



User Guide

© Copyright 2017 HP Development Company, L.P.

Windows is either a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries.

Confidential computer software. Valid license from HP required for possession, use or copying. Consistent with FAR 12.211 and 12.212, Commercial Computer Software, Computer Software Documentation, and Technical Data for Commercial Items are licensed to the U.S. Government under vendor's standard commercial license.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

First Edition: May 2017

Document Part Number: 923653-001

Table of contents

1 Programming the interface	1
USB HID	1
2 Input/output settings	2
Manual trigger modes	2
Manual trigger light	2
Mobile phone read mode	3
Poor quality codes	3
Poor quality 1D codes	3
Poor quality PDF codes	3
3 Symbologies	4
All symbologies	5
Message length description	5
Codabar	6
Codabar on/off	6
Codabar start/stop characters	6
Codabar check character	6
Codabar concatenation	7
Codabar message length	7
Code 39	8
Code 39 on/off	8
Code 39 start/stop characters	8
Code 39 check character	8
Code 39 message length	9
Code 39 append	9
Code 32 Pharmaceutical (PARAF)	9
Full ASCII	10
Code 39 code page	14
Interleaved 2 of 5	14
Interleaved 2 of 5 on/off	14
Interleaved 2 of 5 check character	15
Interleaved 2 of 5 message length	15
NEC 2 of 5	15
NEC 2 of 5 on/off	15
NEC 2 of 5 check character	16

NEC 2 of 5 message length	16
Code 93	16
Code 93 on/off	17
Code 93 message length	17
Code 93 append	17
Code 93 code page	17
Straight 2 of 5 Industrial (three-bar start/stop)	18
Straight 2 of 5 Industrial on/off	18
Straight 2 of 5 Industrial message length	18
Straight 2 of 5 IATA (two-bar start/stop)	19
Straight 2 of 5 IATA on/off	19
Straight 2 of 5 IATA message length	19
Matrix 2 of 5	19
Matrix 2 of 5 on/off	19
Matrix 2 of 5 message length	20
Code 11	20
Code 11 on/off	20
Code 11 check character	20
Code 11 message length	21
Code 128	21
Code 128 on/off	21
ISBT 128 concatenation	21
Code 128 message length	22
Code 128 append	22
Code 128 code page	22
GS1-128	23
GS1-128 on/off	23
GS1-128 message length	23
Telepen	23
Telepen on/off	24
Telepen Output	24
Telepen message length	24
UPC-A	25
UPC-A on/off	25
UPC-A check digit	25
UPC-A number system	25
UPC-A addenda	26
UPC-A addenda required	26
UPC-A addenda timeout	26
UPC-A addenda separator	27
UPC-A/EAN-13 with Extended Coupon Code	27

Coupon GS1 DataBar Output	27
UPC-E0	28
UPC-E0 on/off	28
UPC-E0 Expand	28
UPC-E0 addenda required	28
UPC-E0 addenda separator	29
UPC-E0 check digit	29
UPC-E0 leading zero	29
UPC-E0 addenda	30
UPC-E1	30
EAN/JAN-13	31
EAN/JAN-13 on/off	31
Converting UPC-A to EAN-13	31
EAN/JAN-13 check digit	31
EAN/JAN-13 addenda	31
EAN/JAN-13 addenda required	32
EAN/JAN-13 addenda separator	32
ISBN translate	33
EAN/JAN-8	33
EAN/JAN-8 on/off	33
EAN/JAN-8 check digit	33
EAN/JAN-8 addenda	34
EAN/JAN-8 addenda required	34
EAN/JAN-8 addenda separator	34
MSI	35
MSI on/off	35
MSI check character	35
MSI message length	36
GS1 DataBar Omnidirectional	36
GS1 DataBar Omnidirectional on/off	36
GS1 DataBar Limited	37
GS1 DataBar Limited on/off	37
GS1 DataBar Expanded	37
GS1 DataBar Expanded on/off	37
GS1 DataBar Expanded message length	37
Trioptic Code	38
Codablock A	38
Codablock A on/off	38
Codablock A message length	39
Codablock F	39
Codablock F on/off	39

Codablock F message length	39
Label Code	40
PDF417	40
PDF417 on/off	40
PDF417 message length	40
PDF417 code page	41
MacroPDF417	41
MicroPDF417	41
MicroPDF417 on/off	41
MicroPDF417 message length	42
GS1 Composite Codes	42
UPC/EAN version	42
GS1 Composite Code message length	43
GS1 Emulation	43
TCIF Linked Code 39 (TLC39)	44
QR Code	44
QR Code on/off	44
QR Code message length	44
QR Code Append	45
QR Code code page	45
Data Matrix	45
Data Matrix on/off	46
Data Matrix message length	46
Data Matrix Append	46
Data Matrix code page	46
MaxiCode	47
MaxiCode on/off	47
MaxiCode message length	47
Aztec Code	48
Aztec Code on/off	48
Aztec Code message length	48
Aztec Append	48
Aztec code page	49
Chinese Sensible (Han Xin) Code	49
Han Xin Code on/off	49
Han Xin Code message length	49
Postal Codes - 2D	50
Single 2D postal codes	50
Combination 2D postal codes	51
Planet Code check digit	53
Postnet check digit	53

Australian Post interpretation	54
Postal Codes - Linear	54
China Post (Hong Kong 2 of 5)	54
China Post (Hong Kong 2 of 5) on/off	55
China Post (Hong Kong 2 of 5) message length	55
Korea Post	55
Korea Post on/off	55
Korea Post message length	56
Korea Post check digit	56
4 OCR programming	57
OCR defaults	57
Enabling OCR reading	57
Working orientation	58
Predefined OCR templates	59
Passport template	59
ISBN template	59
Price field template	60
MICR E-13B template	60
Multiple predefined OCR templates	61
Custom OCR templates	63
Spaces	63
Character size	63
Euro, pound, and yen currency characters	63
Creating a custom OCR template	63
Control codes chart	64
New template	64
Multiple lines	65
Fixed-character repeat	66
Variable-character repeat	66
Groups	67
Inline group	68
Checksums and weighting	68
Weight scheme	68
Checksum examples	69
OCR programming codes	70
Using the OCR programming codes	72
Appendix A Reference charts	73
Symbology charts	73
Linear symbologies	73

2D symbologies	74
Postal symbologies	75
ASCII conversion chart (Code page 1252)	75
Lower ASCII reference table	77
ISO 2022/ISO 646 character replacements	84
Appendix B Sample symbols	93
Appendix C Programming chart	96
Index	99

1 Programming the interface

Use the following configuration bar codes to program the interface.

 **NOTE:** After you scan one of the codes, restart the host device to implement the interface.

USB HID

Scan the following code to program the scan engine for USB HID.



2 Input/output settings

Manual trigger modes

In manual trigger mode, the scanner scans until either a bar code is read or the trigger is released. Two modes are available: normal and enhanced. By default, the scanner is set to normal mode.

Normal mode offers good scan speed and the longest working ranges (or, depth of field).



Enhanced mode offers the highest possible scan speed but has a shorter working range. Enhanced mode is best when you require a very fast scan speed but do not require a long working range.



Manual trigger light

These codes set the brightness of the light for the scan engine when the trigger is pressed. By default, the brightness is set to high.

 **NOTE:** These lights are similar to a camera flash. The lower the ambient light in the room, the brighter the light of the scan engine needs to be to read the bar codes.

Figure 2-1 Off



Figure 2-2 Low



Figure 2-3 Medium



Figure 2-4 High



Mobile phone read mode

This mode optimizes your scan engine to read bar codes from mobile phone or other LED displays. However, the speed with which printed bar codes are read might be slower when this mode is enabled.



NOTE: To turn off mobile phone read mode, scan a manual trigger mode bar code. See [Manual trigger modes on page 2](#).



PAPHHC.

Use the streaming presentation code to enable mobile phone reading or a hands-free (presentation) application.



PAFSPC.

Poor quality codes

Poor quality 1D codes

This setting improves the scanner's ability to read damaged or badly printed linear bar codes. This setting does not affect 2D bar code reading.

When this feature is on, poor quality linear bar code reading is improved, but the scanner's snappiness is decreased, which makes it less quick when reading good quality bar codes.



DECLD11.

By default, this feature is off. You can also scan the off bar code to turn it off.



DECLD10.

Poor quality PDF codes

This setting improves the scanner's ability to read damaged or badly printed PDF codes by combining information from multiple images. This setting does not affect 1D bar code reading.

When this feature is on, poor quality PDF bar code reading is improved, but the scanner's snappiness is decreased, which makes it less quick when reading good quality bar codes.



PDFXPR1.

By default, this feature is off. You can also scan the off bar code to turn it off.



PDFXPR0.

3 Symbologies

This programming section contains the following menu selections.

- [All symbologies](#)
- [Message length description](#)
- [Codabar](#)
- [Code 39](#)
- [Interleaved 2 of 5](#)
- [NEC 2 of 5](#)
- [Code 93](#)
- [Straight 2 of 5 Industrial \(three-bar start/stop\)](#)
- [Straight 2 of 5 IATA \(two-bar start/stop\)](#)
- [Matrix 2 of 5](#)
- [Code 11](#)
- [Code 128](#)
- [GS1-128](#)
- [Telepen](#)
- [UPC-A](#)
- [UPC-A/EAN-13 with Extended Coupon Code](#)
- [Coupon GS1 DataBar Output](#)
- [UPC-E0](#)
- [UPC-E1](#)
- [EAN/JAN-13](#)
- [EAN/JAN-8](#)
- [MSI](#)
- [GS1 DataBar Omnidirectional](#)
- [GS1 DataBar Limited](#)
- [GS1 DataBar Expanded](#)
- [Trioptic Code](#)
- [Codablock A](#)
- [Codablock F](#)
- [Label Code](#)
- [PDF417](#)

- [MacroPDF417](#)
- [MicroPDF417](#)
- [GS1 Composite Codes](#)
- [GS1 Emulation](#)
- [TCIF Linked Code 39 \(TLC39\)](#)
- [QR Code](#)
- [Data Matrix](#)
- [MaxiCode](#)
- [Aztec Code](#)
- [Chinese Sensible \(Han Xin\) Code](#)
- [Postal Codes - 2D](#)
- [Postal Codes - Linear](#)

All symbologies

If you want to decode all the symbologies allowable for your scanner, scan the **All symbologies on** code.



NOTE: The all symbologies on feature might reduce scanner performance. Only scan All symbologies on if needed.

When this bar code is scanned, 2D Postal Codes are not enabled. 2D Postal Codes must be enabled separately.



ALLEN A1.

If you want to decode only a particular symbology, scan **All symbologies off**, and then scan the on code for that particular symbology.



ALLEN A0.

Message length description

You can set the valid reading length of some bar-code symbologies. You might set the same value for the minimum and maximum length to force the scanner to read fixed length bar-code data. This helps reduce the chance of a misread.

Example: Decode only those bar codes with a count of 9–20 characters.

Minimum length: 09

Maximum length: 20

Example: Decode only those bar codes with a count of 15 characters.

Minimum length: 15

Maximum length: 15

To use a value other than the minimum and maximum length defaults:

1. Scan the bar codes included in the explanation of the symbology.
2. On the [Programming chart on page 96](#), scan the digit value of the message length.
3. Scan **Save**.

The minimum and maximum lengths and the defaults are included with the respective symbologies.

