CipherLab

User Guide

2504MR/SR/DP Barcode Scanner

Setup barcodes included.

Version 1.071

Copyright © 2017~2020 CIPHERLAB CO., LTD.
All rights reserved

The software contains proprietary information of CIPHERLAB CO., LTD.; it is provided under a license agreement containing restrictions on use and disclosure and is also protected by copyright law. Reverse engineering of the software is prohibited.

Due to continued product development this information may change without notice. The information and intellectual property contained herein is confidential between CIPHERLAB and the client and remains the exclusive property of CIPHERLAB CO., LTD. If finding any problems in the documentation, please report them to us in writing. CIPHERLAB does not warrant that this document is error-free.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior written permission of CIPHERLAB CO., LTD.

For product consultancy and technical support, please contact the local sales representative. Alternatively, visit our web site for more information.

The CipherLab logo is a registered trademark of CIPHERLAB CO., LTD.

All brand, product and service, and trademark names are the property of their registered owners.

The editorial use of these names is for identification as well as to the benefit of the owners, with no intention of infringement.

CIPHERLAB CO., LTD.
Website: http://www.cipherlab.com

Important Notices

For USA

This equipment has been tested and found to comply with the limits for a **Class B** digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For Canada

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of Industry Canada.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Cet appareil numerique respecte les limites de bruits radioelectriques applicables aux appareils numeriques de Classe B prescrites dans la norme sur le material brouilleur: "Appareils Numeriques," NMB-003 edictee par l'Industrie.

Safety Precautions

- DO NOT expose the scanner to any flammable sources.
- Under no circumstances, internal components are self-serviceable.
- For AC power adaptor, a socket outlet shall be installed near the equipment and shall be easily accessible. Make sure there is stable power supply for the scanner or its peripherals to operate properly.

Care & Maintenance

- Use a clean cloth to wipe dust off the scanning window and the body of the scanner. DO NOT use/mix any bleach or cleaner.
- Keep the scanner away from any magnets and magnetic fields to prevent the laser engine from malfunctioning.
- If finding the scanner malfunctioning, write down the specific scenario and consult the local sales representative.

Release Notes

Version	Date	Notes
1.071	May 05, 2020	Modified: **Setup QR Barcode** – QR Code limited New: **1.4.4 Power-on Beep** Modified: **1.6 Scan Modes** – scan mode table updated Modified: **1.6.5 Aiming Mode** – 4 submodes added Modified: **1.17 DPM Mode (2504DP Only)** – further details for Mode 1/Mode 2
1.07	Sep. 10, 2019	New: **1.4.3 Bell Ring** New: **1.6.9 Release Mode** New: **1.17 DPM Mode (2504 Only)** Modified: **2.3.1 Activate USB HID & Select Keyboard Type** - the Apple keyboard layout table & setting barcodes added Modified: **3.13.2 GS1 DataBar Omnidirectional (RSS-14)** – enabled by default, Transmit Code ID disabled by default Modified: **3.13.3 GS1 DataBar Expanded (RSS Expanded)** - enabled by default, Transmit Code ID disabled by default Modified: **3.13.4 GS1 DataBar Limited (RSS Limited)** - enabled by default, Transmit Code ID disabled by default
1.06	Jun. 25, 2019	Modified: **2.1.1 Activate Keyboard Wedge & Select Keyboard Type** - Swiss French (48), Czech (49) added Modified: **2.1.6 UTF-8 Conversion** - Swiss French (48), Czech (49) added Modified: **2.3.1 Activate USB HID & Select Keyboard Type** - Swiss French (94), Czech (95) added Modified: **2.3.7 UTF-8 Conversion** - Swiss French (94), Czech (95) added Modified: **3.25.3 Data Matrix** – ECI Information setting barcode added Modified: **Appendix VI Keyboard Type One-Scan Barcode –** Swiss French, Czech added
1.05	Feb. 19, 2019	Modified: **1.6.7 Presentation Mode** – Low Light Enhancement setting barcodes removed Modified: **2.6 Direct USB OPOS** - setting barcode added Modified: **3.25.3 Data Matrix** –Data Matrix Mirror setting barcodes removed

1.04	Aug. 30, 2018	▸ Modified: **1.2.1 Continuous Decoding** – enabled by default ▸ Modified: **2.1.1 Activate Keyboard Wedge & Select Keyboard Type** – Greek(35), Slovenian (45), Mexican Spanish(46) added ▸ Modified: **2.1.5 Special Keyboard Feature** – "Bypass with Control Character Output" setting barcode added ▸ Removed: **2.1.6 Control Output Character (Windows only)** ▸ New: **2.1.6 UTF-8 Conversion** ▸ Modified: **2.3.1 Activate USB HID & Select Keyboard Type** – Greek(81), Slovenian (91), Mexican Spanish(92) added ▸ Modified: **2.3.2 Keyboard Settings** – Alt Composing added ▸ New: **2.3.7 UTF-8 Conversion** ▸ Modified: **2.3.8 USB Polling Interval** – 4ms by default ▸ Removed: **2.3.9 Control Output Character (Windows only)** ▸ New: **2.6 Direct USB OPOS** ▸ Modified: change section article to **4.2.1 Single Character Substitution** (previous article: **Select a Set for Character Substitution**) ▸ New: **4.2.2 Multiple Characters Substitution** ▸ New: **Appendix III Keyboard Wedge Table – Bypass Special Keyboard with Control Character Output** ▸ Modified: **Appendix VI Keyboard Type One-Scan Barcode** – keyboard types updated
1.03	Apr. 20, 2018	▸ Modified: **Specifications** – Splash/Dust Resistance upgraded to IP 65
1.02	Feb. 22, 2018	▸ New: **1.2.1 Continuous Decoding** ▸ New: **1.6.8 Multicode Mode** ▸ Modified: **1.8 Delay between Re-read** – Laser mode added ▸ Modified: **2.1.1 Activate Keyboard Wedge & Select Keyboard Type** – Russian (37), Cyrillic (42), Armenian (43), Thai (44) added ▸ Modified: **2.1.5 Special Keyboard Feature** – default bypass ▸ New: **2.1.6 Control Character Output (Windows only)** ▸ Modified: **2.3.1 Activate USB HID & Select Keyboard Type** – Russian (83), Cyrillic (88), Armenian (89), Thai (90) added ▸ Modified: **2.3.5 HID Character Transmit Mode** – default by character ▸ Modified: **2.3.6 Special Keyboard Feature** – default bypass ▸ New: **2.3.8 USB Polling Interval** ▸ New: **2.3.9 Control Character Output (Windows only)**
1.00	Apr. 13, 2017	▸ Initial release

Contents

IMPORTANT NOTICES ..... - 3 -
For USA ..... - 3 -
For Canada ..... - 3 -
Safety Precautions ..... - 4 -
Care & Maintenance ..... - 4 -
RELEASE NOTES ..... - 5 -
INTRODUCTION 1
Inside the Package 2
Product Highlights 2
Symbologies Supported 3
QUICK START 5
Enter Configuration Mode 6
Exit Configuration Mode 6
Default Settings 7
Save User Settings as Defaults 7
Restore User Defaults 7
Restore System Defaults 7
Read a Setup Barcode 8
Configure Parameters 8
List the Current Settings 12
Create One-Scan Setup Barcodes 14
1D One-Scan Barcode 14
Setup QR Barcode 15
UNDERSTANDING THE BARCODE SCANNER 17
1.1 Power-On 18
1.2 Transmit Buffer 18
1.2.1 Continuous Decoding 19
1.3 LED Indicator 20
1.3.1 Good Read LED 20
1.3.2 Good Read LED Duration 20
1.4 Beeper 21
1.4.1 Beeper Volume 21
1.4.2 Good Read Beep 22
1.4.3 Bell Ring 23
1.4.4 Power-on Beep 23
1.5 Send “NR” to Host 23
1.6 Scan Modes 24

1.6.1 Test Mode 25
1.6.2 Laser Mode 25
1.6.3 Auto Off Mode 25
1.6.4 Auto Power Off Mode 26
1.6.5 Aiming Mode 26
1.6.6 Multi-Barcode Mode 28
1.6.7 Presentation Mode 28
1.6.8 Multicode Mode 29
1.6.9 Release Mode 30
1.7 Scanning Timeout 31
1.8 Delay between Re-read 32
1.9 Read Redundancy (1D) 33
1.10 Addon Security for UPC/EAN Barcodes 34
1.11 Auto-Sense Mode 35
1.12 Negative Barcodes 35
1.13 Cable Auto-Detection 36
1.14 Picklist Mode 36
1.15 Mobile Phone/Display Mode 37
1.16 Illumination Brightness 37
1.17 DPM Mode (2504DP Only) 38

SELECTING OUTPUT INTERFACE 39

2.1 Keyboard Wedge 40
2.1.1 Activate Keyboard Wedge & Select Keyboard Type 41
2.1.2 Keyboard Settings 42
2.1.3 Inter-Character Delay 48
2.1.4 Inter-Function Delay 49
2.1.5 Special Keyboard Feature 49
2.1.6 UTF-8 Conversion 50
2.2 RS-232 51
2.2.1 Activate RS-232 Interface 51
2.2.2 Baud Rate 51
2.2.3 Data Bits 52
2.2.4 Parity 52
2.2.5 Stop Bit 52
2.2.6 Flow Control 53
2.2.7 Inter-Character Delay 54
2.2.8 Inter-Function Delay 54
2.2.9 ACK/NAK Timeout 55
2.3 Direct USB HID 56
2.3.1 Activate USB HID & Select Keyboard Type 56
2.3.2 Keyboard Settings 59
2.3.3 Inter-Character Delay 65
2.3.4 Inter-Function Delay 65
2.3.5 HID Character Transmit Mode 66
2.3.6 Special Keyboard Feature 66

2.3.7 UTF-8 Conversion 66
2.3.8 USB Polling Interval 67
2.4 Direct USB VCOM 68
2.4.1 Activate USB Virtual COM 68
2.4.2 Inter-Function Delay 68
2.4.3 ACK/NAK Timeout 69
2.5 Direct USB VCOM_CDC 70
2.5.1 Activate USB VCOM_CDC 70
2.5.2 Inter-Function Delay 70
2.5.3 ACK/NAK Timeout 71
2.6 Direct USB OPOS 72

CHANGING SYMBOLOGY SETTINGS 73

3.1 Codabar 74
3.1.1 Start/Stop Transmission 74
3.1.2 CLSI Conversion 74
3.1.3 Code Length Qualification 75
3.2 Code 25 – Industrial 25 76
3.2.1 Code Length Qualification 77
3.3 Code 25 – Interleaved 25 78
3.3.1 Verify Check Digit 78
3.3.2 Transmit Check Digit 78
3.3.3 Convert to EAN-13 79
3.3.4 Code Length Qualification 80
3.4 Code 25 – Matrix 25 81
3.4.1 Verify Check Digit 81
3.4.2 Transmit Check Digit 81
3.4.3 Code Length Qualification 82
3.5 Code 25 – Chinese 25 83
3.6 Italian Pharmacode (Code 32) 84
3.7 Code 39 85
3.7.1 Verify Check Digit 85
3.7.2 Transmit Check Digit 85
3.7.3 Standard/Full ASCII Code 39 86
3.7.4 Code Length Qualification 86
3.8 Trioptic Code 39 88
3.9 Code 93 89
3.9.1 Code Length Qualification 90
3.10 Code 128 91
3.11 GS1-128 (EAN-128) 92
3.11.1 Transmit Code ID 92
3.11.2 Field Separator (GS Character) 92
3.11.3 GS1 Formatting 93
3.11.4 Application ID Mark 93
3.12 ISBT 128 94

3.12.1 ISBT Concatenation 94
3.12.2 ISBT Concatenation Redundancy 95
3.13 GS1 DataBar (RSS Family) 96
3.13.1 Select Code ID 96
3.13.2 GS1 DataBar Omnidirectional (RSS-14) 97
3.13.3 GS1 DataBar Expanded (RSS Expanded) 98
3.13.4 GS1 DataBar Limited (RSS Limited) 99
3.13.5 Convert to UPC/EAN 100
3.13.6 Field Separator (GS Character) 100
3.13.7 Application ID Mark 101
3.14 MSI 102
3.14.1 Verify Check Digit 102
3.14.2 Transmit Check Digit 102
3.14.3 Code Length Qualification 103
3.15 EAN-8 104
3.15.1 Transmit Check Digit 104
3.16 EAN-13 105
3.16.1 Convert to ISBN 106
3.16.2 Convert to ISSN 106
3.16.3 Transmit Check Digit 106
3.17 UCC Coupon Extended Code 107
3.18 UPC-A 108
3.18.1 Convert to EAN-13 109
3.18.2 Transmit System Number 109
3.18.3 Transmit Check Digit 109
3.19 UPC-E 110
3.19.1 Select System Number 111
3.19.2 Convert to UPC-A 111
3.19.3 Transmit System Number 112
3.19.4 Transmit Check Digit 112
3.20 Code 11 113
3.20.1 Verify Check Digit 113
3.20.2 Transmit Check Digit 113
3.20.3 Code Length Qualification 114
3.21 Composite Code 115
3.21.1 Composite CC-A/B 115
3.21.2 Composite CC-C 115
3.21.3 Composite TLC-39 116
3.21.4 UPC Composite Mode 116
3.21.5 GS1-128 Emulation Mode for UCC/EAN Composite Codes 117
3.21.6 Field Separator (GS Character) 117
3.21.7 Application ID Mark 118
3.22 US Postal Code 119
3.22.1 US Postnet 119
3.22.2 US Planet 119
3.22.3 Transmit Check Digit 119

3.23 UK Postal Code 120
3.23.1 UK Postal 120
3.23.2 Transmit Check Digit 120
3.24 More Postal Code 121
3.24.1 Japan Postal 121
3.24.2 Australian Postal 121
3.24.3 Dutch Postal 121
3.24.4 USPS 4CB/One Code/Intelligent Mail 121
3.24.5 UPU FICS Postal 122
3.25 2D Symbologies 123
3.25.1 PDF417 123
3.25.2 MICROPDF417 123
3.25.3 Data Matrix 123
3.25.4 Maxicode 125
3.25.5 QR Code 125
3.25.6 MICROQR 126
3.25.7 Aztec 126
3.26 Macro PDF 127
3.26.1 Transmit/Decode Mode 127
3.26.2 Escape Characters 128
3.26.3 Transmit Control Header 128
DEFINING OUTPUT FORMAT 129
4.1 Letter Case 129
4.2 Character Substitution 130
4.2.1 Single Character Substitution 131
4.2.2 Multiple Characters Substitution 132
4.2.3 Symbologies for Character Substitution (All 3 Sets) 134
4.3 Prefix/Suffix Code 144
4.4 Code ID 145
4.4.1 Select Pre-defined Code ID 145
4.4.2 Change Code ID 148
4.4.3 Clear Code ID Settings 151
4.5 Length Code 152
4.6 Multi-Barcode Editor 160
4.6.1 Edit a Concatenation of Barcodes 161
4.6.2 Activate the Concatenation of Barcodes 163
4.7 Removal of Special Character 164
4.8 AIM Code ID 164
APPLYING FORMATS FOR DATA EDITING 165
5.1 Activating Editing Formats 166
5.1.1 Activate Editing Formats 166
5.1.2 Exclusive Data Editing 167
5.2 How to Configure Editing Formats 168
5.2.1 Select Format to Configure 169

5.2.2 Restore Default Format 170
5.3 Configuring Format — Define Data Criteria 171
5.3.1 Applicable Code Type 171
5.3.2 Data Length 181
5.3.3 Matching String & Location 181
5.4 Configuring Format — Define Data Field 182
5.4.1 Start Position 182
5.4.2 Field Adjustment 182
5.4.3 Total Number of Fields 183
5.4.4 Field Settings 184
5.4.5 Pause Field Setting 190
5.5 Configuring Format — Define Transmission Sequence 191
5.6 Programming Examples 193
5.6.1 Example I 193
5.6.2 Example II 194
SPECIFICATIONS 195
FIRMWARE UPGRADE 197
Using RS-232 197
Using USB Virtual COM 199
HOST SERIAL COMMANDS 201
Serial Commands 201
Example 202
KEYBOARD WEDGE TABLE 203
Apply Special Keyboard 203
Bypass Special Keyboard 204
Bypass Special Keyboard with Control Character Output 205
Key Type & Status 206
Key Type 206
Key Status 206
Example 207
NUMERAL SYSTEMS 209
Decimal System 209
Hexadecimal System 210
ASCII Table 211
READING DRIVER LICENSES 213
License Parsing Setup 213
File Type 213
Output Sequence Setup 214
Separators and Fields 220
Edit Separators 221

Edit Fields 222
KEYBOARD TYPE ONE-SCAN BARCODE 223
Keyboard Wedge 223
Direct USB HID 228

Introduction

The small-form-factor Barcode Scanners are capable of reading 2D barcodes. The tethered handheld scanners are designed to help accelerate productivity while lowering the total cost of ownership. Intensive data collection jobs are made easier with fast, accurate barcode scanning in various working environments, especially in small businesses.

Owing to the slim, ergonomic design, extremely low power consumption, and powerful decoding capability, CipherLab Barcode Scanners are the best choice for the following applications –

- Receiving in Retail
- Product labeling & Tracking
- Shelf Product Replenishment
- Mobile Point of Sale (POS)
- Mobile Inventory Management
- Order Picking & Staging
- Work-In-Process Tracking
- Material Flow Control
- Transportation & Distribution
- Warehousing
- Asset Management

This manual contains information on operating the scanner and using its features. It is better to keep one copy of the manual at hand for quick reference or maintenance purposes. To avoid any improper disposal or operation, please read the manual thoroughly before use.

Thank you for choosing CipherLab products!

Update

Inside the Package

The items included in the package may be different, depending on order. Rich choices of output interfaces are available to enhance the total performance of the scanner. Refer to product specifications.

Save the box and packaging material for future use in case it is need to store or ship the scanner.

- Barcode Scanner: 2504MR

Product Highlights

- Small-form-factor and built tough to survive drop test
- Extremely low power consumption
- Firmware upgradeable
- Supports most popular barcode symbologies, including GS1-128 (EAN-128), GS1 DataBar (RSS), etc.
- Supports negative barcodes
- Supports a variety of 2D symbologies
- Supports different scan modes, including Aiming Mode and Multi-Barcode Mode[Note]
- Programmable feedback via LED indicator and beeper
- Beeping tone and duration programmable for Good Read
- Provides choices of output interfaces, including RS-232, Keyboard Wedge, and USB.
- Programmable parameters include data output format, editing format, symbologies, etc.

Note: In any scan mode other than Multi-Barcode Mode, a barcode acceptable to the scanner can only contain data of 7 KB at most.

Enter Setup

Symbologies Supported

Most of the popular barcode symbologies are supported, as listed below. Each can be individually enabled or disabled. The scanner will automatically discriminate and recognize all the symbologies that are enabled. Refer to Chapter 3 Changing Symbology Settings for details of each symbology.

Symbologies Supported: Enable/Disable		Default	
Codabar		Enabled	
Code 93		Enabled	
MSI			Disabled
Code 128	Code 128	Enabled	
	GS1-128 (EAN-128)	Enabled	
	ISBT 128	Enabled	
Code 2 of 5	Industrial 25	Enabled	
	Interleaved 25	Enabled	
	Matrix 25		Disabled
	Chinese 25		Disabled
Code 3 of 9	Code 39	Enabled	
	Italian Pharmacode		Disabled
	Trioptic Code 39		Disabled
EAN / UPC	EAN-8	Enabled	
	EAN-8 Addon 2		Disabled
	EAN-8 Addon 5		Disabled
	EAN-13	Enabled	
	EAN-13 & UPC-A Addon 2		Disabled
	EAN-13 & UPC-A Addon 5		Disabled
	ISBN		Disabled
	UPC-E0	Enabled	
	UPC-E1		Disabled
	UPC-E Addon 2		Disabled
	UPC-E Addon 5		Disabled
	UPC-A	Enabled	
GS1 DataBar (RSS)	GS1 DataBar Omnidirectional (RSS-14)	Enabled	
	GS1 DataBar Truncated	Enabled	
	GS1 DataBar Stacked	Enabled	
	GS1 DataBar Stacked Omnidirectional	Enabled	

	GS1 DataBar Limited (RSS Limited)	Enabled	
	GS1 DataBar Expanded (RSS Expanded)	Enabled	
	GS1 DataBar Expanded Stacked	Enabled	
Code 11			Disabled
Composite Code	Composite CC-A/B		Disabled
	Composite CC-C		Disabled
	Composite TLC-39		Disabled
Postal Code	US Postnet	Enabled	
	US Planet	Enabled	
	UK Postal	Enabled	
	Japan Postal	Enabled	
	Australian Postal	Enabled	
	Dutch Postal	Enabled	
	USPS 4CB/One Code/Intelligent Mail		Disabled
	UPU FICS Postal		Disabled
2D Symbologies	PDF417	Enabled	
	MicroPDF417		Disabled
	Data Matrix	Enabled	
	Maxicode	Enabled	
	QR Code	Enabled	
	MicroQR	Enabled	
	Aztec	Enabled	

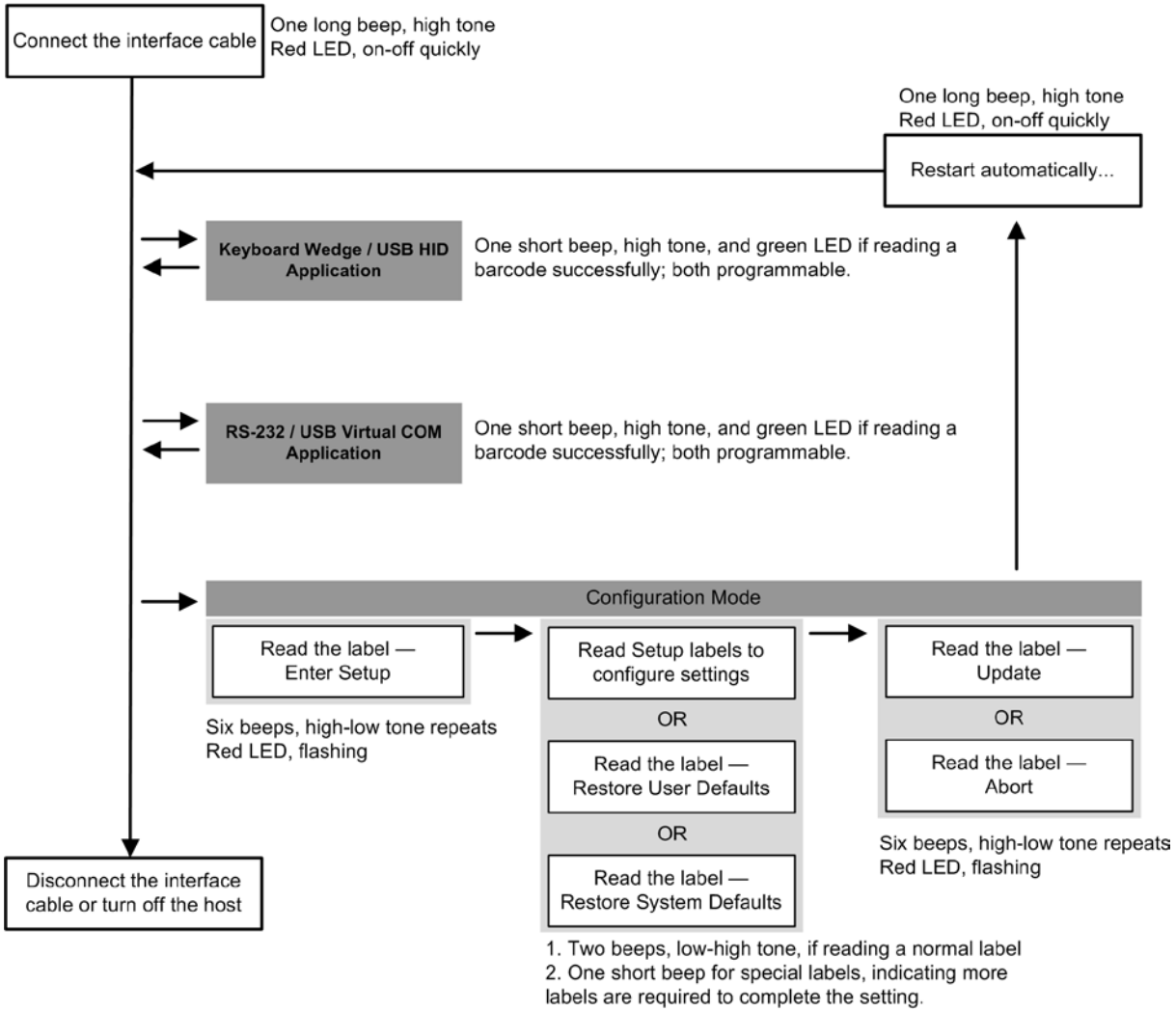
Enter Setup

Quick Start

The configuration of the scanner can be done by reading the setup barcodes (setup labels) contained in this manual or via the *ScanMaster* software.

This section describes the procedure of configuring the scanner by reading the setup barcodes and provides some examples for demonstration.

