

CipherLab **User Guide**

1500/1502 Barcode Scanner

Setup barcodes included.

Version 1.18



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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 numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par l'Industrie.

FOR PRODUCT WITH LASER



CAUTION

This laser component emits FDA / IEC Class 2 laser light at the exit port. Do not stare into beam.

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.
- ▶ If you want to put away the scanner for a period of time, download the collected data to a host computer when in the memory mode, and then take out the battery. Store the scanner and battery separately.
- ▶ When the scanner resumes its work, make sure the battery is fully charged before use.
- ▶ Keep the scanner away from any magnets and magnetic fields to prevent the laser engine from malfunctioning.
- ▶ If you shall find the scanner malfunctioning, write down the specific scenario and consult your local sales representative.

RELEASE NOTES

Version	Date	Notes
1.18	Sep. 15, 2014	<ul style="list-style-type: none"> ▶ New: 3.9.5 EAN-13 Addon Mode ▶ New: 3.9.6 EAN-13 Addon Mode Buzzer
1.17	Mar. 18, 2014	<ul style="list-style-type: none"> ▶ Modified: Care & Maintenance – “Keep the scanner away from any magnets and magnetic fields to prevent the laser engine from malfunctioning.” Added ▶ Modified: 3.8.3 – GTIN-13 format barcodes added ▶ Modified: 3.10.3 – GS1 formatting barcodes added ▶ Modified: 3.10.4 – Application ID Mark barcodes added ▶ Modified: 3.11.1 – ISBT Concatenation barcodes added ▶ Modified: 3.16.5 – Field Separator barcode added ▶ Modified: 3.16.6 – GS1 Formatting barcodes added ▶ Modified: 3.16.7 – Application ID Mark barcodes added
1.16	Dec. 18, 2012	<ul style="list-style-type: none"> ▶ Modification: 2.1.1 Keyboard type added with No. 32 PCAT (Swiss) & No. 33 PCAT (Danish) ▶ New: 2.3.6 Output Format (Wand Emulation) setup barcodes added ▶ New: 3.1 Codabar added w/ security Level (High: 100490/Normal: 100491) ▶ New: 3.7 Code 128 added w/ security Level (High: 100492/Normal: 100493)
1.15	Mar 02, 2012	<ul style="list-style-type: none"> ▶ New: Quick Start — One-Scan Setup Barcodes ▶ Modified: 2.1.1 Activate Keyboard Wedge & Select Keyboard Type — add #31 PCAT (Hungarian) ▶ Modified: 3.10 GS1-128 (EAN-128) enabled by default ▶ New: 3.5.5 Security Level (for Code 39) ▶ Modified: 4.6.1 Edit a Concatenation of Barcodes — Code type for ISBT 128 added ▶ Modified: 5.5 Configuring Format — Define Transmission Sequence (add Null Character Field)
1.14	Jul. 19, 2011	<ul style="list-style-type: none"> ▶ Modified: 3.10 GS1-128 (EAN-128) — Cannot read when disabled since firmware v1.10 ▶ Modified: Specifications — Power Adaptor
1.13	Nov. 23, 2010	<ul style="list-style-type: none"> ▶ Modified: 1.11 Auto-Sense Mode (1500 Only) — add High Sensitivity behavior