Codabar

Figure 3-1 Default Codabar settings



Codabar on/off

Figure 3-2 On (default)



Figure 3-3 Off



Codabar start/stop characters

Start/stop characters identify the leading and trailing ends of the bar code. You can either transmit or not transmit these characters. By default, these characters are not transmitted.

Figure 3-4 Transmit



Figure 3-5 Don't transmit



Codabar check character

Codabar check characters are created using different “modulos.” You can program the scanner to read only Codabar bar codes with Modulo 16 check characters.

No check character indicates that the scanner reads and transmits bar-code data with or without a check character. This is the default setting.



Validate and transmit indicates that the scanner reads only Codabar bar codes printed with a check character, and then transmits this character at the end of the scanned data.



Validate, but don't transmit indicates that the scanner reads only Codabar bar codes printed with a check character, but does not transmit the check character with the scanned data.



Codabar concatenation

Codabar supports symbol concatenation. When you enable concatenation, the scanner looks for a Codabar symbol having a “D” start character, adjacent to a symbol having a “D” stop character. The two messages are concatenated into one with the “D” characters omitted.

Select **Require** to prevent the scanner from decoding a single “D” Codabar symbol without its companion. This selection has no effect on Codabar bar codes without start/stop D characters.

Figure 3-6 On



Figure 3-7 Off (default)



Figure 3-8 Require



Codabar message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 2 and 60 characters. By default, the minimum is 4 and the maximum is 60.

Figure 3-9 Minimum message length



Figure 3-10 Maximum message length



Code 39

Figure 3-11 Default Code 39 settings



Code 39 on/off

Figure 3-12 On (default)



Figure 3-13 Off



Code 39 start/stop characters

Start/stop characters identify the leading and trailing ends of the bar code. You can either transmit or not transmit these characters. By default, these characters are not transmitted.

Figure 3-14 Transmit



Figure 3-15 Don't transmit



Code 39 check character

No check character indicates that the scanner reads and transmits bar-code data with or without a check character. This is the default setting.



Validate and transmit indicates that the scanner reads only Code 39 bar codes printed with a check character, and then transmits this character at the end of the scanned data.



Validate, but don't transmit indicates that the scanner reads only Code 39 bar codes printed with a check character, but does not transmit the check character with the scanned data.



C39CK21.

Code 39 message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 0 and 48 characters. By default, the minimum is 0 and the maximum is 48.

Figure 3-16 Minimum message length



C39MIN.

Figure 3-17 Maximum message length



C39MAX.

Code 39 append

This function allows the scanner to append the data from several Code 39 bar codes together before transmitting them to the host computer. When the scanner encounters a Code 39 bar code with the append trigger characters, it buffers Code 39 bar codes until it reads a Code 39 bar code that does not have an append trigger. The data is then transmitted in the order in which the bar codes were read (FIFO). By default, this function is not enabled.

Figure 3-18 On



C39APP1.

Figure 3-19 Off



C39APP0.

Code 32 Pharmaceutical (PARAF)

Code 32 Pharmaceutical is a form of the Code 39 symbology used by Italian pharmacies. This symbology is also known as PARAF.



NOTE: [Trioptic Code on page 38](#) must be turned off while scanning PARAF codes.

Figure 3-20 On



C39B321.

Figure 3-21 Off (default)



Full ASCII

If Full ASCII Code 39 decoding is enabled, certain character pairs within the bar-code symbol are interpreted as a single character. For instance, \$V is decoded as the ASCII character SYN, and /C is decoded as the ASCII character #. By default, this function is disabled.

Character pair	Decoded ASCII character
%U	NUL
\$A	SOH
\$B	STX
\$C	ETX
\$D	EOT
\$E	ENQ
\$F	ACK
\$G	BEL
\$H	BS
\$I	HT
\$J	LF
\$K	VT
\$L	FF
\$M	CR
\$N	SO
\$O	SI
\$P	DLE
\$Q	DC1
\$R	DC2
\$S	DC3
\$T	DC4
\$U	NAK
\$V	SYN
\$W	ETB
\$X	CAN
\$Y	EM
\$Z	SUB

Character pair	Decoded ASCII character
%A	ESC
%B	FS
%C	GS
%D	RS
%E	US
SPACE	SP
/A	!
/B	"
/C	#
/D	\$
/E	%
/F	&
/G	'
/H	(
/I)
/J	*
/K	+
/L	,
-	-
.	.
/O	/
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
/Z	:
%F	;
%G	<

Character pair	Decoded ASCII character
%H	=
%I	>
%J	?
%V	@
A	A
B	B
C	C
D	D
E	E
F	F
G	G
H	H
I	I
J	J
K	K
L	L
M	M
N	N
O	O
P	P
Q	Q
R	R
S	S
T	T
U	U
V	V
W	W
X	X
Y	Y
Z	Z
%K	[
%L	\
%M]
%N	^

Character pair	Decoded ASCII character
%O	–
%W	‘
+A	a
+B	b
+C	c
+D	d
+E	e
+F	f
+G	g
+H	h
+I	l
+J	j
+K	k
+L	l
+M	m
+N	n
+O	o
+P	p
+Q	q
+R	r
+S	s
+T	t
+U	u
+V	v
+W	w
+X	x
+Y	y
+Z	z
%P	{
%Q	|
%R	}
%S	~
%T	DEL

Character pairs /M and /N decode as a minus sign and period respectively.

Character pairs /P through /Y decode as 0 through 9.

Figure 3-22 On



Figure 3-23 Off



Code 39 code page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it might be because the bar code being scanned was created using a code page that is different from the one the host program is expecting.

To display the data characters properly:

1. Scan the code page bar code.



2. On [ISO 2022/ISO 646 character replacements on page 84](#), scan the code page with which the bar codes were created.
3. On [Programming chart on page 96](#), scan the value and then scan **Save**.

Interleaved 2 of 5

Figure 3-24 Default Interleaved 2 of 5 settings



Interleaved 2 of 5 on/off

Figure 3-25 On (default)



Figure 3-26 Off



Interleaved 2 of 5 check character

No check character indicates that the scanner reads and transmits bar-code data with or without a check character. This is the default setting.



Validate and transmit indicates that the scanner reads only Interleaved 2 of 5 bar codes printed with a check character, and then transmits this character at the end of the scanned data.



Validate, but don't transmit indicates that the scanner reads only Interleaved 2 of 5 bar codes printed with a check character, but does not transmit the check character with the scanned data.



Interleaved 2 of 5 message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 2 and 80 characters. By default, the minimum is 4 and the maximum is 80.

Figure 3-27 Minimum message length



Figure 3-28 Maximum message length



NEC 2 of 5

Figure 3-29 Default NEC 2 of 5 settings



NEC 2 of 5 on/off

Figure 3-30 On (default)



Figure 3-31 Off



NEC 2 of 5 check character

No check character indicates that the scanner reads and transmits bar-code data with or without a check character. This is the default setting.



Validate and transmit indicates that the scanner reads only NEC 2 of 5 bar codes printed with a check character, and then transmits this character at the end of the scanned data.



Validate, but don't transmit indicates that the scanner reads only NEC 2 of 5 bar codes printed with a check character, but does not transmit the check character with the scanned data.



NEC 2 of 5 message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 2 and 80 characters. By default, the minimum is 4 and the maximum is 80.

Figure 3-32 Minimum message length



Figure 3-33 Maximum message length



Code 93

Figure 3-34 Default Code 93 settings



Code 93 on/off

Figure 3-35 On (default)



Figure 3-36 Off



Code 93 message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 0 and 80 characters. By default, the minimum is 0 and the maximum is 80.

Figure 3-37 Minimum message length



Figure 3-38 Maximum message length



Code 93 append

This function allows the scanner to append the data from several Code 93 bar codes together before transmitting them to the host computer. When this function is enabled, the scanner stores those Code 93 bar codes that start with a space (excluding the start and stop symbols), and does not immediately transmit the data. The scanner stores the data in the order in which the bar codes are read, deleting the first space from each. The scanner transmits the appended data when it reads a Code 93 bar code that starts with a character other than a space. By default, this function is not enabled.

Figure 3-39 On



Figure 3-40 Off



Code 93 code page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it might be because the bar code being scanned was created using a code page that is different from the one the host program is expecting.

To display the data characters properly:

1. Scan the code page bar code.



2. On [ISO 2022/ISO 646 character replacements on page 84](#), scan the code page with which the bar codes were created.
3. On [Programming chart on page 96](#), scan the value and then scan **Save**.

Straight 2 of 5 Industrial (three-bar start/stop)

Figure 3-41 Default Straight 2 of 5 Industrial settings



Straight 2 of 5 Industrial on/off

Figure 3-42 On



Figure 3-43 Off (default)



Straight 2 of 5 Industrial message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 48 characters. By default, the minimum is 4 and the maximum is 48.

Figure 3-44 Minimum message length



Figure 3-45 Maximum message length



Straight 2 of 5 IATA (two-bar start/stop)

Figure 3-46 Default Straight 2 of 5 IATA settings



Straight 2 of 5 IATA on/off

Figure 3-47 On



Figure 3-48 Off (default)



Straight 2 of 5 IATA message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 48 characters. By default, the minimum is 4 and the maximum is 48.

Figure 3-49 Minimum message length



Figure 3-50 Maximum message length



Matrix 2 of 5

Figure 3-51 Default Matrix 2 of 5 settings



Matrix 2 of 5 on/off

Figure 3-52 On



Figure 3-53 Off (default)



Matrix 2 of 5 message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 80 characters. By default, the minimum is 4 and the maximum is 80.

Figure 3-54 Minimum message length



Figure 3-55 Maximum message length



Code 11

Figure 3-56 Default Code 11 settings



Code 11 on/off

Figure 3-57 On



Figure 3-58 Off (default)



Code 11 check character

This option sets whether 1 or 2 check digits are required with Code 11 bar codes. By default, two check digits are required.

Figure 3-59 One check digit



Figure 3-60 Two check digits



Code 11 message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 80 characters. By default, the minimum is 4 and the maximum is 80.

Figure 3-61 Minimum message length



Figure 3-62 Maximum message length



Code 128

Figure 3-63 Default Code 128 settings



Code 128 on/off

Figure 3-64 On (default)



Figure 3-65 Off



ISBT 128 concatenation

In 1994, the International Society of Blood Transfusion (ISBT) ratified a standard for communicating critical blood information in a standard manner. The use of ISBT formats requires a paid license. The ISBT 128 Application Specification describes 1) the critical data elements for labeling blood products, 2) the current recommendation to use Code 128 due to its high degree of security and its space-efficient design, 3) a variation of Code 128 that supports concatenation of neighboring symbols, and 4) the standard layout for bar codes on a blood product label. Use the following bar codes to turn concatenation on or off. By default, it is off.

Figure 3-66 On



Figure 3-67 Off



Code 128 message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 0 and 80 characters. By default, the minimum is 0 and the maximum is 80.

Figure 3-68 Minimum message length



Figure 3-69 Maximum message length



Code 128 append

This function allows the scanner to append the data from several Code 128 bar codes together before transmitting them to the host computer. When the scanner encounters a Code 128 bar code with the append trigger characters, it buffers Code 128 bar codes until it reads a Code 128 bar code that does not have an append trigger. The data is then transmitted in the order in which the bar codes were read (FIFO). By default, this function is enabled.