Note: If RS-232 or USB Virtual COM is selected for output interface, the host can directly send serial commands to configure the scanner.
For example, run HyperTerminal.exe and type the 6-digit command located under each setup barcode. Refer to Appendix II Host Serial Commands.



Update

Enter Configuration Mode

For the scanner to enter the configuration mode, have it read the "Enter Setup" barcode located at the bottom of almost every even page of this manual.

- The scanner will respond with six beeps and its LED indicator will become flashing red after reading the barcode.

Enter Setup

For configuring scanner parameters, see "Read a Setup Barcode" below.

Exit Configuration Mode

For the scanner to save settings and exit the configuration mode, have it read the "Update" barcode located at the bottom of almost every odd page of this manual. To exit the configuration mode without saving any changes, have the scanner read the "Abort" barcode instead.

- Just like reading the "Enter Setup" barcode, the scanner will respond with six beeps and its LED indicator will become flashing red after reading the barcode. Wait for a few seconds for the scanner to restart itself.

Update

Abort

Enter Setup

Default Settings

Save User Settings as Defaults

For the scanner to keep the customized settings as user defaults, have it read the “Save as User Defaults” barcode. This is a normal setup barcode, and the scanner will respond with two beeps (low-high tone).

- After reading the “Update” barcode, the current settings will be saved as user defaults.

Save as User Defaults

Restore User Defaults

For the scanner to restore the user defaults, have it read the “Restore User Defaults” barcode. This is a normal setup barcode, and the scanner will respond with two beeps (low-high tone).

- After reading the “Update” barcode, all the parameters of the scanner will return to the customized values.

Restore User Defaults

Restore System Defaults

For the scanner to restore the factory defaults, have it read the “Restore System Defaults” barcode. This is a normal setup barcode, and the scanner will respond with two beeps (low-high tone).

- After reading the “Update” barcode, all the parameters of the scanner will return to the default values.

Restore System Defaults

Note: The system default value (if there is) for each setting is indicated by an asterisk “*”.

Update

Read a Setup Barcode

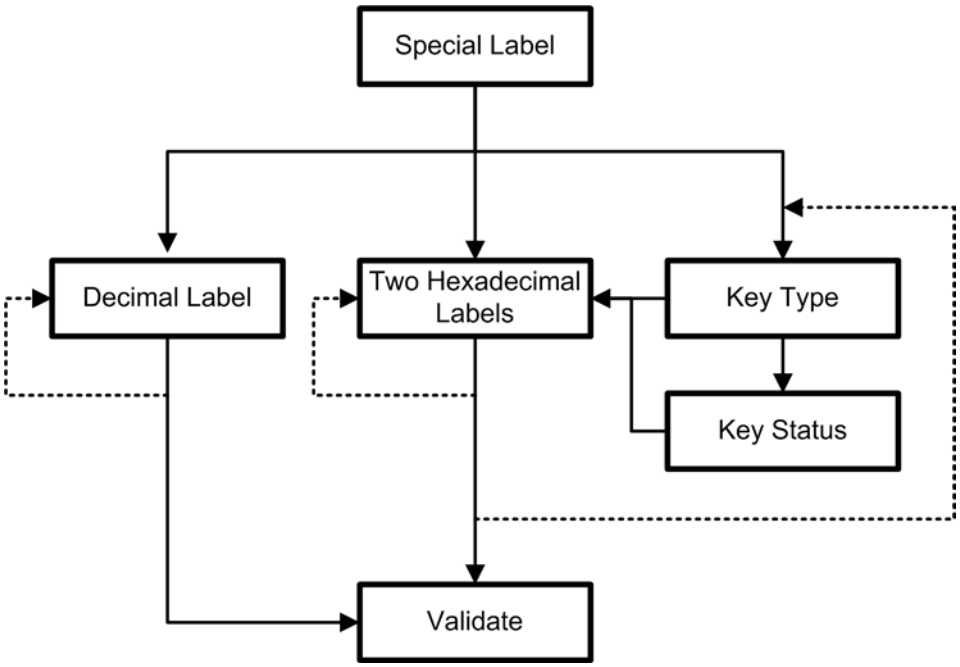
Configure Parameters

For most of the scanner parameters, only one read is required to set them to new values. The scanner will respond with two beeps (low-high tone) when each parameter is set successfully.

But for a number of special parameters, multiple reads are required to complete the setting. In this case, the scanner will respond with a short beep indicating it needs to read more setup barcodes. These special parameters may require reading one or more setup barcodes, such as

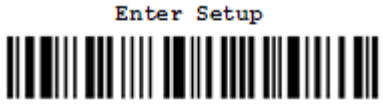
- Numeric barcodes, say, for keyboard type, inter-character delay, length qualification
- Hexadecimal barcodes, say, for character strings as prefix, suffix, etc.
- When “Keyboard Wedge” or “USB HID” is configured as the interface, Key Type and Key Status will then become applicable. Decide whether or not to change key status when “Normal Key” is selected for Key Type.

To complete the configuration of these special parameters, the scanner requires reading the “Validate” barcode, and then responds with two beeps (low-high tone) to indicate the input values are validated.



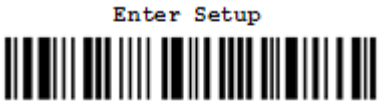
Enter Setup

The example below shows how to save settings as “User Default” so that you can restore user defaults later:

Steps	Action	Scanner Feedback if Successful
1	Power on the scanner…	The scanner will respond with a long beep (high tone) and its LED indicator will become solid red and go off quickly.
2	Enter the Configuration Mode… 	The scanner will respond with six beeps (high-low tone repeats three times), and its LED indicator will be flashing red.
3	Read a Setup barcode… For example,	The scanner will respond with two beeps (low-high tone) if reading a normal setup barcode.
4	Exit the Configuration Mode…	Same as for *Enter the Configuration Mode*.
5	The scanner will automatically restart itself…	Same as for *Power on the scanner*.
*	When any configuration error occurs…	The scanner will respond with one long beep (low tone).

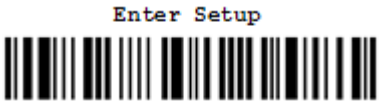
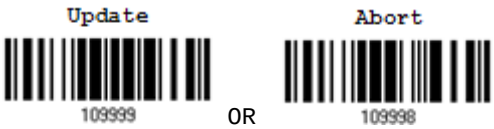
Update

The example below shows how to set numeric parameters:

Steps	Action	Scanner Feedback if Successful
1	Power on the scanner…	The scanner will respond with a long beep (high tone) and its LED indicator will become solid red and go off quickly.
2	Enter the Configuration Mode… 	The scanner will respond with six beeps (high-low tone repeats three times), and its LED indicator will become flashing red.
3	Read a Setup barcode… For example, **Normal setup barcode** **Normal setup barcode** **Special setup barcode** **Decimal barcodes**	Read the “Decimal Value” barcode(s). ▸ Refer to Appendix IV “Decimal System” The scanner will respond with two beeps (low-high tone) when the input values are validated.
4	Exit the Configuration Mode…	Same as for *Enter the Configuration Mode*.
5	The scanner will automatically restart itself…	Same as for *Power on the scanner*.

Enter Setup

The example below shows how to set string parameters:

Steps	Action	Scanner Feedback if Successful
1	Power on the scanner…	The scanner will respond with a long beep (high tone) and its LED indicator will become solid red and go off quickly.
2	Enter the Configuration Mode… 	The scanner will respond with six beeps (high-low tone repeats three times), and its LED indicator will become flashing red.
3	Read a Setup barcode… For example, **Special setup barcodes** 	The scanner will respond with one short beep if reading a special setup barcode such as “Prefix Code”, indicating the setup requires reading more barcodes.
		When “Keyboard Wedge” or “USB HID” is configured for interface, Key Type and Key Status will then become applicable. Decide whether or not to change key status when “Normal Key” is selected for Key Type. ▸ Refer to Appendix III
	Hexadecimal barcodes 	Read the “Hexadecimal Value” barcodes for the desired character string. For example, read “2” and “B” for the scanner to prefix the character “+”. ▸ Refer to Appendix IV “Hexadecimal System”
		The scanner will respond with two beeps (low-high tone) when the input values are validated.
4	Exit the Configuration Mode… 	Same as for *Enter the Configuration Mode*.
5	The scanner will automatically restart itself…	Same as for *Power on the scanner*.

Update

List the Current Settings

The current settings of all scanner parameters can be sent to the host computer for user inspection. The listing includes pages as shown below. Select the page of interest by having the scanner read the “List Page x” barcode. The scanner will respond with two beeps (low-high tone) and send the selected page to the host immediately.

Lists settings regarding Firmware Version, Serial Number, Interface, Buzzer, and Other Scanner Parameters	**List Page 1**	109950
Lists settings regarding Prefix, Suffix, and Length Code Setting (1/2)	**List Page 2**	109951
Lists settings regarding Prefix, Suffix, and Length Code Setting (2/2)	**List Page 3**	109952
Lists settings regarding Code ID	**List Page 4**	109953
Lists settings regarding: Readable Symbologies (1/2)	**List Page 5**	109954
Lists settings regarding: Readable Symbologies (2/2)	**List Page 6**	109955
Lists settings regarding Symbology Parameters (1/3)	**List Page 7**	109956
Lists settings regarding Symbology Parameters (2/3)	**List Page 8**	109957
Lists settings regarding Symbology Parameters (3/3)	**List Page 9**	109958
Reserved	**List Page 10**	109959

Enter Setup

Lists settings regarding Editing Format 1 (1/2)	**List Page 11**	109937
Lists settings regarding Editing Format 1 (2/2)	**List Page 12**	109938
Lists settings regarding Editing Format 2 (1/2)	**List Page 13**	109939
Lists settings regarding Editing Format 2 (2/2)	**List Page 14**	109940
Lists settings regarding Editing Format 3 (1/2)	**List Page 15**	109941
Lists settings regarding Editing Format 3 (2/2)	**List Page 16**	109942
Lists settings regarding Editing Format 4 (1/2)	**List Page 17**	109943
Lists settings regarding Editing Format 4 (2/2)	**List Page 18**	109944
Lists settings regarding Editing Format 5 (1/2)	**List Page 19**	109945
Lists settings regarding Editing Format 5 (2/2)	**List Page 20**	109946
Lists settings of Driver License parsing	**List Page 22**	109948

Update

Create One-Scan Setup Barcodes

Most of the scanner parameters require only one read for setting new values. To facilitate configuring the scanner, create One-Scan setup barcodes for use.

1D One-Scan Barcode

The requirements of a One-Scan setup barcode are:

- a prefix of the "#@" characters
- the six digits of command parameters
- a suffix of the "#"character

For example, the scanner needs reading three setup barcodes for the command parameter "109952" to take effect:

Enter Setup

List Page 3

109952

Update

109999

Now, it requires only one read:

One-Scan Setup Barcode for List Page 3

#@109952#

Note: The scanner will restart automatically upon reading the One-Scan setup barcode for changing the interface. It will respond with a long beep and its LED will come on-off shortly.

Enter Setup

Setup QR Barcode

Users can also scan a single QR code combining with a series of serial commands to configure the scanner. For example, if you want to change the suffix character to '#', you will need to input the serial commands in sequence as follows (underlining the digits is to make them more readable):

#@CipherLab101231109902109903109994

Command	Purpose
#@CipherLab	Enter Setup
101231	Configure suffix
109902	Give the first hexadecimal digit of 0x23
109903	Give the second hexadecimal digit of 0x23 for taking '#' as the suffix
109994	Validate the settings

The serial commands above can be combined to form a setup QR barcode:

Setup QR Code for configuring suffix

Update

Enter Setup

Chapter 1

Understanding the Barcode Scanner

This chapter explains the features and usage of the barcode scanner.

In This Chapter

1.1 Power-On 18
1.2 Transmit Buffer 18
1.3 LED Indicator 20
1.4 Beeper 21
1.5 Send “NR” to Host 23
1.6 Scan Modes 24
1.7 Scanning Timeout 31
1.8 Delay between Re-read 32
1.9 Read Redundancy (1D) 33
1.10 Addon Security for UPC/EAN Barcodes 34
1.11 Auto-Sense Mode 35
1.12 Negative Barcodes 35
1.13 Cable Auto-Detect 36
1.14 Picklist Mode 36
1.15 Mobile Phone/Display Mode 37
1.16 Illumination Brightness 37
1.17 DPM Mode 38

Update

1.1 Power-On

Connect the interface cable between the scanner and computer.

- When using the RS-232 cable, attach the accompanying power adaptor to power up the scanner.
- The scanner will respond with one long beep (high tone) and its LED indicator will become solid red and go off quickly.

1.2 Transmit Buffer

The scanner is designed to send any collected data to a host computer one by one via the transmit buffer (SRAM). Upon reading a barcode successfully, the scanner responds with one short beep (high tone) and its LED indicator becomes solid green and goes off quickly.

The host computer may not receive the data immediately if using a low baud rate or waiting for handshake signal (flow control). With the 10 KB transmit buffer, the scanner can ignore the transmission status and keep on reading barcodes until the buffer is full. A warning is given when the transmit buffer is full — the scanner will respond with one long beep (low tone) and its LED indicator will become solid red and go off quickly.

Note: The 10 KB transmit buffer on the scanner can hold as many as 640 scans based on EAN-13 barcodes. Data will be cleared out once the power adaptor to the RS-232 cable is removed or other interface cable is disconnected!

By default the transmit buffer is enabled. Users can decide whether to use the transmit buffer function by reading the Enable/Disable barcode belowe.

***Enable**

Disable

Enter Setup

1.2.1 Continuous Decoding

By default, the scanner only proceeds with the next decode after the host computer has successfully received data. In case of transmitting a huge mass of 2D barcode data, users may encounter difficulties in keeping decoding barcodes. You can configure the scanner to keep decoding without waiting for the host to complete the data receiving.

***Enable**

Disable

Update

1.3 LED Indicator

The dual-color LED indicator on top of the scanner is used to indicate operating status. For example, the LED becomes solid red and goes off quickly upon powering on or running out of transmit buffer. Users can tell the difference by the beeps – for example, you will hear a long beep of high tone when powering on the scanner, and a long beep of low tone when the transmit buffer becomes full.

Scanner LED		Meaning
Red, on-off	---	▸ Power on, with one long beep (high tone, LED on for 1 second) ▸ Transmit buffer full, with one long beep (low tone) ▸ RS-232/USB Virtual COM connection fails, with two beeps (high-low tone)
---	Green, on-off	Good Read, with one short beep (high tone) and beeper pitch and duration programmable
Red, flashing	---	Configuration Mode (On/Off ratio 0.5 s: 0.5 s)

1.3.1 Good Read LED

***Enable Good Read LED**

Disable Good Read LED

1.3.2 Good Read LED Duration

By default, the Good Read LED stays on for 40 milliseconds. Specify a value, ranging from 1 to 254 in units of 10 milliseconds.

Good Read LED Time-out after 0.01~2.54 sec. (*40 ms)

1) Read the barcode above to specify the time interval before the Good Read LED goes off.
2) Read the "Decimal Value" barcode on page 209. For example, read "1" and "5" for the LED to go off after 150 milliseconds.
3) Read the "Validate" barcode on the same page to complete this setting.

Enter Setup

1.4 Beeper

The scanner has a buzzer to give feedback for various operating conditions.

Beeping	Meaning
One long beep, high tone	Power on, with red LED on (1 second) and off quickly
One short beep, high tone ▸ Programmable, default to 4 KHz	Good Read, with green LED on-off quickly
Six short beeps ▸ High-low tone repeats three times	▸ Enter Configuration Mode, with red LED flashing ▸ Exit Configuration Mode
Two beeps, low-high tone	▸ Setup barcode read successfully
Two beeps, high-low tone	RS-232/USB Virtual COM connection fails (data saved in Transmit Buffer), with red LED on-off quickly
One short beep, high tone	More setup barcode required
One short beep, low tone	More barcodes required to complete the "output sequence" requirements of Multi-Barcode Editor, with green LED on-off quickly (Upon completion, same as Good Read.)
One long beep, low tone	▸ Transmit buffer full, with red LED on-off quickly ▸ Configuration error (Wrong barcode…)
Two long beeps, high-low tone	Multi-Barcode Mode – Buffer full

1.4.1 Beeper Volume

Mute

Minimum Volume

Medium Volume

***Maximum Volume**

Update

1.4.2 Good Read Beep

Frequency

8 kHz

***4 kHz**

2 kHz

1 kHz

Duration

***Shortest**

Shorter

Longer

Longest

Enter Setup

1.4.3 Bell Ring

With this function enabled, the scanner will produce a bell ring when receiving the '0x07' character which is sent via the RS-232, VCOM, and VCOM CDC interface.

Enable

***Disable**

1.4.4 Power-on Beep

By default, the scanner beeps when you press the trigger to power on it. You can have the scanner read the Disable setting barcode below to disable the power-on beep.

Disable

***Enable**

1.5 Send "NR" to Host

This feature only works when Keyboard Wedge or RS-232 is selected for output interface. Have the scanner send the "NR" string to the host to notify the No Read event.

Enable

***Disable**

Update

1.6 Scan Modes

Different scan modes are supported – select the scan mode that best suits the requirements of a specific application. Refer to the comparison table below.

- In any scan mode other than Multi-Barcode Mode, a barcode acceptable to the scanner can only contain data of 7 KB at most.

Scan Mode	Start to Scan					Stop Scanning		
	Always	Press trigger once	Hold trigger	Press trigger twice	Release trigger	Release trigger	Barcode being read	Timeout
Test mode	✓							
Laser mode			✓			✓	✓	✓
Auto Off mode		✓					✓	✓
Auto Power Off mode		✓						✓
Aiming mode (Original)				✓			✓	✓
Aiming mode (Always Aiming)			✓			✓	✓	✓
Aiming mode (Auto Aiming)			✓			✓	✓	✓
Aiming mode (Auto Aiming with Illumination)			✓			✓	✓	✓
Multi-Barcode mode			✓			✓		
Presentation mode	✓							
Multicode mode			✓			✓	✓	✓
Release Mode					✓		✓	✓

Note: By default, the scan mode is set to Laser mode.

Enter Setup

1.6.1 Test Mode

The scanner is always scanning.

- Capable of decoding the same barcode repeatedly without removing it, for testing purpose.

Test Mode

1.6.2 Laser Mode

The scanner will start scanning once the trigger is held down.

- The scanning won't stop until (1) a barcode is decoded, (2) the pre-set timeout expires, or (3) release the trigger.

Note: Refer to 1.7 Scanning Timeout.

***Laser Mode**

1.6.3 Auto Off Mode

The scanner will start scanning once the trigger is pressed.

- The scanning won't stop until (1) a barcode is decoded, and (2) the pre-set timeout expires.

Note: Refer to 1.7 Scanning Timeout.

Auto Off Mode

Update

1.6.4 Auto Power Off Mode

The scanner will start scanning once the trigger is pressed.

- The scanning won't stop until the pre-set timeout expires, and, the pre-set timeout period re-counts after each successful decoding.

Note: Refer to 1.8 Delay between Re-read and 1.7 Scanning Timeout.

Auto Power Off Mode

1.6.5 Aiming Mode

Read the Aiming Mode barcode below to switch to aiming mode.

Aiming Mode

Aiming Timeout

Limit the aiming time interval (1~15). By default, the scanner time-out is set to 1 second.

Aiming Time-out after 1~15 sec. (*1)

1. Read the barcode above to specify the time interval before aiming ends. (It is set to 1 by default.)
2. Read the "Decimal Value" barcode on page 209. For example, read "1" and "0" for the scanner to automatically shut down after being idle for 10 seconds.
3. Read the "Validate" barcode on the same page to complete this setting.

Aiming Submodes

Users can further specify the aiming submode.

Original Mode:

By default, the scanner will aim at a barcode once the trigger is pressed, and start scanning when the trigger is pressed again within the aiming timeout.

- The scanning won't stop until (1) a barcode is decoded, and (2) the pre-set timeout expires.

***Original Mode**

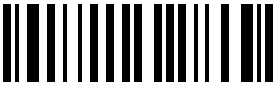
Enter Setup

Note: Refer to 1.7 Scanning Timeout.

Always Aiming:

The scanner is aiming at all times. You are supposed to press the trigger to decode the barcode.

Always Aiming


100232

Auto Aiming:

The scanner will be expecting barcodes. Whenever a barcode is brought within range, the scanner starts aiming at the barcode. Then you are supposed to press the trigger to decode the barcode.

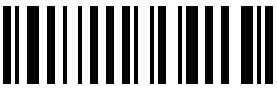
Auto Aiming

100233

Auto Aiming with Illumination:

The scanner will be expecting barcodes. Whenever a barcode is brought within range, the scanner starts aiming at the barcode with visible illumination. Then you are supposed to press the trigger to decode the barcode.

Auto Aiming with Illumination


100234

Update

1.6.6 Multi-Barcode Mode

The scanner will be scanning as long as the trigger is held down, capable of decoding one single barcode, as well as multiple unique barcodes one at a time. While decoding a bunch of unique barcodes, if a barcode is decoded twice, its subsequent decoding will be ignored and the scanner is expecting another unique barcode.

For multiple unique barcodes, the maximum output data length of all the barcodes is 10 KB after configuration. When the output length exceeds 10 KB, Multi-Barcode Mode will not take effect.

- The scanning won't stop until you release the trigger.

Multi-Barcode Mode

Note: (1) A barcode is considered unique when its Code Type or data is different from others.
(2) Multi-Barcode Mode has nothing to do with the Multi-Barcode Editor.

1.6.7 Presentation Mode

The scanner will be expecting barcodes. Whenever a barcode is brought within range, the scanner will be able to decode it. It is suggested to seat the scanner in the Auto-Sense Stand for hands-free operation.

Presentation Mode

Enter Setup

1.6.8 Multicode Mode

This mode is designed to decode multiple barcodes at one time. The scanning starts as long as the trigger is pressed down, capable of decoding multiple barcodes based on the arranged multicode settings (refer to *ScanMaster* user guide).

The multicode settings define the barcode(s) that the scanner can expect to find in an image. And the scanner reports a successful decode only if it decodes all barcodes indicated by the multicode settings, otherwise the decode fails. Barcodes are transmitted in the order defined in the multicode settings.

- The scanning won't stop until (1) a barcode is decoded, (2) the pre-set timeout expires, or (3) you release the trigger.

Note: Refer to 1.7 Scanning Timeout.

Scan the barcode below to enter **Multicode** mode.

Multicode Mode

Note: While in **Multicode** mode, users can press the trigger five times within 1.5 seconds to switch the scanner to Laser mode. Wait for three seconds to attempt to switch again if you fail. Scanning the Enter Setup barcode or rebooting can have the scanner back to Multicode mode.

Select the level of reading security. For example,

- If "No Redundancy" is selected, one successful decoding will make the reading valid and induce the "READER Event".
- If "Three Times" is selected, it will take a total of four consecutive successful decoding of the same barcode to make the reading valid. The higher the reading security is (that is, the more redundancy the user selects), the slower the reading speed gets.

It is obvious that the more redundancy selected, the higher the reading security is, and thus, the slower the reading speed becomes. You have to compromise between reading security and decoding speed.

***No Redundancy**

Update

One Time

Two Times

Three Times

Scan the barcode below to enable the **Same Barcode Allowance** function which increases decoding by one time automatically.

Enable Same Barcode Allowance

***Disable Same Barcode Allowance**

1.6.9 Release Mode

The scanner will aim at a barcode once the trigger is pressed, and then start scanning when the trigger is released.

Note: Refer to 1.7 Scanning Timeout.

Release Mode

Enter Setup

1.7 Scanning Timeout

Specify the scanning time interval (1~254 sec.; 0= Disable) when the scan mode is set to any of the following –

- Laser mode
- Auto Off mode
- Auto Power Off mode
- Aiming mode
- Multicode mode
- Release mode

Scanner Time-out after 0~254 sec. (*10)

1) Read the barcode above to specify the time interval before the scan engine times out.
2) Read the "Decimal Value" barcode on page 209. For example, read "1" and "5" for the scanner to automatically shut down after being idle for 15 seconds.
3) Read the "Validate" barcode on the same page to complete this setting.

1.8 Delay between Re-read

This is also referred to as the “Blocking Time”, which is used to prevent the scanner from accidentally reading the same barcode twice when the scan mode is set to any of the following –

- Auto Power Off mode
- Presentation mode
- Laser mode (with the Auto-sense function working)

100 ms

200 ms

***400 ms**

800 ms

1 sec

2 sec

3 sec

5 sec

Enter Setup

1.9 Read Redundancy (1D)

Select the level of reading security. For example,

- If "No Redundancy" is selected, one successful decoding will make the reading valid and induce the "READER Event".
- If "Two Times" is selected, it will take a total of three consecutive successful decoding of the same barcode to make the reading valid. The higher the reading security is (that is, the more redundancy the user selects), the slower the reading speed gets.

It is obvious that the more redundancy selected, the higher the reading security is, and thus, the slower the reading speed becomes. It will have to compromise between reading security and decoding speed.

***No Redundancy**

One Time

Two Times

Update

1.10 Addon Security for UPC/EAN Barcodes

The scanner is capable of decoding a mix of UPC/EAN barcodes with or without addons. The read redundancy (2~16 times; default is set to 10) allows changing the number of times to decode a UPC/EAN barcode before transmission. The more redundancy selected, the higher the reading security is, and thus, the slower the reading speed becomes. It will have to compromise between reading security and decoding speed.

