transmission timeout.



***3 Second Transmission Timeout**



4 Second Transmission Timeout



5 Second Transmission Timeout



10 Second Transmission Timeout



30 Second Transmission Timeout

Ignore Unknown Characters

Unknown characters are characters the decoder does not recognize. When **Ignore Unknown Characters** is selected, all bar code data is sent except for unknown characters, and no error beeps sound. When **Convert Error on Unknown Characters** is selected, bar codes containing at least one unknown character are not sent to the decoder, and a convert error beep sounds.



***Ignore Unknown Characters**



Convert Error On Unknown Characters

Leading Margin

Scan a bar code below to select a leading margin duration.



1 ms Leading Margin



***2 ms Leading Margin**



3 ms Leading Margin

Leading Margin (continued)



5 ms Leading Margin



10 ms Leading Margin

Check For Decode LED

The attached decoder normally asserts the Decode line to signal to the Scanner Emulation host that it successfully decoded the transmitted bar code. Some decoders, however, do not assert the Decode signal. In this case, the digital scanner emits transmit error beeps to indicate that the bar code was not successfully transmitted. Scan the **Ignore Decode LED** bar code to disable the Transmit Error beeps.



*Check For Decode LED



Ignore Decode LED

Chapter 12 123Scan2

Introduction

123Scan² is an easy-to-use, PC-based software tool that enables rapid and easy customized setup of Symbol scanners by Motorola.

123Scan² uses a wizard tool to guide users through a streamlined set up process. Settings are saved in a configuration file that can be distributed via e-mail, electronically downloaded via a USB cable, or used to generate a sheet of scannable programming bar codes.

Additionally 123Scan² can upgrade scanner firmware, check online to enable support for newly released products, generate a collection of multi-setting bar codes if the number of settings is very large, stage large number of scanners simultaneously, generate reports with asset tracking information and create custom products.

Communication with 123Scan²

To communicate with the 123Scan² program which runs on a host computer running a Windows XP SP2 or Windows Vista operating system, use a USB cable to connect the scanner cradle to the host computer (see *USB Connection on page 6-2*).

123Scan² Requirements

- Host computer with Windows XP SP2 or Windows Vista
- Scanner
- Cradle
- USB cable.

For more information on 123Scan², go to:

<http://www.motorola.com/123Scan2>

To download 123Scan² software and access the Help file integrated in the utility, go to:

<http://support.symbol.com/support/product/123Scan2.html>

Chapter 13 OCR Programming

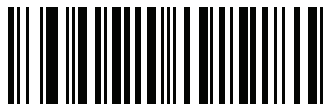
Introduction

This chapter describes how to set up the digital scanner for OCR programming. The digital scanner can read 6 to 60 point OCR typeface. It supports font types OCR-A, OCR-B, MICR-E13B, and US Currency Serial Number.

OCR is not as secure as a bar code. To decrease OCR misdecodes and speed OCR reading, set an accurate OCR template and character subset, and use a check digit.

All OCR fonts are disabled by default. Enabling OCR can slow bar code decoding. Enabling more than one OCR font could also slow OCR decoding and impact OCR decoding accuracy.

Throughout the programming bar code menus, asterisks (*) indicate default values.



* Indicates Default — *Disable OCR-A — Feature/Option



NOTE Most computer monitors allow scanning the bar codes directly on the screen. When scanning from the screen, be sure to set the document magnification to a level where you can see the bar code clearly, and bars and/or spaces are not merging.

OCR Parameter Defaults

[Table 13-1](#) lists the defaults for OCR parameters. To change any option, scan the appropriate bar code(s) provided in the Parameter Descriptions section beginning on [page 13-3](#).

✓ **NOTE** See [Appendix A, Standard Default Parameters](#) for all user preferences, hosts, symbologies, and miscellaneous default parameters.

Table 13-1 OCR Programming Default Table

Parameter	Parameter Number	Default	Page Number
OCR Programming Parameters			
OCR-A	F1h A8h	Disable	13-3
OCR-A Variant	F1h ACh	Full ASCII	13-3
OCR-B	F1h A9h	Disable	13-5
OCR-B Variant	F1h ADh	Full ASCII	13-6
MICR E13B	F1h AAh	Disable	13-9
US Currency	F1h ABh	Disable	13-10
OCR Orientation	F1h AFh	0°	13-10
OCR Lines	F1h B3h	1	13-12
OCR Minimum Characters	F1h B1h	3	13-12
OCR Maximum Characters	F1h B2h	100	13-13
OCR Security Level	F1h 2Ah	80	13-13
OCR Subset	F1h AEh	Selected font variant	13-14
OCR Quiet Zone	F1h B7h	50	13-14
OCR Bright Illumination	F1h BDh	Disable	13-15
OCR Template	F1h 23h	54R	13-16
OCR Check Digit Modulus	F1h B0h	1	13-25
OCR Check Digit Multiplier	F1h BCh	121212121212	13-26
OCR Check Digit Validation	F1h B6h	None	13-27

OCR Programming Parameters

Enable/Disable OCR-A

Parameter # F1h A8h

To enable or disable OCR-A, scan one of the following bar codes.



Enable OCR-A



*Disable OCR-A

OCR-A Variant

Parameter # F1 ACh

Font variant sets a processing algorithm and default character subset for the given font. To choose a variant, scan one of the following bar codes. Selecting the most appropriate font variant optimizes performance and accuracy.

OCR-A supports the following variants:

- OCR-A Full ASCII
!"#\$()*+,-./0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ^
- OCR-A Reserved 1
\$*+-. /0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZ
- OCR-A Reserved 2
\$*+-. /0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ
- OCR-A Banking
-0123456789<> Ψ ϣ ϣ

Special banking characters output as the following representative characters:

Ψ outputs as f

ϣ outputs as c

ϣ outputs as h

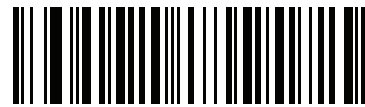


NOTE Enable OCR-A before setting this parameter. If disabling OCR-A, set the variant to its default (OCR-A Full ASCII).

OCR-A Variant (continued)



***OCR-A Full ASCII
(00h)**



**OCR-A Reserved 1
(01h)**



**OCR-A Reserved 2
(02h)**



**OCR-A Banking
(03h)**

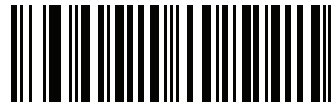
Enable/Disable OCR-B

Parameter # F1h A9h

To enable or disable OCR-B, scan one of the following bar codes.



Enable OCR-B



***Disable OCR-B**

OCR-B Variant

Parameter # F1 ADh

OCR-B has the following variants. Selecting the most appropriate font variant affects performance and accuracy.

- OCR-B Full ASCII
!#\$%()*+,-./0123456789<>ABCDEFGHIJKLMNOPQRSTUVWXYZ^_`~
- OCR-B Banking
#+-0123456789<>JNP|
- OCR-B Limited
+,-./0123456789<>ACENPSTVX
- OCR-B Travel Document Version 1 (TD1) 3-Line ID Cards
-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZ
- OCR-B Passport
-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZÑ
- OCR-B ISBN 10-Digit Book Numbers
-0123456789>BCEINPSXz
- OCR-B ISBN 10 or 13-Digit Book Numbers
-0123456789>BCEINPSXz
- OCR-B Travel Document Version 2 (TD2) 2-Line ID Cards
-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZ
- OCR-B Visa Type A
-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZ
- OCR-B Visa Type B
-0123456789<ABCDEFGHIJKLMNOPQRSTUVWXYZÑ

To choose a variant, scan one of the following bar codes. Selecting the following OCR-B variants automatically sets the appropriate *OCR Lines on page 13-12*. These five variants invoke extensive special algorithms and checking for that particular document type:

Variant	OCR Lines Setting
Passport	2
TD1 ID Cards	3
TD2 ID Cards	2
Visa Type A	2
Visa Type B	2

Selecting one of the ISBN Book Numbers automatically applies the appropriate ISBN checksum, so you do not need to set this.

For the best performance in passport reading, fix the target passport and the imaging engine in place (6.5 - 7.5”).



NOTE Enable OCR-B before setting this parameter. If disabling OCR-B, set the variant to its default (OCR-B Full ASCII).

OCR-B Variant (continued)



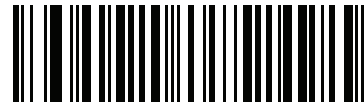
***OCR-B Full ASCII
(00h)**



**OCR-B Banking
(01h)**



**OCR-B Limited
(02h)**



**OCR-B Travel Document Version 1 (TD1)
3 Line ID Cards
(03h)**



**OCR-B Passport
(04h)**

OCR-B Variant (continued)



OCR-B ISBN 10-Digit Book Numbers
(06h)



OCR-B ISBN 10 or 13-Digit Book Numbers
(07h)



OCR-B Travel Document Version 2 (TD2)
2-Line ID Cards
(08h)



OCR-B Visa Type A
(09h)



OCR-B Visa Type B
(0Ah)

Enable/Disable MICR E13B

Parameter # F1h AAh

To enable or disable MICR E13B, scan one of the following bar codes.

MICR E 13B uses the following characters:

0 1 2 3 4 5 6 7 8 9 | : ; ' | " | ' | "

TOAD characters (Transit, On Us, Amount, and Dash) output as the following representative characters:

| : outputs as t

| ' outputs as a

| " outputs as o

| " outputs as d



Enable MICR E13B



***Disable MICR E13B**

Enable/Disable US Currency Serial Number

Parameter # F1 ABh

To enable or disable US Currency Serial Number, scan one of the following bar codes.



Enable US Currency



***Disable US Currency**

OCR Orientation

Parameter # F1 AFh

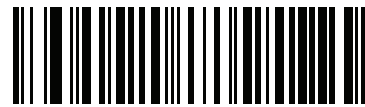
Select one of five options to specify the orientation of an OCR string to be read:

- 0° to the imaging engine (default)
- 270° clockwise (or 90° counterclockwise) to the imaging engine
- 180° (upside down) to the imaging engine
- 90° clockwise to the imaging engine
- Omnidirectional

Setting an incorrect orientation can cause misdecodes.

OCR Orientation (continued)

***OCR Orientation 0°
(00h)**



**OCR Orientation 270° Clockwise
(01h)**



**OCR Orientation 180° Clockwise
(02h)**



**OCR Orientation 90° Clockwise
(03h)**

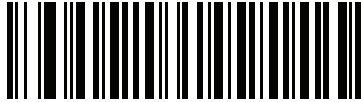


**OCR Orientation Omnidirectional
(04h)**

OCR Lines

Parameter # F1 B3h

To select the number of OCR lines to decode, scan one of the following bar codes. Selecting Visas, Passport, TD1, or TD2 ID cards automatically sets the appropriate **OCR Lines**. Also see *OCR-B Variant* on page 13-6.



***OCR 1 Line
(001h)**



**OCR 2 Lines
(002h)**



**OCR 3 Lines
(003h)**

OCR Minimum Characters

Parameter # F1 B1h

To select the minimum number of OCR characters (not including spaces) per line to decode, scan the following bar code, then scan a three-digit number between 003 and 100 using the numeric keypad in [Chapter 15, Advanced Data Formatting](#) representing the number of OCR characters to decode. Strings of OCR characters less than the minimum are ignored. The default is 003.



OCR Minimum Characters

OCR Maximum Characters

Parameter # F1 B2h

To select the maximum number of OCR characters (including spaces) per line to decode, scan the following bar code, then scan a three-digit number between 003 and 100 using the numeric keypad in [Chapter 15, Advanced Data Formatting](#) represents the number of OCR characters to decode. Strings of OCR characters greater than the maximum are ignored. The default is 100.



OCR Maximum Characters

OCR Security Level

Parameter # F1 2Ah

To select the OCR decoding security/confidence level, scan the following bar code, then scan a two-digit number using the numeric keypad in [Chapter 15, Advanced Data Formatting](#) represents the level of confidence. Greater numbers minimize OCR decoding errors but reduce performance. Setting a value that is too high can result in failure to decode. Setting a value that is too low can cause decoding errors. The range of the security level is 10 - 90 and the default is 80.



OCR Security Level

OCR Subset

Parameter # F1 AEh

Set an OCR subset to define a custom group of characters in place of a preset font variant. For example, if scanning only numbers and the letters A, B, and C, create a subset of just these characters to speed decoding. This applies a designated OCR Subset across all enabled OCR fonts.

To set or modify the OCR font subset, first enable the appropriate OCR font(s). Next, scan the following bar code, then scan numbers and letters to form the OCR Subset from the alphanumeric keyboard in [Chapter 15, Advanced Data Formatting](#). Then scan **End of Message** in [Chapter 15, Advanced Data Formatting](#).



OCR Subset

To cancel an OCR subset, for OCR-A or OCR-B, scan OCR-A variant **Full ASCII**, or OCR-B variant **Full ASCII**.

For MICR E13B or US Currency Serial Number, create a subset which includes all allowed characters in that character set, or scan an option from the *Default Parameters on page 5-4* and re-program the digital scanner.

OCR Quiet Zone

Parameter # F1h B7h

This option sets the OCR quiet zone. The digital scanner stops scanning a field when it detects a sufficiently wide blank space. The width of this space is defined by the End of Field option. Used with parsers that tolerate slanted characters, the End of Field count is roughly a count of 8 for a character width. For example if set to 15, then two character widths are an end of line indicator for the parser. Larger end of field numbers require bigger quiet zones at each end of text line.

To set a quiet zone, scan the following bar code, then scan a two-digit number using the numeric keypad in [Chapter 15, Advanced Data Formatting](#). The range of the quiet zone is 20 - 99 and the default is 50, indicating a six character width quiet zone.



OCR Quiet Zone

OCR Bright Illumination

Parameter # F1h BDh

When enabled, image contrast is improved for OCR scanning. Motorola recommends enabling this when the OCR string is longer than 20 characters, and for applications with busy backgrounds such as passport, check, or VISA reading.



Enable OCR Bright Illumination



***Disable OCR Bright Illumination**



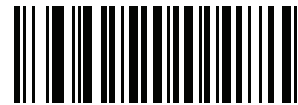
NOTE Enabling **OCR Bright Illumination** causes the aiming pattern to blink due to the lower frame rate setting.

OCR Template

Parameter # F1 23h

This option creates a template for precisely matching scanned OCR characters to a desired input format. Carefully constructing an OCR template eliminates scanning errors.

To set or modify the OCR decode template, scan the [OCR Template](#) bar code, then bar codes corresponding to numbers and letters on the following pages to form the template expression. Then scan **End of Message** in [Chapter 15, Advanced Data Formatting](#). The default is **54R** which accepts any character OCR strings.



OCR Template



End of Message

Required Digit (9)



9

Only a numeric character is allowed in this position.

Template	Valid data	Valid data	Invalid data
99999	12987	30517	123AB

Required Alpha (A)



A

Only an alpha character is allowed in this position.

Template	Valid data	Valid data	Invalid data
AAA	ABC	WXY	12F

Optional Alphanumeric (1)

1

When this option appears in the template string, the data validator accepts an alphanumeric character if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Valid data	Invalid data
99991	1234A	12345	1234<

Optional Alpha (2)

2

When this option appears in the template string, the data validator accepts an alpha character if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Valid data	Invalid data
AAAA2	ABCDE	WXYZ	ABCD6

Alpha or Digit (3)

3

The data validator requires an alphanumeric character in this position to validate the incoming data.

Template	Valid data	Valid data	Invalid data
33333	12ABC	WXY34	12AB<

Any Including Space & Reject (4)

4

The template accepts any character in this position, including space and reject. Rejects are represented as an underscore (_) in the output. This is a good selection for troubleshooting.

Template	Valid data	Valid data
99499	12\$34	34_98

Any except Space & Reject (5)

5

The template accepts any character in this position except a space or reject.

Template	Valid data	Valid data	Invalid data
55999	A.123	*Z456	A BCD

Optional Digit (7)

7

When this option appears in the template string, the template accepts a numeric character if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Valid data	Invalid data
99977	12345	789	789AB

Digit or Fill (8)**8**

The data validator accepts any numeric or fill character in this position.

Template	Valid data	Valid data	Invalid data
88899	12345	>>789	<<789

Alpha or Fill (F)**F**

The data validator accepts any alpha or fill character in this position.

Template	Valid data	Valid data	Invalid data
AAAFF	ABCXY	LMN>>	ABC<5

Required Space ()**Space**

When this option appears in the template string, the template accepts a space if present. Optional characters are not allowed as the first character(s) in a field of like characters.

Template	Valid data	Invalid data
99 99	12 34	67891

Optional Small Special (.)



.

When this option appears in the template string, the data validator accepts a special character if present. Optional characters are not allowed as the first character(s) in a field of like characters. Small special characters are - , and .

Template	Valid data	Valid data	Invalid data
AA.99	MN.35	XY98	XYZ12

Other Template Operators

These template operators assist in capturing, delimiting, and formatting scanned OCR data.