Figure 3-70 On



Figure 3-71 Off



Code 128 code page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it might be because the bar code being scanned was created using a code page that is different from the one the host program is expecting.

To display the data characters properly:

1. Scan the code page bar code.



128DCP.

2. On [ISO 2022/ISO 646 character replacements on page 84](#), scan the code page with which the bar codes were created.
3. On [Programming chart on page 96](#), scan the value and then scan **Save**.

GS1-128

Figure 3-72 Default GS1-128 settings



GS1DFT.

GS1-128 on/off

Figure 3-73 On (default)



GS1ENA1.

Figure 3-74 Off



GS1ENA0.

GS1-128 message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 80 characters. By default, the minimum is 1 and the maximum is 80.

Figure 3-75 Minimum message length



GS1MIN.

Figure 3-76 Maximum message length



GS1MAX.

Telepen

Figure 3-77 Default Telepen settings



TELDFT.

Telepen on/off

Figure 3-78 On



Figure 3-79 Off (default)



Telepen Output

Using AIM Telepen Output, the scanner reads symbols with start/stop pattern 1 and decodes them as standard full ASCII (start/stop pattern 1). Using Original Telepen Output, the scanner reads symbols with start/stop pattern 1 and decodes them as compressed numeric with optional full ASCII (start/stop pattern 2). By default, AIM Telepen Output is used.

Figure 3-80 AIM Telepen Output



Figure 3-81 Original Telepen Output



Telepen message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 60 characters. By default, the minimum is 1 and the maximum is 60.

Figure 3-82 Minimum message length



Figure 3-83 Maximum message length



UPC-A

Figure 3-84 Default UPC-A settings



UPC-A on/off

 **NOTE:** To convert UPC-A bar codes to EAN-13, see [Converting UPC-A to EAN-13 on page 31](#).

Figure 3-85 On (default)



Figure 3-86 Off



UPC-A check digit

This option allows you to specify whether the check digit is transmitted at the end of the scanned data. By default, this option is enabled.

Figure 3-87 On



Figure 3-88 Off



UPC-A number system

The numeric system digit of a UPC symbol is transmitted at the beginning of the scanned data by default, but the scanner can be programmed so it does not transmit it.

Figure 3-89 On



Figure 3-90 Off



UPC-A addenda

This selection adds either 2 or 5 digits to the end of all scanned UPC-A data. By default, this is disabled for both 2- and 5-digit addenda.

Figure 3-91 2-digit addenda on



Figure 3-92 2-digit addenda off



Figure 3-93 5-digit addenda on



Figure 3-94 5-digit addenda off



UPC-A addenda required

When **Required** is scanned, the scanner reads only UPC-A bar codes that have addenda. You must then enable either a 2- or 5-digit addenda. See [UPC-A addenda on page 26](#). By default, addenda is not required.

Figure 3-95 Required



Figure 3-96 Not required



UPC-A addenda timeout

You can set a time during which the scanner looks for an addenda. If an addenda is not found within this time period, the data can either be transmitted or discarded, based on the setting you are using for [UPC-A addenda required on page 26](#).

1. Scan the addenda timeout bar code.



2. On the [Programming chart on page 96](#), set the timeout (from 0 to 65,535 ms).



NOTE: By default, the timeout is 100 ms.

3. Scan **Save**.

UPC-A addenda separator

When this feature is on, there is a space between the data from the bar code and the data from the addenda. When turned off, there is no space. By default, this feature is on.

Figure 3-97 On



Figure 3-98 Off



UPC-A/EAN-13 with Extended Coupon Code

Use the following bar codes to enable or disable UPC-A and EAN-13 with Extended Coupon Code.

When left on the default setting (**Off**), the scanner treats coupon codes and extended coupon codes as single bar codes.



If you scan the **Allow concatenation** code, when the scanner sees the coupon code and the extended coupon code in a single scan, it transmits both as one symbology. Otherwise, it transmits the first coupon code it reads.



If you scan the **Require concatenation** code, the scanner must see and read the coupon code and the extended coupon code in a single read to transmit the data. No data is output unless both codes are read.



Coupon GS1 DataBar Output

If you scan coupons that have both UPC and GS1 DataBar codes, you might need to scan and output the data from the GS1 DataBar code only. Scan the **On** code to scan and output the GS1 DataBar code data only. By default, this feature is off.

Figure 3-99 On



Figure 3-100 Off



UPC-E0

Figure 3-101 Default UPC-E0 settings



UPC-E0 on/off

Most UPC bar codes lead with the 0 number system. To read these codes, use UPC-E0. If you need to read codes that lead with the 1 number system, use [UPC-E1 on page 30](#).

Figure 3-102 On (default)



Figure 3-103 Off



UPC-E0 Expand

UPC-E0 Expand expands the UPC-E code to the 12-digit UPC-A format. By default, this feature is disabled.

Figure 3-104 On



Figure 3-105 Off



UPC-E0 addenda required

When **Required** is scanned, the scanner reads only UPC-E bar codes that have addenda. By default, addenda is not required.

Figure 3-106 Required



Figure 3-107 Not required



UPC-E0 addenda separator

When this feature is **On**, there is a space between the data from the bar code and the data from the addenda. This is the default setting.



When this feature is **Off**, there is no space.



UPC-E0 check digit

This feature specifies whether the check digit is transmitted at the end of the scanned data. By default, it is on.

Figure 3-108 On



Figure 3-109 Off



UPC-E0 leading zero

This feature allows the transmission of a leading zero (0) at the beginning of scanned data. By default, it is on. To prevent transmission, scan **Off**.

Figure 3-110 On



Figure 3-111 Off



UPC-E0 addenda

This selection adds either 2 or 5 digits to the end of all scanned UPC-E data. By default, this is disabled for both 2- and 5-digit addenda.

Figure 3-112 2-digit addenda on



Figure 3-113 2-digit addenda off



Figure 3-114 5-digit addenda on



Figure 3-115 5-digit addenda off



UPC-E1

Most UPC bar codes lead with the 0 number system. To read these codes, see [UPC-E0 on/off on page 28](#). If you need to read codes that lead with the 1 number system, use UPC-E1. By default, this symbology is off.

Figure 3-116 On



Figure 3-117 Off (default)



EAN/JAN-13

Figure 3-118 Default EAN/JAN settings



EAN/JAN-13 on/off

Figure 3-119 On (default)



Figure 3-120 Off



Converting UPC-A to EAN-13

When **UPC-A converted to EAN-13** is scanned, UPC-A bar codes are converted to 13-digit EAN-13 codes by adding a zero to the front.



When **Do not covert UPC-A** is scanned, UPC-A bar codes are read as UPC-A. This is the default setting.



EAN/JAN-13 check digit

This selection allows you to specify whether the check digit is transmitted at the end of the scanned data. By default, this is enabled.

Figure 3-121 On



Figure 3-122 Off



EAN/JAN-13 addenda

This selection adds either 2 or 5 digits to the end of all scanned EAN/JAN-13 data. By default, this is disabled for both 2- and 5-digit addenda.

Figure 3-123 2-digit addenda on



Figure 3-124 2-digit addenda off



Figure 3-125 5-digit addenda on



Figure 3-126 5-digit addenda off



EAN/JAN-13 addenda required

When **Required** is scanned, the scanner reads only EAN/JAN-13 bar codes that have addenda. By default, addenda is not required.

Figure 3-127 Required



Figure 3-128 Not required



EAN/JAN-13 addenda separator

When this feature is **On**, there is a space between the data from the bar code and the data from the addenda. This is the default setting.



When this feature is **Off**, there is no space.



ISBN translate

When **On** is scanned, EAN-13 Bookland symbols are translated into their equivalent ISBN number format. By default, this feature is off.

Figure 3-129 On



Figure 3-130 Off



EAN/JAN-8

Figure 3-131 Default EAN/JAN-8 settings



EAN/JAN-8 on/off

Figure 3-132 On (default)



Figure 3-133 Off



EAN/JAN-8 check digit

This selection allows you to specify whether the check digit is transmitted at the end of the scanned data. By default, this is enabled.

Figure 3-134 On



Figure 3-135 Off



EAN/JAN-8 addenda

This selection adds either 2 or 5 digits to the end of all scanned EAN/JAN-8 data. By default, this is disabled for both 2- and 5-digit addenda.

Figure 3-136 2-digit addenda on



Figure 3-137 2-digit addenda off



Figure 3-138 5-digit addenda on



Figure 3-139 5-digit addenda off



EAN/JAN-8 addenda required

When **Required** is scanned, the scanner reads only EAN/JAN-8 bar codes that have addenda. By default, addenda is not required.

Figure 3-140 Required



Figure 3-141 Not required



EAN/JAN-8 addenda separator

When this feature is **On**, there is a space between the data from the bar code and the data from the addenda. This is the default setting.



When this feature is **Off**, there is no space.



MSI

Figure 3-142 Default MSI settings



MSI on/off

Figure 3-143 On



Figure 3-144 Off (default)



MSI check character

Different types of check characters are used with MSI bar codes. You can program the scanner to read MSI bar codes with Type 10 check characters.

When check character is set to **Validate type 10/11 and transmit**, the scanner reads only MSI bar codes printed with the specified type of check characters, and transmits the characters at the end of the scanned data.

When check character is set to **Validate type 10/11, but don't transmit**, the scanner reads only MSI bar codes printed with the specified type of check characters, but does not transmits the check characters with the scanned data.

Figure 3-145 Validate type 10, but don't transmit (default)



Figure 3-146 Validate type 10 and transmit



Figure 3-147 Validate 2 type 10 characters, but don't transmit



Figure 3-148 Validate 2 type 10 characters and transmit



Figure 3-149 Validate type 10 and then type 11 characters, but don't transmit



Figure 3-150 Validate type 10 then type 11 characters and transmit



Figure 3-151 Disable MSI check characters



MSI message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 4 and 48 characters. By default, the minimum is 4 and the maximum is 48.

Figure 3-152 Minimum message length



Figure 3-153 Maximum message length



GS1 DataBar Omnidirectional

Figure 3-154 Default GS1 DataBar Omnidirectional settings



GS1 DataBar Omnidirectional on/off

Figure 3-155 On (default)



Figure 3-156 Off



GS1 DataBar Limited

Figure 3-157 Default GS1 DataBar Limited settings



GS1 DataBar Limited on/off

Figure 3-158 On (default)



Figure 3-159 Off



GS1 DataBar Expanded

Figure 3-160 Default GS1 DataBar Expanded settings



GS1 DataBar Expanded on/off

Figure 3-161 On (default)



Figure 3-162 Off



GS1 DataBar Expanded message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 4 and 74 characters. By default, the minimum is 4 and the maximum is 74.

Figure 3-163 Minimum message length



Figure 3-164 Maximum message length



Trioptic Code



NOTE: If you are going to scan PARAF codes (see [Code 32 Pharmaceutical \(PARAF\) on page 9](#)), Trioptic Code must be off.

Trioptic Code is used for labeling magnetic storage media.

Figure 3-165 On



Figure 3-166 Off (default)



Codablock A

Figure 3-167 Default Codablock A settings



Codablock A on/off

Figure 3-168 On



Figure 3-169 Off (default)



Codablock A message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 600 characters. By default, the minimum is 1 and the maximum is 600.

Figure 3-170 Minimum message length



Figure 3-171 Maximum message length



Codablock F

Figure 3-172 Default Codablock F settings



Codablock F on/off

Figure 3-173 On



Figure 3-174 Off (default)



Codablock F message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 2048 characters. By default, the minimum is 1 and the maximum is 2048.