Note: UPC/EAN Addon 2 and Addon 5 must be enabled individually for this setting to take effect.

Addon Security Level (2~16; default:10)

1) Read the barcode above to specify the read redundancy for UPC/EAN barcodes. (It is set to 2 by default.)
2) Read the "Decimal Value" barcode on page 209. For example, read "1" and "2" for the scanner to re-read the barcode for 12 times.
3) Read the "Validate" barcode on the same page to complete this setting.

Enter Setup

1.11 Auto-Sense Mode

Auto-sense is only available when the scanner is working in Laser Mode. The scanner will be expecting barcodes as long as it is seated in the Auto-sense stand. Whenever a barcode is brought within range, the scanner will be able to decode it.

To stop this mode, just remove the scanner from the stand.

***Enable Auto-sense**

100271

Disable Auto-sense

100270

1.12 Negative Barcodes

Normally, barcodes are printed with the color of the bars darker than that of the spaces. But for negative barcodes, they are printed in the opposite sense just like negative films. The spaces of negative barcodes are printed with a color darker than that of the bars. Configure the scanner to be able to read negative barcodes in the following symbologies:

- All 1D symbologies
- Data Matrix
- QR Code
- Aztec

Enable

100225

***Disable**

100224

Update

1.13 Cable Auto-Detection

Find the interface cable provided inside the package. Connect it to the scanner. The scanner will detect the interface automatically. Refer to Chapter 2 — Selecting Output Interface.

Cable Auto-Detect	Defaults
Keyboard Wedge	PCAT (US) for keyboard type
RS-232	115200 bps, 8 bits, No parity, 1 stop bit
USB	USB HID and PCAT (US) for keyboard type

Note: If “USB Virtual COM” is desired, have the scanner read the setup barcodes.

***Enable**

Disable

1.14 Picklist Mode

Picklist mode enables the decoder to decode only the barcodes aligned at the center under the laser aiming pattern.

Enable

***Disable**

Enter Setup

1.15 Mobile Phone/Display Mode

By default this mode is disabled. There is a big improvement in reading barcodes displayed on mobile phones and electronic displays when this mode is enabled.

***Disable**

102267

Enable

102268

1.16 Illumination Brightness

Users can adjust the illumination brightness of the LED light source. Specify a value ranging from 1 to 10 to set the brightness level which is set to 10 by default meaning 100% illuminated.

Illumination Brightness (1~*10)

102256

1) Read the barcode above to commence the adjustment.
2) Read the "Decimal Value" barcode on page 209 for the desired illumination brightness level.
3) Read the "Validate" barcode on the same page to complete the setting.

Update

1.17 DPM Mode (2504DP Only)

With a DPM mode specified, the scanner is capable of reading direct part mark of 2D barcodes. Note that once the DPM mode is selected, 1.14 Picklist Mode and 1.15 Mobile Phone/Display Mode functions will be disabled automatically.

Mode 1: When you are scanning a relatively smaller DPM barcode especially on flat surfaces, such as medical or electronic equipment, select Mode 1 that can best improve decoding. This kind of barcode is typically made by printing or laser etching.

Mode 2: In contrast to smaller DPM barcodes on flat surfaces, when you are scanning a relatively larger DPM barcode on coarse surfaces such as product components, select Mode 2 that can best improve decoding. This kind of barcode is mainly made by laser etching or dot peen marking.

Mode 2

102277

Mode 1

102276

***None**

102275

Enter Setup

Chapter 2

Selecting Output Interface

In order to establish a proper connection between computer and the scanner, we suggest following these instructions –

1) Connect the scanner and computer with the provided interface cable. The scanner is capable of detecting the interface.
   - If using the RS-232 cable, join the power supply cord.
   - If using the USB cable, the interface is set to USB HID by default.

   If “USB Virtual COM” is desired, have the scanner read the setup barcodes.

Cable Auto-Detect	Defaults
Keyboard Wedge	PCAT (US) for keyboard type
RS-232	115200 bps, 8 bits, No parity, 1 stop bit
USB	USB HID and PCAT (US) for keyboard type

Note: Please make sure the wired cable supports auto-detection. Check whether there is a sticker on the cable, stating “Cable Detection Supported”.

2) Have the scanner read the “Enter Setup” barcode to enter the configuration mode.
3) Have the scanner read the associated barcodes to activate the desired interface.

   See the following sections for output interfaces supported.
4) Have the scanner read the barcodes for related settings.
5) Have the scanner read the “Update” barcode to apply the settings and quit the configuration mode.

In This Chapter

2.1 Keyboard Wedge..... 40
2.2 RS-232 51
2.3 Direct USB HID 56
2.4 Direct USB VCOM 68
2.5 Direct USB VCOM_CDC 70
2.6 Direct USB OPOS 72

Update

2.1 Keyboard Wedge

The Y cable allows connecting the scanner to the keyboard input port of PC and joining the keyboard as well. The scanned data will be transmitted to the host keyboard port as if it is manually entered via the keyboard.

Keyboard Wedge Settings	Defaults
Keyboard Type	PCAT (US)
Alphabets Layout	Normal
Digits Layout	Normal
Capital Lock Type	Normal
Capital Lock State	Off
Alphabets Transmission	Case-sensitive
Digits Transmission	Alphanumeric keypad
Kanji Transmission	Disable
Alternate Composing	No
Laptop Support	Disable
Inter-Character Delay	0 (ms)
Inter-Function Delay	0 (ms)

Enter Setup

2.1.1 Activate Keyboard Wedge & Select Keyboard Type

When Keyboard Wedge interface is activated, you have to select a keyboard type to complete this setting.

Activate Keyboard Wedge & Select Keyboard Type…

1) Read this barcode above to activate Keyboard Wedge and select a keyboard type.
2) Read the "Decimal Value" barcode on page 209. Refer to the table below for the number of desired keyboard type.
3) Read the "Validate" barcode on the same page to complete this setting.

Keyboard Type

By default, the keyboard type is set to PCAT (US). The following keyboard types are supported –

No.	Keyboard Type	No.	Keyboard Type
1	PCAT (US)	26	IBM 3477 Type 4 (Japanese)
2	PCAT (French)	27	PS2-30
3	PCAT (German)	28	IBM 34XX/319X, Memorex Telex 122 Keys
4	PCAT (Italian)	29	User-defined table
5	PCAT (Swedish)	30	PCAT (Turkish)
6	PCAT (Norwegian)	31	PCAT (Hungarian)
7	PCAT (UK)	32	PCAT (Swiss German)
8	PCAT (Belgium)	33	PCAT (Danish)
9	PCAT (Spanish)	34	Reserved
10	PCAT (Portuguese)	35	PCAT (Greek)
11	PS55 A01-1	36	Reserved
12	PS55 A01-2 (Japanese)	37	PCAT (Russian)
13	PS55 A01-3	38	Reserved
14	PS55 001-1	39	Reserved
15	PS55 001-81	40	Reserved
16	PS55 001-2	41	Reserved
17	PS55 001-82	42	PCAT (Cyrillic on Russian)
18	PS55 001-3	43	PCAT (Armenian)
19	PS55 001-8A	44	PCAT (Thai)
20	PS55 002-1, 003-1	45	PCAT (Slovenian)
21	PS55 002-81, 003-81	46	PCAT (Mexican Spanish)

Update

22	PS55 002-2, 003-2	47	Reserved
23	PS55 002-82, 003-82	48	PCAT (Swiss French)
24	PS55 002-3, 003-3	49	PCAT (Czech)
25	PS55 002-8A, 003-8A		

2.1.2 Keyboard Settings

- Alphabets Layout
- Digits Layout
- Capital Lock Type
- Capital Lock Setting
- Alphabets Transmission
- Digits Transmission
- Kanji Transmission
- Alternate Composing
- Laptop Support

Alphabets Layout

By default, the alphabets layout is set to normal mode, also known as the standard English layout. Select French or German keyboard layout if necessary. The scanner will make adjustments when sending the "A", "Q", "W", "Z", "Y", and "M" characters according to this setting.

***Normal**

100060

AZERTY

100061

QWERTZ

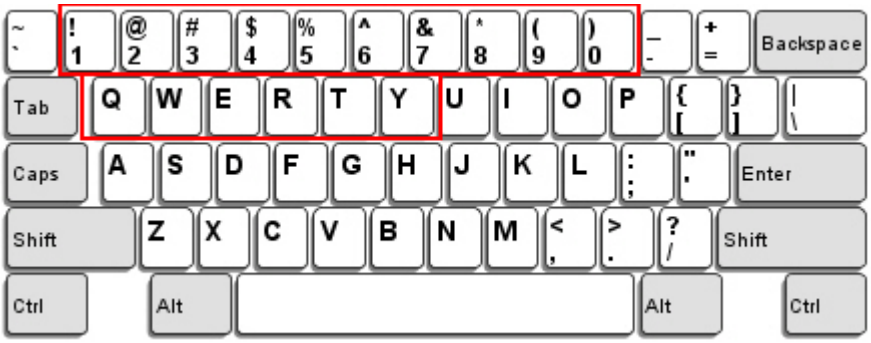
100062

Note: This setting only works when the keyboard type selected is US keyboard, such as PCAT (US). The Alphabets Layout and Digits Layout setting must match the keyboard.

Enter Setup

US Keyboard Style – Normal

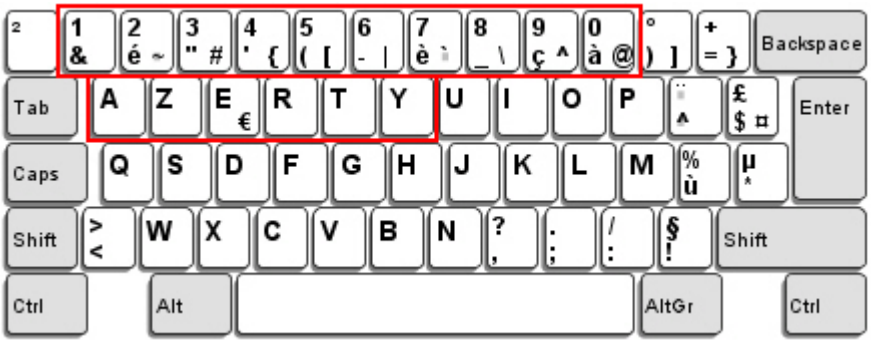
QWERTY layout, which is normally used in western countries.



- Select “Lower Row” for the “Digits Layout” setting because the upper row is for special characters.

French Keyboard Style – AZERTY

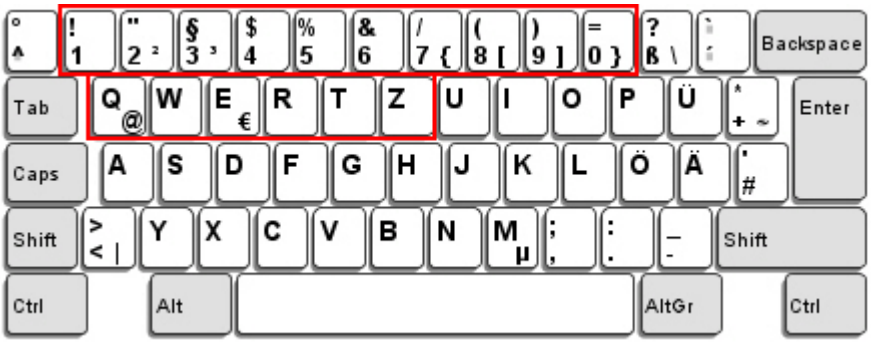
French layout; see below for French Keyboard Style.



- Select “Upper Row” for the “Digits Layout” setting because the lower row is for special characters.

German Keyboard Layout – QWERTZ

German layout; see below for German Keyboard Style.



- Select “Lower Row” for the “Digits Layout” setting because the upper row is for special characters.

Digits Layout

Select a proper layout that matches the alphabets layout. The scanner will make adjustments according to this setting.

Options	Description
Normal	Depends on the [Shift] key or [Shift Lock] setting
Lower Row	For QWERTY or QWERTZ keyboard
Upper Row	For AZERTY keyboard

***Normal**

Upper Row

Lower Row

Note: This layout setting is meant to be used with the Alphabets Layout; and perhaps with the Character Substitution setting when support to certain keyboard types (languages) is unavailable but required.

Enter Setup

Capital Lock Type & Setting

In order to send the alphabets with correct case, the scanner needs to know the status of Caps Lock on the keyboard. Incorrect settings may result in reversed case of the alphabets being transmitted.

Cap Lock Type	Description
Normal	Normal type
Capital Lock	When enabled, the keys of alphabetic characters will be interpreted as capital letters. However, this does not affect the number or punctuation keys.
Shift Lock	When enabled, the keys of alphabetic characters will be interpreted as capital letters. In addition, this affects the number or punctuation keys.

***Normal**

Shift Lock

Capital Lock

Capital Lock State	Description
Capital Lock OFF	Assuming that the status of Caps Lock on the keyboard is OFF, transmitted characters are exactly the same as in the barcode (when "case-sensitive" is selected for Alphabets Transmission).
Capital Lock ON	Assuming that the status of Caps Lock on the keyboard is ON, transmitted characters are exactly the same as in the barcode (when "case-sensitive" is selected for Alphabets Transmission). ▸ Refer to the Capital Lock Type above.
Auto Detection	The scanner will automatically detect the status of Caps Lock on the keyboard before data is transmitted; transmitted characters are exactly the same as in the barcode (when "case-sensitive" is selected for Alphabets Transmission).

Auto Detect

Capital Lock ON

Update

***Capital Lock OFF**

100052

Alphabets Transmission

By default, the alphabets transmission is case-sensitive, meaning that the alphabets will be transmitted according to their original case, the status of Caps Lock on the keyboard, as well as the Capital Lock setting. Select [Ignore Case] to have alphabets transmitted according to the status of Caps Lock on the keyboard only.

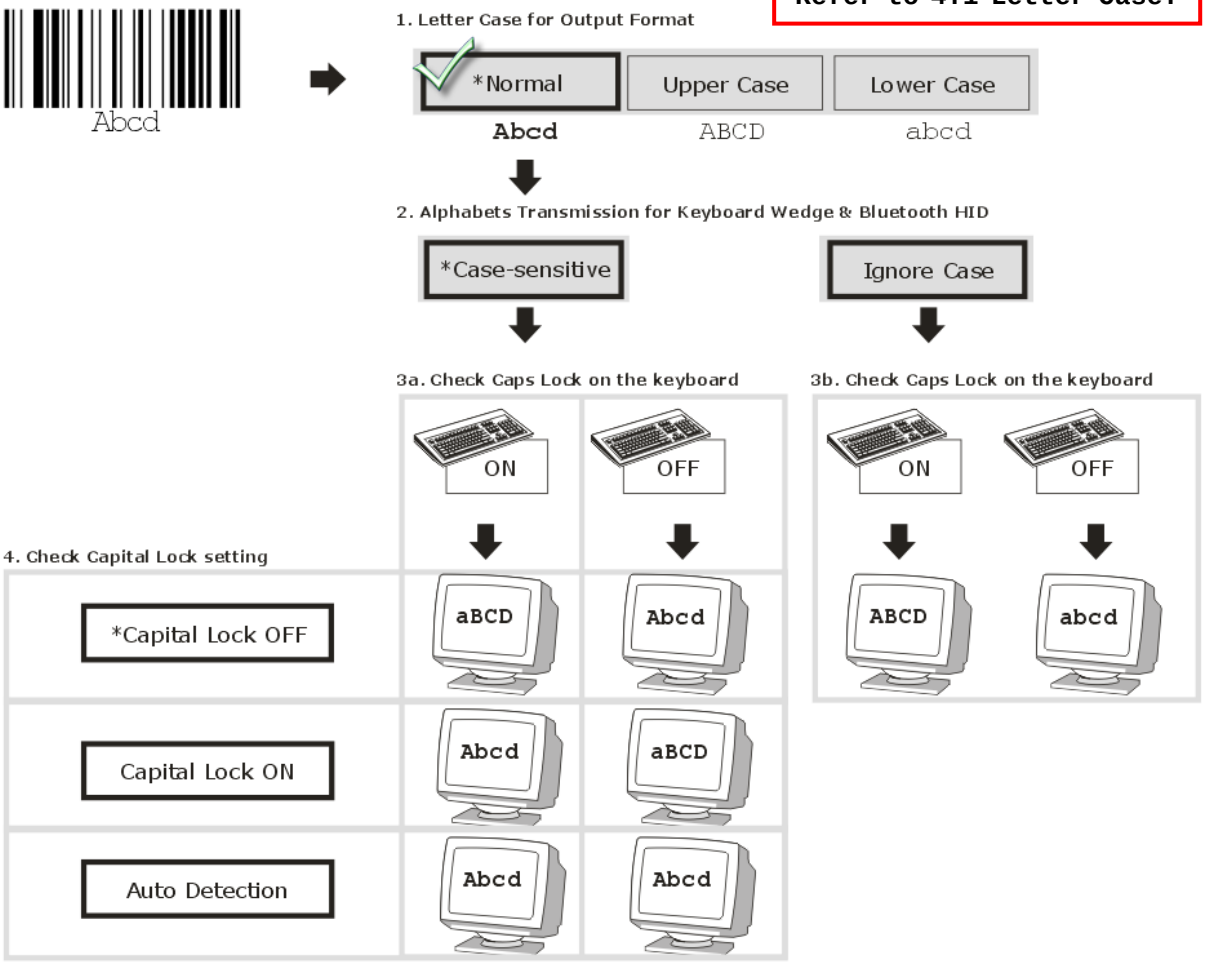
Ignore Case

100051

***Case-sensitive**

100050

Refer to 4.1 Letter Case.



Enter Setup

Digits Transmission

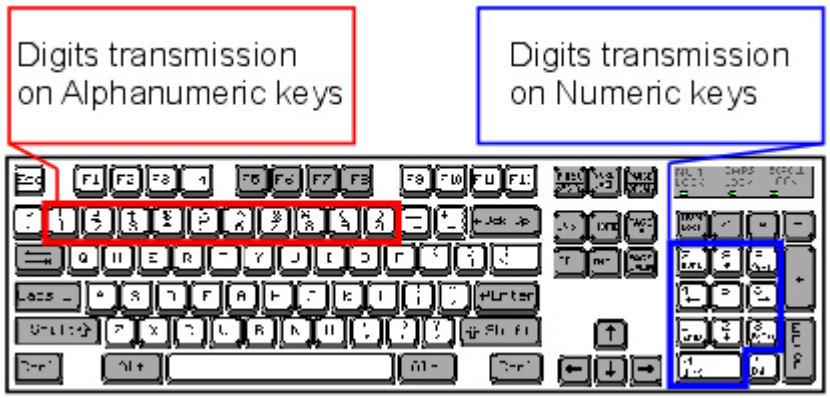
By default, the alphanumeric keypad is used for transmitting digits. Select “Numeric Keypad” if wishing to use the keys on the numeric keypad.

Numeric Key

100041

***Alphanumeric Key**

100040



Note: If selecting “Numeric Keypad”, the Num Lock status of the physical keyboard should be “ON”.

Kanji Transmission

Kanji Transmission is supported by the scanner when either Keyboard Wedge or Direct USB HID is selected for the output interface. By Kanji Transmission, when the host computer is running on Japanese Windows O.S., the scanner is able to transmit Japanese characters including the Chinese characters used in modern Japanese writing system.

Kanji Transmission is disabled by default. Enable/disable scanner’s Kanji Transmission by reading the following barcodes:

Enable

100067

***Disable**

100066

Update

ALT Composing

By default, Alternate key composing is disabled. Select [Yes] to allow emulating Alternate key code of a specific keyboard character. For example, [Alt] + [065] will be sent to host for the character "A" regardless the keyboard type you are using.

Yes

100057

***No**

100056

Laptop Support

By default, laptop support value is disabled. It suggests enabling this feature if connecting the wedge cable to a laptop without an external keyboard being inter-connected.

Enable

100059

***Disable**

100058

2.1.3 Inter-Character Delay

By default, the inter-character delay is set to zero. Specify a value, ranging from 0 to 254 in units of millisecond, to match the computer response time of the keyboard interface. Such delay time is inserted between every character being transmitted. The longer the delay time is, the slower the transmission speed will be.

Inter-Character Delay… (*0~254)

100011

1) Read the barcode above to specify the inter-character delay.
2) Read the "Decimal Value" barcode on page 209 for the desired inter-character delay (millisecond).
3) Read the "Validate" barcode on the same page to complete this setting.

Enter Setup

2.1.4 Inter-Function Delay

By default, the inter-function delay is set to zero. Specify a value, ranging from 0 to 254 in units of millisecond, to match the computer response time of the keyboard interface. Such delay time is inserted between every function code (0x01 ~ 0x1F) being transmitted. The longer the delay time is, the slower the transmission speed will be.

Inter-Function Delay… (*0~254)

1) Read the barcode above to specify the inter-function delay.
2) Read the "Decimal Value" barcode on page 209 for the desired inter-function delay (millisecond).
3) Read the "Validate" barcode on the same page to complete this setting.

2.1.5 Special Keyboard Feature

By default, the scanner bypasses the special keyboard (refer to Keyboard Wedge Table). You can decide whether to apply the special keyboard feature.

Besides bypassing the special keyboard, you can also have the scanner read the "Bypass with Control Character Output" setting barcode below to output control characters ranging from *0x01* to *0x1F*. For example, [Alt] + [018] (the *Cancel* control character) will be sent to host computer (Windows only) regardless the keyboard type you are using.

Apply

***Bypass**

Bypass with Control Character Output

Update

2.1.6 UTF-8 Conversion

This function, disabled by default, is only for certain keyboard types listed in the table below. Enable this function to get the UTF-8-encoded data.

No.	Keyboard Type	No.	Keyboard Type
35	PCAT (Greek)	45	PCAT (Slovenian)
37	PCAT (Russian)	46	PCAT (Mexican Spanish)
42	PCAT (Cyrillic on Russian)	48	PCAT (Swiss French)
43	PCAT (Armenian)	49	PCAT (Czech)

Enable

***Disable**

Enter Setup

2.2 RS-232

Use the RS-232 cable to connect the scanner to the serial port of PC and join the power adaptor to the RS-232 connector. The associated RS-232 parameters must match those configured on the computer. The scanned data will be transmitted to the serial port.

RS-232 Settings	Defaults
Baud Rate, Data Bit, Parity, Stop Bit	115200 bps, 8 bits, No parity, 1 stop bit
Flow Control	None
Inter-Character Delay	0 (ms)
Inter-Function Delay	0 (ms)
ACK/NAK Timeout	0
ACK/NAK Beep	Disable

2.2.1 Activate RS-232 Interface

Activate RS-232 Interface

2.2.2 Baud Rate

***115200 bps**

57600 bps

38400 bps

19200 bps

9600 bps

4800 bps

Update

2400 bps

100085

1200 bps

100086

600 bps

100087

2.2.3 Data Bits

***8 bits**

100093

7 bits

100092

2.2.4 Parity

***No parity**

100088

Even

100090

Odd

100091

2.2.5 Stop Bit

2 stop bits

100099

***1 stop bit**

100098

Enter Setup

2.2.6 Flow Control

By default, there is no flow control in use. Select the flow control (handshake) method.

Options	Description
No	No flow control
Scanner Ready	The scanner will activate the RTS signal upon powering on. After each good read, the scanner will then wait for the CTS signal to become active. Data will not be sent until the CTS signal becomes active.
Data Ready	The RTS signal will be activated after each good read. The scanner will then wait for the CTS signal to become active. Data will not be sent until the CTS signal becomes active.
Inverted Data Ready	It works the same as the Data Ready flow control except that the RTS signal level is inverted.

***None**

Scanner Ready

Data Ready

Invert Data Ready

Update

2.2.7 Inter-Character Delay

By default, the inter-character delay is zero. Specify a value, ranging from 0 to 254 in units of millisecond, to match the computer response time. Such delay time is inserted between every character being transmitted. The longer the delay time is, the slower the transmission speed will be.

Inter-Character Delay… (*0~254)

1) Read the barcode above to specify the inter-character delay.
2) Read the "Decimal Value" barcode on page 209 for the desired inter-character delay (millisecond).
3) Read the "Validate" barcode on the same page to complete this setting.

2.2.8 Inter-Function Delay

By default, the inter-function delay is set to zero. Specify a value, ranging from 0 to 254 in units of millisecond, to match the computer response time of the keyboard interface. Such delay time is inserted between every function code (0x01 ~ 0x1F) being transmitted. The longer the delay time is, the slower the transmission speed will be.

Inter-Function Delay… (*0~254)

1) Read this barcode above to specify the inter-function delay.
2) Read the "Decimal Value" barcode on page 209 for the desired inter-function delay (millisecond).
3) Read the "Validate" barcode on the same page to complete this setting.

Enter Setup

2.2.9 ACK/NAK Timeout

By default, the scanner sends data to the host without waiting for an ACK/NAK response before sending more data. Specify a value, ranging from 1 to 99 in units of 0.1 second. If no response within the specified period of time, the scanner will attempt to send the same data two more times. If all three attempts fail without any notification, data loss will occur.