Literal String (" and +)



"



+

Use either of these delimiting characters surrounding characters from the alphanumeric keyboard in [Chapter 15, Advanced Data Formatting](#) to define a literal string within a template that must be present in scanned OCR data. There are two characters used to delimit required literal strings; if one of the delimiter characters is present in the desired literal string, use the other delimiter.

Template	Valid data	Invalid data
"35+BC"	35+BC	AB+22

New Line (E)**E**

To create a template of multiple lines, add **E** between the template of each single line.

Template	Valid data	Valid data	Invalid data
999EAAAA	321	987	XYZW
	BCAD	ZXYW	12

String Extract (C)**C**

This operator combined with others defines a string of characters to extract from the scanned data. The string extract is structured as follows:

CbPe

Where:

- C is the string extract operator
- b is the string begin delimiter
- P is the category (one or more numeric or alpha characters) describing the string representation
- e is the string end delimiter

Values for b and e can be any scannable character. They are included in the output stream.

Template	Incoming data	Output
C>A>	XQ3>ABCDE>	>ABCDE>
	->ATHRUZ>123	>ATHRUZ>
	1ABCXYZ	No Output

Ignore to End of Field (D)**D**

This operator causes all characters after a template to be ignored. Use this as the last character in a template expression. Examples for the template 999D:

Template	Incoming data	Output
999D	123 - PED	123
	357298	357
	193	193

Skip Until (P1)**P****1**

This operator allows skipping over characters until a specific character type or a literal string is detected. It can be used in two ways:

P1ct

Where:

- P1 is the Skip Until operator
- c is the type of character that triggers the start of output
- t is one or more template characters

P1"s"t

Where:

- P1 is the Skip Until operator
- "s" is one or more literal string characters (see *Literal String (" and +)* on page 13-20) that trigger the start of output
- t is one or more template characters

The trigger character or literal string is included in output from a Skip Until operator, and the first character in the template should accommodate this trigger.

Template	Incoming data	Output
P1 "PN"AA999	123PN9876	PN9876
	PN1234	PN1234
	X-PN3592	PN3592

Skip Until Not (P0)



P



0

This operator allows skipping over characters until a specific character type or a literal string is not matched in the output stream. It can be used in two ways:

P0ct

Where:

- P0 is the Skip Until Not operator
- c is the type of character that triggers the start of output
- t is one or more template characters

P0"s"t

Where:

- P0 is the Skip Until Not operator
- "s" is one or more literal string characters (see *Literal String (" and +)* on page 13-20) that trigger the start of output
- t is one or more template characters

The trigger character or literal string is not included in output from a Skip Until Not operator.

Template	Incoming data	Output
P0A9999	BPN3456	3456
	PN1234	PN1234
	5341	5341

Template	Incoming data	Output
P0"PN"9999	PN3456	3456
	5341	5341
	PNPN7654	7654

Repeat Previous (R)



R

This operator allows a template character to repeat one or more times, allowing the capture of variable-length scanned data. The following examples capture two required alpha characters followed by one or more required digits:

Template	Incoming data	Output
AA9R	AB3	AB3
	PN12345	PN12345
	32RM52700	No output

Scroll Until Match (S)



S

This operator steps through scanned data one character at a time until the data matches the template.

Template	Incoming data	Output
S99999	AB3	No Output
	PN12345	12345
	32RM52700	52700

Template Examples

Following are sample templates with descriptions of valid data for each definition.

Field Definition	Description
"M"99977	M followed by three digits and two optional digits.
"X"997777"X"	X followed by two digits, four optional digits, and an X .
9959775599	Two digits followed by any character, a digit, two optional digits, any two characters, and two digits.
A55"-"999"-"99	A letter followed by two characters, a dash, three digits, a dash, and two digits.
33A"."99	Two alphanumeric characters followed by a letter, a period, and two digits.
999992991	Five digits followed by an optional alpha, two digits, and an optional alphanumeric.
"PN98"	Literal field - PN98

OCR Check Digit Modulus

Parameter # F1h B0h

This option sets OCR module check digit calculation. The check digit is the last digit (in the rightmost position) in an OCR string and improves the accuracy of the collected data. The check digit is the end product of a calculation made on the incoming data. For check digit calculation, for example Modulus 10, alpha and numeric characters are assigned numeric weights (see *OCR Check Digit Multiplier on page 13-26*). The calculation is applied to the character weights and the resulting check digit is added to the end of the data. If the incoming data does not match the check digit, the data is considered corrupt.

The selected check digit option does not take effect until you set **OCR Check Digit Validation**.

To choose the Check Digit Modulus, such as 10 for modulo 10, scan the following bar code, then scan a three-digit number from 001 to 099 representing the check digit using the numeric keypad in [Chapter 15, Advanced Data Formatting](#). The default is 1.



OCR Check Digit

OCR Check Digit Multiplier

Parameter # F1h BCh

This option sets OCR check digit multipliers for the character positions. For check digit validation, each character in scanned data has an equivalent weight used in the check digit calculation. DS9808 OCR ships with the following weight equivalents:

0 = 0	A = 10	K = 20	U = 30
1 = 1	B = 11	L = 21	V = 31
2 = 2	C = 12	M = 22	W = 32
3 = 3	D = 13	N = 23	X = 33
4 = 4	E = 14	O = 24	Y = 34
5 = 5	F = 15	P = 25	Z = 35
6 = 6	G = 16	Q = 26	Space = 0
7 = 7	H = 17	R = 27	
8 = 8	I = 18	S = 28	
9 = 9	J = 19	T = 29	

All other characters are equivalent to one (1).

You can define the multiplier string if it is different from the default.

121212121212 (default)

123456789A (for ISBN, Product Add Right to Left. See *OCR Check Digit Validation on page 13-27*)

For example:

ISBN	0	2	0	1	1	8	3	9	9	4	
Multiplier	10	9	8	7	6	5	4	3	2	1	
Product	0	18	0	7	6	40	12	27	18	4	
Product add	0+	18+	0+	7+	6+	40+	12+	27+	18+	4=	132

ISBN uses modulo 11 for its check digit. In this case, 132 is divisible by 11, so it passes the check digit.

To set the check digit multiplier, scan the following bar code, then scan numbers and letters to form the multiplier string from the alphanumeric keyboard in [Chapter 15, Advanced Data Formatting](#). Then scan **End of Message** in the [Chapter 15, Advanced Data Formatting](#).



OCR Check Digit Multiplier

OCR Check Digit Validation

Parameter # F1h B6h

Use **OCR Check Digit Validation** to protect against scanning errors by applying a check digit validation scheme. The following is a list of options.

None

No check digit validation, indicating no check digit is applied. This is the default.



***No Check Digit
(00h)**

Product Add Left to Right

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 13-26*). Each digit representing a character in the scanned data is multiplied by its corresponding digit in the multiplier, and the sum of these products is computed. The check digit passes if this sum modulo Check Digit Modulus is zero.

Example:

Scanned data numeric value is 132456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	6
Multiplier	1	2	3	4	5	6
Product	1	6	6	16	25	36
Product add	1+	6+	6+	16+	25+	36= 90

The Check Digit Modulus is 10. It passes because 90 is divisible by 10 (the remainder is zero).



**Product Add Left to Right
(03h)**

Product Add Right to Left

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 13-26*). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of these products is computed. The check digit passes if this sum modulo Check Digit Modulus is zero.

Example:

Scanned data numeric value is 132459 (check digit is 9)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	9
Multiplier	6	5	4	3	2	1
Product	6	15	8	12	10	9
Product add	6+	15+	8+	12+	10+	9= 60

The Check Digit Modulus is 10. It passes because 60 is divisible by 10 (the remainder is 0).



**Product Add Right to Left
(01h)**

Digit Add Left to Right

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 13-26*). Each value representing a character in the scanned data is multiplied by its corresponding digit in the multiplier, resulting in a product for each character in the scanned data. The sum of each individual digit in all of the products is then calculated. The check digit passes if this sum modulo Check Digit Modulus is zero.

Example:

Scanned data numeric value is 132456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	6
Multiplier	1	2	3	4	5	6
Product	1	6	6	16	25	36
Digit add	1+	6+	6+	1+6+	2+5+	3+6= 36

The Check Digit Modulus is 12. It passes because 36 is divisible by 12 (the remainder is 0).



**Digit Add Left to Right
(04h)**

Digit Add Right to Left

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 13-26*). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of each individual digit in all of the products is then calculated. The check digit passes if this sum modulo Check Digit Modulus is zero.

Example:

Scanned data numeric value is 132456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	3	2	4	5	6
Multiplier	6	5	4	3	2	1
Product	6	15	8	12	10	6
Digit add	6+	1+5+	8+	1+2+	1+0+	6= 30

The Check Digit Modulus is 10. It passes because 30 is divisible by 10 (the remainder is 0).



**Digit Add Right to Left
(02h)**

Product Add Right to Left Simple Remainder

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 13-26*). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of these products **except for the check digit's product** is computed. The check digit passes if this sum modulo Check Digit Modulus is equal to the check digit's product.

Example:

Scanned data numeric value is 122456 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	2	2	4	5	6
Multiplier	6	5	4	3	2	1
Product	6	10	8	12	10	6
Product add	6+	10+	8+	12+	10=	46 6

The Check Digit Modulus is 10. It passes because 46 divided by 10 leaves a remainder of 6.



**Product Add Right to Left Simple Remainder
(05h)**

Digit Add Right To Left Simple Remainder

Each character in the scanned data is assigned a numeric value (see *OCR Check Digit Multiplier on page 13-26*). The check digit multiplier is reversed in order. Each value representing a character in the scanned data is multiplied by its corresponding digit in the reversed multiplier, resulting in a product for each character in the scanned data. The sum of each individual digit in all of the products **except for the check digit's product** is then calculated. The check digit passes if this sum modulo Check Digit Modulus is equal to the check digit's product.

Example:

Scanned data numeric value is 122459 (check digit is 6)

Check digit multiplier string is 123456

Digit	1	2	2	4	5	9
Multiplier	6	5	4	3	2	1
Product	6	10	8	12	10	9
Digit add	6+	1+0+	8+	1+2+	1+0=	19 9

The Check Digit Modulus is 10. It passes because 19 divided by 10 leaves a remainder of 9.



**Digit Add Right to Left Simple Remainder
(06h)**

Health Industry - HIBCC43

This is the health industry module 43 check digit standard.



**Health Industry - HIBCC43
(09h)**

Chapter 14 Symbologies

Introduction

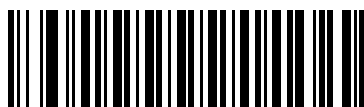
This chapter describes symbology features and provides programming bar codes for selecting these features. Before programming, follow the instructions in [Chapter 1, Getting Started](#).

To set feature values, scan a single bar code or a short bar code sequence. The settings are stored in non-volatile memory and are preserved even when the digital scanner powers down.

✓ **NOTE** Most computer monitors allow scanning the bar codes directly on the screen. When scanning from the screen, be sure to set the document magnification to a level where you can see the bar code clearly, and bars and/or spaces do not merge.

Select a host type (see each host chapter for specific host information) after the power-up beeps sound. This is only necessary upon the first power-up when connected to a new host.

To return all features to default values, scan the [Set Default Parameter on page 4-4](#). Throughout the programming bar code menus, asterisks (*) indicate default values.



* Indicates Default — *Enable UPC-A — Feature/Option
(01h) — Option Hex Value

Scanning Sequence Examples

In most cases, scanning one bar code sets the parameter value. For example, to transmit bar code data without the UPC-A check digit, simply scan the **Do Not Transmit UPC-A Check Digit** bar code under *Transmit UPC-A Check Digit on page 14-14*. The digital scanner issues a fast warble beep and the LED turns green, signifying a successful parameter entry.

Other parameters, such as **Set Length(s) for D 2 of 5** require scanning several bar codes. See the individual parameter, such as **Set Length(s) for D 2 of 5**, for this procedure.

Errors While Scanning

Unless otherwise specified, to correct an error during a scanning sequence, just re-scan the correct parameter.

Symbology Parameter Defaults

[Table 14-1](#) lists the defaults for all symbologies parameters. To change the default values, scan the appropriate bar codes in this guide. These new values replace the standard default values in memory. To recall the default parameter values, scan the [Set Default Parameter on page 4-4](#).

✓ **NOTE** See [Appendix A, Standard Default Parameters](#) for all user preferences, hosts, and miscellaneous default parameters.

Table 14-1 *Parameter Defaults*

Parameter	Parameter Number	Default	Page Number
UPC/EAN			
UPC-A	01h	Enable	14-7
UPC-E	02h	Enable	14-7
UPC-E1	0Ch	Disable	14-8
EAN-8/JAN 8	04h	Enable	14-8
EAN-13/JAN 13	03h	Enable	14-9
Bookland EAN	53h	Disable	14-9
Decode UPC/EAN/JAN Supplementals (2 and 5 digits)	10h	Ignore	14-10
User-Programmable Supplementals			14-13
Supplemental 1:	F1h 43h		
Supplemental 2:	F1h 44h		
UPC/EAN/JAN Supplemental Redundancy	50h	10	14-13
Decode UPC/EAN/JAN Supplemental AIM ID	F1h A0h	Combined	14-14
Transmit UPC-A Check Digit	28h	Enable	14-14
Transmit UPC-E Check Digit	29h	Enable	14-15
Transmit UPC-E1 Check Digit	2Ah	Enable	14-15
UPC-A Preamble	22h	System Character	14-16
UPC-E Preamble	23h	System Character	14-17
UPC-E1 Preamble	24h	System Character	14-18
Convert UPC-E to A	25h	Disable	14-19

Table 14-1 *Parameter Defaults (Continued)*

Parameter	Parameter Number	Default	Page Number
Convert UPC-E1 to A	26h	Disable	14-19
EAN-8/JAN-8 Extend	27h	Disable	14-20
Bookland ISBN Format	F1h 40h	ISBN-10	14-21
UCC Coupon Extended Code	55h	Enable	14-22
ISSN EAN	F1h 69h	Disable	14-22
Code 128			
Code 128	08h	Enable	14-23
Set Length(s) for Code 128	D1h, D2h	Any Length	14-23
GS1-128 (formerly UCC/EAN-128)	0Eh	Enable	14-24
ISBT 128	54h	Enable	14-25
ISBT Concatenation	F1h 41h	Disable	14-26
Check ISBT Table	F1h 42h	Enable	14-27
ISBT Concatenation Redundancy	DFh	10	14-27
Code 39			
Code 39	00h	Enable	14-28
Trioptic Code 39	0Dh	Disable	14-28
Convert Code 39 to Code 32 (Italian Pharmacy Code)	56h	Disable	14-29
Code 32 Prefix	E7h	Disable	14-29
Set Length(s) for Code 39	12h, 13h	2 to 55	14-30
Code 39 Check Digit Verification	30h	Disable	14-31
Transmit Code 39 Check Digit	2Bh	Disable	14-31
Code 39 Full ASCII Conversion	11h	Disable	14-32
Buffer Code 39	71h	Disable	14-32
Code 93			
Code 93	09h	Disable	14-35
Set Length(s) for Code 93	1Ah, 1Bh	4 to 55	14-35
Code 11			
Code 11	0Ah	Disable	14-37
Set Lengths for Code 11	1Ch, 1Dh	4 to 55	14-37
Code 11 Check Digit Verification	34h	Disable	14-39

Table 14-1 Parameter Defaults (Continued)

Parameter	Parameter Number	Default	Page Number
Transmit Code 11 Check Digit(s)	2Fh	Disable	14-40
Interleaved 2 of 5 (ITF)			
Interleaved 2 of 5 (ITF)	06h	Disable	14-40
Set Lengths for I 2 of 5	16h, 17h	14	14-41
I 2 of 5 Check Digit Verification	31h	Disable	14-43
Transmit I 2 of 5 Check Digit	2Ch	Disable	14-43
Convert I 2 of 5 to EAN 13	52h	Disable	14-44
Discrete 2 of 5 (DTF)			
Discrete 2 of 5	05h	Disable	14-44
Set Length(s) for D 2 of 5	14h, 15h	12	14-45
Codabar (NW - 7)			
Codabar	07h	Disable	14-47
Set Lengths for Codabar	18h, 19h	5 to 55	14-47
CLSI Editing	36h	Disable	14-49
NOTIS Editing	37h	Disable	14-49
MSI			
MSI	0Bh	Disable	14-50
Set Length(s) for MSI	1Eh, 1Fh	4 to 55	14-50
MSI Check Digits	32h	One	14-52
Transmit MSI Check Digit	2Eh	Disable	14-52
MSI Check Digit Algorithm	33h	Mod 10/Mod 10	14-53
Chinese 2 of 5			
Chinese 2 of 5	F0h 98h	Disable	14-53
Matrix 2 of 5			
Matrix 2 of 5	F1h 6Ah	Disable	14-54
Matrix 2 of 5 Lengths	F1h 6Bh F1h 6Ch	1 Length - 14	14-55
Matrix 2 of 5 Redundancy	F1h 6Dh	Disable	14-56
Matrix 2 of 5 Check Digit	F1h 6Eh	Disable	14-56
Transmit Matrix 2 of 5 Check Digit	F1h 6Fh	Disable	14-57