Figure 3-175 Minimum message length



Figure 3-176 Maximum message length



Label Code

The standard Label Code is used in libraries. By default, this symbology is off.

Figure 3-177 On



Figure 3-178 Off (default)



PDF417

Figure 3-179 Default PDF417 settings



PDF417 on/off

Figure 3-180 On (default)



Figure 3-181 Off



PDF417 message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 2750 characters. By default, the minimum is 1 and the maximum is 2750.

Figure 3-182 Minimum message length



Figure 3-183 Maximum message length



PDF417 code page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it might be because the bar code being scanned was created using a code page that is different from the one the host program is expecting.

To display the data characters properly:

1. Scan the code page bar code.



2. On [ISO 2022/ISO 646 character replacements on page 84](#), scan the code page with which the bar codes were created.
3. On [Programming chart on page 96](#), scan the value and then scan **Save**.

MacroPDF417

MacroPDF417 is an implementation of PDF417 capable of encoding very large amounts of data into multiple PDF417 bar codes. When this selection is enabled, these multiple bar codes are assembled into a single data string.

Figure 3-184 On (default)



Figure 3-185 Off



MicroPDF417

Figure 3-186 Default MicroPDF417 settings



MicroPDF417 on/off

Figure 3-187 On



Figure 3-188 Off (default)



MicroPDF417 message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 366 characters. By default, the minimum is 1 and the maximum is 366.

Figure 3-189 Minimum message length



Figure 3-190 Maximum message length



GS1 Composite Codes

Linear codes are combined with a unique 2D composite component to form a new class called GS1 Composite symbology. GS1 Composite symbologies allow for the coexistence of symbologies already in use.

Figure 3-191 On



Figure 3-192 Off (default)



UPC/EAN version

Scan the **UPC/EAN version on** bar code to decode GS1 Composite symbols that have a UPC or EAN linear component. (This does not affect GS1 Composite symbols with a GS1-128 or GS1 linear component.) By default, this feature is disabled.

Figure 3-193 UPC/EAN version on



Figure 3-194 UPC/EAN version off



GS1 Composite Code message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 2435 characters. By default, the minimum is 1 and the maximum is 2435.

Figure 3-195 Minimum message length



Figure 3-196 Maximum message length



GS1 Emulation

The scanner can automatically format the output from any GS1 data carrier to emulate what would be encoded in an equivalent GS1-128 or GS1 DataBar symbol. GS1 data carriers include UPC-A and UPC-E, EAN-13 and EAN-8, ITF-14, GS1-128, GS1-128 DataBar, and GS1 Composites. (Any application that accepts GS1 data can be simplified because it needs only to recognize one data carrier type.)

If **GS1-128 Emulation** is scanned, all retail codes (UPC, UPC-E, EAN-8, and EAN-13) are expanded to 16 digits. If the AIM ID is enabled, the value is the GS1-128 AIM ID,]C1. (See [Symbology charts on page 73](#).)



If **GS1 Code Expansion Off** is scanned, retail code expansion is disabled, and UPC-E expansion is controlled by the [UPC-E0 Expand on page 28](#) setting. If the AIM ID is enabled, the value is the GS1-128 AIM ID,]C1. (See [Symbology charts on page 73](#).)



If **EAN-8 to EAN-13 Conversion** is scanned, all EAN-8 bar codes are converted to EAN-13 format.



If **GS1-128 Emulation** is scanned, all retail codes (UPC, UPC-E, EAN-8, and EAN-13) are expanded to 16 digits. If the AIM ID is enabled, the value is the GS1-128 AIM ID,]C1. (See [Symbology charts on page 73](#).)



By default, GS1 Emulation is **Off**.



TCIF Linked Code 39 (TLC39)

This code is a composite code because it has both a Code 39 linear component and a MicroPDF417 stacked code component. All bar code readers are capable of reading the Code 39 linear component. The MicroPDF417 component can be decoded only if this symbology is on. The linear component might be decoded as Code 39 even if this symbology is off.

Figure 3-197 On



Figure 3-198 Off (default)



QR Code

Figure 3-199 Default QR Code settings



QR Code on/off

This selection applies to both QR Code and Micro QR Code.

Figure 3-200 On (default)



Figure 3-201 Off



QR Code message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 7089 characters. By default, the minimum is 1 and the maximum is 7089.

Figure 3-202 Minimum message length



Figure 3-203 Maximum message length



QR Code Append

This function allows the scanner to append the data from several QR Code bar codes together before transmitting them to the host computer. When the scanner encounters a QR Code bar code with the append trigger characters, it buffers the number of QR Code bar codes determined by information included in those bar codes. After the proper number of codes is reached, the data is output in the order specified in the bar codes. By default, this function is enabled.

Figure 3-204 On



Figure 3-205 Off



QR Code code page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it might be because the bar code being scanned was created using a code page that is different from the one the host program is expecting.

To display the data characters properly:

1. Scan the code page bar code.



2. On [ISO 2022/ISO 646 character replacements on page 84](#), scan the code page with which the bar codes were created.
3. On [Programming chart on page 96](#), scan the value and then scan **Save**.

Data Matrix

Figure 3-206 Default Data Matrix settings



Data Matrix on/off

Figure 3-207 On (default)



Figure 3-208 Off



Data Matrix message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 3116 characters. By default, the minimum is 1 and the maximum is 3116.

Figure 3-209 Minimum message length



Figure 3-210 Maximum message length



Data Matrix Append

This function allows the scanner to append the data from several Data Matrix bar codes together before transmitting them to the host computer. When the scanner encounters a Data Matrix bar code with the append trigger characters, it buffers the number of Data Matrix bar codes determined by information included in those bar codes. After the proper number of codes is reached, the data is output in the order specified in the bar codes. By default, this function is enabled.

Figure 3-211 On



Figure 3-212 Off



Data Matrix code page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it might be because the bar code being scanned was created using a code page that is different from the one the host program is expecting.

To display the data characters properly:

1. Scan the code page bar code.



2. On [ISO 2022/ISO 646 character replacements on page 84](#), scan the code page with which the bar codes were created.
3. On [Programming chart on page 96](#), scan the value and then scan **Save**.

MaxiCode

Figure 3-213 Default MaxiCode settings



MaxiCode on/off

Figure 3-214 On



Figure 3-215 Off (default)



MaxiCode message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 150 characters. By default, the minimum is 1 and the maximum is 150.

Figure 3-216 Minimum message length



Figure 3-217 Maximum message length



Aztec Code

Figure 3-218 Default Aztec Code settings



Aztec Code on/off

Figure 3-219 On (default)



Figure 3-220 Off



Aztec Code message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 3832 characters. By default, the minimum is 1 and the maximum is 3832.

Figure 3-221 Minimum message length



Figure 3-222 Maximum message length



Aztec Append

This function allows the scanner to append the data from several Aztec bar codes together before transmitting them to the host computer. When the scanner encounters an Aztec bar code with the append trigger characters, it buffers the number of Aztec bar codes determined by information included in those bar codes. After the proper number of codes is reached, the data is output in the order specified in the bar codes. By default, this function is enabled.

Figure 3-223 On



Figure 3-224 Off



Aztec code page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it might be because the bar code being scanned was created using a code page that is different from the one the host program is expecting.

To display the data characters properly:

1. Scan the code page bar code.



2. On [ISO 2022/ISO 646 character replacements on page 84](#), scan the code page with which the bar codes were created.
3. On [Programming chart on page 96](#), scan the value and then scan **Save**.

Chinese Sensible (Han Xin) Code

Figure 3-225 Default Han Xin settings



Han Xin Code on/off

Figure 3-226 On



Figure 3-227 Off (default)



Han Xin Code message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 1 and 7833 characters. By default, the minimum is 1 and the maximum is 7833.

Figure 3-228 Minimum message length



HX_MIN.

Figure 3-229 Maximum message length



HX_MAX.

Postal Codes - 2D

The following lists the possible 2D postal codes, as well as 2D postal code combinations that are allowed. Only one 2D postal code selection can be active at a time. If you scan a second 2D postal code selection, the first selection is overwritten. By default, 2D postal codes are off.

Figure 3-230 Off



POSTAL0.

Single 2D postal codes

Figure 3-231 Australian Post on



POSTAL1.

Figure 3-232 British Post on



POSTAL7.

Figure 3-233 Canadian Post on



POSTAL30.

Figure 3-234 Intelligent Mail Bar Code on



POSTAL10.

Figure 3-235 Japanese Post on



POSTAL3.

Figure 3-236 KIX Post on



POSTAL4.

Figure 3-237 Planet Code on



POSTAL5.

 **NOTE:** See [Planet Code check digit on page 53](#).

Figure 3-238 Postal-4i on



POSTAL9.

Figure 3-239 Postnet on



POSTAL6.

 **NOTE:** See [Postnet check digit on page 53](#).

Figure 3-240 Postnet with B and B' Fields on



POSTAL11.

Figure 3-241 InfoMail on



POSTAL2.

Combination 2D postal codes

Figure 3-242 InfoMail and British Post on



POSTAL8.

Figure 3-243 Intelligent Mail Bar Code and Postnet with B and B' Fields on



POSTAL20.

Figure 3-244 Postnet and Postal-4i on



POSTAL14.

Figure 3-245 Postnet and Intelligent Mail Bar Code on



Figure 3-246 Postal-4i and Intelligent Mail Bar Code on



Figure 3-247 Postal-4i and Postnet with B and B' Fields on



Figure 3-248 Planet Code and Postnet on



Figure 3-249 Planet code and Postnet with B and B' Fields on



Figure 3-250 Planet Code and Postal-4i on



Figure 3-251 Planet Code and Intelligent Mail Bar Code on



Figure 3-252 Planet Code, Postnet, and Postal-4i on



Figure 3-253 Planet Code, Postnet, and Intelligent Mail Bar Code on



Figure 3-254 Planet Code, Postal-4i, and Intelligent Mail Bar Code on



Figure 3-255 Postnet, Postal-4i, and Intelligent Mail Bar Code on



Figure 3-256 Planet Code, Postal-4i, and Postnet with B and B' Fields on



Figure 3-257 Planet Code, Intelligent Mail Bar Code, and Postnet with B and B' Fields on



Figure 3-258 Postal-4i, Intelligent Mail Bar Code, and Postnet with B and B' Fields on



Figure 3-259 Planet Code, Postal-4i, Intelligent Mail Bar Code, and Postnet on



Figure 3-260 Planet Code, Postal-4i, Intelligent Mail Bar Code, and Postnet with B and B' Fields on



Planet Code check digit

This setting allows you to specify whether the check digit is transmitted at the end of Planet Code data. By default, this setting is disabled.

Figure 3-261 On



Figure 3-262 Off



Postnet check digit

This setting allows you to specify whether the check digit is transmitted at the end of Postnet data. By default, this setting is disabled.

Figure 3-263 On



Figure 3-264 Off



Australian Post interpretation

This setting controls which interpretation is applied to customer fields in Australian 4-State symbols.



NOTE: For more information, see the specification tables by the Australian Post.

Bar Output lists the bar patterns in “0123” format. This is the default setting.



Numeric N Table causes that field to be interpreted as numeric data using the N table.



Alphanumeric C Table causes the field to be interpreted as alphanumeric data using the C Table.