ACK/NAK Time-out after … (*0~99)

1) Read the barcode above to specify the time interval for the scanner to send data and wait for a response from the host.
2) Read the "Decimal Value" barcode on page 209. For example, read "1" and "0" for the scanner to automatically shut down after being idle for 1 second.
3) Read the "Validate" barcode on the same page to complete this setting.

ACK/NAK Error Beep

Enable Error Beep

***Disable Error Beep**

Note: We suggest enabling the error beep to notice of such data loss and have the scanner re-read data.

Update

2.3 Direct USB HID

For USB HID, connect the scanner to the USB port of PC. Run any text editor on the computer, and the scanned data will be transmitted to the computer.

HID Settings	Defaults
Keyboard Type	PCAT (US)
Digits Layout	Normal
Capital Lock Type	Normal
Capital Lock State	Off
Alphabets Transmission	Case-sensitive
Digits Transmission	Alphanumeric keypad
Kanji Transmission	Disable
Inter-Character Delay	0 (ms)
Inter-Function Delay	0 (ms)
Alternate Composing	No

2.3.1 Activate USB HID & Select Keyboard Type

When USB HID interface is activated, it will have to select a keyboard type to complete this setting.

Activate Direct USB HID & Select Keyboard Type…

1) Read the barcode above to activate USB HID and select a keyboard type.
2) Read the "Decimal Value" barcode on page 209. Refer to the table below for the number of desired keyboard type.
3) Read the "Validate" barcode on the same page to complete this setting.

Enter Setup

USB HID

By default, the keyboard type is set to PCAT (US). The following keyboard types are supported —

No.	Keyboard Type	No.	Keyboard Type
64	PCAT (US)	80	Reserved
65	PCAT (French)	81	PCAT (Greek)
66	PCAT (German)	82	Reserved
67	PCAT (Italy)	83	PCAT (Russian)
68	PCAT (Swedish)	84	Reserved
69	PCAT (Norwegian)	85	Reserved
70	PCAT (UK)	86	Reserved
71	PCAT (Belgium)	87	Reserved
72	PCAT (Spanish)	88	PCAT (Cyrillic)
73	PCAT (Portuguese)	89	PCAT (Armenian)
74	PS55 A01-2 (Japanese)	90	PCAT (Thai)
75	User-defined table	91	PCAT (Slovenian)
76	PCAT (Turkish)	92	PCAT (Mexican Spanish)
77	PCAT (Hungarian)	94	PCAT (Swiss French)
78	PCAT (Switzerland German)	95	PCAT (Czech)
79	PCAT (Danish)		

The following keyboard types are supported for Apple —

No.	Keyboard Type (Apple)	No.	Keyboard Type (Apple)
64	Apple (US)	78	Apple (Swiss German)
65	Apple (French)	79	Apple (Danish)
66	Apple (German)	80	Apple (Dutch)
67	Apple (Italian)	81	Apple (Greek)
68	Apple (Swedish)	82	Apple (Hebrew)
69	Apple (Norwegian)	83	Apple (Russian)
72	Apple (Spanish)	84	Apple (Flemish)
73	Apple (Portuguese)	85	Apple (Arabic)
75	User-defined table	86	Apple (Austria German)
76	Apple (Turkish)	87	Apple (Brazilian Portuguese)

Note: 81/82/83/85 keyboard types don't support English input.

Update

By default, the scanner uses non-Apple keyboard layout. Read the following barcodes to toggle between Apple and non-Apple keyboard layouts.

Toggle to Apple Keyboard Layout

***Non-Apple Keyboard Layout**

Enter Setup

2.3.2 Keyboard Settings

- Alphabets Layout
- Digits Layout
- Capital Lock Type
- Capital Lock Setting
- Alphabets Transmission
- Digits Transmission
- Kanji Transmission
- Alternate Composing

Alphabets Layout

By default, the alphabets layout is set to normal mode, also known as the standard English layout. Select French or German keyboard layout if necessary. The scanner will make adjustments when sending the "A", "Q", "W", "Z", "Y", and "M" characters according to this setting.

***Normal**

AZERTY

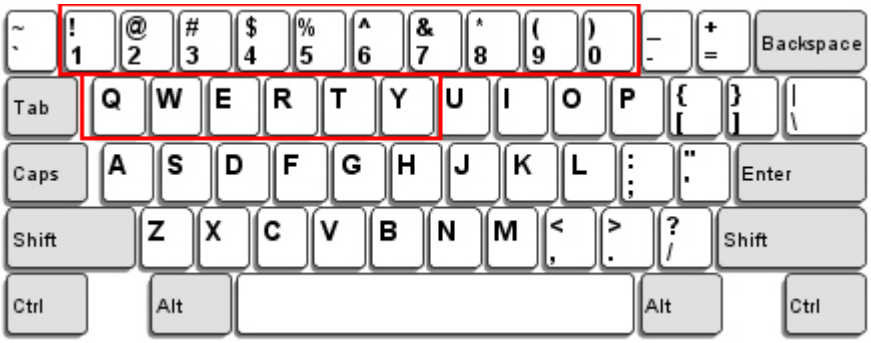
QWERTZ

Note: This setting only works when the keyboard type selected is US keyboard, such as PCAT (US). The Alphabets Layout and Digits Layout setting must match the keyboard.

Update

US Keyboard Style – Normal

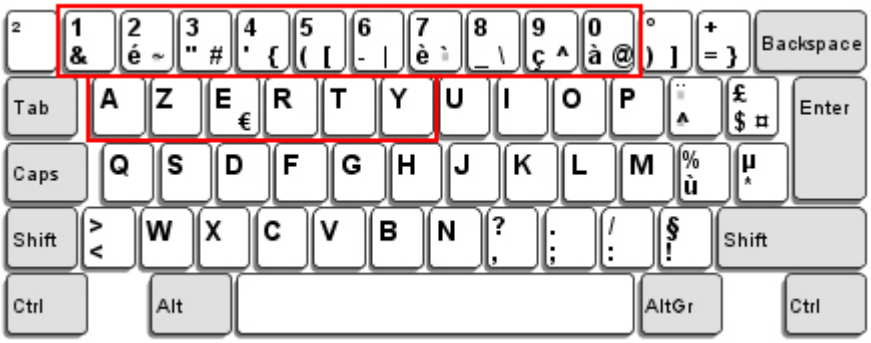
QWERTY layout, which is normally used in western countries.



- Select “Lower Row” for the “Digits Layout” setting for the upper row is for special characters.

French Keyboard Style – AZERTY

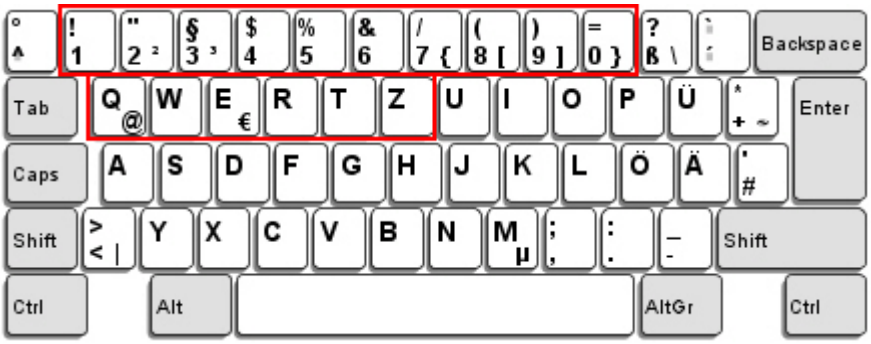
French layout; see below for French Keyboard Style.



- Select “Upper Row” for the “Digits Layout” setting for the lower row is for special characters.

German Keyboard Layout – QWERTZ

German layout; see below for German Keyboard Style.



- Select “Lower Row” for the “Digits Layout” setting for the upper row is for special characters.

Enter Setup

Digits Layout

Select a proper layout that matches the alphabets layout. The scanner will make adjustments according to this setting.

Options	Description
Normal	Depends on the [Shift] key or [Shift Lock] setting
Lower Row	For QWERTY or QWERTZ keyboard
Upper Row	For AZERTY keyboard

***Normal**

Upper Row

Lower Row

Note: This setting is to be used with the Character Substitution setting when support to certain keyboard types (languages) is unavailable but required.

Update

Capital Lock Type & Setting

In order to send the alphabets with correct case, the scanner needs to know the status of Caps Lock on the keyboard. Incorrect settings may result in reversed case of the alphabets being transmitted.

Cap Lock Type	Description
Normal	Normal type
Capital Lock	When enabled, the keys of alphabetic characters will be interpreted as capital letters. However, this does not affect the number or punctuation keys.
Shift Lock	When enabled, the keys of alphabetic characters will be interpreted as capital letters. In addition, this affects the number or punctuation keys.

***Normal**

100042

Shift Lock

100045

Capital Lock

100044

Capital Lock State	Description
Capital Lock OFF	Assuming that the status of Caps Lock on the keyboard is OFF, transmitted characters are exactly the same as in the barcode (when "case-sensitive" is selected for Alphabets Transmission).
Capital Lock ON	Assuming that the status of Caps Lock on the keyboard is ON, transmitted characters are exactly the same as in the barcode (when "case-sensitive" is selected for Alphabets Transmission). ▸ Refer to the Capital Lock Type above.
Auto Detection	The scanner will automatically detect the status of Caps Lock on the keyboard before data is transmitted; transmitted characters are exactly the same as in the barcode (when "case-sensitive" is selected for Alphabets Transmission).

Auto Detect

100054

Capital Lock ON

100053

Enter Setup

***Capital Lock OFF**

100052

Alphabets Transmission

By default, the alphabets transmission is case-sensitive, meaning that the alphabets will be transmitted according to their original case, the status of Caps Lock on the keyboard, as well as the Capital Lock setting. Select [Ignore Case] to have alphabets transmitted according to the status of Caps Lock on the keyboard only.

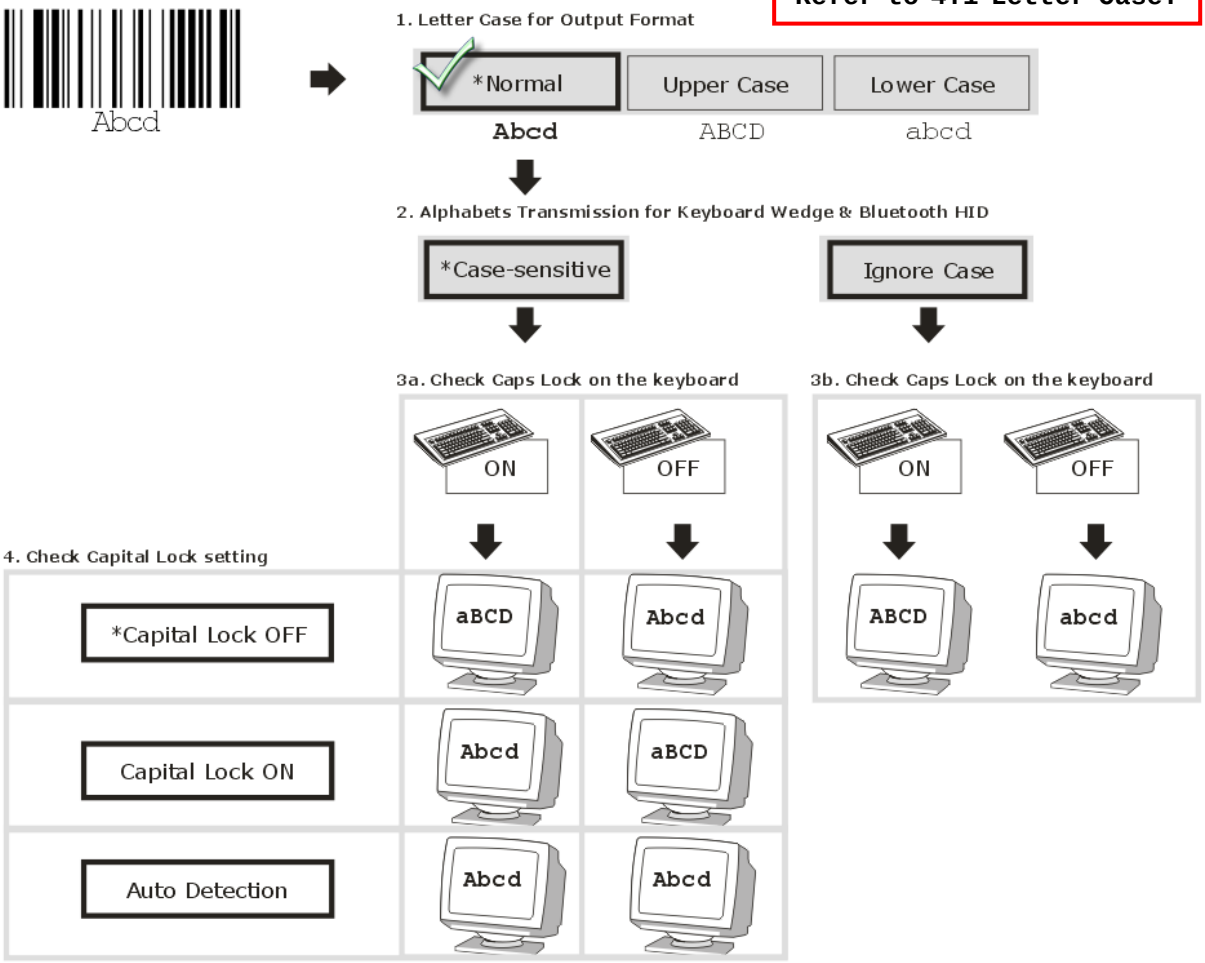
Ignore Case

100051

***Case-sensitive**

100050

Refer to 4.1 Letter Case.



Update

Digits Transmission

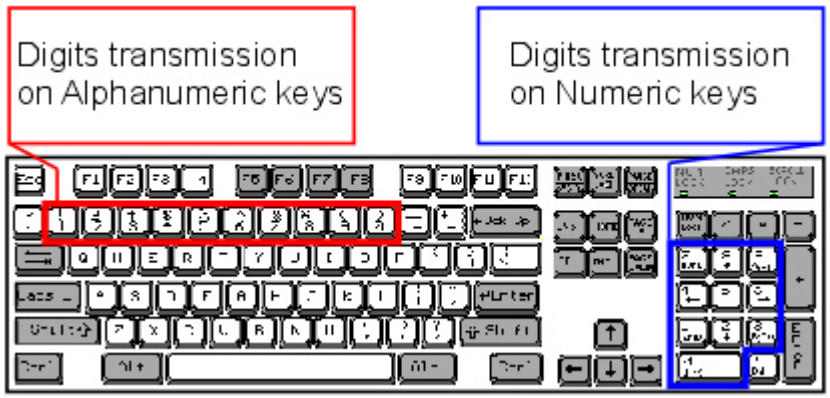
By default, the alphanumeric keypad is used for transmitting digits. Select “Numeric Keypad” to use the keys on the numeric keypad.

Numeric Key

100041

***Alphanumeric Key**

100040



Note: If selecting “Numeric Keypad”, the Num Lock status of the physical keyboard should be "ON".

Kanji Transmission

Kanji Transmission is supported by the scanner when either Keyboard Wedge or Direct USB HID is selected for the output interface. By Kanji Transmission, when the host computer is running on Japanese Windows O.S., the scanner is able to transmit Japanese characters including the Chinese characters used in modern Japanese writing system.

Kanji Transmission is disabled by default. Enable/disable scanner’s Kanji Transmission by reading the following barcodes:

Enable

100067

***Disable**

100066

ALT Composing

By default, Alternate key composing is disabled. Select [Yes] to allow emulating Alternate key code of a specific keyboard character. For example, [Alt] + [065] will be sent to host for the character “A” regardless the keyboard type you are using.

Enter Setup

Yes

100057

***No**

100056

2.3.3 Inter-Character Delay

By default, the inter-character delay is set to zero. Specify a value, ranging from 0 to 254 in units of millisecond, to match the computer response time of the keyboard interface. Such delay time is inserted between every character being transmitted. The longer the delay time is, the slower the transmission speed will be.

Inter-Character Delay… (*0~254)

100011

1) Read the barcode above to specify the inter-character delay.
2) Read the "Decimal Value" barcode on page 209 for the desired inter-character delay (millisecond).
3) Read the "Validate" barcode on the same page to complete this setting.

2.3.4 Inter-Function Delay

By default, the inter-function delay is set to zero. Specify a value, ranging from 0 to 254 in units of millisecond, to match the computer response time of the keyboard interface. Such delay time is inserted between every function code (0x01 ~ 0x1F) being transmitted. The longer the delay time is, the slower the transmission speed will be.

Inter-Function Delay… (*0~254)

100012

1) Read the barcode above to specify the inter-function delay.
2) Read the "Decimal Value" barcode on page 209 for the desired inter-function delay (millisecond).
3) Read the "Validate" barcode on the same page to complete this setting.

Update

2.3.5 HID Character Transmit Mode

By default, HID interface sends data to the host character by character. You may have the scanner read the “Batch Processing” barcode to process data in batch.

Batch Processing

***By Character**

Note: “By Character” transmit mode is required when working with iPhone or iPad. It’s recommended that the Auto-Correction function on your iOS keyboard should be turned off.

2.3.6 Special Keyboard Feature

Refer to 2.1.5 Special Keyboard Feature.

2.3.7 UTF-8 Conversion

This function, disabled by default, is only for certain keyboard types listed in the table below. Enable this function to get the UTF-8-encoded data.

No.	Keyboard Type	No.	Keyboard Type
81	PCAT (Greek)	91	PCAT (Slovenian)
83	PCAT (Russian)	92	PCAT (Mexican Spanish)
88	PCAT (Cyrillic on Russian)	94	PCAT (Swiss French)
89	PCAT (Armenian)	95	PCAT (Czech)

Enable

***Disable**

Enter Setup

2.3.8 USB Polling Interval

Scan the barcodes below to specify the USB polling interval ranging from 1 to 15ms.

Set USB polling interval
1~15 ms(*4)

1) Read the barcode above to specify the USB polling interval time.
2) Read the "Decimal Value" barcode on page 209.
3) Read the "Validate" barcode on the same page to complete this setting.

Update

2.4 Direct USB VCOM

For USB Virtual COM, connect the scanner to the USB port of PC. Run HyperTerminal.exe on the computer, and the scanned data will be transmitted to the computer.

Note: If using USB Virtual COM for the first time, you must install the accompanying driver beforehand. Driver version 5.4 or later is required. Please remove older versions! Instead, users can also decide to use the USB communication device class (CDC) driver by selecting Direct USB VCOM_CDC. Refer to 2.5 Direct USB VCOM_CDC.

2.4.1 Activate USB Virtual COM

Activate Direct USB Virtual COM

2.4.2 Inter-Function Delay

By default, the inter-function delay is set to zero. Specify a value, ranging from 0 to 254 in units of millisecond, to match the computer response time of the keyboard interface. Such delay time is inserted between every function code (0x01 ~ 0x1F) being transmitted. The longer the delay time is, the slower the transmission speed will be.

Inter-Function Delay… (*0~254)

1) Read the barcode above to specify the inter-function delay.
2) Read the "Decimal Value" barcode on page 209 for the desired inter-function delay (millisecond).
3) Read the "Validate" barcode on the same page to complete this setting.

Enter Setup

2.4.3 ACK/NAK Timeout

By default, the scanner sends data to the host without waiting for an ACK/NAK response before sending more data. Specify a value, ranging from 1 to 99 in units of 0.1 second. If no response within the specified period of time, the scanner will attempt to send the same data two more times. If all three attempts fail without any notification, data loss will occur.

ACK/NAK Time-out after … (*0~99)

1) Read the barcode above to specify the time interval for the scanner to send data and wait for a response from the host.
2) Read the "Decimal Value" barcode on page 209. For example, read "1" and "0" for the scanner to automatically shut down after being idle for 1 second.
3) Read the "Validate" barcode on the same page to complete this setting.

ACK/NAK Error Beep

Enable Error Beep

***Disable Error Beep**

Note: We suggest enabling the error beep to notice of such data loss and have the scanner re-read data.

Update

2.5 Direct USB VCOM_CDC

For USB Virtual COM, connect the scanner to the USB port of PC. Run HyperTerminal.exe on the computer, and the scanned data will be transmitted to the computer.

Note: If using USB Virtual COM for the first time, you must install the accompanying VCOM_CDC driver beforehand.

2.5.1 Activate USB VCOM_CDC

Activate Direct USB VCOM_CDC

2.5.2 Inter-Function Delay

By default, the inter-function delay is set to zero. Specify a value, ranging from 0 to 254 in units of millisecond, to match the computer response time of the keyboard interface. Such delay time is inserted between every function code (0x01 ~ 0x1F) being transmitted. The longer the delay time is, the slower the transmission speed will be.

Inter-Function Delay… (*0~254)

1) Read the barcode above to specify the inter-function delay.
2) Read the "Decimal Value" barcode on page 209 for the desired inter-function delay (millisecond).
3) Read the "Validate" barcode on the same page to complete this setting.

Enter Setup

2.5.3 ACK/NAK Timeout

By default, the scanner sends data to the host without waiting for an ACK/NAK response before sending more data. Specify a value, ranging from 1 to 99 in units of 0.1 second. If no response within the specified period of time, the scanner will attempt to send the same data two more times. If all three attempts fail without any notification, data loss will occur.

ACK/NAK Time-out after … (*0~99)

1) Read the barcode above to specify the time interval for the scanner to send data and wait for a response from the host.
2) Read the "Decimal Value" barcode on page 209. For example, read "1" and "0" for the scanner to automatically shut down after being idle for 1 second.
3) Read the "Validate" barcode on the same page to complete this setting.

ACK/NAK Error Beep

Enable Error Beep

***Disable Error Beep**

Note: We suggest enabling the error beep to notice of such data loss and have the scanner re-read data.

Update

2.6 Direct USB OPOS

Before using the USB OPOS interface, users have to install CipherLab's scanner OPOS kit on the Windows 32/64 bits and Windows Embedded operating systems. Besides, make sure your scanner which supports OPOS has been upgraded.

Change to OPOS

The OPOS Kit (Driver & OPOS User Guide included) can be downloaded from:

http://scanmaster.cipherlab.com/download/opos/CipherLabOPOSKit-latest.exe

Please refer to the CipherLab OPOS User Guide for further details.

Enter Setup

Chapter 3

Changing Symbology Settings

In this chapter, a brief on the symbology settings is provided for reference.

In This Chapter

3.1 Codabar 74
3.2 Code 25 – Industrial 25 76
3.3 Code 25 – Interleaved 25 78
3.4 Code 25 – Matrix 25 81
3.5 Code 25 – Chinese 25 83
3.6 Italian Pharmacode (Code 32) 84
3.7 Code 39 85
3.8 Trioptic Code 39 88
3.9 Code 93 89
3.10 Code 128 91
3.11 GS1-128 (EAN-128) 92
3.12 ISBT 128 93
3.13 GS1 DataBar (RSS Family) 96
3.14 MSI 102
3.15 EAN-8 104
3.16 EAN-13 105
3.17 UCC Coupon Extended Code 107
3.18 UPC-A 108
3.19 UPC-E 110
3.20 Code 11 113
3.21 Composite Code 115
3.22 US Postal Code 119
3.23 UK Postal Code 120
3.24 More Postal Code 121
3.25 2D Symbologies 123
3.26 Macro PDF 127

Update

3.1 Codabar

***Enable**

Disable

3.1.1 Start/Stop Transmission

Decide whether to include the start/stop characters in the data being transmitted.

Transmit Start/Stop Characters

***Do Not Transmit**

3.1.2 CLSI Conversion

When enabled, the CLSI editing strips the start/stop characters and inserts a space after the first, fifth, and tenth characters of a 14-character Codabar barcode.

Apply CLSI Editing

***Do Not Apply**

Note: The 14-character barcode length does not include start/stop characters.

Enter Setup

3.1.3 Code Length Qualification

To prevent the "short scan" error, define the "Length Qualification" settings to ensure that the correct barcode is read by qualifying the allowable code length.

- If "Max/Min Length" is selected, the maximum length and the minimum length must be specified. It only accepts those barcodes with lengths that fall between max/min lengths specified.
- If “Fixed Length” is selected, up to 2 fixed lengths can be specified.

Note: The specified length(s) must include the check digit(s) the barcode contains.

1) Read the barcode to enable either Max. /Min. Length qualification or Fixed Length(s) qualification.

***Enable Max./Min. Length (1~55)…**

102222

Enable Fixed Length(s)…

102221

2) Read the barcode for Max. Length or Fixed Length 1, and follow steps 3~4.

Repeat steps 2~4 for Min. Length or Fixed Length 2.

Max. Length (*55) or Fixed Length 1

102223

Min. Length (*4) or Fixed Length 2

102224

3) Read the “Decimal Value” barcode on page 209 for the desired length.

4) Read the “Validate” barcode on the same page to complete this setting.

Update

3.2 Code 25 – Industrial 25

***Enable**

Disable

Enter Setup

3.2.1 Code Length Qualification

To prevent the "short scan" error, define the "Length Qualification" settings to ensure that the correct barcode is read by qualifying the allowable code length.