Table 14-1 *Parameter Defaults (Continued)*

Parameter	Parameter Number	Default	Page Number
Korean 3 of 5			
Korean 3 of 5	F1h 45h	Disable	14-57
Inverse 1D	F1h 4Ah	Regular	14-58
Postal Codes			
US Postnet	59h	Disable	14-59
US Planet	5Ah	Disable	14-59
Transmit US Postal Check Digit	5Fh	Enable	14-60
UK Postal	5Bh	Disable	14-60
Transmit UK Postal Check Digit	60h	Enable	14-61
Japan Postal	F0h 22h	Disable	14-61
Australian Postal	F0h 23h	Disable	14-62
Netherlands KIX Code	F0h 46h	Disable	14-62
USPS 4CB/One Code/Intelligent Mail	F1h 50h	Disable	14-63
UPU FICS Postal	F1h 63h	Disable	14-63
GS1 DataBar			
GS1 DataBar-14	F0h 52h	Disable	14-64
GS1 DataBar Limited	F0h 53h	Disable	14-64
GS1 DataBar Expanded	F0h 54h	Disable	14-65
Convert GS1 DataBar to UPC/EAN	F0h 8Dh	Disable	14-65
Composite			
Composite CC-C	F0h 55h	Disable	14-66
Composite CC-A/B	F0h 56h	Disable	14-66
Composite TLC-39	F0h 73h	Disable	14-67
UPC Composite Mode	F0h 58h	Never Linked	14-67
Composite Beep Mode	F0h 8Eh	Beep As Each Code Type is Decoded	14-68
GS1-128 Emulation Mode for UCC/EAN Composite Codes	F0h ABh	Disable	14-68
2D Symbologies			
PDF417	0Fh	Enable	14-69
MicroPDF417	E3h	Disable	14-69

Table 14-1 *Parameter Defaults (Continued)*

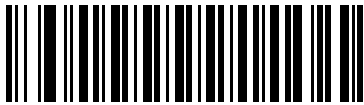
Parameter	Parameter Number	Default	Page Number
Code 128 Emulation	7Bh	Disable	14-70
Data Matrix	F0h 24h	Enable	14-71
Data Matrix Inverse	F1h 4Ch	Regular	14-71
Maxicode	F0h 26h	Disable	14-72
QR Code	F0h 25h	Enable	14-72
QR Inverse	F1h 4Bh	Regular	14-73
MicroQR	F1h 3Dh	Enable	14-73
Aztec	F1h 3Eh	Enable	14-74
Aztec Inverse	F1h 4Dh	Regular	14-74
Symbology-Specific Security Levels			
Redundancy Level	4Eh	1	14-75
Security Level	4Dh	0	14-77
Intercharacter Gap Size	F0h 7Dh	Normal	14-78
Report Version			14-78
Macro PDF			
Flush Macro PDF Buffer			14-79
Abort Macro PDF Entry			14-79

UPC/EAN

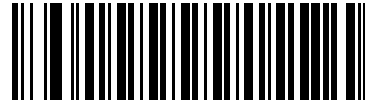
Enable/Disable UPC-A

Parameter # 01h

To enable or disable UPC-A, scan the appropriate bar code below.



*Enable UPC-A
(01h)

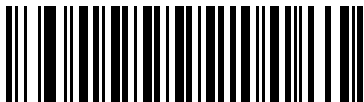


Disable UPC-A
(00h)

Enable/Disable UPC-E

Parameter # 02h

To enable or disable UPC-E, scan the appropriate bar code below.



*Enable UPC-E
(01h)



Disable UPC-E
(00h)

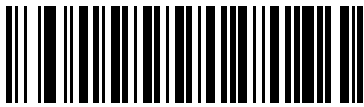
Enable/Disable UPC-E1

Parameter # 0Ch

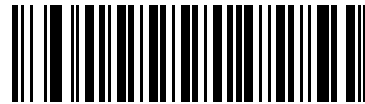
UPC-E1 is disabled by default.

To enable or disable UPC-E1, scan the appropriate bar code below.

✓ **NOTE** UPC-E1 is not a UCC (Uniform Code Council) approved symbology.



Enable UPC-E1
(01h)

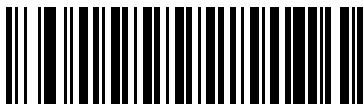


*Disable UPC-E1
(00h)

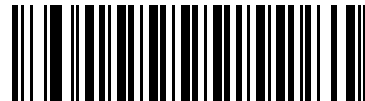
Enable/Disable EAN-8/JAN-8

Parameter # 04h

To enable or disable EAN-8/JAN-8, scan the appropriate bar code below.



*Enable EAN-8/JAN-8
(01h)

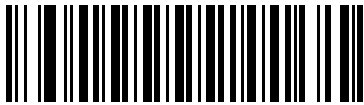


Disable EAN-8/JAN-8
(00h)

Enable/Disable EAN-13/JAN-13

Parameter # 03h

To enable or disable EAN-13/JAN-13, scan the appropriate bar code below.



*Enable EAN-13/JAN-13
(01h)

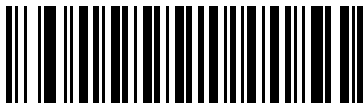


Disable EAN-13/JAN-13
(00h)

Enable/Disable Bookland EAN

Parameter # 53h

To enable or disable Bookland EAN, scan the appropriate bar code below.



Enable Bookland EAN
(01h)



*Disable Bookland EAN
(00h)



NOTE If you enable Bookland EAN, select a *Bookland ISBN Format* on page 14-21. Also select either Decode UPC/EAN Supplementals, Autodiscriminate UPC/EAN Supplementals, or Enable 978/979 Supplemental Mode in *Decode UPC/EAN/JAN Supplementals* on page 14-10.

Decode UPC/EAN/JAN Supplementals

Parameter # 10h

Supplementals are bar codes appended according to specific format conventions (e.g., UPC A+2, UPC E+2, EAN 13+2). The following options are available:

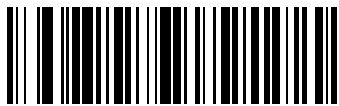
- If you select **Ignore UPC/EAN with Supplementals**, and the digital scanner is presented with a UPC/EAN plus supplemental symbol, the digital scanner decodes UPC/EAN and ignores the supplemental characters.
- If you select **Decode UPC/EAN with Supplementals**, the digital scanner only decodes UPC/EAN symbols with supplemental characters, and ignores symbols without supplementals.
- If you select **Autodiscriminate UPC/EAN Supplementals**, the digital scanner decodes UPC/EAN symbols with supplemental characters immediately. If the symbol does not have a supplemental, the digital scanner must decode the bar code the number of times set via [UPC/EAN/JAN Supplemental Redundancy on page 14-13](#) before transmitting its data to confirm that there is no supplemental.
- If you select one of the following **Supplemental Mode** options, the digital scanner immediately transmits EAN-13 bar codes starting with that prefix that have supplemental characters. If the symbol does not have a supplemental, the digital scanner must decode the bar code the number of times set via [UPC/EAN/JAN Supplemental Redundancy on page 14-13](#) before transmitting its data to confirm that there is no supplemental. The digital scanner transmits UPC/EAN bar codes that do not have that prefix immediately.
 - **Enable 378/379 Supplemental Mode**
 - **Enable 978/979 Supplemental Mode**

✓ **NOTE** If you select 978/979 Supplemental Mode and are scanning Bookland EAN bar codes, see [Enable/Disable Bookland EAN on page 14-9](#) to enable Bookland EAN, and select a format using [Bookland ISBN Format on page 14-21](#).

- **Enable 977 Supplemental Mode**
- **Enable 414/419/434/439 Supplemental Mode**
- **Enable 491 Supplemental Mode**
- **Enable Smart Supplemental Mode** - applies to EAN-13 bar codes starting with any prefix listed previously.
- **Supplemental User-Programmable Type 1** - applies to EAN-13 bar codes starting with a 3-digit user-defined prefix. Set this 3-digit prefix using [User-Programmable Supplementals on page 14-13](#).
- **Supplemental User-Programmable Type 1 and 2** - applies to EAN-13 bar codes starting with either of two 3-digit user-defined prefixes. Set the 3-digit prefixes using [User-Programmable Supplementals on page 14-13](#).
- **Smart Supplemental Plus User-Programmable 1** - applies to EAN-13 bar codes starting with any prefix listed previously or the user-defined prefix set using [User-Programmable Supplementals on page 14-13](#).
- **Smart Supplemental Plus User-Programmable 1 and 2** - applies to EAN-13 bar codes starting with any prefix listed previously or one of the two user-defined prefixes set using [User-Programmable Supplementals on page 14-13](#).

✓ **NOTE** To minimize the risk of invalid data transmission, select either to decode or ignore supplemental characters.

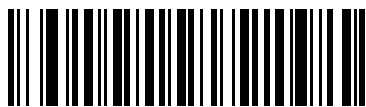
Decode UPC/EAN/JAN Supplementals (continued)



Decode UPC/EAN/JAN Only With Supplementals
(01h)



*Ignore Supplementals
(00h)



Autodiscriminate UPC/EAN/JAN Supplementals
(02h)



Enable 378/379 Supplemental Mode
(04h)



Enable 978/979 Supplemental Mode
(05h)



Enable 977 Supplemental Mode
(07h)

Decode UPC/EAN/JAN Supplementals (continued)



Enable 414/419/434/439 Supplemental Mode
(06h)



Enable 491 Supplemental Mode
(08h)



Enable Smart Supplemental Mode
(03h)



Supplemental User-Programmable Type 1
(09h)



Supplemental User-Programmable Type 1 and 2
(0Ah)



Smart Supplemental Plus User-Programmable 1
(0Bh)



Smart Supplemental Plus User-Programmable 1 and 2
(0Ch)

User-Programmable Supplementals

Supplemental 1: Parameter # F1h 43h

Supplemental 2: Parameter # F1h 44h

If you selected a Supplemental User-Programmable option from *Decode UPC/EAN/JAN Supplementals on page 14-10*, select **User-Programmable Supplemental 1** to set the 3-digit prefix. Then select the 3 digits using the numeric bar codes beginning on [page D-1](#). Select **User-Programmable Supplemental 2** to set a second 3-digit prefix. Then select the 3 digits using the numeric bar codes beginning on [page D-1](#).



User-Programmable Supplemental 1



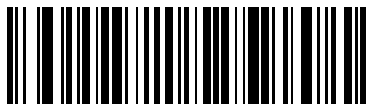
User-Programmable Supplemental 2

UPC/EAN/JAN Supplemental Redundancy

Parameter # 50h

If you selected **Autodiscriminate UPC/EAN/JAN Supplementals**, this option adjusts the number of times to decode a symbol without supplementals before transmission. The range is from two to thirty times. Five or above is recommended when decoding a mix of UPC/EAN/JAN symbols with and without supplementals. The default is 10.

Scan the bar code below to set a decode redundancy value. Next, scan two numeric bar codes in [Appendix D, Numeric Bar Codes](#). Enter a leading zero for single digit numbers. To correct an error or change a selection, scan [Cancel on page D-2](#).



UPC/EAN/JAN Supplemental Redundancy

UPC/EAN/JAN Supplemental AIM ID Format

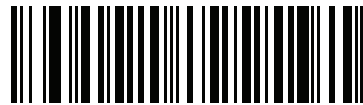
Parameter # F1h A0h

Select an output format when reporting UPC/EAN/JAN bar codes with supplementals with AIM ID enabled:

- Separate - UPC/EAN with supplementals transmit as]E<0 or 4><data>]E<1 or 2>[supp data]
- Combined - EAN-8 with supplementals transmit as]E4<data>]E<1 or 2>[supp data]
All other UPC/EAN with supplementals transmit as]E3<data+supps>



Separate
(00h)

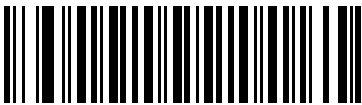


*Combined
(01h)

Transmit UPC-A Check Digit

Parameter # 28h

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate bar code below to transmit the bar code data with or without the UPC-A check digit. It is always verified to guarantee the integrity of the data.



*Transmit UPC-A Check Digit
(01h)

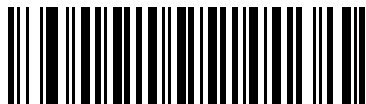


Do Not Transmit UPC-A Check Digit
(00h)

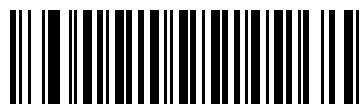
Transmit UPC-E Check Digit

Parameter # 29h

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate bar code below to transmit the bar code data with or without the UPC-E check digit. It is always verified to guarantee the integrity of the data.



***Transmit UPC-E Check Digit
(01h)**

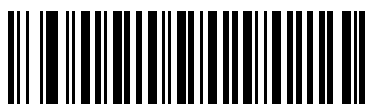


**Do Not Transmit UPC-E Check Digit
(00h)**

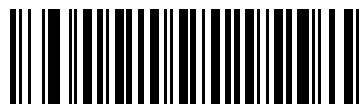
Transmit UPC-E1 Check Digit

Parameter # 2Ah

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate bar code below to transmit the bar code data with or without the UPC-E1 check digit. It is always verified to guarantee the integrity of the data.



***Transmit UPC-E1 Check Digit
(01h)**

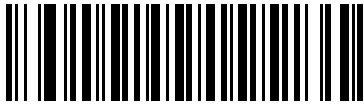


**Do Not Transmit UPC-E1 Check Digit
(00h)**

UPC-A Preamble

Parameter # 22h

Preamble characters are part of the UPC symbol, and include Country Code and System Character. There are three options for transmitting a UPC-A preamble to the host device: transmit System Character only, transmit System Character and Country Code ("0" for USA), and transmit no preamble. Select the appropriate option to match the host system.



No Preamble (<DATA>)
(00h)



*System Character (<SYSTEM CHARACTER> <DATA>)
(01h)



System Character & Country Code
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)
(02h)

UPC-E Preamble

Parameter # 23h

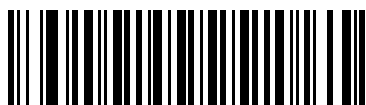
Preamble characters are part of the UPC symbol, and include Country Code and System Character. There are three options for transmitting a UPC-E preamble to the host device: transmit System Character only, transmit System Character and Country Code ("0" for USA), and transmit no preamble. Select the appropriate option to match the host system.



No Preamble (<DATA>)
(00h)



*System Character (<SYSTEM CHARACTER> <DATA>)
(01h)

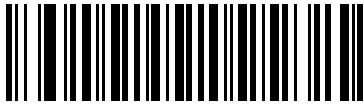


System Character & Country Code
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)
(02h)

UPC-E1 Preamble

Parameter # 24h

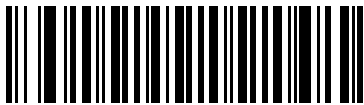
Preamble characters are part of the UPC symbol, and include Country Code and System Character. There are three options for transmitting a UPC-E1 preamble to the host device: transmit System Character only, transmit System Character and Country Code ("0" for USA), and transmit no preamble. Select the appropriate option to match the host system.



No Preamble (<DATA>)
(00h)



*System Character (<SYSTEM CHARACTER> <DATA>)
(01h)



System Character & Country Code
(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)
(02h)

Convert UPC-E to UPC-A

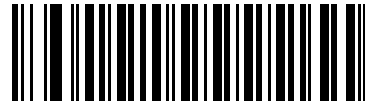
Parameter # 25h

Enable this to convert UPC-E (zero suppressed) decoded data to UPC-A format before transmission. After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

Disable this to transmit UPC-E decoded data as UPC-E data, without conversion.



Convert UPC-E to UPC-A (Enable)
(01h)



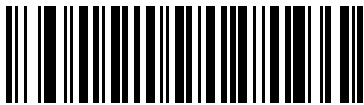
*Do Not Convert UPC-E to UPC-A (Disable)
(00h)

Convert UPC-E1 to UPC-A

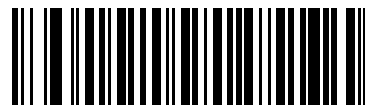
Parameter # 26h

Enable this to convert UPC-E1 decoded data to UPC-A format before transmission. After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

Disable this to transmit UPC-E1 decoded data as UPC-E1 data, without conversion.