Combination C and N Tables causes the field to be interpreted using either the C or N tables.



Postal Codes - Linear

The following lists linear postal codes. Any combination of linear postal code selections can be active at a time.

China Post (Hong Kong 2 of 5)

Figure 3-265 Default China Post (Hong Kong 2 of 5) settings



China Post (Hong Kong 2 of 5) on/off

Figure 3-266 On



Figure 3-267 Off (default)



China Post (Hong Kong 2 of 5) message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 2 and 80 characters. By default, the minimum is 4 and the maximum is 80.

Figure 3-268 Minimum message length



Figure 3-269 Maximum message length



Korea Post

Figure 3-270 Default Korea Post settings



Korea Post on/off

Figure 3-271 On



Figure 3-272 Off (default)



Korea Post message length

Scan the following bar codes to change the message length. See [Message length description on page 5](#) for additional information. The minimum and maximum lengths can be anywhere between 2 and 80 characters. By default, the minimum is 4 and the maximum is 48.

Figure 3-273 Minimum message length



Figure 3-274 Maximum message length



Korea Post check digit

This selection allows you to specify whether the check digit is transmitted at the end of the scanned data. By default, this data is not transmitted.

Figure 3-275 On



Figure 3-276 off



4 OCR programming

The following instructions are for programming your scanner for optical character recognition (OCR).

The scanner reads OCR-A, OCR-B, MICR E-13B, and SEMI Font, in a 6- to 60-point OCR typeface. You can either select a predefined OCR template, or create your own custom template for the type of OCR format you intend to read.

The following OCR characters are currently supported:

- OCR-A:

```
OCR-A:  
  ABCDEFGHIJKLMNOPQRSTUVWXYZ  
  0123456789  
  # $ % & ( ) * + - . / < > @ \ € ¥
```

- OCR-B

```
OCR-B:  
  ABCDEFGHIJKLMNOPQRSTUVWXYZ  
  0123456789  
  # $ % & ( ) * + - . / < > @ \ € ¥
```

- MICR E-13B:

– 0123456789 

OCR defaults

- ▲ Scan the following bar code to reset all OCR selections to their custom or factory default settings.



Enabling OCR reading

- ▲ Scan one of the following bar codes to program your scanner to read OCR in **Normal video** (black characters on a white background), **Reverse video** (white characters on a black background), or **Both normal and reverse video**.

Figure 4-1 Normal video



Figure 4-2 Reverse video



Figure 4-3 Both normal and reverse video



To disable OCR reading:

- ▲ Scan the **OCR off** bar code.



Working orientation

OCR characters are direction-sensitive. For example, OCR can misread characters that are scanned sideways or upside down. Use the working orientation settings if your OCR characters are not usually upright when scanned. If the OCR string is not in the selected orientation, it is not read.

To select a working orientation:

- ▲ Scan one of the following bar codes.

Figure 4-4 Upright (default)



Figure 4-5 Vertical, bottom to top



Figure 4-6 Upside down



Figure 4-7 Vertical, top to bottom



ISBN 978-0-571-08989-5

This format differs from the 13-character format in that the checksum is a Mod 10 checksum of 10 numbers (0 to 9) only.

- ▲ Scan the following bar code to enable the ISBN template.



You can enable multiple predefined OCR templates along with the ISBN template. See [Multiple predefined OCR templates on page 61](#).

Price field template

The price field is used in a number of applications including book pricing. The price field template reads both OCR-A and OCR-B fonts. The format is as follows:

C1234 P5678E

The field begins with a *C* and ends with an *E*. The first part of the price field is a *C* followed by four numeric digits. The second half begins with a currency character. The above example shows the letter *P* but the price field template allows the following additional characters:

¢ € £ ¥

Following the currency character, a numeric grouping of 3, 4, 5, or 6 digits is followed by a terminating letter *E*. The template reads both OCR-A and OCR-B fonts. The following examples can also be read when the price field template is enabled:

C6712 ¢801E
C0217 €4399E
C0823 ¥31559E
C0331 £706213E

- ▲ Scan the following bar code to enable the price field template.



You can enable multiple predefined OCR templates along with the price field template. See [Multiple predefined OCR templates on page 61](#).

MICR E-13B template

MICR E-13B consists of 14 characters: the numbers 0 to 9 and 4 control characters. The 4 control characters are known as TOAD (Transit, On Us, Amount and Dash), and are output in the following manner:

MICR character	Function	ASCII character	Decimal	Hex
	Transit	A	65	0x41
	Amount	B	66	0x42

MICR character	Function	ASCII character	Decimal	Hex
␣␣␣	On Us	C	67	0x43
␣␣␣	Dash	D	68	0x44

MICR E-13B is used in financial applications, such as checks, to encode bank account numbers, bank routing numbers, check numbers, and other information on a single row. There are standard guidelines that address how data must be represented on checks and other financial documents, but there is a great deal of flexibility left to the discretion of the document designer.

The MICR E-13B template reads any MICR string whose length is between 4 and 40 characters. Only one consecutive space is allowed in a template. Because there are many checks produced where the MICR line contains fields separated by more than one space, these fields are read and output as individual MICR strings. There is a broad range of strings that produce MICR output, so you should check for partial reads of MICR text where only part of the targeted MICR string is actually in the image presented to the scanner.

The following examples can be read when the MICR E-13B template is enabled:

```

␣␣␣ 1 2 3 4 5 6 7 8 9 ␣␣
␣␣␣ 0 1 2 3 5 ␣␣ 1 2 3 4 5 6 7 8 9 ␣␣ 1 9 3 4 1 2 4 5 4 ␣␣
␣␣ 9 8 7 6 5 ␣␣ 5 6 8 1 2 3 9 7 7 ␣␣ 6 7 8 9 1 7 8 8 ␣␣ 7 0

```

NOTE: In the third example, there are two separate output results because of the 4-space gap between the first and second fields.

▲ Scan the following bar code to enable the MICR E-13B template.



You can enable multiple predefined OCR templates along with the MICR E-13B template. See [Multiple predefined OCR templates on page 61](#).

One of the standard fields within MICR E13-B is the routing field. It begins with the Transit symbol (A) and is followed by 9 numeric digits and a terminating Transit symbol. In some checks, the routing field is separated on each end by at least one space and can be read as a standalone field. This can be done by creating the following template (see [Custom OCR templates on page 63](#)):

```
1 4 x 4 1 5 1 4 9 x 4 1 0
```

If the routing field is part of a longer field (that is, there is no space between either the leading or trailing transit character and other MICR data), then a custom template must be created to read those documents.

Multiple predefined OCR templates

▲ Scan one of the following bar codes to enable combinations of predefined OCR templates.

Figure 4-8 Enable ISBN and custom templates



Figure 4-9 Enable ISBN and price field templates



Figure 4-10 Enable ISBN and MICR E-13B templates



Figure 4-11 Enable ISBN, custom, and price field templates



Figure 4-12 Enable ISBN, custom, and MICR E-13B templates



Figure 4-13 Enable ISBN, price field, and MICR-E13B templates



Figure 4-14 Enable ISBN, custom, price field, and MICR E-13B templates



Figure 4-15 Enable price field and custom templates



Figure 4-16 Enable price field and MICR E-13B templates



Figure 4-17 Enable price field, custom, and MICR-E13B templates



Figure 4-18 Enable MICR E-13B and custom templates



Custom OCR templates

You can create a custom template consisting of a character string that defines the length and content of OCR strings that are read with your scanner. The templates define the OCR font as well as the layout of the text in a row-and-column format. Each row can have up to 50 characters, with up to 18 rows in a template, with a maximum of 320 characters. Within each character position, the allowable characters can be specified either through explicit ASCII values, groups of ASCII values, wildcard characters, or combinations of these types. To achieve better OCR results, limit each character position's values to the specific expected values in your application.

Spaces

Internal gaps longer than one space are not allowed in a template.

The following OCR text is valid because there is only one space between the *E* and *S* in the text.

ONE SPACE

However, the following text is illegal, given the two spaces between the words:

TWO SPACES

An arbitrary number of spaces at the beginning and end of a line are acceptable. These spaces must be included in the template with the ASCII value of a space (32 decimal, 0x20 hex), and must not be included as part of a group or wildcard character.

Character size

The ideal height of an OCR character after sampling is about 20 pixels, but characters up to 50 pixels in height can be read. If OCR characters are consistently above 40 pixels in height, downsampling the image by a factor of 2 achieves better results in both speed and decode rates.

Euro, pound, and yen currency characters

7-bit ASCII values are used in the OCR template strings; however, there are no 7-bit ASCII representations for the euro, pound, or yen currency characters. 8-bit codes for these characters are as follows:

Currency	Decimal	Hex
Euro	128	0x80
Pound	163	0xA3
Yen	165	0xA5

The hex character is output. For example, the euro output is [0xA3]. See the [Lower ASCII reference table on page 77](#).

Creating a custom OCR template

Custom OCR templates are strings made up of various control codes and standard ASCII values.



NOTE: In the examples in this section, spaces are used in template strings for readability only.

Control codes chart

Control code	Value	Argument
End of template	0	
New template	1	Font: 1: OCR-A 2: OCR-B 3: Both OCR-A and OCR-B 4: MICR 5: Semi
New line	2	
Define group start	3	ID [001-255]
Define group end	4	
Wildcard: Numeric	5	[0-9]
Wildcard: Alpha	6	[A-Z uppercase]
Wildcard: Alphanumeric	7	[0-9] [A-Z uppercase]
Wildcard: Any (including a space)	8	
Defined group	A	ID [001-255]
Inline group start	B	
Inline group end	C	
Checksum	D	Weights, Type, MOD
Fixed character repeat	E	[01-50]
Variable character repeat	F	Range low [01-50] Range high [01-50]
ASCII hex value	x##	2 digits

New template

All OCR templates begin with the **New template** control code. The value immediately following this control code indicates the font(s) for which this template is designed.

Example: You need to read 8 numeric digits in either OCR-A or OCR-B as follows:

12345678

The string would be: 1 3 5 5 5 5 5 5 0

The breakdown is as follows:

Control code	Description
1	New template
3	Both OCR-A and OCR-B font

Control code	Description
5	Wildcard: Numeric (8 times)
5	
5	
5	
5	
5	
5	
5	
0	End of template

A template may contain multiple distinct templates all within the same string. Begin each template with a **New template** control code.

Multiple lines

A new line within a multiple line template is indicated by the **New line** control code.

Example: You need to read 2 lines of OCR-A characters. The first line has 4 numeric digits and the second line has 8 alphanumeric characters and spaces.

12345678

The string would be: 1 1 5 5 5 2 8 8 8 8 8 8 0

The breakdown is as follows:

Control code	Description
1	New template
1	OCR-A font
5	Wildcard: Numeric (4 times)
5	
5	
5	
2	New line
8	Wildcard: Numeric (8 times)
8	
8	
8	
8	
8	
8	

Control code	Description
8	
0	End of template

Fixed-character repeat

To simplify the creation of user templates, the **Fixed-character repeat** control code can be used to repeat a character a specified number of times. Any specific ASCII value, wildcard, or group can be repeated. Because each OCR line is limited to a maximum of 50 characters, you can shorten your string by using a fixed-character repeat.