- If "Max/Min Length" is selected, the maximum length and the minimum length must be specified. It only accepts those barcodes with lengths that fall between max/min lengths specified.
- If “Fixed Length” is selected, up to 2 fixed lengths can be specified.

Note: The specified length(s) must include the check digit(s) the barcode contains.

1) Read the barcode to enable either Max. /Min. Length qualification or Fixed Length(s) qualification.

***Enable Max./Min. Length (1~55)…**

Enable Fixed Length(s)…

2) Read the barcode for Max. Length or Fixed Length 1, and follow steps 3~4.

Repeat steps 2~4 for Min. Length or Fixed Length 2.

Max. Length (*55) or Fixed Length 1

Min. Length (*4) or Fixed Length 2

3) Read the “Decimal Value” barcode on page 209 for the desired length.

4) Read the “Validate” barcode on the same page to complete this setting.

Update

3.3 Code 25 – Interleaved 25

***Enable**

Disable

3.3.1 Verify Check Digit

Decide whether to verify the check digit. When desired, select one of the algorithms, USS or OPCC. If incorrect, the barcode will not be accepted.

***Do Not Verify**

USS Check Digit

OPCC Check Digit

3.3.2 Transmit Check Digit

Decide whether to include the check digit in the data being transmitted.

***Transmit Interleaved 25 Check Digit**

Do Not Transmit

Enter Setup

3.3.3 Convert to EAN-13

Decide whether to convert a 14-character barcode into EAN-13 if the following requirements are met:

- The barcode must have a leading 0 and a valid EAN-13 check digit.
- "Verify Check Digit" must be disabled.

Convert to EAN-13

***Do Not Convert**

Update

3.3.4 Code Length Qualification

To prevent the "short scan" error, define the "Length Qualification" settings to ensure that the correct barcode is read by qualifying the allowable code length.

- If "Max/Min Length" is selected, the maximum length and the minimum length must be specified. It only accepts those barcodes with lengths that fall between max/min lengths specified.
- If “Fixed Length” is selected, up to 2 fixed lengths can be specified.

Note: The specified length(s) must include the check digit(s) the barcode contains.

1) Read the barcode to enable either Max. /Min. Length qualification or Fixed Length(s) qualification.

***Enable Max./Min. Length (1~55)…**

Enable Fixed Length(s)…

2) Read the barcode for Max. Length or Fixed Length 1, and follow steps 3~4.

Repeat steps 2~4 for Min. Length or Fixed Length 2.

Max. Length (*55) or Fixed Length 1

Min. Length (*4) or Fixed Length 2

3) Read the “Decimal Value” barcode on page 209 for the desired length.

4) Read the “Validate” barcode on the same page to complete this setting.

Enter Setup

3.4 Code 25 – Matrix 25

Enable

100311

***Disable**

100310

3.4.1 Verify Check Digit

Decide whether to verify the check digit. If incorrect, the barcode will not be accepted.

Verify Matrix 25 Check Digit

100433

***Do Not Verify**

100432

3.4.2 Transmit Check Digit

Decide whether to include the check digit in the data being transmitted.

***Transmit Matrix 25 Check Digit**

100435

Do Not Transmit

100434

Update

3.4.3 Code Length Qualification

To prevent the "short scan" error, define the "Length Qualification" settings to ensure that the correct barcode is read by qualifying the allowable code length.

- If "Max/Min Length" is selected, the maximum length and the minimum length must be specified. It only accepts those barcodes with lengths that fall between max/min lengths specified.
- If “Fixed Length” is selected, up to 2 fixed lengths can be specified.

Note: The specified length(s) must include the check digit(s) the barcode contains.

1) Read the barcode to enable either Max. /Min. Length qualification or Fixed Length(s) qualification.

***Enable Max./Min. Length (1~55)…**

100609

Enable Fixed Length(s)…

100608

2) Read the barcode for Max. Length or Fixed Length 1, and follow steps 3~4.

Repeat steps 2~4 for Min. Length or Fixed Length 2.

Max. Length (*55) or Fixed Length 1

100610

Min. Length (*4) or Fixed Length 2

100611

3) Read the “Decimal Value” barcode on page 209 for the desired length.

4) Read the “Validate” barcode on the same page to complete this setting.

Enter Setup

3.5 Code 25 – Chinese 25

Enable

***Disable**

Update

3.6 Italian Pharmacode (Code 32)

Enable

100303

***Disable**

100302

Note: Code 39 must be enabled first.

Enter Setup

3.7 Code 39

***Enable**

Disable

3.7.1 Verify Check Digit

Decide whether to verify the check digit. If incorrect, the barcode will not be accepted.

Verify Code 39 Check Digit

***Do Not Verify**

3.7.2 Transmit Check Digit

Decide whether to include the check digit in the data being transmitted.

***Transmit Code 39 Check Digit**

Do Not Transmit

Update

3.7.3 Standard/Full ASCII Code 39

Decide whether to support Code 39 Full ASCII that includes all the alphanumeric and special characters.

Code 39 Full ASCII

***Standard Code 39**

Note: Trioptic Code 39 and Code 39 Full ASCII cannot be enabled at the same time.

3.7.4 Code Length Qualification

To prevent the "short scan" error, define the "Length Qualification" settings to ensure that the correct barcode is read by qualifying the allowable code length.

- If "Max/Min Length" is selected, the maximum length and the minimum length must be specified. It only accepts those barcodes with lengths that fall between max/min lengths specified.
- If “Fixed Length” is selected, up to 2 fixed lengths can be specified.

Note: The specified length(s) must include the check digit(s) the barcode contains.

I) Read the barcode to enable either Max. /Min. Length qualification or Fixed Length(s) qualification.

***Enable Max./Min. Length (1~55)…**

Enable Fixed Length(s)…

2) Read the barcode for Max. Length or Fixed Length 1, and follow steps 3~4.

Repeat steps 2~4 for Min. Length or Fixed Length 2.

Enter Setup

Max. Length (*55) or Fixed Length 1

Min. Length (*4) or Fixed Length 2

3) Read the "Decimal Value" barcode on page 209 for the desired length.

4) Read the "Validate" barcode on the same page to complete this setting.

Update

3.8 Trioptic Code 39

Decide whether to decode Trioptic Code 39.

- Trioptic Code 39 is a variant of Code 39 used in the marking of computer tap cartridges. It always contains six characters.

Enable

***Disable**

Note: Trioptic Code 39 and Code 39 Full ASCII cannot be enabled at the same time.

Enter Setup

3.9 Code 93

***Enable**

Disable

Update

3.9.1 Code Length Qualification

To prevent the "short scan" error, define the "Length Qualification" settings to ensure that the correct barcode is read by qualifying the allowable code length.

- If "Max/Min Length" is selected, the maximum length and the minimum length must be specified. It only accepts those barcodes with lengths that fall between max/min lengths specified.
- If “Fixed Length” is selected, up to 2 fixed lengths can be specified.

Note: The specified length(s) must include the check digit(s) the barcode contains.

1) Read the barcode to enable either Max. /Min. Length qualification or Fixed Length(s) qualification.

***Enable Max./Min. Length (1~55)…**

102226

Enable Fixed Length(s)…

102225

2) Read the barcode for Max. Length or Fixed Length 1, and follow steps 3~4.

Repeat steps 2~4 for Min. Length or Fixed Length 2.

Max. Length (*55) or Fixed Length 1

102227

Min. Length (*4) or Fixed Length 2

102228

3) Read the “Decimal Value” barcode on page 209 for the desired length.

4) Read the “Validate” barcode on the same page to complete this setting.

Enter Setup

3.10 Code 128

***Enable**

Disable

Update

3.11 GS1-128 (EAN-128)

***Enable**

Disable

Note: GS1-128 barcodes can be decoded only when this setting is enabled.

3.11.1 Transmit Code ID

Decide whether to include the Code ID ("]C1") in the data being transmitted.

Transmit GS1-128 Code ID

***Do Not Transmit**

3.11.2 Field Separator (GS Character)

Decide whether to apply a field separator (to convert the FNC1 control character to human readable character).

Enable Field Separator…

1) Read the barcode above to enable field separator.
2) Read the "Hexadecimal Value" barcode on page 210 for the desired character string.
3) Read the "Validate" barcode to complete this setting.

Note: GS1-128 barcodes start with the FNC1 control character to distinguish themselves from other uses of Code 128. FNC1 is also used to separate data fields in the GS1-128 barcodes.

Enter Setup

3.11.3 GS1 Formatting

Decide whether to enable GS1 formatting for GS1-128.

Enable

***Disable**

3.11.4 Application ID Mark

Decide whether to add an application ID mark (1 character) to the left (AIMark1) or right (AIMark2) of an application ID (AI) for the purpose of labeling it when formatting the GS1 data.

AIMark1

AIMark2

1) Read the barcode above to add a mark to the left (AIMark1)/right (AIMark2) of an application ID.
2) Read the "Hexadecimal System" barcode on page 210 for the desired character. Read '00' if you want to remove the AI mark.
3) Read the "Validate" barcode to complete this setting.

Update

3.12 ISBT 128

***Enable**

Disable

3.12.1 ISBT Concatenation

Decide whether to decode and concatenate pairs of ISBT barcodes.

- Disable ISBT Concatenation

  It will not concatenate pairs of ISBT barcodes it encounters.

- Enable ISBT Concatenation

  There must be two ISBT barcodes in order for the scanner to decode and perform concatenation. It does not decode single ISBT barcodes.

- Auto-discriminate ISBT Concatenation

  It decodes and concatenates pairs of ISBT barcodes immediately. If only a single ISBT barcode is present, the scanner must decode 10 times before transmitting its data to confirm that there is no additional ISBT barcode.

Disable

Enable

***Auto-discriminate**

Enter Setup

3.12.2 ISBT Concatenation Redundancy

Specify the concatenation redundancy (2~20 times) when ISBT concatenation is enabled.

ISBT Concatenation Redundancy 2~20 (*10)

1) Read the barcode above to specify the concatenation redundancy.
2) Read the "Decimal Value" barcode on page 209 for the desired redundancy.
3) Read the "Validate" barcode on the same page to complete this setting.

Update

3.13 GS1 DataBar (RSS Family)

It is categorized into three groups:

Group I – GS1 DataBar Omnidirectional (RSS-14)

This group consists of the following:

- GS1 DataBar Omnidirectional
- GS1 DataBar Truncated
- GS1 DataBar Stacked
- GS1 DataBar Stacked Omnidirectional

Group II – GS1 DataBar Expanded (RSS Expanded)

This group consists of the following:

- GS1 DataBar Expanded
- GS1 DataBar Expanded Stacked

Group III – GS1 DataBar Limited (RSS Limited)

This group consists of the following:

- GS1 DataBar Limited

3.13.1 Select Code ID

Select a desired Code ID to use:

- "]e0" (GS1 DataBar Code ID)
- "]C1" (GS1-128 Code ID)

Use "]C1"

***Use "]e0"**

Enter Setup

3.13.2 GS1 DataBar Omnidirectional (RSS-14)

***Enable RSS-14 & RSS Expanded (Groups I, II)**

100349

Disable

100348

The settings below apply to Group I symbologies only:

- GS1 DataBar Omnidirectional
- GS1 DataBar Truncated
- GS1 DataBar Stacked
- GS1 DataBar Stacked Omnidirectional

Transmit Code ID

Decide whether to include the Code ID in the data being transmitted.

Transmit RSS-14 Code ID

100523

***Do Not Transmit**

100522

Transmit Application ID

Decide whether to include the Application ID ("01") in the data being transmitted.

***Transmit RSS-14 Application ID**

100529

Do Not Transmit

100528

GS1 Formatting for GS1 DataBar Omnidirectional

Decide whether to enable GS1 formatting for GS1 DataBar Omnidirectional.

Update

Enable

***Disable**

3.13.3 GS1 DataBar Expanded (RSS Expanded)

***Enable RSS-14 & RSS Expanded (Groups I, II)**

Disable

The settings below apply to Group II symbologies only:

- GS1 DataBar Expanded
- GS1 DataBar Expanded Stacked

Transmit Code ID

Decide whether to include the Code ID in the data being transmitted.

Transmit RSS Expanded Code ID

***Do Not Transmit**

GS1 Formatting for GS1 DataBar Expanded

Decide whether to enable GS1 formatting for GS1 DataBar Expanded.

Enable

***Disable**

Enter Setup

3.13.4 GS1 DataBar Limited (RSS Limited)

***Enable RSS Limited (Group III)**

Disable

Transmit Code ID

Decide whether to include the Code ID in the data being transmitted.

Transmit RSS Limited Code ID

***Do Not Transmit**

Transmit Application ID

Decide whether to include the Application ID ("01") in the data being transmitted.

***Transmit RSS Limited Application ID**

Do Not Transmit

GS1 Formatting for GS1 DataBar Limited

Decide whether to enable GS1 formatting for GS1 DataBar Limited.

Enable

***Disable**

Update

3.13.5 Convert to UPC/EAN

This only applies to GS1 DataBar Omnidirectional and GS1 DataBar Limited barcodes not decoded as part of a Composite barcode.

- Convert to EAN-13: It will strip the leading “010” from barcodes.

  “01” is the Application ID and must be followed by a single zero (the first digit encoded).

- Convert to UPC-A: It will strip the leading “0100” from barcodes.

  “01” is the Application ID and must be followed by two or more zeros (but not six zeros).

Convert to UPC/EAN

***Do Not Convert**

3.13.6 Field Separator (GS Character)

Decide whether to apply a field separator (to convert the GS control character to human readable character).

Enable Field Separator…

1) Read the barcode above to enable field separator.
2) Read the “Hexadecimal System” barcode on page 210 for the desired character string.
3) Read the “Validate” barcode to complete this setting.

Enter Setup

3.13.7 Application ID Mark

Decide whether to add an application ID mark (1 character) to the left (AIMark1) or right (AIMark2) of an application ID (AI) for the purpose of labeling it when formatting the GS1 data.

AIMark1

AIMark2

1) Read the barcode above to add a mark to the left (AIMark1)/right (AIMark2) of an application ID.
2) Read the "Hexadecimal System" barcode on page 210 for the desired character. Read '00' if you want to remove the AI mark.
3) Read the "Validate" barcode to complete this setting.

Update

3.14 MSI

Enable

100345

***Disable**

100344

3.14.1 Verify Check Digit

Select one of the three calculations to verify check digit(s) when decoding barcodes. If incorrect, the barcode will not be accepted.

***Single Modulo 10**

100448

Double Modulo 10

100449

Modulo 10 & 11

100450

3.14.2 Transmit Check Digit

Decide whether to include the check digit(s) in the data being transmitted.

***Last Digit Not Transmitted**

100452

Both Digits Transmitted

100453

Both Digits Not Transmitted

100454

Enter Setup

3.14.3 Code Length Qualification

To prevent the "short scan" error, define the "Length Qualification" settings to ensure that the correct barcode is read by qualifying the allowable code length.

- If "Max/Min Length" is selected, the maximum length and the minimum length must be specified. It only accepts those barcodes with lengths that fall between max/min lengths specified.
- If “Fixed Length” is selected, up to 2 fixed lengths can be specified.

Note: The specified length(s) must include the check digit(s) the barcode contains.

1) Read the barcode to enable either Max. /Min. Length qualification or Fixed Length(s) qualification.

***Enable Max./Min. Length (1~55)…**

Enable Fixed Length(s)…

2) Read the barcode for Max. Length or Fixed Length 1, and follow steps 3~4.

Repeat steps 2~4 for Min. Length or Fixed Length 2.

Max. Length (*55) or Fixed Length 1

Min. Length (*4) or Fixed Length 2

3) Read the “Decimal Value” barcode on page 209 for the desired length.

4) Read the “Validate” barcode on the same page to complete this setting.

Update

3.15 EAN-8

EAN-8

***Enable EAN-8 (No Addon)**

Disable

EAN-8 Addon 2

Enable EAN-8 Addon 2

***Disable**

EAN-8 Addon 5

Enable EAN-8 Addon 5

***Disable**

3.15.1 Transmit Check Digit

Decide whether to include the check digit in the data being transmitted.

***Transmit EAN-8 Check Digit**

Do Not Transmit

Enter Setup

3.16 EAN-13

EAN-13

***Enable EAN-13 (No Addon)**

Disable

EAN-13 Addon 2

Enable EAN-13 Addon 2

***Disable**

EAN-13 Addon 5

Enable EAN-13 Addon 5

***Disable**

Update

3.16.1 Convert to ISBN

Decide whether to convert the EAN-13 barcode, starting with 978 and 979, to ISBN.

Convert EAN-13 to ISBN

***Do Not Convert**

3.16.2 Convert to ISSN

Decide whether to convert the EAN-13 barcode, starting with 977 to ISSN.

Convert EAN-13 to ISSN

***Do Not Convert**

3.16.3 Transmit Check Digit

Decide whether to include the check digit in the data being transmitted.

***Transmit EAN-13 Check Digit**

Do Not Transmit

Enter Setup

3.17 UCC Coupon Extended Code

Decide whether to decode the following barcodes as Coupon Code.

- UPC-A barcodes starting with digit “5”
- EAN-13 barcodes starting with digits “99”
- UPC-A/EAN-128 Coupon Codes

Enable

***Disable**

Note: Depending on requirements, UPC-A, EAN-13 and EAN-128 must be enabled first!

Update

3.18 UPC-A

UPC-A

***Enable UPC-A (No Addon)**

Disable

UPC-A Addon 2

Enable UPC-A Addon 2

***Disable**

UPC-A Addon 5

Enable UPC-A Addon 5

***Disable**

Enter Setup

3.18.1 Convert to EAN-13

Decide whether to expand the read UPC-A barcode, as well as its addons, into EAN-13.

- After conversion, the data follows EAN-13 format and is affected by EAN-13 programming selections (e.g. Check Digit).

Convert UPC-A to EAN-13

***Do Not Convert**

3.18.2 Transmit System Number

Decide whether to include the system number in the data being transmitted.

***Transmit UPC-A System Number**

Do Not Transmit

3.18.3 Transmit Check Digit

Decide whether to include the check digit in the data being transmitted.

***Transmit UPC-A Check Digit**

Do Not Transmit

Update

3.19 UPC-E

UPC-E

***Enable UPC-E (No Addon)**

100321

Disable

100320

UPC-E Addon 2

Enable UPC-E Addon 2

100323

***Disable**

100322

UPC-E Addon 5

Enable UPC-E Addon 5

100325

***Disable**

100324

Enter Setup

3.19.1 Select System Number

Decide whether to decode the ordinary UPC-E barcodes only or both UPC-E0 and UPC-E1 barcodes.

- System number `0` enabled for decoding UPC-E0 barcodes.
- System number `1` enabled for decoding UPC-E1 barcodes.

System Number 0 & 1

***System Number 0 Only**

Warning: Because of the way system number 1 is encoded, if both system numbers are enabled, the user might suffer from short scanning UPC-A or EAN-13 barcodes into UPC-E1 barcodes.

3.19.2 Convert to UPC-A

Decide whether to expand the read UPC-E barcode, as well as its addons, into UPC-A.

- After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (e.g. System Number, Check Digit).

Convert UPC-E to UPC-A

***Do Not Convert**

Update

3.19.3 Transmit System Number

Decide whether to include the system number in the data being transmitted.

Transmit UPC-E System Number

100475

***Do Not Transmit**

100474

3.19.4 Transmit Check Digit

Decide whether to include the check digit in the data being transmitted.

***Transmit UPC-E Check Digit**

100467

Do Not Transmit

100466

Enter Setup

3.20 Code 11

Enable

***Disable**

3.20.1 Verify Check Digit

Decide whether to verify the check digit(s). If incorrect, the barcode will not be accepted.

Verify One Check Digit

Verify Two Check Digit

***Do Not Verify**

3.20.2 Transmit Check Digit

Decide whether to include the check digit(s) in the data being transmitted.

Transmit Code 11 Check Digit

***Do Not Transmit**

Note: "Verify Check Digit" must be enabled first.

Update

3.20.3 Code Length Qualification

To prevent the "short scan" error, define the "Length Qualification" settings to ensure that the correct barcode is read by qualifying the allowable code length.

- If "Max/Min Length" is selected, the maximum length and the minimum length must be specified. It only accepts those barcodes with lengths that fall between max/min lengths specified.
- If “Fixed Length” is selected, up to 2 fixed lengths can be specified.

Note: The specified length(s) must include the check digit(s) the barcode contains.

1) Read the barcode to enable either Max. /Min. Length qualification or Fixed Length(s) qualification.

***Enable Max./Min. Length (1~55)…**

Enable Fixed Length(s)…

2) Read the barcode for Max. Length or Fixed Length 1, and follow steps 3~4.

Repeat steps 2~4 for Min. Length or Fixed Length 2.

Max. Length (*55) or Fixed Length 1

Min. Length (*4) or Fixed Length 2

3) Read the “Decimal Value” barcode on page 209 for the desired length.

4) Read the “Validate” barcode on the same page to complete this setting.

Enter Setup

3.21 Composite Code

3.21.1 Composite CC-A/B

Decide whether to enable Composite CC-A/B.

Enable Composite CC-A/B

***Disable**

Decide whether to enable GS1 formatting for Composite CC-A/B. When enabled, the field separator and application ID mark will be automatically added to the output data.

Enable

***Disable**

3.21.2 Composite CC-C

Decide whether to enable Composite CC-C.

Enable Composite CC-C

***Disable**

Decide whether to enable GS1 formatting for Composite CC-C.

Enable

***Disable**

Update

3.21.3 Composite TLC-39

Enable Composite TLC-39

***Disable**

3.21.4 UPC Composite Mode

UPC barcodes can be “linked” with a 2D barcode during transmission as if they were one barcode.

- UPC Never Linked

  Transmit UPC barcodes regardless of whether a 2D barcode is detected.

- UPC Always Linked

  Transmit UPC barcodes and the 2D portion. If the 2D portion is not detected, the UPC barcode will not be transmitted.

Note: CC-A/B or CC-C must be enabled!

- Auto-discriminate UPC Composites

  Transmit UPC barcodes as well as the 2D portion if present.

UPC Never Linked

***UPC Always Linked**

Auto-discriminate

Enter Setup

3.21.5 GS1-128 Emulation Mode for UCC/EAN Composite Codes

Decide whether to transmit UCC/EAN Composite Code data as if it was encoded in GS1-128 barcodes.

Enable GS1-128 Emulation Mode

***Disable**

3.21.6 Field Separator (GS Character)

Decide whether to apply a field separator (to convert the GS control character to human readable character). The field separator is automatically added to the data when GS1 formatting is enabled.

Specify Field Separator…

1) Read the barcode above to specify field separator.
2) Read the "Hexadecimal Value" barcode on page 210 for the desired character string.
3) Read the "Validate" barcode to complete this setting.

Update

3.21.7 Application ID Mark

Decide whether to add an application ID mark (1 character) to the left (AIMark1) or right (AIMark2) of an application ID (AI) for the purpose of labeling it when formatting the GS1 data.

AIMark1

100620

AIMark2

100621

1) Read the barcode above to add a mark to the left (AIMark1)/right (AIMark2) of an application ID.
2) Read the "Hexadecimal System" barcode on page 210 for the desired character. Read '00' if you want to remove the AI mark.
3) Read the "Validate" barcode to complete this setting.

Enter Setup

3.22 US Postal Code

3.22.1 US Postnet

***Enable US Postnet**

Disable

3.22.2 US Planet

***Enable US Planet**

Disable

3.22.3 Transmit Check Digit

Decide whether to include the check digit in the data being transmitted.

***Transmit US Postal Check Digit**

Do Not Transmit

Update

3.23 UK Postal Code

3.23.1 UK Postal

***Enable UK Postal**

Disable

3.23.2 Transmit Check Digit

Decide whether to include the check digit in the data being transmitted.

***Transmit UK Postal Check Digit**

Do Not Transmit

Enter Setup

3.24 More Postal Code

3.24.1 Japan Postal

***Enable Japan Postal**

102023

Disable

102022

3.24.2 Australian Postal

***Enable Australian Postal**

102025

Disable

102024

3.24.3 Dutch Postal

***Enable Dutch Postal**

102027

Disable

102026

3.24.4 USPS 4CB/One Code/Intelligent Mail

Enable USPS 4CB/ One Code/ Intelligent Mail

102029

***Disable**

102028

Update

3.24.5 UPU FICS Postal

Enable UPU FICS Postal

***Disable**

Enter Setup

3.25 2D Symbologies

3.25.1 PDF417

***Enable PDF417**

Disable

3.25.2 MICROPDF417

Enable MicroPDF417

***Disable**

3.25.3 Data Matrix

Decide whether to enable Data Matrix barcodes.

***Enable Data Matrix**

Disable

GS1 Formatting

Decide whether to enable GS1 formatting for GS1-Data Matrix barcodes. When enabled, the field separator and application ID mark will be automatically added to the output data.

Enable

Update

***Disable**

101497

Field Separator

Decide whether to apply a field separator (to convert the GS control character to human readable character). The field separator is automatically added to the data when GS1 formatting is enabled.

Specify Field Separator…

100616

1) Read the barcode above to specify field separator.
2) Read the "Hexadecimal Value" barcode on page 210 for the desired character string.
3) Read the "Validate" barcode to complete this setting.