Convert UPC-E1 to UPC-A (Enable)
(01h)



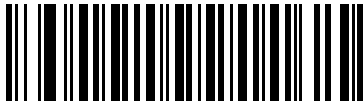
*Do Not Convert UPC-E1 to UPC-A (Disable)
(00h)

EAN-8/JAN-8 Extend

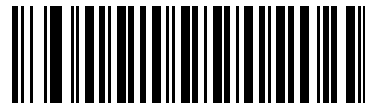
Parameter # 27h

Enable this parameter to add five leading zeros to decoded EAN-8 symbols to make them compatible in format to EAN-13 symbols.

Disable this to transmit EAN-8 symbols as is.



**Enable EAN/JAN Zero Extend
(01h)**



***Disable EAN/JAN Zero Extend
(00h)**

Bookland ISBN Format

Parameter # F1h 40h

If you enabled Bookland EAN using *Enable/Disable Bookland EAN on page 14-9*, select one of the following formats for Bookland data:

- **Bookland ISBN-10** - The digital scanner reports Bookland data starting with 978 in traditional 10-digit format with the special Bookland check digit for backward-compatibility. Data starting with 979 is not considered Bookland in this mode.
- **Bookland ISBN-13** - The digital scanner reports Bookland data (starting with either 978 or 979) as EAN-13 in 13-digit format to meet the 2007 ISBN-13 protocol.



*Bookland ISBN-10
(00h)



Bookland ISBN-13
(01h)

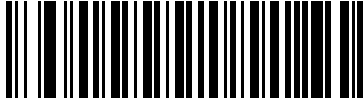


NOTE For Bookland EAN to function properly, first enable Bookland EAN using *Enable/Disable Bookland EAN on page 14-9*, then select either Decode UPC/EAN Supplementals, Autodiscriminate UPC/EAN Supplementals, or Enable 978/979 Supplemental Mode in *Decode UPC/EAN/JAN Supplementals on page 14-10*.

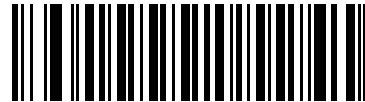
UCC Coupon Extended Code

Parameter # 55h

Enable this parameter to decode UPC-A bar codes starting with digit '5', EAN-13 bar codes starting with digit '99', and UPC-A/GS1-128 Coupon Codes. UPCA, EAN-13, and GS1-128 must be enabled to scan all types of Coupon Codes.



*Enable UCC Coupon Extended Code
(01h)



Disable UCC Coupon Extended Code
(00h)



NOTE See *UPC/EAN/JAN Supplemental Redundancy* on page 14-13 to control autodiscrimination of the GS1-128 (right half) of a coupon code.

ISSN EAN

Parameter # F1h 69h

To enable or disable ISSN EAN, scan the appropriate bar code below.



Enable ISSN EAN
(01h)



*Disable ISSN EAN
(00h)

Code 128

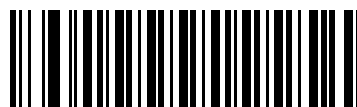
Enable/Disable Code 128

Parameter # 08h

To enable or disable Code 128, scan the appropriate bar code below.



*Enable Code 128
(01h)



Disable Code 128
(00h)

Set Lengths for Code 128

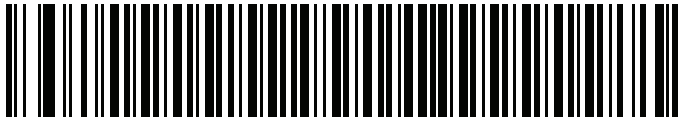
Parameter # L1 = D1h, L2 = D2h

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 128 to any length, one or two discrete lengths, or lengths within a specific range.

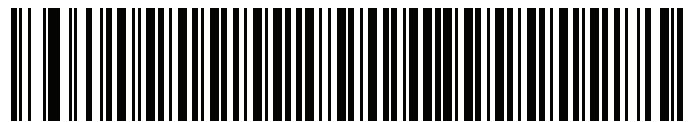
✓ **NOTE** When setting lengths for different bar code types, enter a leading zero for single digit numbers.

- **One Discrete Length** - Select this option to decode only Code 128 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Code 128 symbols with 14 characters, scan **Code 128 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Two Discrete Lengths** - Select this option to decode only Code 128 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Code 128 symbols containing either 2 or 14 characters, select **Code 128 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**. To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Length Within Range** - Select this option to decode a Code 128 symbol with a specific length range. Select lengths using numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode Code 128 symbols containing between 4 and 12 characters, first scan **Code 128 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers). To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Any Length** - Select this option to decode Code 128 symbols containing any number of characters within the digital scanner's capability.

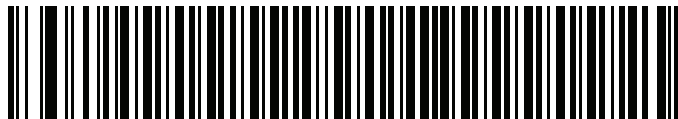
Set Lengths for Code 128 (continued)



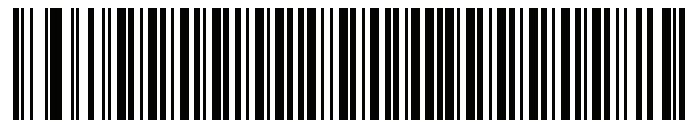
Code 128 - One Discrete Length



Code 128 - Two Discrete Lengths



Code 128 - Length Within Range



*Code 128 - Any Length

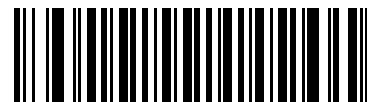
Enable/Disable GS1-128 (formerly UCC/EAN-128)

Parameter # 0Eh

To enable or disable GS1-128, scan the appropriate bar code below.



*Enable GS1-128
(01h)



Disable GS1-128
(00h)

Enable/Disable ISBT 128

Parameter # 54h

ISBT 128 is a variant of Code 128 used in the blood bank industry. Scan a bar code below to enable or disable ISBT 128. If necessary, the host must perform concatenation of the ISBT data.



***Enable ISBT 128
(01h)**



**Disable ISBT 128
(00h)**

ISBT Concatenation

Parameter # F1h 41h

Select an option for concatenating pairs of ISBT code types:

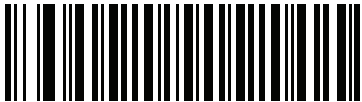
- If you select **Disable ISBT Concatenation**, the digital scanner does not concatenate pairs of ISBT codes it encounters.
- If you select **Enable ISBT Concatenation**, there must be two ISBT codes in order for the digital scanner to decode and perform concatenation. The digital scanner does not decode single ISBT symbols.
- If you select **Autodiscriminate ISBT Concatenation**, the digital scanner decodes and concatenates pairs of ISBT codes immediately. If only a single ISBT symbol is present, the digital scanner must decode the symbol the number of times set via [ISBT Concatenation Redundancy on page 14-27](#) before transmitting its data to confirm that there is no additional ISBT symbol.



*Disable ISBT Concatenation
(00h)



Enable ISBT Concatenation
(01h)



Autodiscriminate ISBT Concatenation
(00h)

Check ISBT Table

Parameter # F1h 42h

The ISBT specification includes a table that lists several types of ISBT bar codes that are commonly used in pairs. If you set **ISBT Concatenation** to **Enable**, enable **Check ISBT Table** to concatenate only those pairs found in this table. Other types of ISBT codes are not concatenated.



*Enable Check ISBT Table
(01h)



Disable Check ISBT Table
(00h)

ISBT Concatenation Redundancy

Parameter # DFh

If you set **ISBT Concatenation** to **Autodiscriminate**, use this parameter to set the number of times the digital scanner must decode an ISBT symbol before determining that there is no additional symbol.

Scan the bar code below, then scan two numeric bar codes in [Appendix D, Numeric Bar Codes](#) to set a value between 2 and 20. Enter a leading zero for single digit numbers. To correct an error or change a selection, scan [Cancel on page D-2](#). The default is 10.



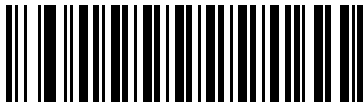
ISBT Concatenation Redundancy

Code 39

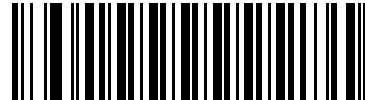
Enable/Disable Code 39

Parameter # 00h

To enable or disable Code 39, scan the appropriate bar code below.



***Enable Code 39
(01h)**

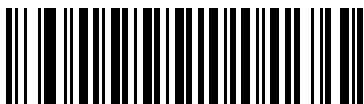


**Disable Code 39
(00h)**

Enable/Disable Trioptic Code 39

Parameter # 0Dh

Trioptic Code 39 is a variant of Code 39 used in the marking of computer tape cartridges. Trioptic Code 39 symbols always contain six characters. To enable or disable Trioptic Code 39, scan the appropriate bar code below.



**Enable Trioptic Code 39
(01h)**



***Disable Trioptic Code 39
(00h)**



NOTE You cannot enable Trioptic Code 39 and Code 39 Full ASCII simultaneously.

Convert Code 39 to Code 32

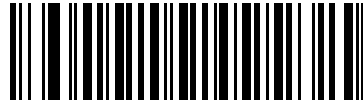
Parameter # 56h

Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry. Scan the appropriate bar code below to enable or disable converting Code 39 to Code 32.

✓ **NOTE** Code 39 must be enabled for this parameter to function.



Enable Convert Code 39 to Code 32
(01h)



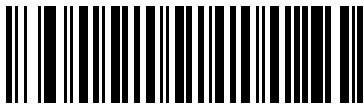
*Disable Convert Code 39 to Code 32
(00h)

Code 32 Prefix

Parameter # E7h

Scan the appropriate bar code below to enable or disable adding the prefix character “A” to all Code 32 bar codes.

✓ **NOTE** Convert Code 39 to Code 32 must be enabled for this parameter to function.



Enable Code 32 Prefix
(01h)



*Disable Code 32 Prefix
(00h)

Set Lengths for Code 39

Parameter # L1 = 12h, L2 = 13h

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 39 to any length, one or two discrete lengths, or lengths within a specific range. If Code 39 Full ASCII is enabled, **Length Within a Range** or **Any Length** are the preferred options.

✓ **NOTE** When setting lengths for different bar code types, enter a leading zero for single digit numbers.

- **One Discrete Length** - Select this option to decode only Code 39 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Code 39 symbols with 14 characters, scan **Code 39 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Two Discrete Lengths** - Select this option to decode only Code 39 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Code 39 symbols containing either 2 or 14 characters, select **Code 39 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**. To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Length Within Range** - Select this option to decode a Code 39 symbol with a specific length range. Select lengths using numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode Code 39 symbols containing between 4 and 12 characters, first scan **Code 39 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers). To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Any Length** - Select this option to decode Code 39 symbols containing any number of characters within the digital scanner's capability.



Code 39 - One Discrete Length



Code 39 - Two Discrete Lengths



Code 39 - Length Within Range

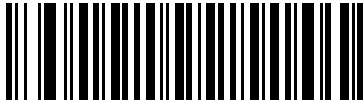


Code 39 - Any Length

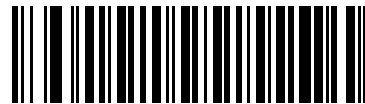
Code 39 Check Digit Verification

Parameter # 30h

Enable this feature to check the integrity of all Code 39 symbols to verify that the data complies with specified check digit algorithm. Only Code 39 symbols which include a modulo 43 check digit are decoded. Enable this feature if the Code 39 symbols contain a Modulo 43 check digit.



Enable Code 39 Check Digit
(01h)

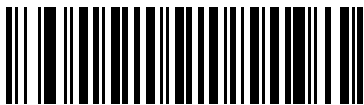


*Disable Code 39 Check Digit
(00h)

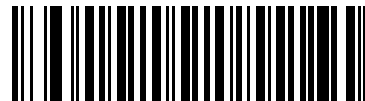
Transmit Code 39 Check Digit

Parameter # 2Bh

Scan a bar code below to transmit Code 39 data with or without the check digit.



Transmit Code 39 Check Digit (Enable)
(01h)



*Do Not Transmit Code 39 Check Digit (Disable)
(00h)



NOTE Code 39 Check Digit Verification must be enabled for this parameter to function.

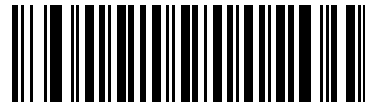
Code 39 Full ASCII Conversion

Parameter # 11h

Code 39 Full ASCII is a variant of Code 39 which pairs characters to encode the full ASCII character set. To enable or disable Code 39 Full ASCII, scan the appropriate bar code below.



Enable Code 39 Full ASCII
(01h)



*Disable Code 39 Full ASCII
(00h)



NOTE You cannot enable Trioptic Code 39 and Code 39 Full ASCII simultaneously.

Code 39 Full ASCII to Full ASCII Correlation is host-dependent, and is therefore described in the ASCII Character Set Table for the appropriate interface. See the *ASCII Character Set for USB* on page 6-13 or the *ASCII Character Set for RS-232* on page 7-19.

Code 39 Buffering - Scan & Store

Parameter # 71h

This feature allows the digital scanner to accumulate data from multiple Code 39 symbols.

Selecting the Scan and Store option (Buffer Code 39) temporarily buffers all Code 39 symbols having a leading space as a first character for later transmission. The leading space is not buffered.

Decoding a Code 39 symbol with no leading space transmits in sequence all buffered data in a first-in first-out format, plus the “triggering” symbol. See the following pages for further details.

Select **Do Not Buffer Code 39** to transmit all decoded Code 39 symbols immediately without storing them in the buffer.

Code 39 Buffering - Scan & Store (continued)

This feature affects Code 39 only. If selecting **Buffer Code 39**, we recommend configuring the digital scanner to decode Code 39 symbology only.



Buffer Code 39 (Enable)
(01h)



***Do Not Buffer Code 39 (Disable)**
(00h)

While there is data in the transmission buffer, you cannot select **Do Not Buffer Code 39**. The buffer holds 200 bytes of information.

To disable Code 39 buffering when there is data in the transmission buffer, first force the buffer transmission (see [Transmit Buffer on page 14-34](#)) or clear the buffer.

Buffer Data

To buffer data, enable Code 39 buffering and scan a Code 39 symbol with a space immediately following the start pattern.

- Unless the data overflows the transmission buffer, the digital scanner issues a low/high beep to indicate successful decode and buffering. (For overflow conditions, see [Overfilling Transmission Buffer on page 14-34](#).)
- The digital scanner adds the decoded data excluding the leading space to the transmission buffer.
- No transmission occurs.

Clear Transmission Buffer

To clear the transmission buffer, scan the **Clear Buffer** bar code below, which contains only a start character, a dash (minus), and a stop character.

- The digital scanner issues a short high/low/high beep.
- The digital scanner erases the transmission buffer.
- No transmission occurs.



Clear Buffer



NOTE The Clear Buffer contains only the dash (minus) character. In order to scan this command, set Code 39 lengths to include length 1.

Transmit Buffer

There are two methods to transmit the Code 39 buffer.

1. Scan the **Transmit Buffer** bar code below, which includes only a start character, a plus (+), and a stop character.
2. The digital scanner transmits and clears the buffer.
 - The digital scanner issues a low/high beep.



Transmit Buffer

3. Scan a Code 39 bar code with a leading character other than a space.
 - The digital scanner appends new decode data to buffered data.
 - The digital scanner transmits and clears the buffer.
 - The digital scanner signals that it transmitted the buffer with a low/high beep.
 - The digital scanner transmits and clears the buffer.

✓ **NOTE** The Transmit Buffer contains only a plus (+) character. In order to scan this command, set Code 39 lengths to include length 1.

Overfilling Transmission Buffer

The Code 39 buffer holds 200 characters. If the symbol just read overflows the transmission buffer:

- The digital scanner indicates that it rejected the symbol by issuing three long, high beeps.
- No transmission occurs. The data in the buffer is not affected.

Attempt to Transmit an Empty Buffer

If you scan the **Transmit Buffer** symbol and the Code 39 buffer is empty:

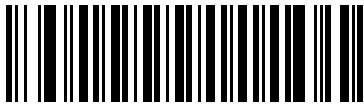
- A short low/high/low beep signals that the buffer is empty.
- No transmission occurs.
- The buffer remains empty.

Code 93

Enable/Disable Code 93

Parameter # 09h

To enable or disable Code 93, scan the appropriate bar code below.



Enable Code 93
(01h)



*Disable Code 93
(00h)

Set Lengths for Code 93

Parameter # L1 = 1Ah, L2 = 1Bh

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 93 to any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only Code 93 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Code 93 symbols with 14 characters, scan **Code 93 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Two Discrete Lengths** - Select this option to decode only Code 93 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Code 93 symbols containing either 2 or 14 characters, select **Code 93 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Length Within Range** - Select this option to decode a Code 93 symbol with a specific length range. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode Code 93 symbols containing between 4 and 12 characters, first scan **Code 93 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers). To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Any Length** - Scan this option to decode Code 93 symbols containing any number of characters within the digital scanner's capability.