Example: Using the same example as [New template on page 64](#), you need to read 8 numeric digits in either OCR-A or OCR-B font:

12345678

Without repeating characters, the string was: 1 3 5 5 5 5 5 5 0

With a fixed-character repeat, the string is: 3 5 E 0 8 0

The breakdown is as follows:

Control code	Description
1	New template
3	Both OCR-A and OCR-B font
E	Fixed-character repeat (8 times)
0	
8	
0	End of template

Variable-character repeat

The **Variable-character repeat** control code can be used to repeat a count for a character a variable number of times. Any specific ASCII value, wildcard, or group can be repeated.

The control code requires 4 bytes that give the minimum and maximum number of times (2 bytes each) that the character may appear in the template. Because each OCR line is limited to a maximum of 50 characters, you can shorten your string by using a variable character repeat. The minimum and maximum counts must be in the range from 1 to 50, with the minimum count less than or equal to the maximum count.

Example: You need to read OCR-B characters that may contain 5, 6, or 7 numeric digits. The string, without repeating variable characters, is as follows:

1 2 5 5 5 5 1 2 5 5 5 5 5 1 2 5 5 5 5 5 0

Using repeating variable characters, the string is as follows: 1 2 5 F 0 5 0 7 0

The breakdown is as follows:

Control code	Description
1	New template
2	OCR-B font
5	Wildcard: Numeric
F	Variable-character repeat (5 times minimum, 7 times maximum)
05	
07	
0	End of template

Groups

In a given character position, you must specify which values a text character can take. To reduce the overall size of templates, you may define common groups of ASCII characters and then use the defined group control character rather than repeating the same sequence over and over.

Groups can be made up of individual ASCII values or wildcard values. The wildcard values are the **Numeric** (5), **Alpha** (6), **Alphanumeric** (7), and **Any** (8) control codes.

To define a group, specify the **Defined group** control code followed by an ID from 1 to 255. (Up to 255 groups may be defined in a single template.) Use the group ID to use the group in any template you build.



NOTE: Groups cannot be nested.

Example: You need to read 3 numeric digits, then either A, B, C, or another numeric digit. The string is as follows:

1 2 3 0 0 1 x 4 1 x 4 2 x 4 3 5 4 5 5 5 A 0 0 1 0

The breakdown is as follows:

Control code	Description
1	New template
2	Both OCR-A and OCR-B font
3	Defined group
001	Group ID
x41	ASCII hex value for A
x42	ASCII hex value for B
x43	ASCII hex value for C
5	Numeric digit
4	Define group end
5	3 numeric digits
5	
5	

Control code	Description
A001	Defined group, ID 001
0	End of template

See [ASCII conversion chart \(Code page 1252\) on page 75](#) and [Lower ASCII reference table on page 77](#) for character-to-hex conversions.

Inline group

The **Inline group** control code defines a one-time instance of a group that occupies one character position in the template. Use this for unique groups of characters that occur only once.

Checksums and weighting

A checksum reduces the probability of misreads. There are two types of checksums: row and block. For additional checksum protection, there are four different weighting schemes: 1, 12, 13, and 137. The checksum calculation is based on modulo arithmetic. The modulo factor may vary from 6 to 36.

The byte immediately following the **Checksum** control code (D) defines the type of checksum that is used, as shown in the following table.

Bit positions	Meaning
7, 6: Weight scheme	00: Weight scheme: 1
	01: Weight scheme: 12
	10: Weight scheme: 13
	11: Weight scheme: 137
5: Checksum type	0: Row
	1: Block
4–0: Modulo value	Checksum modulo—5

Row checksums (0) perform a checksum calculation on all characters preceding them up to the first character on the same row. Block checksums (1) perform a checksum calculation on all characters up to the very first character in the template; they span multiple rows.

The 5-bit Modulo value stores the checksum modulo—5. The stored number can range from 1, which is a checksum Modulo value of 5, to 31, which describes a checksum modulo of 36. A Modulo value of 0 (Checksum Modulo of 5) is illegal. The characters within a checksum field have a numerical value that is used in the checksum calculation. Digits are converted to their numerical value (0 to 9), while uppercase letters range from 10 for an A to 35 for a Z. All punctuation characters have a value of 0 for checksum purposes; however, they do count as a spot for determining the weight values used in calculating the checksum.

Weight scheme

The weight scheme defines how the weight values can be changed based on their character position. The default weight scheme is 1. This means that the checksum is based only on the character value and is not dependent on its position. The other weight schemes multiply the character value by a repetitive weight value that helps in identifying characters that have had their column locations switched.

The four weight schemes are as follows:

Weight scheme	Multiplier values
1	1 1 1 1 1 ...
12	1 2 1 2 1 2 ...
13	1 3 1 3 1 3 ...
137	1 3 7 1 3 7 1 3 7 ...

The checksum character always starts with a weight of 1. As you move to the left of the checksum, the weight value is updated to the next member of the sequence. The sequences repeat until the first character in a row for a row-type checksum, and to the first character in the template for a block-type checksum. The resulting sum is then divided by the checksum modulo number of the checksum. The remainder of this division should be zero for a valid checksum.

Checksum examples

```

A B C D 6
E F G 5 Y
  
```

The two lines of OCR-B text above both contain a row checksum. In addition, the last character of row 2 is a block checksum. The two row checksums are mod 10 with a 13 weight (133 decimal, 0x85 hex), while the block checksum is a mod 36 with a 137 weight (255 decimal, 0xFF hex).

The following template reads this text:



NOTE: The row and block checksum notations are in bold text.

```

2 6 6 6 6 D 8 5 2 6 6 6 D 8 5 D F F 0
  
```

The breakdown of the row checksum is as follows:

D85	Description
1	Weight scheme: 13
0	See Checksums and weighting on page 68 .
0	Checksum type: row See Checksums and weighting on page 68 .
0	Translation of the sum to binary code
0	
1	
0	
0	

The breakdown of the block checksum is as follows:

DFF	Description
1	Weight scheme: 137
1	See Checksums and weighting on page 68 .
1	Checksum type: block See Checksums and weighting on page 68 .
1	Translation of the sum to binary code
1	
1	
1	
1	

The top line checksum is the 6 at the end of the line. While this example shows the checksum at the end of the line, it can appear anywhere on the line and then protect all the characters to its left. The following sum is generated to verify a proper checksum on line 1:

$$\begin{array}{cccccc}
 6 & D & C & B & A & \\
 (1 \times 6) + (3 \times 13) + (1 \times 12) + (3 \times 11) + (1 \times 10) = 100
 \end{array}$$

Note that the 13 weight scheme starts with a 1 on the checksum digit, and then alternates between a 1 and 3 for all digits to the left of the checksum, up to the first character on the line. The numerical values of the alphabetic characters range from 10 for an A to a 35 for a Z. The sum of 100 is a multiple of 10, so the mod 10 checksum here has passed.

On line 2, the row checksum is the 5 following the G. Verify its line by generating its sum as follows:

$$\begin{array}{cccc}
 5 & G & F & E \\
 (1 \times 5) + (3 \times 16) + (1 \times 15) + (3 \times 14) = 110
 \end{array}$$

Again, a value is obtained that is a multiple of 10, validating this row checksum.

The X at the end of the line is a mod 36 block checksum with 137 weighting. It protects all the characters in the template, including the first line. Calculating its sum working backward from the block checksum and using the 137 weighting scheme results in the following:

$$\begin{array}{cccccccccc}
 Y & 5 & G & F & E & 6 & D & C & B & A \\
 (1 \times 34) + (3 \times 5) + (7 \times 16) + (1 \times 15) + (3 \times 14) + (7 \times 6) + (1 \times 13) + (3 \times 12) + (7 \times 11) + (1 \times 10) = 396
 \end{array}$$

The resulting sum is a multiple of 36, so the block checksum has been validated.

OCR programming codes

Figure 4-19 0



Figure 4-20 1



Figure 4-21 2



Figure 4-22 3



Figure 4-23 4



Figure 4-24 5



Figure 4-25 6



Figure 4-26 7



Figure 4-27 8



Figure 4-28 9



Figure 4-29 A



Figure 4-30 B



Figure 4-31 C



Figure 4-32 D



Figure 4-33 E



Figure 4-34 F



You can also scan the **x** bar code to enter hex codes.



Using the OCR programming codes

You can enter OCR templates using serial commands, or by using the following procedure.

1. Scan the **Enter OCR template** bar code.



OCRTMP.

2. Enter the programming codes.
3. Scan **Save** to exit and save. See [Programming chart on page 96](#).



NOTE: If you make an error, scan **Discard** to exit without saving.

A Reference charts

Symbology charts

 **NOTE:** “m” represents the AIM modifier character. See International Technical Specification, Symbology Identifiers, for AIM modifier character details.

Prefix/suffix entries for specific symbologies override the universal (All symbologies, 99) entry.

Linear symbologies

Symbology	AIM ID	Possible modifiers (m)	HP ID	HP Hex
All symbologies				99
Codabar	]Fm	0–1	a	61
Code 11	]H3		h	68
Code 128	]Cm	0, 1, 2, 4	j	6A
Code 32 Pharmaceutical (PARAF)	]X0		<	3C
Code 39 (supports Full ASCII mdoe)	]Am	0, 1, 2, 3, 4, 5, 7	b	62
TCIF Linked Code 39 (TLC39)	]L2		T	54
Code 93 and 93i	]Gm	0–9, A–Z, a–m	l	69
EAN	]Em	0, 1, 3, 4	d	64
EAN-13 (including Bookland EAN)	]E0		d	64
EAN-13 with Add-On	]E3		d	64
EAN-13 with Extended Coupon Code	]E3		d	64
EAN-8	]E4		D	44
EAN-8 with Add-On	]E3		D	44
GS1				
GS1 DataBar	]em	0	y	79
GS1 DataBar Limited	]em		{	7B
GS1 DataBar Expanded	]em		}	7D
GS1 – 128	]C1		l	49
2 of 5				
China Post (Hong Kong 2 of 5)	]X0		Q	51
Interleaved 2 of 5	]lm	0, 1, 3	e	65
Matrix 2 of 5	]X0		m	6D
NEC 2 of 5	]X0		Y	59

Symbology	AIM ID	Possible modifiers (m)	HP ID	HP Hex
Straight 2 of 5 IATA	]Rm	0, 1, 3	f	66
Straight 2 of 5 Industrial	]SO		f	66
MSI	]Mm	0, 1	g	67
Telepen	Bm		t	74
UPC		0, 1, 2, 3, 8, 9, A, B, C		
UPC-A	]E0		c	63
UPC-A with Add-On	]E3		c	63
UPC-A with Extended Coupon Code	]E3		c	63
UPC-E	]E0		E	45
UPC-E with Add-On	]E3		E	45
UPC-E1	]X0		E	45

Symbology	HP ID	HP Hex
Add HP Code ID		5C80
Add AIM Code ID		5C81
Add Backslash		5C5C
Batch mode quantity	5	35

2D symbologies

Symbology	AIM ID	AIM possible modifiers (m)	HP ID	HP Hex
All symbologies				99
Aztec Code	]zm	0–9, A–C	z	7A
Chinese Sensible Code (Han Zin Code)	]X0		H	48
Codablock A	]06	0, 1, 4, 5, 6	V	56
Codablock F	]0m	0, 1, 4, 5, 6	q	71
Code 49	]Tm	0, 1, 2, 4	l	6C
Data Matrix	]dm	0–6	w	77
GS1	]em	0–3		
GS1 Composite	]em	0–3	y	79
GS1 DataBar Omnidirectional	]em		y	79
MaxiCode	]Um	0–3	x	78
PDF417	]Lm	0–2	r	72

Symbology	AIM ID	AIM possible modifiers (m)	HP ID	HP Hex
MicroPDF417	]Lm	3–5	R	52
QR Code	]Qm	0–6	s	73
Micro QR Code	]Qm		s	73

Postal symbologies

Symbology	AIM ID	AIM possible modifiers (m)	HP ID	HP Hex
All symbologies				99
Australian Post	]X0		A	41
British Post	]X0		B	42
Canadian Post	]X0		C	43
China Post	]X0		Q	51
InfoMail	]X0		,	2c
Intelligent Mail Bar Code	]X0		M	4D
Japanese Post	]X0		J	4A
KIX (Netherlands) Post	]X0		K	4B
Korea Post	]X0		?	3F
Planet Code	]X0		L	4C
Postal-4i	]X0		N	4E
Postnet	]X0		P	50

ASCII conversion chart (Code page 1252)

In keyboard applications, ASCII control characters can be represented in three different ways, as shown in the following table. The CTRL + X function is operating system and software dependent. The following table lists some commonly used Windows functions. This table applies to US-style keyboards. Certain characters might differ depending on your country code or PC regional settings.