Application ID Mark

Decide whether to add an application ID mark (1 character) to the left (AIMark1) or right (AIMark2) of an application ID (AI) for the purpose of labeling it when formatting the GS1 data.

AIMark1

100620

AIMark2

100621

1) Read the barcode above to add a mark to the left (AIMark1)/right (AIMark2) of an application ID.
2) Read the "Hexadecimal System" barcode on page 210 for the desired character.
3) Read '00' if you want to remove the AI mark.Read the "Validate" barcode to complete this setting.

Enter Setup

ECI Information

Users can determine whether to show the embedded ECI information when scanning a barcode.

Enable

***Disable**

3.25.4 Maxicode

***Enable Maxicode**

Disable

3.25.5 QR Code

***Enable QR Code**

Disable

GS1 Formatting

Decide whether to enable GS1 formatting for GS1-QR Code barcodes. When enabled, the field separator and application ID mark will be automatically added to the output data.

Enable

***Disable**

Field Separator (GS Character)

Update

Decide whether to apply a field separator (to convert the GS control character to human readable character). The field separator is automatically added to the data when GS1 formatting is enabled.

Specify Field Separator…

1) Read the barcode above to specify field separator.
2) Read the "Hexadecimal Value" barcode on page 210 for the desired character string.
3) Read the "Validate" barcode to complete this setting.

Application ID Mark

Decide whether to add an application ID mark (1 character) to the left (AIMark1) or right (AIMark2) of an application ID (AI) for the purpose of labeling it when formatting the GS1 data.

AIMark1

AIMark2

1) Read the barcode above to add a mark to the left (AIMark1)/right (AIMark2) of an application ID.
2) Read the "Hexadecimal System" barcode on page 210 for the desired character.Read '00' if you want to remove the AI mark.
3) Read the "Validate" barcode to complete this setting.

3.25.6 MICROQR

***Enable MicroQR**

Disable

3.25.7 Aztec

Enter Setup

***Enable Aztec**

Disable

3.26 Macro PDF

Macro PDF is a special feature for concatenating multiple PDF barcodes into one file, known as Macro PDF417 or Macro MicroPDF417.

Note: When printing barcodes, keep each Macro PDF sequence separate, as each has a unique identifier. Do not mix barcodes from several Macro PDF sequences, even if they encode the same data. When scan Macro PDF sequences, scan the entire Macro PDF sequence without interruption!

3.26.1 Transmit/Decode Mode

Decide how to handle Macro PDF decoding.

- Buffer All Symbols / Transmit Macro PDF When Complete

  Transmit all decoded data from an entire Macro PDF sequence only when the entire sequence is scanned and decoded. If the decoded data exceeds the limit of 50 symbols, no transmission because the entire sequence was not scanned!

- Transmit Any Symbol in Set / No Particular Order

  Transmit data from each Macro PDF symbol as decoded, regardless of the sequence.

- Passthrough All Symbols

  Transmit and decode all Macro PDF symbols and perform no processing. In this mode, the host is responsible for detecting and parsing the Macro PDF sequences.

Buffer All Symbols / Transmit When Complete

Transmit Any Symbol in Set / No Particular Order

***Passthrough All Symbols**

Update

3.26.2 Escape Characters

When enabled, it uses the backslash "\" as an Escape character for systems that can process transmissions containing special data sequences. It will format special data according to the Global Label Identifier (GLI) protocol, which only affects the data portion of a Macro PDF symbol transmission. The Control Header, if enabled, is always sent with GLI formatting.

GLI Protocol

***None**

3.26.3 Transmit Control Header

The control header contains the segment index and file ID. For example, the field may be “\92800000\725\120\343”. The five digits after the \928 are the segment index (or block index), and \725\120\343 is the file ID.

- Enable this when selecting “Transmit Any Symbol in Set/ No Particular Order”.
- Disable this when selecting “Buffer All Symbols/Transmit Macro PDF When Complete”.
- This option has no effect when selecting "Passthrough All Symbols".

Transmit Control Header

***Do Not Transmit**

Enter Setup

Chapter 4

Defining Output Format

Users can configure the data output format in which the collected data will be output to the host computer. Barcodes read by the scanner will be processed in the following sequence –

1) Perform character substitution on the data scanned.
2) Add Code ID and Length Code to the front of the data:`[Code ID][Length Code][Data]`
3) Process the whole data in step 2 with user formats. Data is now divided into fields by user specified rules. Refer to Chapter 5 Applying Formats for Data Editing.
4) Add Prefix Code and Suffix Code before transmission:`[Prefix Code][Processed Data][Suffix Code]`

In This Chapter

4.1 Letter Case 129
4.2 Character Substitution 130
4.3 Prefix/Suffix Code 144
4.4 Code ID 145
4.5 Length Code 152
4.6 Multi-Barcode Editor 160
4.7 Removal of Special Character 164
4.8 AIM Code ID 164

4.1 Letter Case

By default, the alphabets transmission is case-sensitive, meaning that the alphabets will be transmitted according to their original case. Ignoring the original letter case, select [Upper Case] to output data in upper case only; otherwise, select [Lower Case] to output data in lower case only.

***Normal**

Upper Case

Lower Case

Update

4.2 Character Substitution

Character substitution is performed on every occurrence of the first character specified. If only one character is specified, each time the character occurs in the barcode will be taken away.

- The first character will be replaced by the second character(s).
- Up to three sets of character substitution can be configured.
- If “Keyboard Wedge” or “USB HID” is configured for interface, Key Type and Key Status will then become applicable. You may decide whether to apply Key Status when “Normal Key” is selected for Key Type.

Key Type		Key Status
Scan Code	Only 1 scan code value is allowed. Refer to 4.2.1 Single Character Substitution.	N/A
Normal Key	Up to 3 character strings are allowed.	▸ Add Shift ▸ Add Left Ctrl ▸ Add Left Alt ▸ Add Right Ctrl ▸ Add Right Alt Refer to Keyboard Wedge Table.

Note: The character substitution is performed only on the barcode itself and before the processing of editing formats. It is not applicable to the Prefix/Suffix Code, Code ID, Length Code, or any Additional Field.

Enter Setup

4.2.1 Single Character Substitution

Please follow steps below to replace a single character with one or more characters.

Configure Set 1

Configure Set 2

Configure Set 3

1) Read the barcode above to enable character substitution by set.

   For example, have the scanner read the "Set 1" barcode to configure the first set of character substitution. The scanner will respond with one short beep, high tone, to indicate more setup barcodes are required.

2) Read the "Hexadecimal Value" barcode on page 210 for the desired character substitution. The first character specified is the target one to be replaced; then the character(s) specified after the first one will be the replacement character(s). For example,

KEY TYPE = NORMAL

- Read "3", "0", "2", and "D" to replace the character "0" with a dash "-".
- Read "3", "0", "2", "D", "3", and "0" to replace the character "0" with a dash "-0".

KEY TYPE = SCAN CODE

Replace the character "0" with "a" (= "1C" on the scan code table):

1. Read "3" and "0".
2. Read the "Scan Code" barcode.
3. Read "1" and "C".

KEY TYPE = NORMAL + KEY STATUS = SHIFT

Replace the character "0" with "!" (= "Shift" + "1" on keyboard):

1. Read "3" and "0".
2. Read the "Add Shift" barcode.
3. Read "3" and "1".

3) Read the "Validate" barcode to complete this setting. (The defined set or sets will be applied to all symbologies by default.)

Update

4.2.2 Multiple Characters Substitution

Users can replace a string up to 16 characters with another one.

Configure Set 1

Set 1 Target String

Set 1 Replacment String

Configure Set 2

Set 2 Target String

Set 2 Replacment String

Configure Set 3

Set 3 Target String

Set 3 Replacment String

Please follow steps below:

1) Respectively read the “Target String” and “Replacement String” barcodes above to enable string substitution by set.

   For example, have the scanner read the “Target String” barcode of “Set 1” to specify the target characters to be replaced. Then the scanner will respond with one short beep indicating users to proceed with barcode reading for target characters.

   Read the “Hexadecimal Value” barcode on page 210 for the desired characters.

2) After specifying the target characters, have the scanner read the “Replacement String” barcode of “Set 1” to specify the replacement characters. Read the “Hexadecimal Value” barcode on page 210 for the desired characters. For example,

Enter Setup

KEY TYPE = NORMAL

Replace the character “0-0” with “***”:

1. Read the Target String barcode.
2. Read “3”, “0”, “2”, “D”, “3”, and “0” barcodes to specify the target string “0-0” (zero, dash, zero).
3. Read the Replacement String barcode.
4. Read “2”, “A”, “2”, “A”, “2”, and “A” barcodes to specify the replacement string “***” (stars).

KEY TYPE = SCAN CODE

Replace the character “0-0” with “***” (“*” = “3E” on the scan code table):

1. Read the Target String barcode.
2. Read “3”, “0”, “2”, “D”, “3”, and “0” barcodes to specify the target string “0-0” (zero, dash, zero).
3. Read the Replacement String barcode.
4. Read the “Scan Code” barcode.
5. Read “3”, “E”, “3”, “E”, “3”, and “E” barcodes to specify the replacement string “***” (stars).

KEY TYPE = NORMAL + KEY STATUS = SHIFT

Replace the character “0-0” with “!!!” (“!” = “Shift” + “1” on keyboard):

1. Read the Target String barcode.
2. Read “3”, “0”, “2”, “D”, “3”, and “0” barcodes to specify the target string “0-0” (zero, dash, zero).
3. Read the Replacement String barcode.
4. Read the “Add Shift” barcode.
5. Read “3”, “1”, “3”, “1”, “3”, and “1”.

3) Read the “Validate” barcode to complete this setting. (The defined set or sets will be applied to all symbologies by default.)

Update

4.2.3 Symbologies for Character Substitution (All 3 Sets)

By default character substitution will be performed on all symbologies. If the character substitution is not desired with one or more symbologies, read the "Do Not Apply" barcode for each undesired symbologies and all the three sets will be ignored for them.

Character Substitution for Codabar

***Apply**

Do Not Apply

Character Substitution for Code 39

***Apply**

Do Not Apply

Character Substitution for Trioptic Code 39

***Apply**

Do Not Apply

Character Substitution for Code 93

***Apply**

Do Not Apply

Enter Setup

Character Substitution for Code 128

***Apply**

Do Not Apply

Character Substitution for GS1-128

***Apply**

Do Not Apply

Character Substitution for ISBT 128

***Apply**

Do Not Apply

Character Substitution for EAN-8 (No Addon)

***Apply**

Do Not Apply

Character Substitution for EAN-8 Addon 2

***Apply**

Do Not Apply

Update

Character Substitution for EAN-8 Addon 5

*Apply

Do Not Apply

Character Substitution for EAN-13 (No Addon)

*Apply

Do Not Apply

Character Substitution for EAN-13 Addon 2

*Apply

Do Not Apply

Character Substitution for EAN-13 Addon 5

*Apply

Do Not Apply

Character Substitution for Italian Pharmacode

*Apply

Do Not Apply

Enter Setup

Character Substitution for Industrial 25

*Apply

Do Not Apply

Character Substitution for Interleaved 25

*Apply

Do Not Apply

Character Substitution for Matrix 25

*Apply

Do Not Apply

Character Substitution for Chinese 25

*Apply

Do Not Apply

Character Substitution for MSI

*Apply

Do Not Apply

Update

Character Substitution for GS1 DataBar

*Apply

Do Not Apply

Character Substitution for UPC-A (No Addon)

*Apply

Do Not Apply

Character Substitution for UPC-A Addon 2

*Apply

Do Not Apply

Character Substitution for UPC-A Addon 5

*Apply

Do Not Apply

Character Substitution for UPC-E (No Addon)

*Apply

Do Not Apply

Enter Setup

Character Substitution for UPC-E Addon 2

***Apply**

Do Not Apply

Character Substitution for UPC-E Addon 5

***Apply**

Do Not Apply

Character Substitution for UCC Coupon Extended Code

***Apply**

Do Not Apply

Character Substitution for Code 11

***Apply**

Do Not Apply

Character Substitution for Composite CC-A/B

***Apply**

Do Not Apply

Update

Character Substitution for Composite CC-C

*Apply

102613

Do Not Apply

102612

Character Substitution for Composite TLC-39

*Apply

102615

Do Not Apply

102614

Character Substitution for US Postnet

*Apply

102619

Do Not Apply

102618

Character Substitution for US Planet

*Apply

102621

Do Not Apply

102620

Character Substitution for UK Postal

*Apply

102623

Do Not Apply

102622

Enter Setup

Character Substitution for Japan Postal

***Apply**

102625

Do Not Apply

102624

Character Substitution for Australian Postal

***Apply**

102627

Do Not Apply

102626

Character Substitution for Dutch Postal

***Apply**

102629

Do Not Apply

102628

Character Substitution for USPS 4CB/One Code/Intelligent Mail

***Apply**

102631

Do Not Apply

102630

Character Substitution for UPU FICS Postal

***Apply**

102633

Do Not Apply

102632

Update

Character Substitution for PDF417

*Apply

Do Not Apply

Character Substitution for MicroPDF417

*Apply

Do Not Apply

Character Substitution for Data Matrix

*Apply

Do Not Apply

Character Substitution for Maxicode

*Apply

Do Not Apply

Character Substitution for QR Code

*Apply

Do Not Apply

Enter Setup

Character Substitution for MicroQR

***Apply**

Do Not Apply

Character Substitution for Aztec

***Apply**

Do Not Apply

Update

4.3 Prefix/Suffix Code

By default, there is no prefix code, and [ENTER] or [CR] (Carriage Return) is configured to be suffix code. Up to 8 characters can be configured, for example, “Barcode_”, and you will have the string appear in front of the barcode read, like this – “Barcode_1234567890”.

- If “Keyboard Wedge” or “USB HID” is configured for interface, Key Type and Key Status will then become applicable. You may decide whether to apply Key Status when “Normal Key” is selected for Key Type.

Key Type		Key Status
Scan Code	Up to 4 scan code values are allowed.	N/A
Normal Key	Up to 8 character strings are allowed.	▸ Add Shift ▸ Add Left Ctrl ▸ Add Left Alt ▸ Add Right Ctrl ▸ Add Right Alt Refer to Keyboard Wedge Table.

Configure Prefix

Configure Suffix

1) Read the barcode above to apply prefix code or suffix code separately, and follow steps 2~3. (Max. 8 characters each)
2) Read the “Hexadecimal Value” barcode on page 210 for the desired character string. For example, read “2” and “B” for the scanner to prefix or suffix the character [+].
3) Read the “Validate” barcode to complete this setting.

Enter Setup

4.4 Code ID

Up to two characters for Code ID can be configured for each symbology. To make the Code ID configuration easier, the scanner provides five pre-defined Code ID sets from which you can select one and make necessary changes on it.

- If “Keyboard Wedge” or “USB HID” is configured for interface, Key Type and Key Status will then become applicable. You may decide whether to apply Key Status when “Normal Key” is selected for Key Type.

Key Type		Key Status
Scan Code	Only 1 scan code value is allowed.	N/A
Normal Key	Up to 2 character strings are allowed.	▸ Add Shift ▸ Add Left Ctrl ▸ Add Left Alt ▸ Add Right Ctrl ▸ Add Right Alt Refer to Keyboard Wedge Table.

Note: "]C1" is the Code ID of GS1-128 (EAN-128) barcodes; "]e0" is the default Code ID of GS1 DataBar (RSS) barcodes.

4.4.1 Select Pre-defined Code ID

Apply Code ID Set 1

Apply Code ID Set 2

Apply Code ID Set 3

Apply Code ID Set 4

Apply Code ID Set 5

Update

Code ID options	Set 1	Set 2	Set 3	Set 4	Set 5
Code 39	A	C	Y	M	A
Trioptic Code 39	A	C	Y	M	X
Italian Pharmacode	A	C	Y	M	A
Industrial 25	C	H	H	H	S
Interleaved 25	D	I	Z	I	S
Matrix 25	E	G	G	G	S
Chinese 25	Q	M	P	S	X
Codabar	F	N	X	N	F
Code 93	I	L	L	L	G
Code 128	H	K	K	K	C
ISBT 128	H	K	K	K	C
UPC-E	S	E	C	E	E
EAN-8	P	B	B	FF	E
EAN-13	M	A	A	F	E
UPC-A	J	A	A	A	E
MSI	V	V	D	P	M
UCC Coupon Code	G	F	I	C	C
Code 11	K	J	J	D	H
Composite CC-A/B	L	X	M	J	La
Composite CC-C	N	Y	N	O	Lc
Composite TLC-39	O	Z	O	R	L2
US Postnet	h	a	s	i	X
US Planet	i	b	t	j	X
UK Postal	j	c	u	k	X
Japan Postal	k	d	v	l	X
Australian Postal	l	e	w	m	X
Dutch Postal	m	f	x	n	X
USPS 4 CB / One Code / Intelligent Mail	n	g	y	o	X
UPU FICS Postal	o	h	z	p	X
PDF417	a	O	W	T	L
MicroPDF417	b	P	V	U	L
Data Matrix	c	Q	U	V	d
Maxicode	d	R	T	W	U
QR Code	e	S	S	X	Q

Enter Setup

MicroQR	f	T	R	Y	Q
Aztec	g	U	Q	Z	z
IATA	z	z	r	h	S
Macro PDF417	p	i	a	q	L
Macro MicroPDF417	q	j	b	r	L

Update

4.4.2 Change Code ID

1) Read the barcode below to change code ID of a specific symbology.
2) Read the "Hexadecimal Value" barcode on page 210 for the desired character string. For example, read "4" and "4" for applying the character [D] for Code ID.
3) Read the "Validate" barcode to complete this setting.

Configure Code ID for Codabar

101456

Configure Code ID for Code 39

101450

Configure Code ID for Trioptic Code 39

102566

Configure Code ID for Code 93

101457

Configure Code ID for Code 128

101458

Configure Code ID for ISBT 128

101466

Configure Code ID for EAN-8

101460

Configure Code ID for EAN-13

101461

Configure Code ID for Italian Pharmacode

101451

Configure Code ID for Industrial 25

101453

Enter Setup

Configure Code ID for Interleaved 25

101454

Configure Code ID for Matrix 25

101455

Configure Code ID for Chinese 25

102571

Configure Code ID for MSI

101463

Configure Code ID for UPC-A

101462

Configure Code ID for UPC-E

101459

Configure Code ID for UCC Coupon Code

102565

Configure Code ID for Code 11

102567

Configure Code ID for Composite CC-A/B

102568

Configure Code ID for Composite CC-C

102569

Configure Code ID for Composite TLC-39

102570

Configure Code ID for US Postnet

102572

Update

Configure Code ID for US Planet

102573

Configure Code ID for UK Postal

102574

Configure Code ID for Japan Postal

102575

Configure Code ID for Australian Postal

102576

Configure Code ID for Dutch Postal

102577

Configure Code ID for USPS 4CB / One Code / Intelligent Mail

102578

Configure Code ID for UPU FICS Postal

102579

Configure Code ID for PDF417

102580

Configure Code ID for MicroPDF417

102581

Configure Code ID for Data Matrix

102582

Configure Code ID for Maxicode

102583

Configure Code ID for QR Code

102584

Enter Setup

Configure Code ID for MicroQR

Configure Code ID for Aztec

Configure Code ID for IATA

Configure Code ID for Macro PDF417

Configure Code ID for Macro MicroPDF417

4.4.3 Clear Code ID Settings

Clear All Code ID Settings

Update

4.5 Length Code

A 4-digit code representing the length of barcode data (character count) can be inserted in front of data being transmitted. Such "Length" code can be individually enabled or disabled for each symbology.

Length Code for Codabar

Apply

***Do Not Apply**

Length Code for Code 39

Apply

***Do Not Apply**

Length Code for Trioptic Code 39

Apply

***Do Not Apply**

Length Code for Code 93

Apply

***Do Not Apply**

Enter Setup

Length Code for Code 128

Apply

***Do Not Apply**

Length Code for GS1-128 & GS1 DataBar

Apply

***Do Not Apply**

Length Code for ISBT 128

Apply

***Do Not Apply**

Length Code for EAN-8

Apply

***Do Not Apply**

Length Code for EAN-13

Apply

***Do Not Apply**

Update

Length Code for Italian Pharmacode

Apply

101403

***Do Not Apply**

101402

Length Code for Industrial 25

Apply

101407

***Do Not Apply**

101406

Length Code for Interleaved 25

Apply

101409

***Do Not Apply**

101408

Length Code for Matrix 25

Apply

101411

***Do Not Apply**

101410

Length Code for Chinese 25

Apply

102515

***Do Not Apply**

102514

Enter Setup

Length Code for MSI

Apply

***Do Not Apply**

Length Code for UPC-A

Apply

***Do Not Apply**

Length Code for UPC-E

Apply

***Do Not Apply**

Length Code for UCC Coupon Extended Code

Apply

***Do Not Apply**

Length Code for Code 11

Apply

***Do Not Apply**

Update

Length Code for Composite CC-A/B

Apply

102509

***Do Not Apply**

102508

Length Code for Composite CC-C

Apply

102511

***Do Not Apply**

102510

Length Code for Composite TLC-39

Apply

102513

***Do Not Apply**

102512

Length Code for US Postnet

Apply

102517

***Do Not Apply**

102516

Length Code for US Planet

Apply

102519

***Do Not Apply**

102518

Enter Setup

Length Code for UK Postal

Apply

102521

***Do Not Apply**

102520

Length Code for Japan Postal

Apply

102523

***Do Not Apply**

102522

Length Code for Australian Postal

Apply

102525

***Do Not Apply**

102524

Length Code for Dutch Postal

Apply

102527

***Do Not Apply**

102526

Length Code for USPS 4CB/One Code/Intelligent Mail

Apply

102529

***Do Not Apply**

102528

Update

Length Code for UPU FICS Postal

Apply

102531

***Do Not Apply**

102530

Length Code for PDF417

Apply

102533

***Do Not Apply**

102532

Length Code for MicroPDF417

Apply

102535

***Do Not Apply**

102534

Length Code for Data Matrix

Apply

102537

***Do Not Apply**

102536

Length Code for Maxicode

Apply

102539

***Do Not Apply**

102538

Enter Setup

Length Code for QR Code

Apply

***Do Not Apply**

Length Code for MicroQR

Apply

***Do Not Apply**

Length Code for Aztec

Apply

***Do Not Apply**

Update

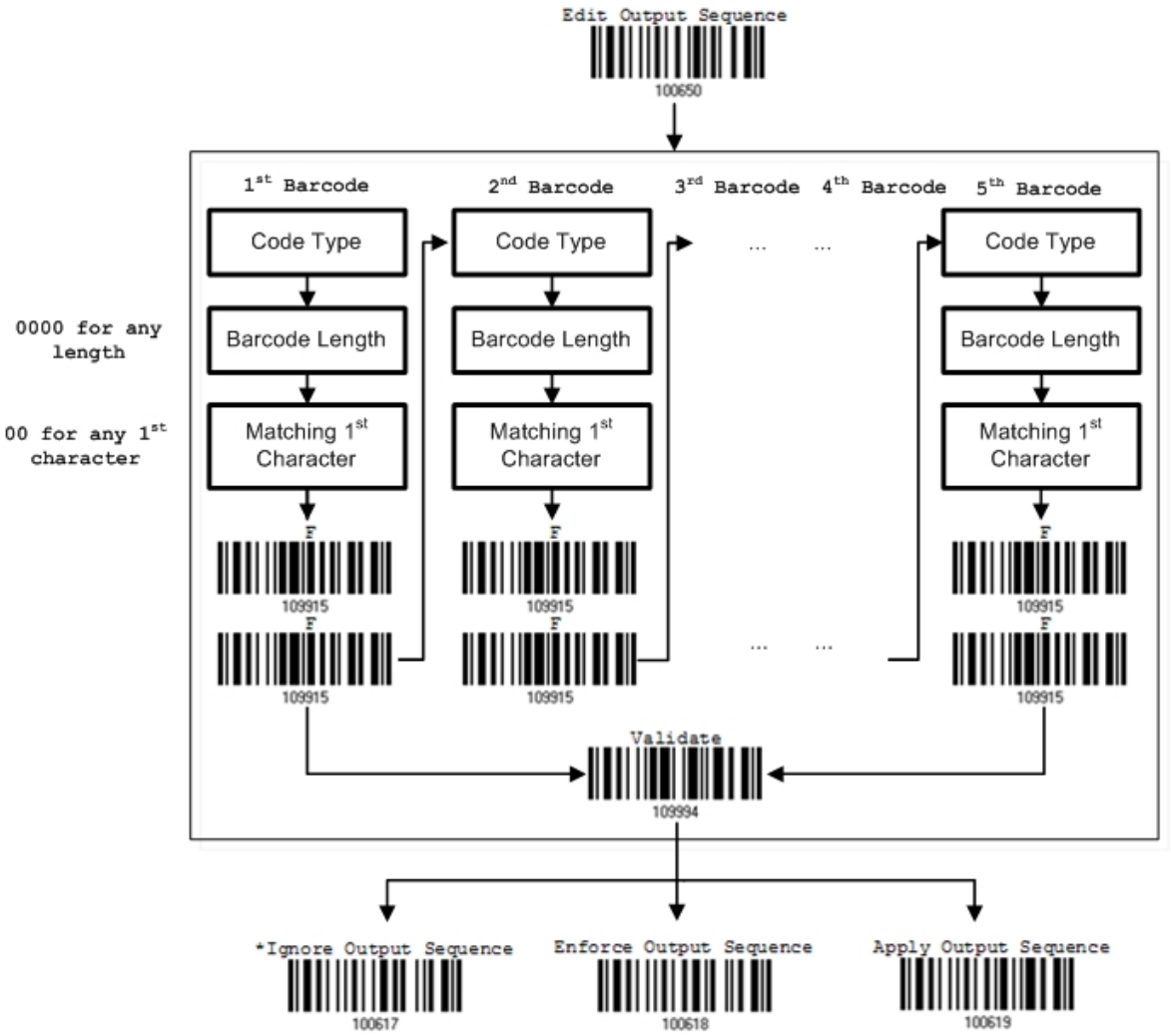
4.6 Multi-Barcode Editor

The Multi-Barcode Editor allows users to decide the output sequence of a concatenation of barcodes. Up to five barcodes can be specified. Enabling this mode will force the scanner to apply Laser mode as the scan mode. For the scanner to concatenate barcodes, the maximum output data length of all the barcodes is 10 KB after configuration. When the data length exceeds 10 KB, the concatenation will not take effect.