Set Lengths for Code 93 (continued)



Code 93 - One Discrete Length



Code 93 - Two Discrete Lengths



Code 93 - Length Within Range



Code 93 - Any Length

Code 11

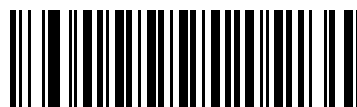
Code 11

Parameter # 0Ah

To enable or disable Code 11, scan the appropriate bar code below.



Enable Code 11
(01h)



*Disable Code 11
(00h)

Set Lengths for Code 11

Parameter # L1 = 1Ch, L2 = 1Dh

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Code 11 to any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only Code 11 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Code 11 symbols with 14 characters, scan **Code 11 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Two Discrete Lengths** - Select this option to decode only Code 11 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Code 11 symbols containing either 2 or 14 characters, select **Code 11 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Length Within Range** - Select this option to decode a Code 11 symbol with a specific length range. Select lengths using numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode Code 11 symbols containing between 4 and 12 characters, first scan **Code 11 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers). To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Any Length** - Scan this option to decode Code 11 symbols containing any number of characters within the digital scanner's capability.

Set Lengths for Code 11 (continued)



Code 11 - One Discrete Length



Code 11 - Two Discrete Lengths



Code 11 - Length Within Range



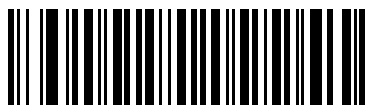
Code 11 - Any Length

Code 11 Check Digit Verification

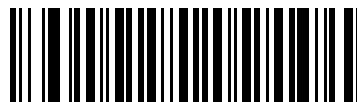
Parameter # 34h

This feature allows the digital scanner to check the integrity of all Code 11 symbols to verify that the data complies with the specified check digit algorithm. This selects the check digit mechanism for the decoded Code 11 bar code. The options are to check for one check digit, check for two check digits, or disable the feature.

To enable this feature, scan the bar code below corresponding to the number of check digits encoded in the Code 11 symbols.



***Disable
(00h)**



**One Check Digit
(01h)**

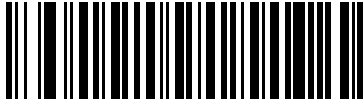


**Two Check Digits
(02h)**

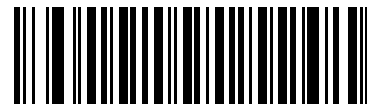
Transmit Code 11 Check Digits

Parameter # 2Fh

This feature selects whether or not to transmit the Code 11 check digit(s).



Transmit Code 11 Check Digit(s) (Enable)
(01h)



*Do Not Transmit Code 11 Check Digit(s) (Disable)
(00h)



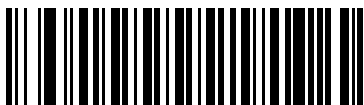
NOTE Code 11 Check Digit Verification must be enabled for this parameter to function.

Interleaved 2 of 5 (ITF)

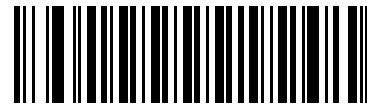
Enable/Disable Interleaved 2 of 5

Parameter # 06h

To enable or disable Interleaved 2 of 5, scan the appropriate bar code below, and select an Interleaved 2 of 5 length from the following pages.



Enable Interleaved 2 of 5
(01h)



*Disable Interleaved 2 of 5
(00h)

Set Lengths for Interleaved 2 of 5

Parameter # L1 = 16h, L2 = 17h

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for I 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range. The range for Interleaved 2 of 5 lengths is 0 - 55.

- **One Discrete Length** - Select this option to decode only I 2 of 5 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only I 2 of 5 symbols with 14 characters, scan **I 2 of 5 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Two Discrete Lengths** - Select this option to decode only I 2 of 5 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only I 2 of 5 symbols containing either 2 or 14 characters, select **I 2 of 5 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Length Within Range** - Select this option to decode an I 2 of 5 symbol with a specific length range. Select lengths using numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode I 2 of 5 symbols containing between 4 and 12 characters, first scan **I 2 of 5 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers). To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Any Length** - Scan this option to decode I 2 of 5 symbols containing any number of characters within the digital scanner's capability.

✓ **NOTE** Due to the construction of the I 2 of 5 symbology, it is possible for a scan line covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the bar code. To prevent this, select specific lengths (I 2 of 5 - One Discrete Length, Two Discrete Lengths) for I 2 of 5 applications.

Set Lengths for Interleaved 2 of 5 (continued)



I 2 of 5 - One Discrete Length



I 2 of 5 - Two Discrete Lengths



I 2 of 5 - Length Within Range



I 2 of 5 - Any Length

I 2 of 5 Check Digit Verification

Parameter # 31h

Enable this feature to check the integrity of all I 2 of 5 symbols to verify the data complies with either the specified Uniform Symbology Specification (USS), or the Optical Product Code Council (OPCC) check digit algorithm.



***Disable
(00h)**



**USS Check Digit
(01h)**

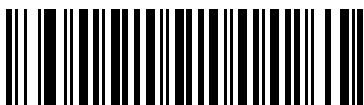


**OPCC Check Digit
(02h)**

Transmit I 2 of 5 Check Digit

Parameter # 2Ch

Scan the appropriate bar code below to transmit I 2 of 5 data with or without the check digit.



**Transmit I 2 of 5 Check Digit (Enable)
(01h)**

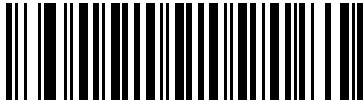


***Do Not Transmit I 2 of 5 Check Digit (Disable)
(00h)**

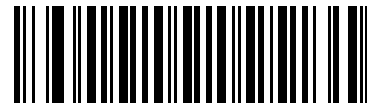
Convert I 2 of 5 to EAN-13

Parameter # 52h

Enable this parameter to convert 14-character I 2 of 5 codes to EAN-13, and transmit to the host as EAN-13. To accomplish this, the I 2 of 5 code must be enabled, and the code must have a leading zero and a valid EAN-13 check digit.



Convert I 2 of 5 to EAN-13 (Enable)
(01h)



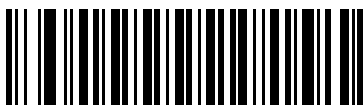
*Do Not Convert I 2 of 5 to EAN-13 (Disable)
(00h)

Discrete 2 of 5 (DTF)

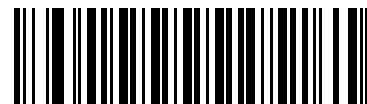
Enable/Disable Discrete 2 of 5

Parameter # 05h

To enable or disable Discrete 2 of 5, scan the appropriate bar code below.



Enable Discrete 2 of 5
(01h)



*Disable Discrete 2 of 5
(00h)

Set Lengths for Discrete 2 of 5

Parameter # L1 = 14h, L2 = 15h

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for D 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range. The range for Discrete 2 of 5 lengths is 0 - 55.

- **One Discrete Length** - Select this option to decode only D 2 of 5 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only D 2 of 5 symbols with 14 characters, scan **D 2 of 5 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Two Discrete Lengths** - Select this option to decode only D 2 of 5 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only D 2 of 5 symbols containing either 2 or 14 characters, select **D 2 of 5 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Length Within Range** - Select this option to decode a D 2 of 5 symbol with a specific length range. Select lengths using numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode D 2 of 5 symbols containing between 4 and 12 characters, first scan **D 2 of 5 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers). To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Any Length** - Scan this option to decode D 2 of 5 symbols containing any number of characters within the digital scanner's capability.

✓ **NOTE** Due to the construction of the D 2 of 5 symbology, it is possible for a scan line covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the bar code. To prevent this, select specific lengths (**D 2 of 5 - One Discrete Length, Two Discrete Lengths**) for D 2 of 5 applications.

Set Lengths for Discrete 2 of 5 (continued)



D 2 of 5 - One Discrete Length



D 2 of 5 - Two Discrete Lengths



D 2 of 5 - Length Within Range



D 2 of 5 - Any Length

Codabar (NW - 7)

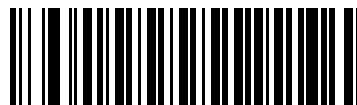
Enable/Disable Codabar

Parameter # 07h

To enable or disable Codabar, scan the appropriate bar code below.



Enable Codabar
(01h)



* Disable Codabar
(00h)

Set Lengths for Codabar

Parameter # L1 = 18h, L2 = 19h

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Codabar to any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only Codabar symbols containing a selected length. Select the length using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Codabar symbols with 14 characters, scan **Codabar - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Two Discrete Lengths** - Select this option to decode only Codabar symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Codabar symbols containing either 2 or 14 characters, select **Codabar - Two Discrete Lengths**, then scan **0**, **2**, **1**, and then **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Length Within Range** - Select this option to decode a Codabar symbol with a specific length range. Select lengths using numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode Codabar symbols containing between 4 and 12 characters, first scan **Codabar - Length Within Range**. Then scan **0**, **4**, **1**, and **2** (enter a leading zero for single digit numbers). To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Any Length** - Scan this option to decode Codabar symbols containing any number of characters within the digital scanner's capability.

Set Lengths for Codabar (continued)



Codabar - One Discrete Length



Codabar - Two Discrete Lengths



Codabar - Length Within Range



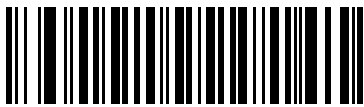
Codabar - Any Length

CLSI Editing

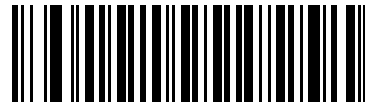
Parameter # 36h

Enable this parameter to strip the start and stop characters and insert a space after the first, fifth, and tenth characters of a 14-character Codabar symbol. Enable this feature if the host system requires this data format.

✓ **NOTE** Symbol length does not include start and stop characters.



Enable CLSI Editing
(01h)

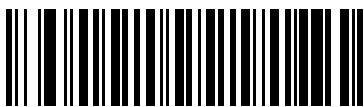


*Disable CLSI Editing
(00h)

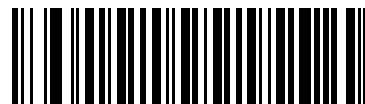
NOTIS Editing

Parameter # 37h

Enable this parameter to strip the start and stop characters from a decoded Codabar symbol. Enable this feature if the host system requires this data format.



Enable NOTIS Editing
(01h)



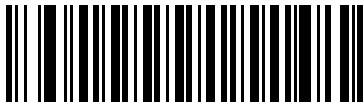
*Disable NOTIS Editing
(00h)

MSI

Enable/Disable MSI

Parameter # 0Bh

To enable or disable MSI, scan the appropriate bar code below.



Enable MSI
(01h)



*Disable MSI
(00h)

Set Lengths for MSI

Parameter # L1 = 1Eh, L2 = 1Fh

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for MSI to any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only MSI symbols containing a selected length. Select the length using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only MSI symbols with 14 characters, scan **MSI - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Two Discrete Lengths** - Select this option to decode only MSI symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only MSI symbols containing either 2 or 14 characters, select **MSI - Two Discrete Lengths**, then scan **0**, **2**, **1**, and then **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Length Within Range** - Select this option to decode a MSI symbol with a specific length range. Select lengths using numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode MSI symbols containing between 4 and 12 characters, first scan **MSI - Length Within Range**. Then scan **0**, **4**, **1**, and **2** (enter a leading zero for single digit numbers). To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Any Length** - Scan this option to decode MSI symbols containing any number of characters within the digital scanner's capability.

Set Lengths for MSI (continued)

- ✓ **NOTE** Due to the construction of the MSI symbology, it is possible for a scan line covering only a portion of the code to transmit as a complete scan, yielding less data than is encoded in the bar code. To prevent this, select specific lengths (**MSI - One Discrete Length, Two Discrete Lengths**) for MSI applications.



MSI - One Discrete Length



MSI - Two Discrete Lengths



MSI - Length Within Range



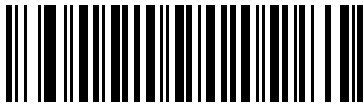
MSI - Any Length

MSI Check Digits

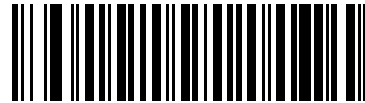
Parameter # 32h

With MSI symbols, one check digit is mandatory and always verified by the reader. The second check digit is optional. If the MSI codes include two check digits, scan the **Two MSI Check Digits** bar code to enable verification of the second check digit.

See [MSI Check Digit Algorithm on page 14-53](#) for the selection of second digit algorithms.



*One MSI Check Digit
(00h)

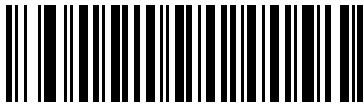


Two MSI Check Digits
(01h)

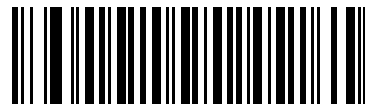
Transmit MSI Check Digit(s)

Parameter # 2Eh

Scan a bar code below to transmit MSI data with or without the check digit.



Transmit MSI Check Digit(s) (Enable)
(01h)

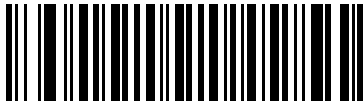


*Do Not Transmit MSI Check Digit(s) (Disable)
(00h)

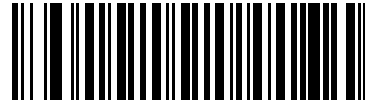
MSI Check Digit Algorithm

Parameter # 33h

Two algorithms are possible for the verification of the second MSI check digit. Select the bar code below corresponding to the algorithm used to encode the check digit.



MOD 10/MOD 11
(00h)



*MOD 10/MOD 10
(01h)

Chinese 2 of 5

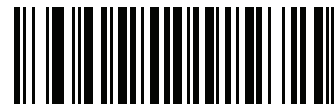
Enable/Disable Chinese 2 of 5

Parameter # F0h 98h

To enable or disable Chinese 2 of 5, scan the appropriate bar code below.



Enable Chinese 2 of 5
(01h)



*Disable Chinese 2 of 5
(00h)

Matrix 2 of 5

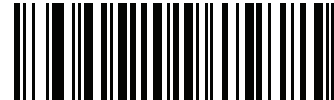
Enable/Disable Matrix 2 of 5

Parameter # F1h 6Ah

To enable or disable Matrix 2 of 5, scan the appropriate bar code below.



Enable Matrix 2 of 5
(01h)



*Disable Matrix 2 of 5
(00h)

Set Lengths for Matrix 2 of 5

Parameter # L1 = F1h 6Bh, L2 = F1h 6Ch

The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains. Set lengths for Matrix 2 of 5 to any length, one or two discrete lengths, or lengths within a specific range.

- **One Discrete Length** - Select this option to decode only Matrix 2 of 5 symbols containing a selected length. Select the length using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Matrix 2 of 5 symbols with 14 characters, scan **Matrix 2 of 5 - One Discrete Length**, then scan **1** followed by **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Two Discrete Lengths** - Select this option to decode only Matrix 2 of 5 symbols containing either of two selected lengths. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode only Matrix 2 of 5 symbols containing either 2 or 14 characters, select **Matrix 2 of 5 - Two Discrete Lengths**, then scan **0, 2, 1**, and then **4**. To correct an error or to change the selection, scan [Cancel on page D-2](#).
- **Length Within Range** - Select this option to decode a Matrix 2 of 5 symbol with a specific length range. Select lengths using the numeric bar codes in [Appendix D, Numeric Bar Codes](#). For example, to decode Matrix 2 of 5 symbols containing between 4 and 12 characters, first scan **Matrix 2 of 5 - Length Within Range**. Then scan **0, 4, 1**, and **2** (enter a leading zero for single digit numbers). To correct an error or change the selection, scan [Cancel on page D-2](#).
- **Any Length** - Scan this option to decode Matrix 2 of 5 symbols containing any number of characters within the digital scanner's capability.



*Matrix 2 of 5 - One Discrete Length



Matrix 2 of 5 - Two Discrete Lengths



Matrix 2 of 5 - Length Within Range



Matrix 2 of 5 - Any Length

Matrix 2 of 5 Redundancy

Parameter # F1h 6Dh

To enable or disable Matrix 2 of 5 redundancy, scan the appropriate bar code below.



**Enable Matrix 2 of 5 Redundancy
(01h)**



***Disable Matrix 2 of 5 Redundancy
(00h)**

Matrix 2 of 5 Check Digit

Parameter # F1h 6Eh

The check digit is the last character of the symbol used to verify the integrity of the data. Scan the appropriate bar code below to transmit the bar code data with or without the Matrix 2 of 5 check digit.



**Enable Matrix 2 of 5 Check Digit
(01h)**



***Disable Matrix 2 of 5 Check Digit
(00h)**

Transmit Matrix 2 of 5 Check Digit

Parameter # F1h 6Fh

Scan a bar code below to transmit Matrix 2 of 5 data with or without the check digit.