NOTE: DEC, HEX, and Character are non-printable, ASCII control characters.

CTRL + X Mode Off (KBDCAS0) and Windows Mode Control + X Mode On (KBDCAS2) both assume that you are in keyboard control + ASCII (CTRL + X) mode.

CTRL + X and CTRL + X function both apply when Windows Mode Control + X Mode On (KBDCAS2) is enabled.

DEC	HEX	Character	CTRL + X Mode Off (KBDCAS0)	CTRL + X	CTRL + X function
0	00	NUL	Reserved	CTRL + @	
1	01	SOH	NP Enter	CTRL + A	Select all

DEC	HEX	Character	CTRL + X Mode Off (KBDCASO)	CTRL + X	CTRL + X function
2	02	STX	Caps Lock	CTRL + B	Bold
3	03	ETX	ALT make	CTRL + C	Copy
4	04	EOT	ALT break	CTRL + D	Bookmark
5	05	ENQ	CTRL make	CTRL + E	Center
6	06	ACK	CTRL break	CTRL + F	Find
7	07	BEL	Enter/return	CTRL + G	
8	08	BS	(Apple make)	CTRL + H	History
9	09	HT	Tab	CTRL + I	Italic
10	0A	LF	(Apple break)	CTRL + J	Justify
11	0B	VT	Tab	CTRL + K	Hyperlink
12	0C	FF	Delete	CTRL + L	List, left align
13	0D	CR	Enter/return	CTRL + M	
14	0E	SO	Insert	CTRL + N	New
15	0F	SI	ESC	CTRL + O	Open
16	10	DLE	F11	CTRL + P	Print
17	11	DC1	Home	CTRL + Q	Quit
18	12	DC2	PrtScn	CTRL + R	
19	13	DC3	Backspace	CTRL + S	Save
20	14	DC4	Back Tab	CTRL + T	
21	15	NAK	F12	CTRL + U	
22	16	SYN	F1	CTRL + V	Paste
23	17	ETB	F2	CTRL + W	
24	18	CAN	F3	CTRL + X	
25	19	EM	F4	CTRL + Y	
26	1A	SUB	F5	CTRL + Z	
27	1B	ESC	F6	CTRL + [
28	1C	FS	F7	CTRL + \	
29	1D	GS	F8	CTRL +]	
30	1E	RS	F9	CTRL + ^	
31	1F	US	F10	CTRL + -	
127	7F	delete	NP Enter		

Lower ASCII reference table



NOTE: Windows Code page 1252 and lower ASCII use the same characters.

Table A-1 Printable characters

DEC	HEX	Character
32	20	<SPACE>
33	21	!
34	22	"
35	23	#
36	24	\$
37	25	%
38	26	&
39	27	'
40	28	(
41	29)
42	2A	*
43	2B	+
44	2C	,
45	2D	-
46	2E	.
47	2F	/
48	30	0
49	31	1
50	32	2
51	33	3
52	34	4
53	35	5
54	36	6
55	37	7
56	38	8
57	39	9
58	3A	:
59	3B	;
60	3C	<
61	3D	=
62	3E	>

Table A-1 Printable characters (continued)

DEC	HEX	Character
63	3F	?
64	40	@
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G
72	48	H
73	49	I
74	4A	J
75	4B	K
76	4C	L
77	4D	M
78	4E	N
79	4F	O
80	50	P
81	51	Q
82	52	R
83	53	S
84	54	T
85	55	U
86	56	V
87	57	W
88	58	X
89	59	Y
90	5A	Z
91	5B	[
92	5C	\
93	5D]
94	5E	^
95	5F	_

Table A-1 Printable characters (continued)

DEC	HEX	Character
96	60	`
97	61	a
98	62	b
99	63	c
100	64	d
101	65	e
102	66	f
103	67	g
104	68	h
105	69	i
106	6A	j
107	6B	k
108	6C	l
109	6D	m
110	6E	n
111	6F	o
112	70	p
113	71	q
114	72	r
115	73	s
116	74	t
117	75	u
118	76	v
119	77	w
120	78	x
121	79	y
122	7A	z
123	7B	{
124	7C	|
125	7D	}
126	7E	~
127	7F	delete

Table A-2 Extended ASCII characters

DEC	HEX	CP 1252	ASCII	Alternate Extended	PS2 scan code
128	80	€	Ç	up arrow	0x48
129	81		ü	down arrow	0x50
130	82	,	é	right arrow	0x4B
131	83	f	â	left arrow	0x4D
132	84	„	ä	Insert	0x52
133	85	...	à	Delete	0x53
134	86	†	â	Home	0x47
135	87	‡	ç	End	0x4F
136	88	^	ê	Page Up	0x49
137	89	%o	ë	Page Down	0x51
138	8A	Š	è	Right ALT	0x38
139	8B	‘	ï	Right CTRL	0x1D
140	8C	Œ	î	Reserved	n/a
141	8D		ï	Reserved	n/a
142	8E	Ž	Ä	Numeric Keypad Enter	0x1C
143	8F		Å	Numeric Keypad /	0x35
144	90		É	F1	0x3B
145	91	‘	æ	F2	0x3C
146	92	’	Æ	F3	0x3D
147	93	“	ô	F4	0x3E
148	94	”	ö	F5	0x3F
149	95	•	ò	F6	0x40
150	96	–	ù	F7	0x41
151	97	—	û	F8	0x42
152	98	~	ÿ	F9	0x43
153	99	™	Ö	F10	0x44
154	9A	š	Ü	F11	0x57
155	9B	›	ç	F12	0x58
156	9C	œ	£	Numeric Keypad +	0x4E
157	9D		¥	Numeric Keypad -	0x4A
158	9E	ž	Ps	Numeric Keypad *	0x37
159	9F	ÿ	f	Caps Lock	0x3A

Table A-2 Extended ASCII characters (continued)

DEC	HEX	CP 1252	ASCII	Alternate Extended	PS2 scan code
160	A0		á	Num Lock	0x45
161	A1	ı	í	Left ALT	0x38
162	A2	ç	ó	Left CTRL	0x1D
163	A3	£	ú	Left Shift	0x2A
164	A4	¤	ñ	Right Shift	0x36
165	A5	¥	Ñ	Print Screen	n/a
166	A6	ı	ª	Tab	0x0F
167	A7	§	º	Shift Tab	0x8F
168	A8	¨	¿	Enter	0x1C
169	A9	©	¬	Esc	0x01
170	AA	ª	¬	ALT make	0x36
171	AB	«	½	ALT break	0xB6
172	AC	¬	¼	CTRL make	0x1D
173	AD		ı	CTRL break	0x9D
174	AE	®	«	ALT sequence with 1 character	0x36
175	AF	¬	»	CTRL sequence with 1 character	0x1D
176	B0	°	⦿		
177	B1	±	⦿		
178	B2	²	⦿		
179	B3	³	|		
180	B4	´	┆		
181	B5	µ	┆		
182	B6	¶	┆		
183	B7	·	¶		
184	B8	,	¶		
185	B9	¹	┆		
186	BA	º	||		
187	BB	»	¶		
188	BC	¼	┆		
189	BD	½	┆		
190	BE	¾	┆		
191	BF	¿	¶		

Table A-2 Extended ASCII characters (continued)

DEC	HEX	CP 1252	ASCII	Alternate Extended	PS2 scan code
192	C0	À	┬		
193	C1	Á	┴		
194	C2	Â	┼		
195	C3	Ã	┴		
196	C4	Ä	—		
197	C5	Å	┴		
198	C6	Æ	┴		
199	C7	Ç	┴		
200	C8	È	┴		
201	C9	É	┴		
202	CA	Ê	┴		
203	CB	Ë	┴		
204	CC	Ì	┴		
205	CD	Í	=		
206	CE	Î	┴		
207	CF	Ï	┴		
208	D0	Ð	┴		
209	D1	Ñ	┴		
210	D2	Ò	┴		
211	D3	Ó	┴		
212	D4	Ô	┴		
213	D5	Õ	┴		
214	D6	Ö	┴		
215	D7	×	┴		
216	D8	Ø	┴		
217	D9	Ù	┴		
218	DA	Ú	┴		
219	DB	Û	■		
220	DC	Ü	■		
221	DD	Ý	■		
222	DE	Þ	■		
223	DF	ß	■		
224	E0	à	α		

Table A-2 Extended ASCII characters (continued)

DEC	HEX	CP 1252	ASCII	Alternate Extended	PS2 scan code
225	E1	á	ß		
226	E2	â	Γ		
227	E3	ã	π		
228	E4	ä	Σ		
229	E5	å	σ		
230	E6	æ	μ		
231	E7	ç	τ		
232	E8	è	Φ		
233	E9	é	θ		
234	EA	ê	Ω		
235	EB	ë	δ		
236	EC	ì	∞		
237	ED	í	φ		
238	EE	î	ε		
239	EF	ï	∩		
240	F0	ð	≡		
241	F1	ñ	±		
242	F2	ò	≥		
243	F3	ó	≤		
244	F4	ô	[
245	F5	õ]		
246	F6	ö	÷		
247	F7	÷	≈		
248	F8	ø	°		
249	F9	ù	·		
250	FA	ú	·		
251	FB	û	√		
252	FC	ü	"		
253	FD	ý	²		
254	FE	þ	■		
255	FF	ÿ			

ISO 2022/ISO 646 character replacements

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it might be because the bar code being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, select the code page with which the bar codes were created. The data characters then appear properly.

Code page selection method/ country	Standard	Keyboard country	HP code page option
United States (standard ASCII)	ISO/IEC 646-IRV	n/a	1
Automatic National Character replacement	ISO/IEC 2022	n/a	2 (default)
Binary Code page	n/a	n/a	3
Unite States*	ISO/IEC 646-06	0	1
Canada	ISO/IEC 646-121	54	95
Canada	ISO/IEC 646-122	18	96
Japan	ISO/IEC 646-14	28	98
China	ISO/IEC 646-57	92	99
Great Britain (UK)	ISO/IEC 646-04	7	87
France	ISO/IEC 646-69	3	83
Germany	ISO/IEC 646-21	4	84
Switzerland	ISO/IEC 646-CH	6	86
Sweden/Finland (extended Annex C)	ISO/IEC 646-11	2	82
Ireland	ISO/IEC 646-207	73	97
Denmark	ISO/IEC 646-08	8	88
Norway	ISO/IEC 646-60	9	94
Italy	ISO/IEC 646-15	5	85
Portugal	ISO/IEC 646-16	13	92
Spain	ISO/IEC 646-17	10	90
Spain	ISO/IEC 646-85	51	91

* By default, **Automatic National Character replacement** selects these HP code page options for Code 128, Code 39, and Code 93.