Note: The Multi-Barcode Editor has nothing to do with Multi-Barcode Mode.

The barcodes that are found meeting the specified criteria below will be arranged in the desired sequence.

- Code Type
- 4-digit barcode length, excluding prefix, suffix, length code, etc.
- Matching the first character of barcode data



Enter Setup

4.6.1 Edit a Concatenation of Barcodes

Edit Output Sequence

1) Read the barcode above to start editing a concatenation of barcodes.

2) Code Type setting – read the "Hexadecimal Value" barcode on page 210 for Code Type of the (first) barcode. For example, read "4" and "1" for Code 39.

Code Type	Symbology	Code Type	Symbology
40 (@)	ISBT 128		
41 (A)	Code 39		
42 (B)	Italian Pharmacode		
43 (C)	N/A		
44 (D)	Industrial 25	64 (d)	TLC-39 (TCIF Linked Code 39)
45 (E)	Interleaved 25	65 (e)	Trioptic Code 39
46 (F)	Matrix 25		
47 (G)	Codabar (NW7)	67 (g)	Code 11
48 (H)	Code 93		
49 (I)	Code 128		
4A (J)	UPC-E0 / UPC-E1	6A (j)	Composite CC-C
4B (K)	UPC-E with Addon 2	6B (k)	PDF417
4C (L)	UPC-E with Addon 5	6C (l)	MicroPDF417
4D (M)	EAN-8	6D (m)	Data Matrix
4E (N)	EAN-8 with Addon 2	6E (n)	Maxicode
4F (O)	EAN-8 with Addon 5	6F (o)	QR Code
50 (P)	EAN-13	70 (p)	US Postnet
51 (Q)	EAN-13 with Addon 2	71 (q)	US Planet
52 (R)	EAN-13 with Addon 5	72 (r)	UK Postal
53 (S)	MSI	73 (s)	Japan Postal
54 (T)	N/A	74 (t)	Australian Postal
55 (U)	GS1-128 (EAN-128)	75 (u)	Dutch Postal
56 (V)	UPC-A	76 (v)	Composite CC-A/B
57 (W)	UPC-A with Addon 2	77 (w)	Macro PDF417
58 (X)	UPC-A with Addon 5	78 (x)	Macro MicroPDF417

Update

		79 (y)	Chinese 25
5A (Z)	N/A	7A (z)	Aztec
5B ([ )	GS1 DataBar (RSS)	7B ({)	Micro QR
		7C (|)	USPS 4CB / One Code / Intelligent Mail
		7D (})	UPU FICS Postal
		7E (~)	UCC Coupon Extended Code

3) Barcode Length setting – read the "Decimal Value" barcode on page 209 for the 4-digit length of the (first) barcode. For example, read "0065" for barcode length of 65 characters or read "0000" for any length.

Note: If not reading 0000 for any length, the 4-digit length must exclude prefix, suffix (0x0d by default), length code, etc.

4) Matching Character setting – read the "Hexadecimal Value" barcode on page 210 for the 1st character that must be found matching in the (first) barcode. For example, read "4" and "1" for matching character "A" as the first character in the barcode or read "00" for any character.

5) Read twice the "F" barcode on page 210 ("FF") to complete the setting of each barcode.

6) Read the "Validate" barcode to end the editing of the barcode set.

Enter Setup

4.6.2 Activate the Concatenation of Barcodes

By default, the output sequence editing of the concatenation of barcodes is not applied.

When “Enforce Output Sequence” is enabled, all barcodes read by the scanner must meet with the criteria for the concatenation. If data is found excluded from all output sequence sets (= not meeting with the criteria), the scanner will not accept the reading, and therefore, data will not be transmitted.

When “Apply Output Sequence” is enabled, only barcodes found meeting with the criteria are counted for the concatenation. Those found not meeting with the criteria are processed normally and individually.

Note: When it requires reading more barcodes to complete the “output sequence” requirements, the scanner will respond with one short beep (low tone). After reading an acceptable barcode, its LED indicator will become solid green and go off quickly (= Good Read).
Upon completion of reading acceptable barcodes, the scanner will respond with one short beep (high tone) and its LED indicator will become solid green and go off quickly (= Good Read).

***Ignore Output Sequence**

Enforce Output Sequence

Apply Output Sequence

Warning: When you disable the Multi-Barcode Editor later, the scan mode remains unchanged. If Laser mode is not desired, proceed to select a scan mode best suits the application.

Update

4.7 Removal of Special Character

A single character can be specified only. Every matching character from the starting position of barcode data will be removed until a different character is met. For example, if you specify the character “0” (hex value is “30”) to be removed from barcode data, one or more zeros will be stripped off the barcode data “012345” and “00012345”. However, for barcode data “010333”, only the first zero will be stripped off.

Remove Special Character

1) Read the barcode above to remove the specified character.
2) Read the “Hexadecimal Value” barcode on page 210 for the desired character string. For example, read “3” and “0” for the scanner to remove the character “0”.
3) Read the “Validate” barcode to complete this setting.

4.8 AIM Code ID

You can add an AIM (Automatic Identification and Mobility) code ID in front of the barcode for the common purpose of identifying, tracking, recording, storing, and communicating essential business, personal, or product data. Enabling this function can provide you with a fast and accurate data collection and entry.

***Disable**

Enable

Enter Setup

Chapter 5

Applying Formats for Data Editing

The scanner allows advanced data editing by applying user-configured editing formats. The whole processed data can be divided into fields by user-specified rules. These fields together with the user-configurable additional fields consist of the data actually sent to the host computer.

To apply any editing format, the maximum output data length of a barcode is 7 KB after configuration. When the data length exceeds 7 KB, editing format will not take effect.

[Prefix Code]	[Code ID]	[Length Code]	[Data]	[Suffix Code]	Additional Field(s)
None by default	None by default	None by default	Barcode itself	0x0d by default	

In This Chapter

5.1 Activating Editing Formats..... 166
5.2 How to Configure Editing Formats 168
5.3 Configuring Format — Define Data Criteria..... 171
5.4 Configuring Format — Define Data Field..... 182
5.5 Configuring Format — Define Transmission Sequence.... 190
5.6 Programming Examples 193

5.1 Activating Editing Formats

5.1.1 Activate Editing Formats

Any editing format configured before can directly be applied. If there's not, users must start with configuring an editing format first, and then activate the editing format when it is desired in use.

Editing Format 1

Enable

***Disable**

Editing Format 2

Enable

***Disable**

Editing Format 3

Enable

***Disable**

Editing Format 4

Enable

***Disable**

End Programming Format

Editing Format 5

Enable

***Disable**

5.1.2 Exclusive Data Editing

By default, only barcodes found meeting with the criteria are processed by the editing formats. Those found not meeting with the criteria are processed normally.

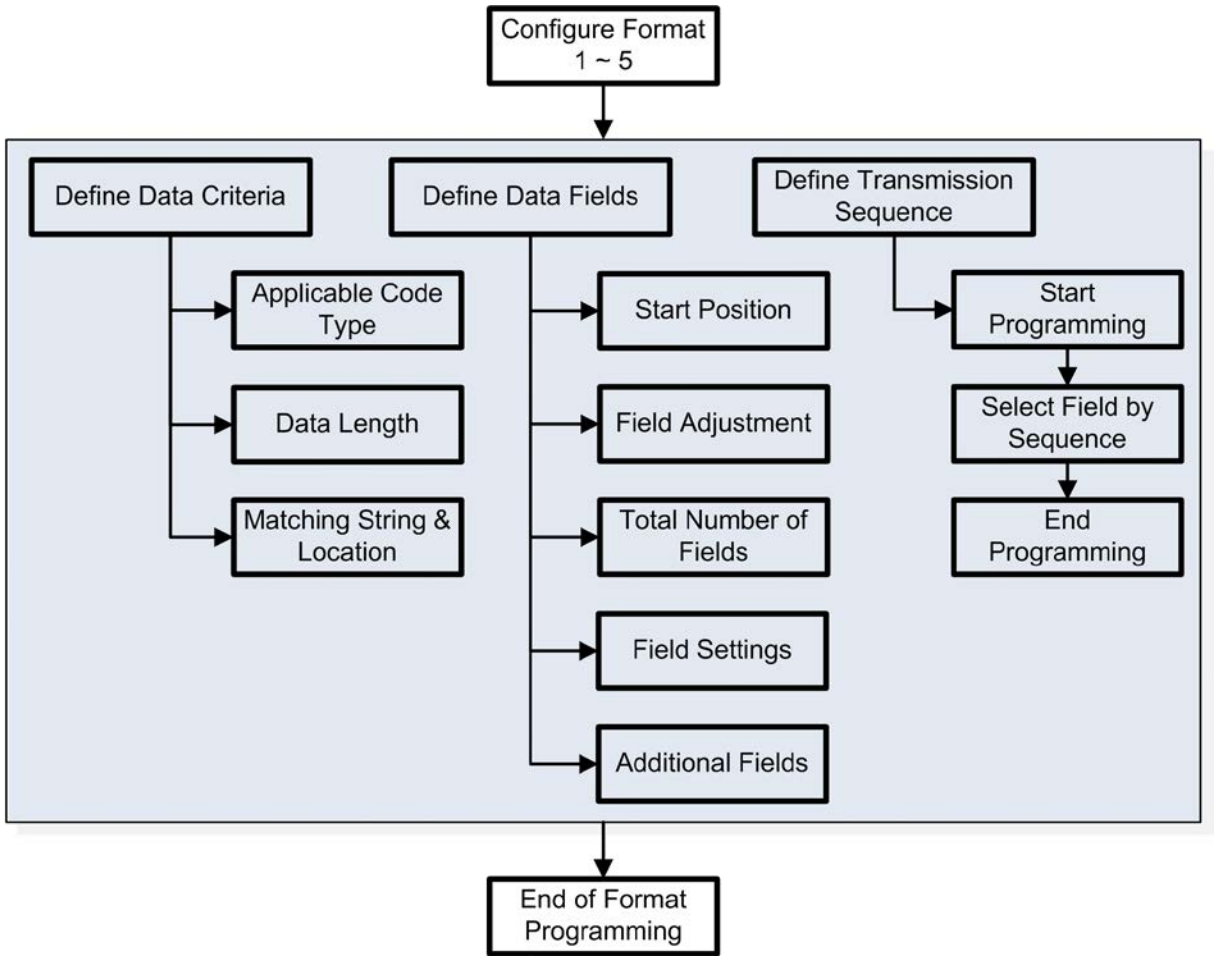
When “Exclusive Data Editing” is enabled, all barcodes read by the scanner must be processed by the editing formats. If data is found excluded from all enabled editing formats (= not meeting with the specified criteria), the scanner will not accept the reading, and therefore, data will not be transmitted.

Yes

***No**

Update

5.2 How to Configure Editing Formats



End Programming Format

5.2.1 Select Format to Configure

Start Programming Format

Select one editing format (Format 1~5) and the parameters pertaining to the editing format can then be configured – applicable code type, data length, matching string & location, start position, field adjustment, total number of fields, field settings (field-dividing rule), additional fields, and field transmission sequence.

- Up to five different formats can be specified.

Configure Format 1

Configure Format 2

Configure Format 3

Configure Format 4

Configure Format 5

Note: Before completing the programming of an editing format, having the scanner read any barcode for parameters other than those pertaining to the editing format will automatically abort the programming process.

End Programming Format

After configuring all the desired parameters, have the scanner read the “End Programming Format” barcode, which can be located at the bottom of every even page in this chapter.

End Programming Format

Update

5.2.2 Restore Default Format

Select an existing editing format and have the defaults restored. The default settings of an editing format are listed below.

Editing format	Defaults
Applicable Code Type	All
Data Length	0 (No qualification)
Matching String	Disable
Matching String Location	None
Start Position	From head
Field Adjustment	No adjustment
Total Number of Fields	1
Field Setting – field-dividing rule	Not configured
Additional Fields	None
Field Transmission Sequence	F1

Restore Default Format

End Programming Format

5.3 Configuring Format — Define Data Criteria

Three applicable conditions can be configured to check whether the data read by the scanner can be processed by the particular editing format.

Note: Data editing cannot be performed unless the three conditions are all met.

5.3.1 Applicable Code Type

By default, barcodes of all the supported symbologies will be processed by any editing format previously configured and enabled. For quick configuration, first clear all, and then select the desired symbologies.

Note: It must have at least one symbology selected.

***Apply to All**

Clear All

Update

Editing Format for Codabar

***Apply**

101513

Do Not Apply

101512

Editing Format for Code 39

***Apply**

101501

Do Not Apply

101500

Editing Format for Trioptic Code 39

***Apply**

101625

Do Not Apply

101624

Editing Format for Code 93

***Apply**

101515

Do Not Apply

101514

Editing Format for Code 128

***Apply**

101517

Do Not Apply

101516

End Programming Format

Editing Format for GS1-128 & GS1 DataBar

*Apply

Do Not Apply

Editing Format for ISBT 128

*Apply

Do Not Apply

Editing Format for EAN-8

*Apply

Do Not Apply

Editing Format for EAN-8 Addon 2

*Apply

Do Not Apply

Editing Format for EAN-8 Addon 5

*Apply

Do Not Apply

Update

Editing Format for EAN-13

***Apply**

Do Not Apply

Editing Format for EAN-13 Addon 2

***Apply**

Do Not Apply

Editing Format for EAN-13 Addon 5

***Apply**

Do Not Apply

Editing Format for Italian Pharmacode

***Apply**

Do Not Apply

Editing Format for Industrial 25

***Apply**

Do Not Apply

End Programming Format

Editing Format for Interleaved 25

***Apply**

Do Not Apply

Editing Format for Matrix 25

***Apply**

Do Not Apply

Editing Format for Chinese 25

***Apply**

Do Not Apply

Editing Format for MSI

***Apply**

Do Not Apply

Editing Format for UPC-A

***Apply**

Do Not Apply

Update

Editing Format for UPC-A Addon 2

*Apply

101541

Do Not Apply

101540

Editing Format for UPC-A Addon 5

*Apply

101543

Do Not Apply

101542

Editing Format for UPC-E

*Apply

101521

Do Not Apply

101520

Editing Format for UPC-E Addon 2

*Apply

101523

Do Not Apply

101522

Editing Format for UPC-E Addon 5

*Apply

101525

Do Not Apply

101524

End Programming Format

Editing Format for UCC Coupon Extended Code

*Apply

101623

Do Not Apply

101622

Editing Format for Code 11

*Apply

101627

Do Not Apply

101626

Editing Format for Composite CC-A/B

*Apply

101629

Do Not Apply

101628

Editing Format for Composite CC-C

*Apply

101631

Do Not Apply

101630

Editing Format for Composite TLC-39

*Apply

101633

Do Not Apply

101632

Update

Editing Format for US Postnet

*Apply

Do Not Apply

Editing Format for US Planet

*Apply

Do Not Apply

Editing Format for UK Postal

*Apply

Do Not Apply

Editing Format for Japan Postal

*Apply

Do Not Apply

Editing Format for Australian Postal

*Apply

Do Not Apply

End Programming Format

Editing Format for Dutch Postal

*Apply

Do Not Apply

Editing Format for USPS 4CB/One Code/Intelligent Mail

*Apply

Do Not Apply

Editing Format for UPU FICS Postal

*Apply

Do Not Apply

Editing Format for PDF417

*Apply

Do Not Apply

Editing Format for MicroPDF417

*Apply

Do Not Apply

Update

Editing Format for Data Matrix

***Apply**

Do Not Apply

Editing Format for Maxicode

***Apply**

Do Not Apply

Editing Format for QR Code

***Apply**

Do Not Apply

Editing Format for MicroQR

***Apply**

Do Not Apply

Editing Format for Aztec

***Apply**

Do Not Apply

End Programming Format

5.3.2 Data Length

The length must include prefix, suffix (0x0d by default), length code, etc. By default, barcodes of any length (character count) are eligible for data editing.

- Specify a value.
- When zero is given to both, the scanner will not perform the length qualification.

1) Read the barcode below to specify Max. Length or Min. Length separately, and follow steps 2~3.

Max. Length

Min. Length

2) Read the "Decimal Value" barcode on page 209 for the desired length.

3) Read the "Validate" barcode on the same page to complete this setting.

5.3.3 Matching String & Location

By default, no matching string is specified, and therefore, it is disabled. Enable this feature by specifying a matching string; up to four characters are allowed.

- When the Matching String Location is zero, the scanner will only check for the existence of the matching string in the barcode data.
- Specify a value to indicate where the matching string starts in the barcode data.

1) Read the barcode to specify a matching string.

Matching String…

2) Read the "Hexadecimal Value" barcode on page 210 for the desired character string.

3) Read the "Validate" barcode to complete this setting.

4) Read the barcode to specify the location of the matching string.

Update

Location of Matching String…

5) Read the "Decimal Value" barcode on page 209 for the desired location.

6) Read the "Validate" barcode on the same page to complete this setting.

5.4 Configuring Format — Define Data Field

5.4.1 Start Position

Data can be divided into fields in one of the following direction –

- from head (F1) to tail (F5)
- from tail (F1) to head (F5)

***From Head**

From Tail

5.4.2 Field Adjustment

Apply equal length to all fields, if necessary. If data is found longer than specified, it will be truncated automatically. When data is found shorter, it will add "Space" (0x20) to field.

***No adjustment**

Set length to adjust fields… (*0)

1) Read the barcode above to adjust field by length.

2) Read the "Decimal Value" barcode on page 209 for the desired field length.

3) Read the "Validate" barcode on the same page to complete this setting.

End Programming Format

5.4.3 Total Number of Fields

Data can be divided into at most 6 fields; each of them is numbered from F1 to F6 accordingly. However, only F1~F5 can be configured.

- The total number of fields must be specified correctly. If three fields are configured for the editing format, the data characters after F3 will be assigned to F4 automatically. This feature is quite useful especially when data of variable lengths is processed by editing formats.

***One Field**

Two Fields

Three Fields

Four Fields

Five Fields

Six Fields

Note: The number of configurable fields is always one less than the total number of fields specified. The extra data characters beyond the last field configured will be automatically assigned to the next field.

Update

5.4.4 Field Settings

Data eligible for editing formats is divided into fields by user-specified rules – either using the field terminating string or specified field length.

By Terminating String

Specify the field terminating string. Up to two characters are allowed. The scanner will search for the occurrence of this particular string in the data.

- By default, this string will be included in the field.

By Length

Alternatively, you may simply specify the field length. The scanner will assign the next specified number of characters into the field.

Field 1 Setting

1. Read the barcode below to divide field 1 by a specified terminating string.

Select Field Separator to Divide Field 1…

2. Read the "Hexadecimal Value" barcode on page 210 for the desired character string.
3. Read the "Validate" barcode to complete this setting.
4. Read the "Discard Separator" barcode if the field separator is not desired in the field.

***Include Separator**

Discard Separator

If not dividing the field by a specific separator, you may divide it by a specified length.

1. Read the barcode below to divide field 1 by length.

Divide Field 1 by Length

2. Read the "Decimal Value" barcode on page 209 for the desired field length.
3. Read the "Validate" barcode on the same page to complete this setting.

End Programming Format

Field 2 Setting

1. Read the barcode below to divide field 2 by a specified terminating string.

Select Field Separator to Divide Field 2…

2. Read the "Hexadecimal Value" barcode on page 210 for the desired character string.
3. Read the "Validate" barcode to complete this setting.
4. Read the "Discard Separator" barcode if the field separator is not desired in the field.

***Include Separator**

Discard Separator

If not dividing the field by a specific separator, you may divide it by a specified length.

1. Read the barcode below to divide field 2 by length.

Divide Field 2 by Length

2. Read the "Decimal Value" barcode on page 209 for the desired field length.
3. Read the "Validate" barcode on the same page to complete this setting.

Update

Field 3 Setting

1. Read the barcode below to divide field 3 by a specified terminating string.

Select Field Separator to Divide Field 3…

2. Read the "Hexadecimal Value" barcode on page 210 for the desired character string.
3. Read the "Validate" barcode to complete this setting.
4. Read the "Discard Separator" barcode if the field separator is not desired in the field.

***Include Separator**

Discard Separator

If not dividing the field by a specific separator, you may divide it by a specified length.

1. Read the barcode below to divide field 3 by length.

Divide Field 3 by Length

2. Read the "Decimal Value" barcode on page 209 for the desired field length.
3. Read the "Validate" barcode on the same page to complete this setting.

End Programming Format

Field 4 Setting

1. Read the barcode below to divide field 4 by a specified terminating string.

Select Field Separator to Divide Field 4…

2. Read the "Hexadecimal Value" barcode on page 210 for the desired character string.
3. Read the "Validate" barcode to complete this setting.
4. Read the "Discard Separator" barcode if the field separator is not desired in the field.

***Include Separator**

Discard Separator

If not dividing the field by a specific separator, you may divide it by a specified length.

1. Read the barcode below to divide field 4 by length.

Divide Field 4 by Length

2. Read the "Decimal Value" barcode on page 209 for the desired field length.
3. Read the "Validate" barcode on the same page to complete this setting.

Update

Field 5 Setting

1. Read the barcode below to divide field 5 by a specified terminating string.

Select Field Separator to Divide Field 5…

2. Read the "Hexadecimal Value" barcode on page 210 for the desired character string.
3. Read the "Validate" barcode to complete this setting.
4. Read the "Discard Separator" barcode if the field separator is not desired in the field.

***Include Separator**

Discard Separator

If not dividing the field by a specific separator, you may divide it by a specified length.

1. Read the barcode below to divide field 5 by length.

Divide Field 5 by Length

2. Read the "Decimal Value" barcode on page 209 for the desired field length.
3. Read the "Validate" barcode on the same page to complete this setting.

End Programming Format

Additional Fields

Up to five additional fields can be created for each editing format; each of them is numbered from AF1 to AF5 accordingly.

- If “Keyboard Wedge” or “USB HID” is configured for interface, Key Type and Key Status will then become applicable. Decide whether to apply Key Status when “Normal Key” is selected for Key Type.

Key Type		Key Status
Scan Code	Up to 2 scan code values are allowed.	N/A
Normal Key	Up to 4 character strings are allowed.	▸ Add Shift ▸ Add Left Ctrl ▸ Add Left Alt ▸ Add Right Ctrl ▸ Add Right Alt Refer to Keyboard Wedge Table.

1. Read the barcode below to specify an additional field, one at a time.

Additional Field 1… 101584

Additional Field 2… 101585

Additional Field 3… 101586

Additional Field 4… 101587

Additional Field 5… 101588

2. Read the “Hexadecimal Value” barcode on page 210 for the desired additional field.
3. Read the “Validate” barcode to complete this setting.

Update

5.4.5 Pause Field Setting

Pause Field Time

Limit the pause time interval (1~16). By default, it is set to 1 second.

Pause Field Time
1~16 sec.
(*1)

1. Read the barcode above to specify the time interval for the Pause Field. (It is set to 1 by default.)
2. Read the "Decimal Value" barcode on page 209. For example, read "1" and "0" for setting the Pause Field Time to 10 seconds.
3. Read the "Validate" barcode on the same page to complete this setting.

End Programming Format

5.5 Configuring Format — Define Transmission Sequence

After configuring the data fields and additional fields, you must now program the transmission sequence of these fields that comprise the final data. This field transmission sequence can be assigned in any desired order and fields can be assigned multiple times as well.

Note: Up to twelve fields can be assigned.

1) Read the "Start" barcode to begin with programming the field transmission sequence.

Start Programming…

2) Program the transmission sequence by reading the desired fields as well as additional fields.

Field 1

Field 2

Field 3

Field 4

Field 5

Field 6

Additional Field 1

Update

Additional Field 2

Additional Field 3

Additional Field 4

Additional Field 5

Pause Field

Null Character Field

3) Read the “End” barcode to complete this setting.

End Programming…

End Programming Format

5.6 Programming Examples

5.6.1 Example I

Extract data from the 10th character to the 19th character...