Transmit Matrix 2 of 5 Check Digit
(01h)



*Do Not Transmit Matrix 2 of 5 Check Digit
(00h)

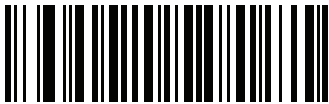
Korean 3 of 5

Enable/Disable Korean 3 of 5

Parameter # F1h 45h

To enable or disable Korean 3 of 5, scan the appropriate bar code below.

✓ **NOTE** The length for Korean 3 of 5 is fixed at 6.



Enable Korean 3 of 5
(01h)



*Disable Korean 3 of 5
(00h)

Inverse 1D

Parameter # F1h 4Ah

This parameter sets the 1D inverse decoder setting. Options are:

- **Regular Only** - the digital scanner decodes regular 1D bar codes only.
- **Inverse Only** - the digital scanner decodes inverse 1D bar codes only.
- **Inverse Autodetect** - the digital scanner decodes both regular and inverse 1D bar codes.



***Regular
(00h)**



**Inverse Only
(01h)**



**Inverse Autodetect
(02h)**

Postal Codes

US Postnet

Parameter # 59h

To enable or disable US Postnet, scan the appropriate bar code below.



Enable US Postnet
(01h)



* Disable US Postnet
(00h)

US Planet

Parameter # 5Ah

To enable or disable US Planet, scan the appropriate bar code below.



Enable US Planet
(01h)

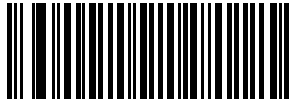


* Disable US Planet
(00h)

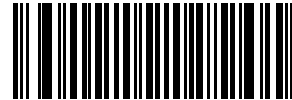
Transmit US Postal Check Digit

Parameter # 5Fh

Select whether to transmit US Postal data, which includes both US Postnet and US Planet, with or without the check digit.



***Transmit US Postal Check Digit
(01h)**



**Do Not Transmit US Postal Check Digit
(00h)**

UK Postal

Parameter # 5Bh

To enable or disable UK Postal, scan the appropriate bar code below.



**Enable UK Postal
(01h)**



***Disable UK Postal
(00h)**

Transmit UK Postal Check Digit

Parameter # 60h

Select whether to transmit UK Postal data with or without the check digit.



***Transmit UK Postal
Check Digit
(01h)**



**Do Not Transmit UK Postal Check Digit
(00h)**

Japan Postal

Parameter # F0h, 22h

To enable or disable Japan Postal, scan the appropriate bar code below.



**Enable Japan Postal
(01h)**



***Disable Japan Postal
(00h)**

Australian Postal

Parameter # F0h, 23h

To enable or disable Australian Postal, scan the appropriate bar code below.



**Enable Australian Postal
(01h)**



***Disable Australian Postal
(00h)**

Netherlands KIX Code

Parameter # F0h, 46h

To enable or disable Netherlands KIX Code, scan the appropriate bar code below.



**Enable Netherlands KIX Code
(01h)**



***Disable Netherlands KIX Code
(00h)**

USPS 4CB/One Code/Intelligent Mail

Parameter # F1h 50h

To enable or disable USPS 4CB/One Code/Intelligent Mail, scan the appropriate bar code below.



Enable USPS 4CB/One Code/Intelligent Mail
(01h)



*Disable USPS 4CB/One Code/Intelligent Mail
(00h)

UPU FICS Postal

Parameter # F1h 63h

To enable or disable UPU FICS Postal, scan the appropriate bar code below.



Enable UPU FICS Postal
(01h)



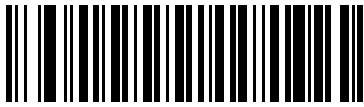
*Disable UPU FICS Postal
(00h)

GS1 DataBar

The variants of GS1 DataBar are DataBar-14, DataBar Expanded, and DataBar Limited. The limited and expanded versions have stacked variants. Scan the appropriate bar codes to enable or disable each variant of GS1 DataBar.

GS1 DataBar-14

Parameter # F0h 52h.



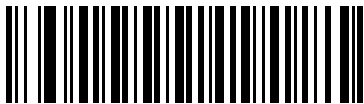
Enable GS1 DataBar-14
(01h)



*Disable GS1 DataBar 14
(00h)

GS1 DataBar Limited

Parameter # F0h 53h.



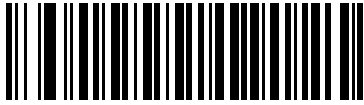
Enable GS1 DataBar Limited
(01h)



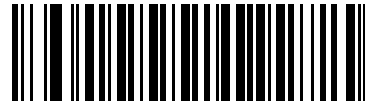
*Disable GS1 DataBar Limited
(00h)

GS1 DataBar Expanded

Parameter # F0h 54h.



**Enable GS1 DataBar Expanded
(01h)**



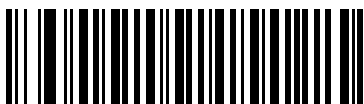
***Disable GS1 DataBar Expanded
(00h)**

Convert GS1 DataBar to UPC/EAN

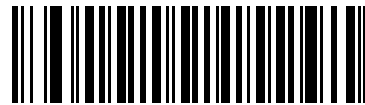
Parameter # F0h, 8Dh

This parameter only applies to GS1 DataBar-14 and GS1 DataBar Limited symbols not decoded as part of a Composite symbol. Enable this to strip the leading '010' from DataBar-14 and DataBar Limited symbols encoding a single zero as the first digit, and report the bar code as EAN-13.

For bar codes beginning with two or more zeros but not six zeros, this parameter strips the leading '0100' and reports the bar code as UPC-A. The UPC-A Preamble parameter that transmits the system character and country code applies to converted bar codes. Note that neither the system character nor the check digit can be stripped.



**Enable Convert GS1 DataBar to UPC/EAN
(01h)**



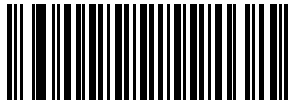
***Disable Convert GS1 DataBar to UPC/EAN
(00h)**

Composite

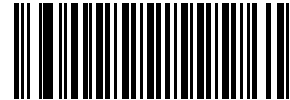
Composite CC-C

Parameter # F0h 55h

Scan a bar code below to enable or disable Composite bar codes of type CC-C.



Enable CC-C
(01h)



*Disable CC-C
(00h)

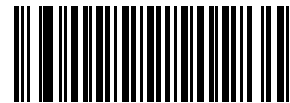
Composite CC-A/B

Parameter # F0h 56h

Scan a bar code below to enable or disable Composite bar codes of type CC-A/B.



Enable CC-A/B
(01h)

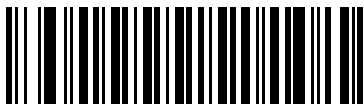


*Disable CC-A/B
(00h)

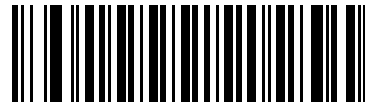
Composite TLC-39

Parameter # F0h 73h

Scan a bar code below to enable or disable Composite bar codes of type TLC-39.



Enable TLC39
(01h)



*Disable TLC39
(00h)

UPC Composite Mode

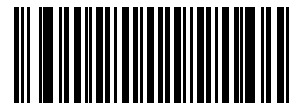
Parameter # F0h 58h

Select an option for linking UPC symbols with a 2D symbol during transmission as if they were one symbol:

- Select **UPC Never Linked** to transmit UPC bar codes regardless of whether a 2D symbol is detected.
- Select **UPC Always Linked** to transmit UPC bar codes and the 2D portion.
If 2D is not present, the UPC bar code does not transmit.
- If you select **Autodiscriminate UPC Composites**, the digital scanner determines if there is a 2D portion, then transmits the UPC, as well as the 2D portion if present.



*UPC Never Linked
(00h)



UPC Always Linked
(01h)

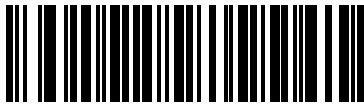


Autodiscriminate UPC Composites
(02h)

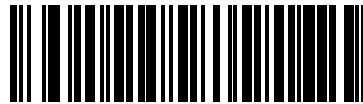
Composite Beep Mode

Parameter # F0h, 8Eh

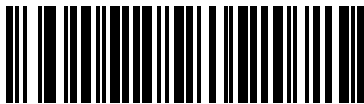
To select the number of decode beeps when a composite bar code is decoded, scan the appropriate bar code.



Single Beep after both are decoded
(00h)



*Beep as each code type is decoded
(01h)



Double Beep after both are decoded
(02h)

GS1-128 Emulation Mode for UCC/EAN Composite Codes

Parameter # F0h, ABh

Select whether to enable or disable this mode.



Enable GS1-128 Emulation Mode for
UCC/EAN Composite Codes
(01h)



*Disable GS1-128 Emulation Mode for
UCC/EAN Composite Codes
(00h)

2D Symbologies

Enable/Disable PDF417

Parameter # 0Fh

To enable or disable PDF417, scan the appropriate bar code below.



*** Enable PDF417
(01h)**



**Disable PDF417
(00h)**

Enable/Disable MicroPDF417

Parameter # E3h

To enable or disable MicroPDF417, scan the appropriate bar code below.



**Enable MicroPDF417
(01h)**



*** Disable MicroPDF417
(00h)**

Code 128 Emulation

Parameter # 7Bh

Enable this parameter to transmit data from certain MicroPDF417 symbols as Code 128. *AIM Code ID Character (01h)* on page 4-34 must be enabled for this parameter to work.

Enable Code 128 Emulation to transmit these MicroPDF417 symbols with one of the following prefixes:

-]C1 if the first codeword is 903-905
-]C2 if the first codeword is 908 or 909
-]C0 if the first codeword is 910 or 911

Disable Code 128 Emulation to transmit these MicroPDF417 symbols with one of the following prefixes:

-]L3 if the first codeword is 903-905
-]L4 if the first codeword is 908 or 909
-]L5 if the first codeword is 910 or 911

Scan a bar code below to enable or disable Code 128 Emulation.



NOTE Linked MicroPDF codewords 906, 907, 912, 914, and 915 are not supported. Use GS1 Composites instead.



**Enable Code 128 Emulation
(01h)**



***Disable Code 128 Emulation
(00h)**

Data Matrix

Parameter # F0h, 24h

To enable or disable Data Matrix, scan the appropriate bar code below.



***Enable Data Matrix
(01h)**



**Disable Data Matrix
(00h)**

Data Matrix Inverse

Parameter # F1h 4Ch

This parameter sets the Data Matrix inverse decoder setting. Options are:

- **Regular Only** - the digital scanner decodes regular Data Matrix bar codes only.
- **Inverse Only** - the digital scanner decodes inverse Data Matrix bar codes only.
- **Inverse Autodetect** - the digital scanner decodes both regular and inverse Data Matrix bar codes.



***Regular
(00h)**



**Inverse Only
(01h)**



**Inverse Autodetect
(02h)**

Maxicode

Parameter # F0h, 26h

To enable or disable Maxicode, scan the appropriate bar code below.



**Enable Maxicode
(01h)**



***Disable Maxicode
(00h)**

QR Code

Parameter # F0h, 25h

To enable or disable QR Code, scan the appropriate bar code below.



***Enable QR Code
(01h)**



**Disable QR Code
(00h)**

QR Inverse

Parameter # F1h 4Bh

This parameter sets the QR inverse decoder setting. Options are:

- **Regular Only** - the digital scanner decodes regular QR bar codes only.
- **Inverse Only** - the digital scanner decodes inverse QR bar codes only.
- **Inverse Autodetect** - the digital scanner decodes both regular and inverse QR bar codes.



*Regular
(00h)



Inverse Only
(01h)



Inverse Autodetect
(02h)

MicroQR

Parameter # F1h 3Dh

To enable or disable MicroQR, scan the appropriate bar code below.



*Enable MicroQR
(01h)



Disable MicroQR
(00h)

Aztec

Parameter # F1h 3Eh

To enable or disable Aztec, scan the appropriate bar code below.



*Enable Aztec
(01h)



Disable Aztec
(00h)

Aztec Inverse

Parameter # F1h 4Dh

This parameter sets the Aztec inverse decoder setting. Options are:

- **Regular Only** - the digital scanner decodes regular Aztec bar codes only.
- **Inverse Only** - the digital scanner decodes inverse Aztec bar codes only.
- **Inverse Autodetect** - the digital scanner decodes both regular and inverse Aztec bar codes.



*Regular
(00h)



Inverse Only
(01h)



Inverse Autodetect
(02h)

Redundancy Level

Parameter # 4Eh

The digital scanner offers four levels of decode redundancy. Select higher redundancy levels for decreasing levels of bar code quality. As redundancy levels increase, the digital scanner's aggressiveness decreases.

Select the redundancy level appropriate for the bar code quality.

Redundancy Level 1

The following code types must be successfully read twice before being decoded:

Table 14-2 *Redundancy Level 1 Codes*

Code Type	Code Length
Codabar	8 characters or less
MSI	4 characters or less
D 2 of 5	8 characters or less
I 2 of 5	8 characters or less

Redundancy Level 2

The following code types must be successfully read twice before being decoded:

Table 14-3 *Redundancy Level 2 Codes*

Code Type	Code Length
All	All

Redundancy Level 3

Code types other than the following must be successfully read twice before being decoded. The following codes must be read three times:

Table 14-4 *Redundancy Level 3 Codes*

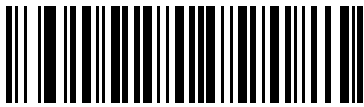
Code Type	Code Length
MSI	4 characters or less
D 2 of 5	8 characters or less
I 2 of 5	8 characters or less
Codabar	8 characters or less

Redundancy Level 4

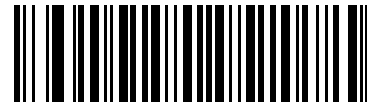
The following code types must be successfully read three times before being decoded:

Table 14-5 *Redundancy Level 4 Codes*

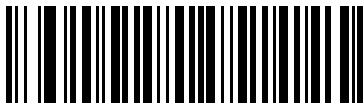
Code Type	Code Length
All	All



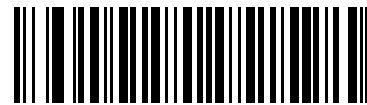
*Redundancy Level 1
(01h)



Redundancy Level 2
(02h)



Redundancy Level 3
(03h)



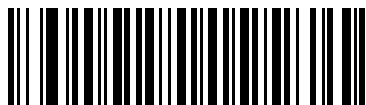
Redundancy Level 4
(04h)

Security Level

Parameter # 4Dh

The digital scanner offers four levels of decode security for delta bar codes, which include the Code 128 family, UPC/EAN, and Code 93. Select increasing levels of security for decreasing levels of bar code quality. There is an inverse relationship between security and digital scanner aggressiveness, so choose only that level of security necessary for any given application.

- **Security Level 0:** This setting allows the digital scanner to operate in its most aggressive state, while providing sufficient security in decoding most “in-spec” bar codes.
- **Security Level 1:** This default setting eliminates most misdecodes.
- **Security Level 2:** Select this option if Security level 1 fails to eliminate misdecodes.
- **Security Level 3:** If you selected Security Level 2 and misdecodes still occur, select this security level. Be advised, selecting this option is an extreme measure against mis-decoding severely out of spec bar codes. Selecting this level of security significantly impairs the decoding ability of the digital scanner. If you need this level of security, try to improve the quality of the bar codes.



*Security Level 0
(00h)



Security Level 1
(01h)



Security Level 2
(02h)



Security Level 3
(03h)

Intercharacter Gap Size

Parameter # F0h, 7Dh

The Code 39 and Codabar symbologies have an intercharacter gap that is typically quite small. Due to various bar code-printing technologies, this gap can grow larger than the maximum size allowed, preventing the digital scanner from decoding the symbol. If this problem occurs, scan the **Large Intercharacter Gaps** parameter to tolerate these out-of-specification bar codes.



***Normal Intercharacter Gaps
(06h)**



**Large Intercharacter Gaps
(0Ah)**

Report Version

Scan the bar code below to report the version of software installed in the digital scanner.



Report Software Version

Macro PDF Features

Macro PDF is a special feature for concatenating multiple PDF symbols into one file. The scanner can decode symbols that are encoded with this feature, and can store more than 64 Kb of decoded data stored in up to 50 MacroPDF symbols.



CAUTION When printing, keep each Macro PDF sequence separate, as each sequence has unique identifiers. Do not mix bar codes from several Macro PDF sequences, even if they encode the same data. When scanning Macro PDF sequences, scan the entire Macro PDF sequence without interruption. If, when scanning a mixed sequence, the digital scanner emits two long low beeps (Low/Low) this indicates an inconsistent file ID or inconsistent symbology error.