The following tables provide the ISO/IEC 646 National Character replacements for different Dec and Hex codes.

Table A-3 Dec Code 35 and Hex Code 23

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	#
CA	54	95	#

Table A-3 Dec Code 35 and Hex Code 23 (continued)

Country	Country Keyboard	HP Code Page	Replacement
CA	18	96	#
JP	28	98	#
CN	92	99	#
GB	7	87	£
FR	3	83	£
DE	4	84	#
CH	6	86	ù
SE/FI	2	82	#
DK	8	88	#
NO	9	94	#
IE	73	97	£
IT	5	85	£
PT	13	92	#
ES	10	90	#
ES	51	91	#

Table A-4 Dec Code 36 and Hex Code 24

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	\$
CA	54	95	\$
CA	18	96	\$
JP	28	98	\$
CN	92	99	¥
GB	7	87	\$
FR	3	83	\$
DE	4	84	\$
CH	6	86	\$
SE/FI	2	82	¤
DK	8	88	\$
NO	9	94	\$
IE	73	97	\$
IT	5	85	\$
PT	13	92	\$

Table A-4 Dec Code 36 and Hex Code 24 (continued)

Country	Country Keyboard	HP Code Page	Replacement
ES	10	90	\$
ES	51	91	\$

Table A-5 Dec Code 64 and Hex Code 40

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	@
CA	54	95	à
CA	18	96	à
JP	28	98	@
CN	92	99	@
GB	7	87	@
FR	3	83	à
DE	4	84	§
CH	6	86	à
SE/FI	2	82	É
DK	8	88	@
NO	9	94	@
IE	73	97	Ó
IT	5	85	§
PT	13	92	§
ES	10	90	§
ES	51	91	.

Table A-6 Dec Code 91 and Hex Code 58

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	[
CA	54	95	â
CA	18	96	â
JP	28	98	[
CN	92	99	[
GB	7	87	[
FR	3	83	°
DE	4	84	Ä

Table A-6 Dec Code 91 and Hex Code 58 (continued)

Country	Country Keyboard	HP Code Page	Replacement
CH	6	86	è
SE/FI	2	82	Ä
DK	8	88	Æ
NO	9	94	Æ
IE	73	97	É
IT	5	85	°
PT	13	92	Ã
ES	10	90	í
ES	51	91	í

Table A-7 Dec Code 92 and Hex Code 5C

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	\
CA	54	95	ç
CA	18	96	ç
JP	28	98	¥
CN	92	99	\
GB	7	87	\
FR	3	83	ç
DE	4	84	Ö
CH	6	86	ç
SE/FI	2	82	Ö
DK	8	88	Ø
NO	9	94	Ø
IE	73	97	í
IT	5	85	ç
PT	13	92	Ç
ES	10	90	Ñ
ES	51	91	Ñ

Table A-8 Dec Code 93 and Hex Code 5D

Country	Country Keyboard	HP Code Page	Replacement
US	0	1]

Table A-8 Dec Code 93 and Hex Code 5D (continued)

Country	Country Keyboard	HP Code Page	Replacement
CA	54	95	ê
CA	18	96	é
JP	28	98]]
CN	92	99]]
GB	7	87]]
FR	3	83	§
DE	4	84	Û
CH	6	86	ê
SE/FI	2	82	Å
DK	8	88	Å
NO	9	94	Å
IE	73	97	Ú
IT	5	85	é
PT	13	92	Õ
ES	10	90	¿
ES	51	91	Ç

Table A-9 Dec Code 94 and Hex Code 5E

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	^
CA	54	95	î
CA	18	96	É
JP	28	98	^
CN	92	99	^
GB	7	87	^
FR	3	83	^
DE	4	84	^
CH	6	86	î
SE/FI	2	82	Û
DK	8	88	^
NO	9	94	^
IE	73	97	Á
IT	5	85	^

Table A-9 Dec Code 94 and Hex Code 5E (continued)

Country	Country Keyboard	HP Code Page	Replacement
PT	13	92	^
ES	10	90	^
ES	51	91	¿

Table A-10 Dec Code 96 and Hex Code 60

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	`
CA	54	95	ô
CA	18	96	ô
JP	28	98	`
CN	92	99	`
GB	7	87	`
FR	3	83	µ
DE	4	84	`
CH	6	86	ô
SE/FI	2	82	é
DK	8	88	`
NO	9	94	`
IE	73	97	ó
IT	5	85	ù
PT	13	92	`
ES	10	90	`
ES	51	91	`

Table A-11 Dec Code 123 and Hex Code 7B

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	{
CA	54	95	é
CA	18	96	é
JP	28	98	{
CN	92	99	{
GB	7	87	{
FR	3	83	é

Table A-11 Dec Code 123 and Hex Code 7B (continued)

Country	Country Keyboard	HP Code Page	Replacement
DE	4	84	ä
CH	6	86	ä
SE/FI	2	82	ä
DK	8	88	æ
NO	9	94	æ
IE	73	97	é
IT	5	85	à
PT	13	92	ã
ES	10	90	°
ES	51	91	'

Table A-12 Dec Code 124 and Hex Code 7C

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	|
CA	54	95	ù
CA	18	96	ù
JP	28	98	|
CN	92	99	|
GB	7	87	|
FR	3	83	ù
DE	4	84	ö
CH	6	86	ö
SE/FI	2	82	ö
DK	8	88	ø
NO	9	94	ø
IE	73	97	í
IT	5	85	ò
PT	13	92	ç
ES	10	90	ñ
ES	51	91	ñ

Table A-13 Dec Code 125 and Hex Code 7D

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	}
CA	54	95	è
CA	18	96	è
JP	28	98	}
CN	92	99	}
GB	7	87	}
FR	3	83	è
DE	4	84	ü
CH	6	86	ü
SE/FI	2	82	å
DK	8	88	å
NO	9	94	å
IE	73	97	ú
IT	5	85	è
PT	13	92	õ
ES	10	90	ç
ES	51	91	ç

Table A-14 Dec Code 126 and Hex Code 7E

Country	Country Keyboard	HP Code Page	Replacement
US	0	1	~
CA	54	95	û
CA	18	96	û
JP	28	98	–
CN	92	99	–
GB	7	87	~
FR	3	83	..
DE	4	84	ß
CH	6	86	û
SE/FI	2	82	ü
DK	8	88	~
NO	9	94	..
IE	73	97	á

Table A-14 Dec Code 126 and Hex Code 7E (continued)

Country	Country Keyboard	HP Code Page	Replacement
IT	5	85	ì
PT	13	92	°
ES	10	90	~
ES	51	91	¨

B Sample symbols

Figure B-1 UPC-A 01234567890



Figure B-2 Interleaved 2 of 5 1234567890

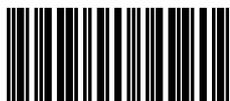


Figure B-3 EAN-13 9 780330290951



Figure B-4 Code 128 Code 128

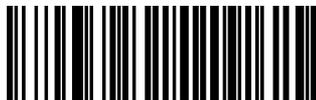


Figure B-5 Code 39 BC321



Figure B-6 Codabar A13579B



Figure B-7 Code 93 123456-9\$



Figure B-8 Code 2 of 5 123456

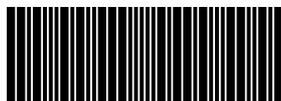


Figure B-9 Matrix 2 of 5 6543210



Figure B-10 RSS-14 (01)00123456789012



Figure B-11 PDF417 Car Registration



Figure B-12 Code 49 1234567890



Figure B-13 Postnet Zip Code



Figure B-14 Data Matrix Test Symbol



Figure B-15 QR Code Numbers



Figure B-16 Aztec Package Label



Figure B-17 MaxiCode Test Message

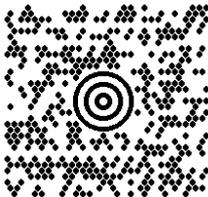


Figure B-18 Micro PDF417 Test Message



Figure B-19 OCR-A with Modulo 36 check character 532427D

532427D

Figure B-20 OCR-A with Modulo 10 check character 5324277

5324277

C Programming chart

 **NOTE:** If you make an error while scanning the letters or digits, do not scan **Save**. Scan **Discard**, scan the correct letters or digits, and then scan **Save**.

Figure C-1 0



Figure C-2 1



Figure C-3 2



Figure C-4 3



Figure C-5 4



Figure C-6 5



Figure C-7 6



Figure C-8 7



Figure C-9 8



Figure C-10 9



Figure C-11 A



Figure C-12 B



Figure C-13 C



Figure C-14 D



Figure C-15 E



Figure C-16 F



Figure C-17 Save



Figure C-18 Discard



Figure C-19 Reset



Index

A

ASCII
 conversion chart 75
 lower reference table 77
Aztec Code 48

C

China Post (Hong Kong 2 of 5) 54
Chinese Sensible Code 49
Codabar 6
Codablock A 38
Codablock F 39
Code 11 20
Code 128 21
Code 39 8
Code 93 16
code quality 3
 1D 3
 PDF 3
Coupon GS1 DataBar Output 27

D

Data Matrix 45

E

EAN-13 31
EAN-8 33

G

GS1 DataBar Expanded 37
GS1 DataBar Limited 37
GS1 DataBar Omnidirectional 36
GS1 Emulation 43
GS1-128 23
GSI Composite Codes 42

H

Han Xin Code 49

I

Interleaved 2 of 5 14
ISO
 2022 character replacements 84
 646 character replacements 84

J

JAN-13 31
JAN-8 33

K

Korea Post 55

L

Label Code 40
light 2

M

MacroPDF417 41
manual trigger
 light 2
 modes 2
Matrix 2 of 5 19
MaxiCode 47
message length 5
MicroPDF417 41
mobile phone read mode 3
MSI 35

N

NEC 2 of 5 15

O

OCR
 checksum examples 69
 checksums 68
 control codes chart 64
 custom template character size 63
 custom template currency characters 63
 custom template spaces 63
 custom template, creating 63
 defaults 57
 enabling reading 57
 fixed-character repeat 66
 groups 67
 inline group 68
 ISBN template 59, 60
 MICR E-13B template 60
 multiple line templates 65

new template 64
passport template 59
programming 57
programming codes 70
templates, custom 63
templates, multiple predefined 61
templates, predefined 59
variable-character repeat 66
weight scheme 68
weighting 68
working orientation 58

P

PDF417 40
Postal Codes
 2D 50
 Linear 54
programming chart 96

Q

QR Code 44

S

Straight 2 of 5 IATA 19
Straight 2 of 5 Industrial 18
symbology 4
 2D 74
 all 5
 charts 73
 linear 73
 postal 75

T

TCIF Linked Code 39 44
Telepen 23
TLC39 44

U

UPC-A 25
UPC-A/EAN-13 with Extended Coupon Code 27
UPC-E0 28
UPC-E1 30
USB HID 1