1.12	Sep. 27, 2010	<ul style="list-style-type: none"> ▶ Modified: Introduction, Symbolologies Supported — add support of more RSS symbolologies ▶ Modified: 3.16 GS1 DataBar (RSS Family) ▶ Modified: 3.16.2 GS1 DataBar Omnidirectional (RSS-14) ▶ Modified: 3.16.3 GS1 DataBar Expanded (RSS Expanded) ▶ Modified: 4.2 Character Substitution — add table for Scan Code/Normal Key ▶ New: 5.4.5 Pause Field Setting ▶ Modified: 5.5 Configuring Format — Define Transmission Sequence (add Pause Field) ▶ Specifications: add 1502
1.11	Apr. 14, 2010	<ul style="list-style-type: none"> ▶ Modified: 2.1.1 Activate Keyboard Wedge & Select Keyboard Type — add Turkish ▶ Modified: 3.9.4 Security Level
1.10	Apr. 09, 2010	<ul style="list-style-type: none"> ▶ New: Introduction — add 1500WA ▶ Modified: Appendix III Keyboard Wedge Table — remove settings for user-defined scan code ▶ Modified: Appendix III Keyboard Wedge Table — provide examples
1.09	Nov. 25, 2009	<ul style="list-style-type: none"> ▶ Modified: 2.2.2 Baud Rate — change setup barcode for 4800 bps (change 100079 to 100100)
1.08	Oct. 30, 2009	<ul style="list-style-type: none"> ▶ Modified: 1.10 Auto-Sense Mode (1500 Only) — Continuous mode as an alternative ▶ Modified: 1.12 Symbolologies Supported — ISBT 128 enabled by default ▶ Modified: 2.2.2 Baud Rate — add setup barcode for 4800 bps ▶ Modified: 4.2.2 Symbolologies for Character Substitution (All 3 Sets) — add ISBT 128 ▶ Modified: 4.4.1 Select Pre-defined Code ID — add ISBT 128 ▶ Modified: 4.4.2 Change Code ID — add ISBT 128 ▶ Modified: 4.5 Length Code — add ISBT 128 ▶ Modified: 5.3.1 Applicable Code Type (for Editing Format) — add ISBT 128
1.07	June 03, 2009	<ul style="list-style-type: none"> ▶ Modified: 1.3 LED Indicator — Power on LED (1 s) ▶ Modified: 1.4 Beeper — More barcodes required for Multi-Barcode Editor ▶ Modified: 3.12.3 Code Length Qualification — MSI must include checksum ▶ Modified: 4.6.2 Activate the Concatenation of Barcodes — add description of LED and beeper ▶ Modified: 4.7 Removal of Special Character ▶ Modified: Appendix I Firmware Upgrade ▶ Modified: Appendix II Host Serial Commands
1.06	Mar. 02, 2009	<ul style="list-style-type: none"> ▶ Modified: 3.10 GS1-128 (EAN-128) ▶ Modified: 3.16 GS1 DataBar (RSS Family) ▶ Modified: 3.16.2 GS1 DataBar Omnidirectional (RSS-14) ▶ Modified: 3.16.3 GS1 DataBar Expanded (RSS Expanded) ▶ Modified: 3.16.4 GS1 DataBar Limited (RSS Limited)

1.05	Feb. 11, 2009	<ul style="list-style-type: none"> ▶ Modified: 1.6 Scan Modes — add Alternate Mode to table ▶ New: 1.6.8 Alternate Mode — add setup barcode (100203) ▶ Modified: 1.8 Delay between Re-read — add Alternate Mode
1.04	Dec. 12, 2008	<ul style="list-style-type: none"> ▶ Modified: 4.6 Multi-Barcode Editor — 4-digit length excludes prefix, suffix, length code, etc. ▶ Modified: 5.2.3 Define Data Criteria — Data length includes prefix, suffix, length code, etc.
1.03	Nov. 24, 2008	<ul style="list-style-type: none"> ▶ New: Quick Start — Flowchart ▶ New: 1.3.2 Good Read LED Duration ▶ Modified: 4.6 Multi-Barcode Editor — Reset scan mode to “Laser” ▶ Modified: Host Serial Commands — adds D, E commands
1.02	Sep. 11, 2008	<ul style="list-style-type: none"> ▶ Modified: section 1.10 Auto-Sense Mode — add setup barcodes for improving sensitivity
1.01	July 23, 2008	<ul style="list-style-type: none"> ▶ Modified: section 1.2 Transmit Buffer — the use of transmit buffer is different from memory mode, and the latter is not supported by 1500 scanner!
1.00	May 26, 2008	Initial release

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INTRODUCTION

CipherLab's small-form-factor 1500 Series Barcode Scanners are specifically designed to answer your mobile demands. 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. A new ordering option is provided for adapting a wide angle CCD scan engine to read long barcodes.

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. We recommend you 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!



INSIDE THE PACKAGE

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

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

- ▶ Barcode Scanner: 1500, 1500WA, or 1502
- ▶ Product CD

Note: (1) The CD-ROM includes this manual and Windows-based *ScanMaster* software for configuration, as well as the USB Virtual COM driver.
(2) For model designation, please see the label on the scanner.

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 wide angle scan engine for long barcodes
- ▶ Supports negative barcodes
- ▶ Supports different scan modes, including Aiming Mode and Multi-Barcode Mode
- ▶ User 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 Wand Emulation.
- ▶ Programmable parameters include data output format, editing format, symbologies, etc.



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
Plessey			Disabled
Telepen			Disabled
Code 128	Code 128	Enabled	
	GS1-128 (EAN-128)		Disabled
	ISBT 128	Enabled	

Note: Starting from firmware version 1.10, ISBT 128 is enabled by default.