Flush Macro Buffer

This flushes the buffer of all decoded Macro PDF data stored to that point, transmits it to the host device, and aborts from Macro PDF mode.



Flush Macro PDF Buffer

Abort Macro PDF Entry

This clears all currently-stored Macro PDF data in the buffer without transmission and aborts from Macro PDF mode.



Abort Macro PDF Entry

Chapter 15 Advanced Data Formatting

Introduction

Advanced Data Formatting (ADF) is a means of customizing data before transmission to the host device. Scan data can be edited to suit particular requirements.

To implement ADF, scan a related series of bar codes, which begin on [page 15-8](#), which allows programming the digital scanner with Advanced Data Formatting (ADF) Rules.

Avoid using ADF formatting with bar codes containing more than 60 characters. To add a prefix or suffix value for such bar codes, use *Prefix/Suffix Values on page 5-34*. Using ADF with longer bar codes transmits the bar code in segments of length 252 or less (depending on the host selected), and applies the rule to each segment

Rules: Criteria Linked to Actions

ADF uses **rules** to customize data. These rules perform detailed actions when the data meets certain criteria. One rule may consist of single or multiple criteria applied to single or multiple actions.

For instance, a data formatting rule could be:

Criteria: *When scan data is Code 39, length 12, and data at the start position is the string "129",*
Actions: *pad all sends with zeros to length 8,
send all data up to X,
send a space.*

Scanning a Code 39 bar code of 1299X1559828 transmits the following: 00001299<space>. If you scan a Code 39 bar code of 1299X15598, this rule is ignored because the bar code did not meet the length criteria.

The rule specifies the editing conditions and requirements before data transmission occurs.

Using ADF Bar Codes

When programming a rule, make sure the rule is logically correct. Plan ahead before scanning.

To program each data formatting rule:

- **Start the Rule.** Scan the *Begin New Rule bar code on page 15-8*.
- **Specify Criteria.** Scan the bar codes for all pertinent criteria. Criteria can include code type (e.g., Code 128), code length, or data that contains a specific character string (e.g., the digits “129”). See *Criteria on page 15-11*.
- **Select Actions.** Scan all actions related to, or affecting, these criteria. The actions of a rule specify how to format the data for transmission. See *Actions on page 15-24*.
- **Save the Rule.** Scan the *Save Rule bar code on page 15-8*. This places the rule in the “top” position in the rule buffer.
- To correct any errors, see *Erase on page 15-9* to erase criteria, actions, and entire rules.

ADF Bar Code Menu Example

This section provides an example of how to enter and use ADF rules for scan data.

An auto parts distribution center wants to encode manufacturer ID, part number, and destination code into their own Code 128 bar codes. The distribution center also has products that carry UPC bar codes, placed there by the manufacturer. The Code 128 bar codes have the following format:

MMMMMPPPPD

Where: M = Manufacturer ID
 P = Part Number
 D = Destination Code

The distribution center uses a PC with dedicated control characters for manufacturer ID <CTRL M>, part number <CTRL P>, and destination code <CTRL D>. At this center the UPC data is treated as manufacturer ID code.

The following rules need to be entered:

When scanning data of code type Code 128, send the next 5 characters, send the manufacturer ID key <CTRL M>, send the next 5 characters, send the part number key <CTRL P>, send the next 2 characters, send the destination code key <CTRL D>.

When scanning data of code type UPC/EAN, send all data, send the manufacturer ID key <CTRL M>.

To enter these rules, see the following steps.

Rule 1: The Code 128 Scanning Rule

Step	Bar Code	On Page	Beep Indication
1	Begin New Rule	15-8	High High
2	Code 128	15-11	High High
3	Send next 5 characters	15-25	High High
4	Send <CTRL M>	15-45	High High
5	Send next 5 characters	15-25	High High
6	Send <CTRL P>	15-45	High High
7	Send next 2 characters	15-24	High High
8	Send <CTRL D>	15-44	High High
9	Save Rule	15-8	High Low High Low

Rule 2: The UPC Scanning Rule

Step	Bar Code	On Page	Beep Indication
1	Begin New Rule	15-8	High High
2	UPC/EAN	15-13	High High
3	Send all remaining data	15-24	High High
4	Send <CTRL M>	15-45	High High
5	Save Rule	15-8	High Low High Low

To correct any errors made while entering this rule, scan the *Quit Entering Rules bar code on page 15-9*. If you already saved the rule, scan the *Erase Previously Saved Rule bar code on page 15-9*.

Alternate Rule Sets

You can group ADF rules into one of four alternate sets which you can turn on and off when needed. This is useful to format the same message in different ways. For example, a Code 128 bar code contains the following information:

Class (2 digits), Stock Number (8) digits, Price (5 digits)

The bar code might look like this:

245671243701500

where:

Class = 24

Stock Number = 56712437

Price = 01500

Ordinarily, data is sent as follows:

24 (class key)

56712437 (stock key)

01500 (enter key)

But, when there is a sale, send only the following:

24 (class key)

56712437 (stock key)

and the cashier keys the price manually.

To implement this, first enter an ADF rule that applies to the normal situation, such as:

Scan Rule Belongs to Set 1. When scanning a bar code of length 15, send the next 2 characters, send the class key, send the next 8 characters, send the stock key, send the data that remains, send the Enter key.

The “sale” rule may look like this:

Scan Rule Belongs to Set 2. When scanning a bar code of length 15, send the next 2 characters, send the class key, send the next 8 characters, send the stock key.

To switch between the two sets of rules, program a “switching rule” that specifies what type of bar code to scan to switch between the rule sets. For example, in the case of the “sale” rule above, the rule programmer wants the cashier to scan the bar code “M” before a sale. To do this, a rule can be entered as follows:

When scanning a bar code of length 1 that begins with “M”, select rule set number 1.

Program another rule to switch back.

When scanning a bar code of length 1 that begins with “N”, turn off rule set number 1.

Or include the switching back to normal rules in the “sale” rule:

When scanning a bar code of length 15, send the next 2 characters, send the class key, send the next 8 characters, send the stock key, turn off rule set 1.

For optimal results, scan the *Disable All Rule Sets bar code on page 15-10* after programming a rule belonging to an alternate rule set.

In addition to enabling and disabling rule sets within the rules, enable or disable them by scanning the appropriate bar codes on [page 15-10](#).

Rules Hierarchy (in Bar Codes)

The order of programming individual rules is important. Program the most general rule first.

All programmed rules are stored in a buffer. As they are programmed, they are stored at the “top” of a rules list. If you create three rules, the list is configured as follows:

Third Rule
Second Rule
First Rule

When you scan data, the rules list is checked from top to bottom to determine if the criteria matches (and therefore, if the actions occur). Input is modified into the data format specified by the first matching set of criteria it finds. Be sure to program the most general rule first.

For example, if the THIRD rule states:

When scanning a bar code of any length, send all data, then send the ENTER key.

And the SECOND rule states:

When scanning a Code 128 bar code of length 12, send the first four characters, then send the ENTER key, then send all remaining data.

and you scan a Code 128 bar code of length 12, the THIRD rule applies, and the SECOND rule appears to not function.

Note that using the standard data editing functions also creates ADF rules. Scan options are entered as ADF rules, and the hierarchy mentioned above also applies to them. For the digital scanner, this applies to prefix/suffix programming in the parameter *Scan Data Transmission Format* on page 5-35.

These rules reside in the same “rule list” as ADF Rules, so the order you create them is also important.

Default Rules

Every unit has a default rule to send all scan data. Units with custom software may have one or more default rules burned in. The rules hierarchy checks user programmable rules first, then the default rules. Disable default rules by entering the following general rule in the user programmable buffer:

When receiving scan data, send all data.

Since this rule always applies, ADF never applies the default rules.

ADF Bar Codes

Table 15-1 lists the bar codes available through ADF.

Table 15-1 ADF Bar Codes

Parameter	Page Number
<i>Special Commands</i>	15-8
<i>Pause Duration</i>	15-8
<i>Begin New Rule</i>	15-8
<i>Save Rule</i>	15-8
<i>Erase</i>	15-9
<i>Quit Entering Rules</i>	15-9
<i>Disable Rule Set</i>	15-10
<i>Criteria</i>	15-11
<i>Code Types</i>	15-11
<i>Code Lengths</i>	15-15
<i>1 Character - 6 Characters</i>	15-15
<i>7 Characters - 13 Characters</i>	15-16
<i>14 Characters - 20 Characters</i>	15-17
<i>21 Characters - 27 Characters</i>	15-18
<i>28 Characters - 30 Characters</i>	15-19
<i>Specific String at Start</i>	15-19
<i>Specific String, Any Location</i>	15-20
<i>Any Message OK</i>	15-20
<i>Numeric Keypad</i>	15-21
<i>Rule Belongs To Set</i>	15-23
<i>Actions</i>	15-24
<i>Send Data</i>	15-24
<i>Send Data Up To Character</i>	15-24
<i>Send Next Character</i>	15-24
<i>Send All Data That Remains</i>	15-24
<i>Send Next 2 Characters - Send Next 20 Characters</i>	15-24
<i>Move Cursor</i>	15-28

Table 15-1 ADF Bar Codes (Continued)

Parameter	Page Number
<i>Send Pause</i>	15-28
<i>Skip Ahead</i>	15-29
<i>Skip Back</i>	15-30
<i>Send Preset Value</i>	15-32
<i>Remove All Spaces</i>	15-32
<i>Crunch All Spaces</i>	15-32
<i>Stop Space Removal</i>	15-32
<i>Remove Leading Zeros</i>	15-33
<i>Stop Zero Removal</i>	15-33
<i>Pad Data with Spaces</i>	15-34
<i>Pad Data with Zeros</i>	15-38
<i>Beeps</i>	15-43
<i>Control Characters</i>	15-43
<i>Keyboard Characters</i>	15-48
<i>Send ALT Characters</i>	15-61
<i>Send Keypad Characters</i>	15-67
<i>Send Function Key</i>	15-72
<i>Send F1 Key - Send F24 Key</i>	15-72
<i>Send PF1 Key - Send PF30 Key</i>	15-75
<i>Send Right Control Key</i>	15-79
<i>Send Graphic User Interface (GUI) Characters</i>	15-80
<i>Send GUI 0 - Send GUI 9</i>	15-80
<i>Send GUI A - Send GUI Z</i>	15-81
<i>Turn On/Off Rule Sets</i>	15-85
<i>Alphanumeric Keyboard</i>	15-87
<i>Space - `</i>	15-87
<i>0 - 9</i>	15-91
<i>A - Z</i>	15-92
<i>Cancel</i>	15-96

Table 15-1 ADF Bar Codes (Continued)

Parameter	Page Number
<i>End of Message</i>	15-96
<i>a - z</i>	15-96
<i>{ - ~</i>	15-100

Special Commands

Pause Duration

Use this parameter, along with [Send Pause on page 15-28](#), to insert a pause in the data transmission. Set the pause by scanning a two-digit number (i.e., two bar codes) from [Appendix D, Numeric Bar Codes](#) in 0.1 second intervals. For example, scanning bar codes **0** and **1** inserts a 0.1 second pause; **0** and **5** inserts a 0.5 second delay. To correct an error or change a selection, scan [Cancel on page D-3](#).



Pause Duration

Begin New Rule

Scan the bar code below to start entering a new rule



Begin New Rule

Save Rule

Scan the bar code below to save the rule.



Save Rule

Erase

Use these bar codes to erase criteria, actions, or rules.



Erase Criteria And Start Again



Erase Actions And Start Again



Erase Previously Saved Rule



Erase All Rules

Quit Entering Rules

Scan the bar code below to quit entering rules.



Quit Entering Rules

Disable Rule Set

Use these bar codes to disable rule sets.



Disable Rule Set 1



Disable Rule Set 2



Disable Rule Set 3



Disable Rule Set 4



Disable All Rule Sets

Criteria

Code Types

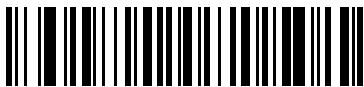
Scan the bar codes for all code to be affected by the rule. Scan the codes in succession, prior to selecting other criteria. *To select all code types, do not scan any code type.*



Code 39



Codabar



GS1 DataBar-14



GS1 DataBar Limited



GS1 DataBar Expanded



Code 128



D 2 OF 5

Code Types (continued)



IATA 2 OF 5



I 2 OF 5



Code 93



UPC-A



UPC-E



EAN-8



EAN-13

Code Types (continued)



MSI



GS1-128



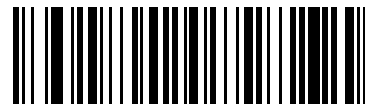
UPC-E1



Bookland EAN



Trioptic Code 39



Code 11



Code 32

Code Types (continued)



ISBT 128



Coupon Code



TLC 39



UPC/EAN Composites



GS1 DataBar and EAN128 Composites



NOTE When selecting composite bar codes, enable AIM IDs if parsing UPC or EAN composite data, or data from an application that uses symbol separators.

Code Lengths

Scan these bar codes to define the number of characters the selected code type must contain. Select one length per rule only. *Do not select any code length to select code types of any length.*



1 Character



2 Characters



3 Characters



4 Characters



5 Characters



6 Characters

Code Lengths (continued)



7 Characters



8 Characters



9 Characters



10 Characters



11 Characters



12 Characters



13 Characters

Code Lengths (continued)



14 Characters



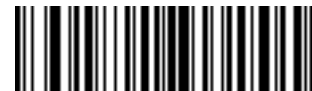
15 Characters



16 Characters



17 Characters



18 Characters



19 Characters



20 Characters

Code Lengths (continued)



21 Characters



22 Characters



23 Characters



24 Characters



25 Characters



26 Characters



27 Characters

Code Lengths (continued)



28 Characters



29 Characters



30 Characters

Message Containing A Specific Data String

Use this feature to select whether the formatting affects data that begins with a specific character or data string, or contains a specific character or data string.

There are 4 features:

- Specific String at Start
- Specific String, Any Location
- Any Message OK
- Rule Belongs to Set

Specific String at Start

1. Scan the following bar code.
2. Scan the bar codes representing the desired character or characters (up to a total of 8) using the *Alphanumeric Keyboard on page 15-87*.
3. Scan *End of Message bar code on page 15-96*.



Specific String At Start

Specific String, Any Location

1. Scan the following bar code.
2. Enter a location by scanning a two-digit number representing the **position** (use a leading "zero" if necessary) using the *Numeric Keypad on page 15-21*.
3. Scan the bar codes representing the desired character or characters (up to a total of 8) using the *Alphanumeric Keyboard on page 15-87*.
4. Scan *End of Message bar code on page 15-96*.



Specific String Any Location

Any Message OK

Do not scan any bar code to format all selected code types, regardless of information contained.

Numeric Keypad

Do not confuse bar codes on this page with those on the alphanumeric keyboard.



0



1



2



3



4



5



6

Numeric Keypad (continued)



7



8



9



Cancel

Rule Belongs To Set

Select the set to which a rule belongs. There are four possible rule sets. See *Alternate Rule Sets on page 15-3* for more information about rule sets.



Rule Belongs To Set 1



Rule Belongs To Set 2



Rule Belongs To Set 3



Rule Belongs To Set 4

Actions

Select how to format the data for transmission.

Send Data

Send all data that remains, send all data up to a specific character selected from the *Alphanumeric Keyboard on page 15-87*, or send the next *X* characters. Note that only bar codes for **Send Next 1 to 20** appear here, and can be scanned multiple times to send values greater than 20. For instance, to send the next 28 characters, scan **Send Next 20 Characters**, then **Send Next 8 Characters**.



Send Data Up To Character



Send All Data That Remains



Send Next Character



Send Next 2 Characters



Send Next 3 Characters



Send Next 4 Characters

Send Data (continued)



Send Next 5 Characters



Send Next 6 Characters



Send Next 7 Characters



Send Next 8 Characters



Send Next 9 Characters



Send Next 10 Characters



Send Next 11 Characters

Send Data (continued)



Send Next 12 Characters



Send Next 13 Characters



Send Next 14 Characters



Send Next 15 Characters



Send Next 16 Characters



Send Next 17 Characters



Send Next 18 Characters

Send Data (continued)

Send Next 19 Characters



Send Next 20 Characters

Setup Field(s)**Table 15-2** *Setup Field(s) Definitions*

Parameter	Description	Page
Move Cursor		
Move Cursor To a Character	Scan the <i>Move Cursor To Character</i> on page 15-28, then any printable ASCII character from the <i>Alphanumeric Keyboard</i> on page 15-87. This moves the cursor to the position after the matching character. If the character is not there, the rule fails and ADF tries the next rule.	15-28
Move Cursor to Start of Data	Scan this bar code to move the cursor to the beginning of the data.	15-28
Move Cursor Past a Character	This action moves the cursor past all sequential occurrences of a selected character. For example, if the selected character is 'A', then the cursor moves past 'A', 'AA', 'AAA', etc. Scan the <i>Move Cursor Past Character</i> on page 15-28, then select a character from the <i>Alphanumeric Keyboard</i> on page 15-87. If the character is not there, the cursor does not move (i.e., has no effect).	15-28
Skip Ahead "N" Characters	Scan one of these bar codes to select the number of positions ahead to move the cursor.	15-29
Skip Back "N" Characters	Scan one of these bar codes to select the number of positions back to move the cursor.	15-30
Send Preset Value	Send Values 1 through 6 by scanning the appropriate bar code. Set these values using the prefix/suffix values in Table 7-4 on page 7-19 . Value 1 = Scan Suffix Value 2 = Scan Prefix Values 3-6 are not applicable	15-30

Move Cursor

Scan a bar code below to move the cursor in relation to a specified character. Then enter a character by scanning a bar code from the *Alphanumeric Keyboard* on page 15-87.