The editing format should be configured as follows:

1. Read the “Enter Setup” barcode to enter the Configuration Mode.
2. Read the “Configure Format 1” barcode.
3. Read the “Clear All” and “Code 128” barcodes for applicable code type.
4. Read the “Three Fields” barcode.
5. Read the “Divide Field 1 by Length” barcode, and set length to 9.
   Field 1 data starts from the 1st character to the 9th character.
6. Read the “Divide Field 2 by Length” barcode, and set length to 10.
   Field 2 data starts from the 10th character to the 19th character.
7. Read the “Start (Programming)” barcode to program the transmission sequence.
8. Read the “Field 2” barcode.
9. Read the “End” barcode to complete the transmission sequence setting.
10. Read the “End Programming Format” barcode to complete the setting of Editing Format 1.
11. Read the “Enable Format 1” barcode to apply Editing Format 1 to Code 128.
12. Read the “Update” barcode to exit the Configuration Mode.

Update

5.6.2 Example II

Extract the date code, item number, and quantity information from barcodes.

Data in a barcode is encoded like this:

- From the 1st character to the 6th character is the date code.
- From the 7th character to the dash '-' character is the item number.
- After the dash '-' character is the quantity information.

Data will be transmitted like this:

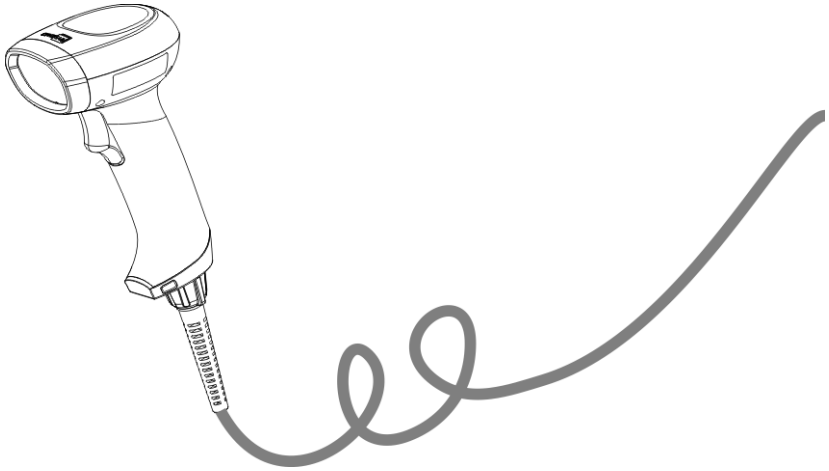
- The item number goes first, then a TAB character, followed by the date code, then another TAB character, and finally the quantity information.

The editing format should be configured as follows:

1. Read the "Enter Setup" barcode to enter the Configuration Mode.
2. Read the "Configure Format 2" barcode.
3. Read the "Three Fields" barcode.
4. Read the "Divide Field 1 by Length" barcode, and set length to 6.
   Field 1 data starts from the 1st character to the 6th character.
5. Read the "Select Field Separator to Divide Field 2" barcode, and use a dash '-' character.
   Field 2 data starts from the 7th character until the dash '-' character is met.
6. Read the "Additional Field 1" barcode, and use a tab character for the field.
7. Read the "Start (Programming)" barcode to program the transmission sequence.
8. Read the "Field 2", "Additional Field 1", "Field 1", "Additional Field 1", "Field 3" barcodes.
9. Read the "End" barcode to complete the transmission sequence (F2 A1 F1 A1 F3) setting.
10. Read the "End Programming Format" barcode to complete the setting of Editing Format 1.
11. Read the "Enable Format 2" barcode to apply Editing Format 2 to all code types.
12. Read the "Update" barcode to exit the Configuration Mode.

End Programming Format

Specifications



Optical Characteristics		2504MR
Scan Engine		2D Imager
Light Source		Aiming pattern: 617nm LED Illumination: Warm White LED
Physical Characteristics		
Switch		Tactile switch
Indication		Dual-color LED (Red/Green) and beeper
Interface Options		Keyboard Wedge, RS-232, USB HID, USB Virtual COM
Weight		Approx. 145 g
Dimensions		160.5 x 96.2 x 66 mm
Power Adaptor (for RS-232)		
Input		AC 100~240 V, 50/60 Hz
Output		DC 5V, 1A
Operating Temperature		0 °C to 40 °C
Environmental Characteristics		
Temperature	Operating Storage	0 °C to 50 °C -40 °C to 70 °C
Humidity (Non-condensing)	Operating Storage	10% to 90% 5% to 95%

Update

Resistance	
Impact Resistance	1.8 m, 5 drops per 6 sides
Splash / Dust Resistance	IP 65
Electrostatic Discharge	± 20 kV air discharge, ± 10 kV contact discharge
Programming Support	
Configuration via Setup Barcodes	Use setup barcodes or host serial commands.
Software	Windows®-based ScanMaster
Firmware upgradeable	Download firmware updates via the download utility.
Accessories (√ means "supported")	
Flexible Stand (Goose Neck)	√
RS-232 Cable	√
Keyboard Wedge Cable	√
USB Cable	√

Enter Setup

Appendix I

Firmware Upgrade

Using RS-232

1) Connect the RS-232 cable between the scanner and the computer, and join the power supply cord.

2) Read the following barcodes in sequence to configure the scanner to use RS-232 as download interface.

Enter Setup

Activate RS-232

115200 bps

Update

3) Read the following barcodes in sequence for the scanner to enter the download mode. The scanner will respond with beeps to indicate it is ready for downloading.

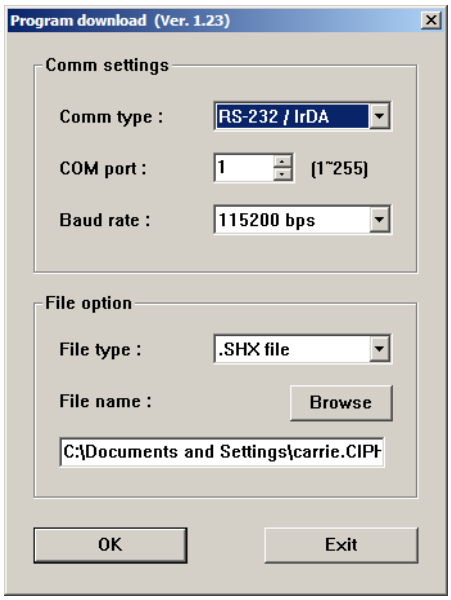
Enter Setup

Download

Update

4) Run the download utility “ProgLoad.exe” on the computer.

Kernel Program	User Program
K250x_V*.shx	STD250x_V*.shx



- For the communication settings, select “RS-232” and the correct COM port for RS-232 or USB Virtual COM interface.
- For RS-232, select 115200 bps for baud rate; for USB Virtual COM, ignore the baud rate setting.
- For the file option, click [Browse] to select the target file for firmware update.
- Click [OK].

5) After upgrading kernel, you will need to restart the scanner manually.

After upgrading the user program, the scanner will automatically restart itself once the download is completed successfully.

Note: The output interface remains unchanged as specified in step 2 (= RS-232 or USB Virtual COM). For RS-232, the baud rate setting is still 115200 bps!

Enter Setup

Using USB Virtual COM

1) Connect the USB cable between the scanner and the computer.
   - If using USB Virtual COM for the first time, you must install its driver beforehand.
2) For Windows platform, read the following barcodes in sequence to configure the scanner to use USB VCOM_CDC as download interface.

Enter Setup

Activate Direct USB VCOM_CDC

100010

Update

109999

For non-Windows platform, read the following barcodes in sequence to configure the scanner to use USB Virtual COM as download interface.

Enter Setup

Activate Direct USB VCOM

100008

Update

109999

3) Read the following barcodes in sequence for the scanner to enter the download mode. The scanner will respond with beeps to indicate it is ready for downloading.

Enter Setup

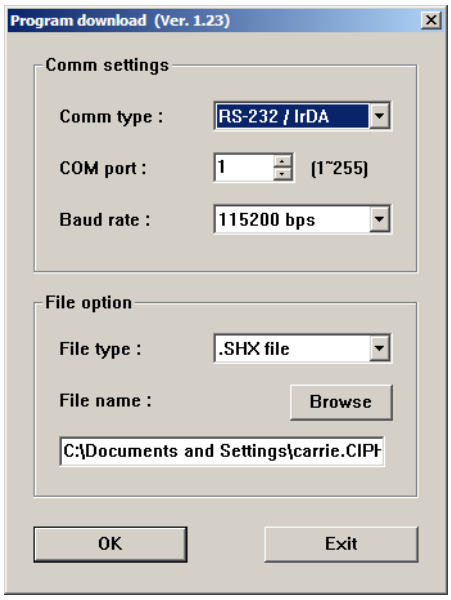
Download

109997

4) Run the download utility “ProgLoad.exe” on the computer.

Update

Kernel Program	User Program
K250x_V*.shx	STD250x_V*.shx



- For the communication settings, select "RS-232" and the correct COM port for RS-232 or USB Virtual COM interface.
- For RS-232, select 115200 bps for baud rate; for USB Virtual COM, ignore the baud rate setting.
- For the file option, click [Browse] to select the target file for firmware update.
- Click [OK].

5) After upgrading kernel, you will need to restart the scanner manually.

After upgrading the user program, the scanner will automatically restart itself once the download is completed successfully.

Note: The output interface remains unchanged as specified in step 2 (= RS-232 or USB Virtual COM). For RS-232, the baud rate setting is still 115200 bps!

Enter Setup

Appendix II

Host Serial Commands

Serial Commands

D

Purpose	To disable the scanner.
Remarks	"D"

E

Purpose	To enable the scanner.
Remarks	"E"

#@ nnnnnn <CR>

Purpose	To configure the scanner.
Remarks	nnnnnn – the six digits of command parameters. For example, "109952" is to list the current Code ID settings.

List Page 3

"0x23" + "0x40" + "0x31" + "0x30" + "0x39" + "0x39" + "0x35" + "0x32" + "0x0d"

Note: After configuring the scanner, send the serial command "#@109999" to save the settings.

#@----<CR>

Purpose	To halt the scanner.
Remarks	"0x23" + "0x40" + "0x2d" + "0x2d" + "0x2d" + "0x2d" + "0x0d"

#@....<CR>

Purpose	To resume operation.
Remarks	"0x23" + "0x40" + "0x2e" + "0x2e" + "0x2e" + "0x2e" + "0x0d"

#@////<CR>

Purpose	To respond with a beep.
Remarks	"0x23" + "0x40" + "0x2f" + "0x2f" + "0x2f" + "0x2f" + "0x0d"

Update

#@TRIGOFF<CR>

Purpose	Disable software trigger
Remarks	"0x23" + "0x40" + "0x54" + "0x52" + "0x49" + "0x47" + "0x4f" + "0x46" + "0x46" + "0x0d"

#@TRIGON<CR>

Purpose	Enable software trigger
Remarks	"0x23" + "0x40" + "0x54" + "0x52" + "0x49" + "0x47" + "0x4f" + "0x4e" + "0x0d"

Example

Run HyperTerminal.exe on the host computer to send serial commands to the scanner via RS-232 or USB Virtual COM.

- For the scanner to stop immediately –

  D

- For the scanner to resume working –

  E

- For the scanner to change the beeper to medium volume and beep –

  #@101011<CR>

  #@////<CR>

- For the scanner to change the beeper to minimal volume and beep –

  #@101010<CR>

  #@////<CR>

- For the scanner to change the beeper frequency to 8 kHz (for Good Read Beep only) and beep –

  #@101001<CR>

  #@////<CR>

- For the scanner to change the beeper length to longest (for Good Read Beep only) and beep –

  #@101008<CR>

  #@////<CR>

- For the scanner to save the settings, send the serial command "#@109999" –

  #@101011<CR>

  #@109999<CR>

Note: Configure more than one scanner connected to the host via RS-232 or USB Virtual COM. To identify the scanner, please end the serial command to have it respond with a beep.

Enter Setup

Appendix III

Keyboard Wedge Table

Apply Special Keyboard

"Apply" Special Keyboard									
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
0		F2	SP	0	@	P	`	p	⓪
1	INS	F3	!	1	A	Q	a	q	①
2	DLT	F4	"	2	B	R	b	r	②
3	Home	F5	#	3	C	S	c	s	③
4	End	F6	$	4	D	T	d	t	④
5	Up	F7	%	5	E	U	e	u	⑤
6	Down	F8	&	6	F	V	f	v	⑥
7	Left	F9	'	7	G	W	g	w	⑦
8	BS	F10	(	8	H	X	h	x	⑧
9	HT	F11	)	9	I	Y	i	y	⑨
A	LF	F12	*	:	J	Z	j	z	
B	Right	ESC	+	;	K	[	k	{	
C	PgUp	Exec	,	<	L	\	l	|	
D	CR	CR*	-	=	M	]	m	}	
E	PgDn		.	>	N	^	n	~	
F	F1		/	?	O	_	o	Dly	ENTER*

Note: (1) ⓪~⑨: Digits of numeric keypad.
(2) CR*/ENTER*: ENTER key on the numeric keypad.

Update

Bypass Special Keyboard

"Bypass" Special Keyboard									
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
0			SP	0	@	P	`	p	
1			!	1	A	Q	a	q	
2			"	2	B	R	b	r	
3			#	3	C	S	c	s	
4			$	4	D	T	d	t	
5			%	5	E	U	e	u	
6			&	6	F	V	f	v	
7			'	7	G	W	g	w	
8	BS		(	8	H	X	h	x	
9	HT		)	9	I	Y	i	y	
A	LF		*	:	J	Z	j	z	
B		ESC	+	;	K	[	k	{	
C			,	<	L	\	l	|	
D	CR		-	=	M	]	m	}	
E			.	>	N	^	n	~	
F			/	?	O	_	o	Dly	

Enter Setup

Bypass Special Keyboard with Control Character Output

"Bypass" Special Keyboard with Control Character Output									
	0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
0		DLE	SP	0	@	P	`	p	
1	SOH	DC1	!	1	A	Q	a	q	
2	STX	DC2	"	2	B	R	b	r	
3	ETX	DC3	#	3	C	S	c	s	
4	EOT	DC4	$	4	D	T	d	t	
5	ENQ	NAK	%	5	E	U	e	u	
6	ACK	SYN	&	6	F	V	f	v	
7	BEL	ETB	'	7	G	W	g	w	
8	BS	CAN	(	8	H	X	h	x	
9	HT	EM	)	9	I	Y	i	y	
A	LF	SUB	*	:	J	Z	j	z	
B	VT	ESC	+	;	K	[	k	{	
C	FF	FS	,	<	L	\	l	|	
D	CR	GS	-	=	M	]	m	}	
E	SO	RS	.	>	N	^	n	~	
F	SI	US	/	?	O	_	o	Dly	

Note: When Special Keyboard is set to "Bypass with Control Character Output" (refer to 2.1.5 Special Keyboard Feature), the control characters ranging from 0x01 to 0x1F (SOH ~ US) can then be sent to host computer (Windows only).

Update

Key Type & Status

Key Type

If “Keyboard Wedge” or “USB HID” is configured for interface, Key Type and Key Status will then become applicable.

***Normal**

Scan Code

Key Status

Decide whether or not to change key status when “Normal Key” is selected for Key Type.

Add Shift

Add Left Ctrl

Add Right Ctrl

Add Left Alt

Add Right Alt

Enter Setup

Example

KEY TYPE = NORMAL

For example, if you want to program the character "!" as the prefix code:

1. Read the "Configure Prefix" barcode.
2. Read the "Hexadecimal Value" barcode on page 210 for "2" and "1".
3. Read the "Validate" barcode to complete this setting.

KEY TYPE = SCAN CODE

For example, if you want to program the character "a" (= "1C" on the scan code table) as the prefix code:

1. Read the "Configure Prefix" barcode.
2. Read the "Scan Code" barcode.
3. Read the "Hexadecimal Value" barcode on page 210 for "1" and "C".
4. Read the "Validate" barcode to complete this setting.

KEY TYPE = NORMAL + KEY STATUS = SHIFT

For example, if you want to program the character "!" (= "Shift" + "1" on keyboard) as the prefix code:

1. Read the "Configure Prefix" barcode.
2. Read the "Add Shift" barcode.
3. Read the "Hexadecimal Value" barcode on page 210 for "3" and "1".
4. Read the "Validate" barcode to complete this setting.

KEY TYPE = NORMAL + KEY STATUS = CTRL

For example, if you want to program "Ctrl+A" and "Ctrl+$" as the prefix code:

1. Read the "Configure Prefix" barcode.
2. Read the "Add Left Ctrl" barcode.
3. Read the "Hexadecimal Value" barcode on page 210 for "4", "1" (= "A").
4. Read the "Add Left Ctrl" barcode.
5. Read the "Hexadecimal Value" barcode on page 210 for "2", "4" (= "$").
6. Read the "Validate" barcode to complete this setting.

Update

Enter Setup

Appendix IV

Numeral Systems

Decimal System

Decimal

0

109900

1

109901

2

109902

3

109903

4

109904

5

109905

6

109906

7

109907

8

109908

9

109909

Validate the Values

Validate

109994

Update

Abort

Hexadecimal System

Hexadecimal

0

109900

1

109901

2

109902

3

109903

4

109904

5

109905

6

109906

7

109907

8

109908

9

109909

A

109910

B

109911

C

109912

D

109913

E

109914

F

109915

Enter Setup

Validate the Values

Validate

109994

ASCII Table

	0	1	2	3	4	5	6	7	
0		DLE	SP	0	@	P	`	p	
1	SOH	DC1	!	1	A	Q	a	q	
2	STX	DC2	"	2	B	R	b	r	
3	ETX	DC3	#	3	C	S	c	s	
4	EOT	DC4	$	4	D	T	d	t	
5	ENQ	NAK	%	5	E	U	e	u	
6	ACK	SYN	&	6	F	V	f	v	
7	BEL	ETB	'	7	G	W	g	w	
8	BS	CAN	(	8	H	X	h	x	
9	HT	EM	)	9	I	Y	i	y	
A	LF	SUB	*	:	J	Z	j	z	
B	VT	ESC	+	;	K	[	k	{	
C	FF	FS	,	<	L	\	l	|	
D	CR	GS	-	=	M	]	m	}	
E	SO	RS	.	>	N	^	n	~	
F	SI	US	/	?	O	_	o	DEL	

Update

Abort

Enter Setup

Appendix V

Reading Driver Licenses

The scanner is capable of reading 2D driver's licenses and other American Association of Motor Vehicle Administrators (AAMVA) compliant ID cards. For compliant 2D licensed card scanning, it decodes the information embedded in the ID cards to a formatted data. This appendix provides the setup barcodes required while ScanMaster utility provides GUI setup that is oganized and easy-to-use.

Note: The configured settings are saved in flash memory for access once a driver's license is read.

License Parsing Setup

***License Parse Disable**

License Parse Enable

Parse Field Clear

File Type

You can check the file type of ANSI by scanning the barcode as below.

***Enable**

Disable

Update

Abort

Output Sequence Setup

The scanner supports arranging the sequences of license embedded data via separators and fields. In order to present data in a consistent format, some barcodes (ex. First Name, Middle Name/Initial, Last Name, Name suffix, Name Prefix, Birth Date and so on) will return data based on the calculated actual data contained in the ID barcode.

Full Name

103011

Last Name

103012

First Name

103013

Middle Name/Initial

103014

Name Suffix

103015

Name Prefix

103016

Mailing Address Line1

103017

Mailing Address Line2

103018

Mailing Address City

103019

Mailing Address State

103020

Enter Setup

Mailing Address Postal Code

103021

Home Address Line1

103022

Home Address Line2

103023

Home Address City

103024

Home Address State

103025

Home Address Postal Code

103026

License ID Number

103027

License Class

103028

License Restrictions

103029

License Endorsements

103030

Height (Feet and/or Inches)

103031

Height (Centimeters)

103032

Update

Abort

Weight (Pounds)

Weight (Kilograms)

Eye Color

Hair Color

License Expiration Date

Birth Date

Gender

License Issue Date

Issue Timestamp

Number of Duplicates

Medical Codes

Organ Donor

Enter Setup

Nonresident

103045

Customer ID

103046

Social Security Number

103047

AKA Birth Date

103048

AKA Social Security Name

103049

AKA Full Name

103050

AKA Last Name

103051

AKA First Name

103052

AKA Middle Name/Initial

103053

AKA Name Suffix

103054

AKA Name Prefix

103055

Weight Range

103056

Document Discriminator

103057

Country

103058

Federal Commission Codes

103059

Place of Birth

103060

Audit Information

103061

Inventory Control

103062

Race/Ethnicity

103063

Std Vehicle Class

103064

Std Restrictions

103065

Std Endorsements

103066

Class Description

103067

Endorsement Description

103068

Enter Setup

Restrictions Description

103069

Permit Class

103070

Permit Expiration Date

103071

Permit ID Number

103072

Permit Issue Date

103073

Permit Restrictions

103074

Permit endorsements

103075

Issuer ID Number

103076

Family Name Truncation

103077

First Name Truncation

103078

Middle Name Truncation

103079

Separators and Fields

Define the separators that separate fields during the transmission sequence of data scanning. In addition to the built-in data elements, you can also specify up to 5 Additional Fields with 4 bytes characters. Program the transmission sequence by reading the desired fields as additional fields.

Note: Up to 5 separators can be assigned.

Separator 1 (1 byte) *"Space"

103128

Separator 2 (1 byte) *"Enter"

103129

Separator 3 (1 byte) *","

103130

Separator 4 (1 byte) *"."

103131

Separator 5 (1 byte) *"-"

103132

Additional Field 1 (4 bytes)

103133

Additional Field 2 (4 bytes)

103134

Additional Field 3 (4 bytes)

103135

Additional Field 4 (4 bytes)

103136

Additional Field 5 (4 bytes)

103137

Enter Setup

Edit Separators

All the driver license fields can be split with a pre-selected separator, for example, “-” as First Name-Last Name or “:” as First Name:Last Name.

Edit Separator 1

Edit Separator 2

Edit Separator 3

Edit Separator 4

Edit Separator 5

1) Read the barcode above to apply separator to driver license information separately, and follow steps 2~3.
2) Read the “Hexadecimal Value” barcode for the desired character string. For example, read “3” and “A” for the separator to split the data with character [:].
3) Read the “Validate” barcode on the same page to complete this setting.

Update

Abort

Edit Fields

Up to five additional fields can be created for each editing format; each of them is numbered from Additional 1 to Additional 5 accordingly.

- If "*Bluetooth*® HID" or "USB HID" is configured for interface, Key Type and Key Status will then become applicable. You may decide whether or not to apply Key Status when "Normal Key" is selected for Key Type.

Key Type		Key Status
Scan Code	Up to 2 scan code values are allowed.	N/A
Normal Key	Up to 4 character strings are allowed.	▸ Add Shift ▸ Add Left Ctrl ▸ Add Left Alt ▸ Add Right Ctrl ▸ Add Right Alt Refer to Keyboard Wedge Table.

Edit Additional Field 1

Edit Additional Field 2

Edit Additional Field 3

Edit Additional Field 4

Edit Additional Field 5

1) Read the barcode above to specify an additional field, one at a time.
2) Read the "Hexadecimal Value" barcode for the desired additional field.
3) Read the "Validate" barcode on the same page to complete this setting.

Enter Setup

Appendix VI

Keyboard Type One-Scan Barcode

Keyboard Wedge

PCAT (US)

PCAT (French)

PCAT (German)

PCAT (Italian)

PCAT (Swedish)

PCAT (Norwegian)

PCAT (UK)

PCAT (Belgium)

PCAT (Spanish)

PCAT (Portuguese)

PS55 A01-1

PS55 A01-2 (Japanese)

PS55 A01-3

PS55 001-1

PS55 001-81

PS55 001-2

PS55 001-82

PS55 001-3

PS55 001-8A

PS55 002-1, 003-1

PS55 002-81, 003-81

PS55 002-2, 003-2

PS55 002-82, 003-82

PS55 002-3, 003-3

PS55 002-8A, 003-8A

IBM 3477 Type 4 (Japanese)

PS2-30

IBM 34XX/319X, Memorex Telex 122 Keys

User-defined table

PCAT (Turkish)

PCAT (Hungarian)

PCAT (Switzerland German)

PCAT (Danish)

PCAT (Greek)

PCAT (Russian)

PCAT (Cyrillic on Russian)

PCAT (Armenian)

PCAT (Thai)

PCAT (Slovenian)

PCAT (Mexican Spanish)

PCAT (Swiss French)

PCAT (Czech)

Direct USB HID

PCAT (US)

PCAT (French)

PCAT (German)

PCAT (Italian)

PCAT (Swedish)

PCAT (Norwegian)

PCAT (UK)

PCAT (Belgium)

PCAT (Spanish)

PCAT (Portuguese)

PS55 A01-2 (Japanese)

User-defined table

PCAT (Turkish)

PCAT (Hungarian)

PCAT (Switzerland German)

PCAT (Danish)

PCAT (Greek)

PCAT (Russian)

PCAT (Cyrillic on Russian)

PCAT (Armenian)

PCAT (Thai)

PCAT (Slovenian)

PCAT (Mexican Spanish)

PCAT (Swiss French)

PCAT (Czech)