✓ **NOTE** If there is no match and the rule fails, the next rule is checked.



Move Cursor To Character



Move Cursor To Start



Move Cursor Past Character

Send Pause

Scan the bar code below to insert a pause in the transmission of data. See *Pause Duration* on page 15-8 to set the length of this pause.



Send Pause

Skip Ahead

Use the following bar codes to skip ahead characters.



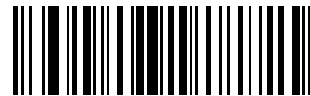
Skip Ahead 1 Character



Skip Ahead 2 Characters



Skip Ahead 3 Characters



Skip Ahead 4 Characters



Skip Ahead 5 Characters



Skip Ahead 6 Characters



Skip Ahead 7 Characters

Skip Ahead (continued)



Skip Ahead 8 Characters



Skip Ahead 9 Characters



Skip Ahead 10 Characters

Skip Back

Use the following bar codes to skip back characters.



Skip Back 1 Character



Skip Back 2 Characters



Skip Back 3 Characters

Skip Back (continued)



Skip Back 4 Characters



Skip Back 5 Characters



Skip Back 6 Characters



Skip Back 7 Characters



Skip Back 8 Characters



Skip Back 9 Characters



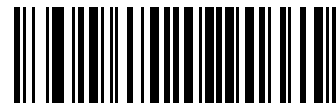
Skip Back 10 Characters

Send Preset Value

Use these bar codes to send preset values. See *Prefix/Suffix Values on page 5-34* to set these values.



Send Prefix



Send Suffix

Modify Data

Modify data as described below. The following actions work for all send commands that follow it within a rule. Programming *pad zeros to length 6, send next 3 characters, stop padding, send next 5 characters*, adds three zeros to the first send, and the next send is unaffected by the padding. These options do not apply to the **Send Keystroke** or **Send Preset Value** options.

Remove All Spaces

To remove all spaces in the send commands that follow, scan the bar code below.



Remove All Spaces

Crunch All Spaces

To leave one space between words, scan the bar code below. This also removes all leading and trailing spaces.



Crunch All Spaces

Stop Space Removal

Scan the bar code below to disable space removal.



Stop Space Removal

Remove Leading Zeros

Scan the bar code below to remove all leading zeros.



Remove Leading Zeros

Stop Zero Removal

Scan the bar code below to disable the removal of zeros.



Stop Zero Removal

Pad Data with Spaces

To pad data to the left, scan the bar code containing the desired number of spaces. Use **Send** commands to activate this parameter.



Pad Spaces To Length 1



Pad Spaces To Length 2



Pad Spaces To Length 3



Pad Spaces To Length 4



Pad Spaces To Length 5



Pad Spaces To Length 6



Pad Spaces To Length 7

Pad Data with Spaces (continued)



Pad Spaces To Length 8



Pad Spaces To Length 9



Pad Spaces To Length 10



Pad Spaces To Length 11



Pad Spaces To Length 12



Pad Spaces To Length 13



Pad Spaces To Length 14

Pad Data with Spaces (continued)



Pad Spaces To Length 15



Pad Spaces To Length 16



Pad Spaces To Length 17



Pad Spaces To Length 18



Pad Spaces To Length 19



Pad Spaces To Length 20



Pad Spaces To Length 21

Pad Data with Spaces (continued)



Pad Spaces To Length 22



Pad Spaces To Length 23



Pad Spaces To Length 24



Pad Spaces To Length 25



Pad Spaces To Length 26



Pad Spaces To Length 27



Pad Spaces To Length 28

Pad Data with Spaces (continued)



Pad Spaces To Length 29



Pad Spaces To Length 30



Stop Pad Spaces

Pad Data with Zeros

To pad data to the left, scan the bar code containing the desired number of zeros. Use **Send** commands to activate this parameter.



Pad Zeros To Length 1



Pad Zeros To Length 2



Pad Zeros To Length 3

Pad Data with Zeros (continued)



Pad Zeros To Length 4



Pad Zeros To Length 5



Pad Zeros To Length 6



Pad Zeros To Length 7



Pad Zeros To Length 8



Pad Zeros To Length 9



Pad Zeros To Length 10

Pad Data with Zeros (continued)



Pad Zeros To Length 11



Pad Zeros To Length 12



Pad Zeros To Length 13



Pad Zeros To Length 14



Pad Zeros To Length 15



Pad Zeros To Length 16



Pad Zeros To Length 17

Pad Data with Zeros (continued)



Pad Zeros To Length 18



Pad Zeros To Length 19



Pad Zeros To Length 20



Pad Zeros To Length 21



Pad Zeros To Length 22



Pad Zeros To Length 23



Pad Zeros To Length 24

Pad Data with Zeros (continued)



Pad Zeros To Length 25



Pad Zeros To Length 26



Pad Zeros To Length 27



Pad Zeros To Length 28



Pad Zeros To Length 29



Pad Zeros To Length 30



Stop Pad Zeros

Beeps

Select a beep sequence for each ADF rule.



Beep Once



Beep Twice



Beep Three Times

Send Keystroke (Control Characters and Keyboard Characters)

Control Characters

Scan a **Send** bar code for the keystroke to send.



Send Control 2



Send Control A



Send Control B

Control Characters (continued)



Send Control C



Send Control D



Send Control E



Send Control F



Send Control G



Send Control H



Send Control I

Control Characters (continued)



Send Control J



Send Control K



Send Control L



Send Control M



Send Control N



Send Control O



Send Control P

Control Characters (continued)



Send Control R



Send Control Q



Send Control S



Send Control T



Send Control U



Send Control V



Send Control W

Control Characters (continued)



Send Control X



Send Control Y



Send Control Z



Send Control [



**Send Control **



Send Control]

Control Characters (continued)



Send Control 6



Send Control -

Keyboard Characters

Scan a **Send** bar code for the keyboard characters to send.



Send Space



Send !



Keyboard Characters (continued)



Send \$



Send %



Send &



Send '



Send (



Send)



Send *

Keyboard Characters (continued)



Send +



Send ,



Send -



Send .



Send /



Send 0



Send 1

Keyboard Characters (continued)



Send 2



Send 3



Send 4



Send 5



Send 6



Send 7



Send 8

Keyboard Characters (continued)



Send 9



Send :



Send ;



Send <



Send =



Send >



Send ?

Keyboard Characters (continued)



Send @



Send A



Send B



Send C



Send D



Send E



Send F

Keyboard Characters (continued)



Send G



Send H



Send I



Send J



Send K



Send L



Send M

Keyboard Characters (continued)



Send N



Send O



Send P



Send Q



Send R



Send S



Send T

Keyboard Characters (continued)



Send U



Send V



Send W



Send X



Send Y



Send Z



Send [

Keyboard Characters (continued)



Send \



Send]



Send ^



Send _



Send `



Send a



Send b

Keyboard Characters (continued)



Send c



Send d



Send e



Send f



Send g



Send h



Send i

Keyboard Characters (continued)



Send j



Send k



Send l



Send m



Send n



Send o



Send p

Keyboard Characters (continued)



Send q



Send r



Send s



Send t



Send u



Send v



Send w

Keyboard Characters (continued)



Send x



Send y



Send z



Send {



Send |



Send }



Send ~

Send ALT Characters



Send Alt 2



Send Alt A



Send Alt B



Send Alt C



Send Alt D



Send Alt E



Send Alt F

Send ALT Characters (continued)



Send Alt G



Send Alt H



Send Alt I



Send Alt J



Send Alt K



Send Alt L



Send Alt M

Send ALT Characters (continued)



Send Alt N



Send Alt O



Send Alt P



Send Alt Q



Send Alt R



Send Alt S



Send Alt T

Send ALT Characters (continued)



Send Alt U



Send Alt V



Send Alt W



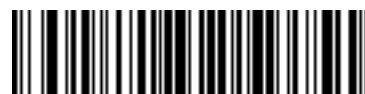
Send Alt X



Send Alt Y



Send Alt Z



Send Alt [

Send ALT Characters (continued)



**Send Alt **



Send Alt]

Send Keypad Characters



Send Keypad *



Send Keypad +



Send Keypad -



Send Keypad .



Send Keypad /



Send Keypad 0



Send Keypad 1

Send Keypad Characters (continued)



Send Keypad 2



Send Keypad 3



Send Keypad 4



Send Keypad 5



Send Keypad 6



Send Keypad 7



Send Keypad 8

Send Keypad Characters (continued)



Send Keypad 9



Send Keypad Enter



Send Keypad Numlock



Send Break Key



Send Delete Key



Send Page Up Key



Send End Key

Send Keypad Characters (continued)



Send Page Down Key



Send Pause Key



Send Scroll Lock Key



Send Backspace Key



Send Tab Key



Send Print Screen Key



Send Insert Key

Send Keypad Characters (continued)



Send Home Key



Send Enter Key



Send Escape Key



Send Up Arrow Key



Send Down Arrow Key



Send Left Arrow Key



Send Right Arrow Key

Send Function Key



Send F1 Key



Send F2 Key



Send F3 Key



Send F4 Key



Send F5 Key



Send F6 Key



Send F7 Key

Send Function Key (continued)



Send F8 Key



Send F9 Key



Send F10 Key



Send F11 Key



Send F12 Key



Send F13 Key



Send F14 Key

Send Function Key (continued)



Send F15 Key



Send F16 Key



Send F17 Key



Send F18 Key



Send F19 Key



Send F20 Key



Send F21 Key

Send Function Key (continued)



Send F22 Key



Send F23 Key



Send F24 Key



Send PF1 Key



Send PF2 Key



Send PF3 Key



Send PF4 Key

Send Function Key (continued)



Send PF5 Key



Send PF6 Key



Send PF7 Key



Send PF8 Key



Send PF9 Key



Send PF10 Key



Send PF11 Key

Send Function Key (continued)



Send PF12 Key



Send PF13 Key



Send PF14 Key



Send PF15 Key



Send PF16 Key



Send PF17 Key



Send PF18 Key

Send Function Key (continued)



Send PF19 Key



Send PF20 Key



Send PF21 Key



Send PF22 Key



Send PF23 Key



Send PF24 Key



Send PF25 Key

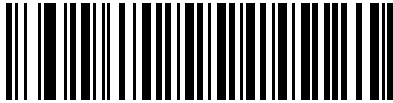
Send Function Key (continued)**Send PF26 Key****Send PF27 Key****Send PF28 Key****Send PF29 Key****Send PF30 Key****Send Right Control Key**

The “Send Right Control Key” action will send a tap (press and release) of the Right Control Key.

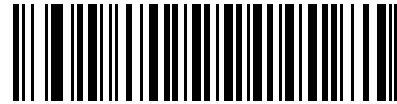
**Send Right Control Key**

Send Graphic User Interface (GUI) Characters

The **Send Graphic User Interface Character** actions taps the specified key while holding the System Dependent Graphic User Interface (GUI) Key. The definition of the Graphic User Interface key depends on the attached system.



Send GUI 0



Send GUI 1



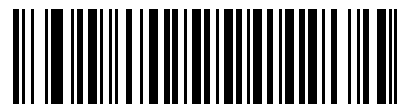
Send GUI 2



Send GUI 3



Send GUI 4

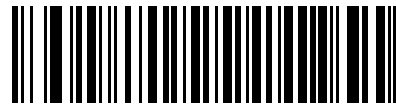


Send GUI 5

Send Graphic User Interface (GUI) Characters (continued)



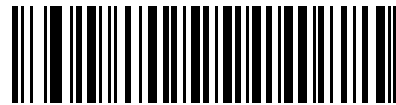
Send GUI 6



Send GUI 7



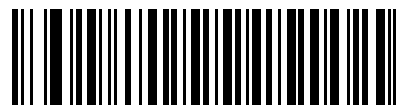
Send GUI 8



Send GUI 9



Send GUI A

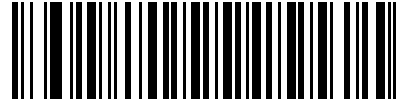


Send GUI B

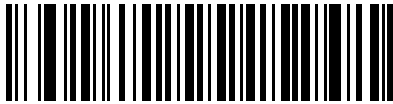


Send GUI C

Send Graphic User Interface (GUI) Characters (continued)



Send GUI D



Send GUI E



Send GUI F



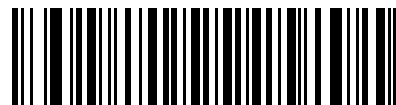
Send GUI G



Send GUI H



Send GUI I

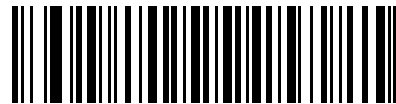


Send GUI J

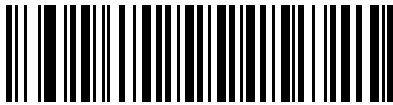
Send Graphic User Interface (GUI) Characters (continued)



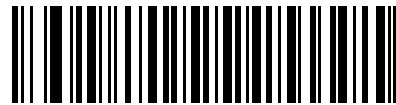
Send GUI K



Send GUI L



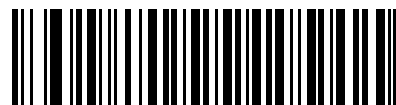
Send GUI M



Send GUI N



Send GUI O

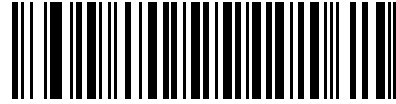


Send GUI P

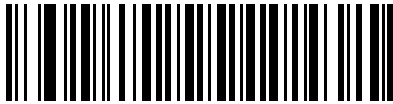


Send GUI Q

Send Graphic User Interface (GUI) Characters (continued)



Send GUI R



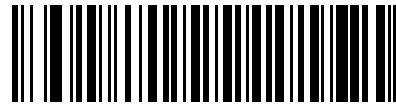
Send GUI S



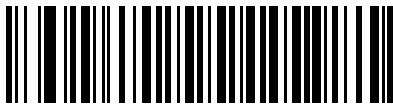
Send GUI T



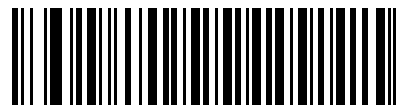
Send GUI U



Send GUI V



Send GUI W

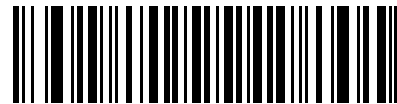


Send GUI X

Send Graphic User Interface (GUI) Characters (continued)



Send GUI Y



Send GUI Z

Turn On/Off Rule Sets

Use these bar codes to turn rule sets on and off.



Turn On Rule Set 1



Turn On Rule Set 2



Turn On Rule Set 3



Turn On Rule Set 4

Turn On/Off Rule Sets (continued)

Use these bar codes to turn rule sets on and off.



Turn Off Rule Set 1



Turn Off Rule Set 2



Turn Off Rule Set 3



Turn Off Rule Set 4

Alphanumeric Keyboard



Space



#



\$



%



*

(Single Quote)



+



-

(Dash)

Alphanumeric Keyboard (continued)



'
(Comma)



!



&



(



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/



“



'

Alphanumeric Keyboard (continued)



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>



?

Alphanumeric Keyboard (continued)



@



[



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]



^



—
(Underscore)



,

Alphanumeric Keyboard (continued)

✓ **NOTE** Do not confuse the numeric bar codes below with those on the numeric keypad.



0



1



2



3



4



5

Alphanumeric Keyboard (continued)



6



7



8



9



A



B



C

Alphanumeric Keyboard (continued)



D



E



F



G



H



I



J

Alphanumeric Keyboard (continued)



K



L



M



N



O



P



Q

Alphanumeric Keyboard (continued)



R



S



T



U



V



W



X

Alphanumeric Keyboard (continued)



Y



Z



Cancel



End of Message



a



b



c

Alphanumeric Keyboard (continued)



d



e



f



g



h



i



j

Alphanumeric Keyboard (continued)



k



l



m



n



o



p



q

Alphanumeric Keyboard (continued)



s



r



t



u



v



w



x

Alphanumeric Keyboard (continued)



y



z



{



|



}



~