Code 2 of 5	Industrial 25	Enabled	
	Interleaved 25	Enabled	
	Matrix 25		Disabled
Code 3 of 9	Code 39	Enabled	
	Italian Pharmacode		Disabled
	French Pharmacode		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)		Disabled
	GS1 DataBar Truncated		Disabled
	GS1 DataBar Stacked		Disabled
	GS1 DataBar Stacked Omnidirectional		Disabled
	GS1 DataBar Limited (RSS Limited)		Disabled
	GS1 DataBar Expanded (RSS Expanded)		Disabled
	GS1 DataBar Expanded Stacked		Disabled



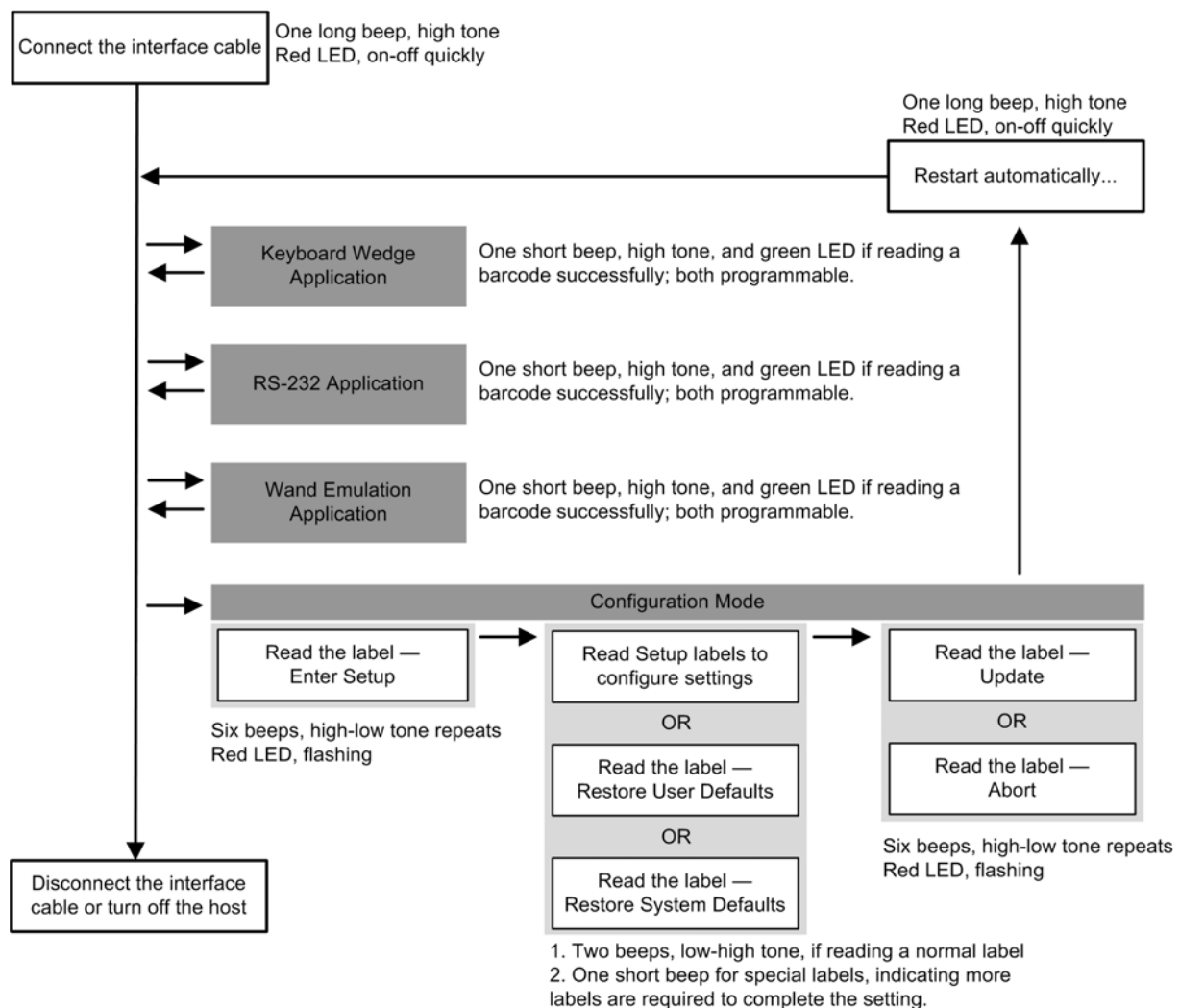
QUICK START

The configuration of the scanner can be done by reading the setup barcodes 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 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](#).



ENTER CONFIGURATION MODE

For the scanner to enter the configuration mode, you must have it read the "Enter Setup" barcode, which can be 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, you must have it read the "Update" barcode, which can be located at the bottom of almost every odd page of this manual. If you want 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



109999

Abort



109998



DEFAULT SETTINGS

SAVE USER SETTINGS AS DEFAULTS

For the scanner to keep the customized settings as user defaults, you must 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



109986

RESTORE USER DEFAULTS

For the scanner to restore the user defaults, which you have saved earlier, you must 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 their customized values.

Restore User
Defaults



109987

RESTORE SYSTEM DEFAULTS

For the scanner to restore the factory defaults, you must 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 their default values.

Restore System
Defaults



109993

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



READ A SETUP BARCODE

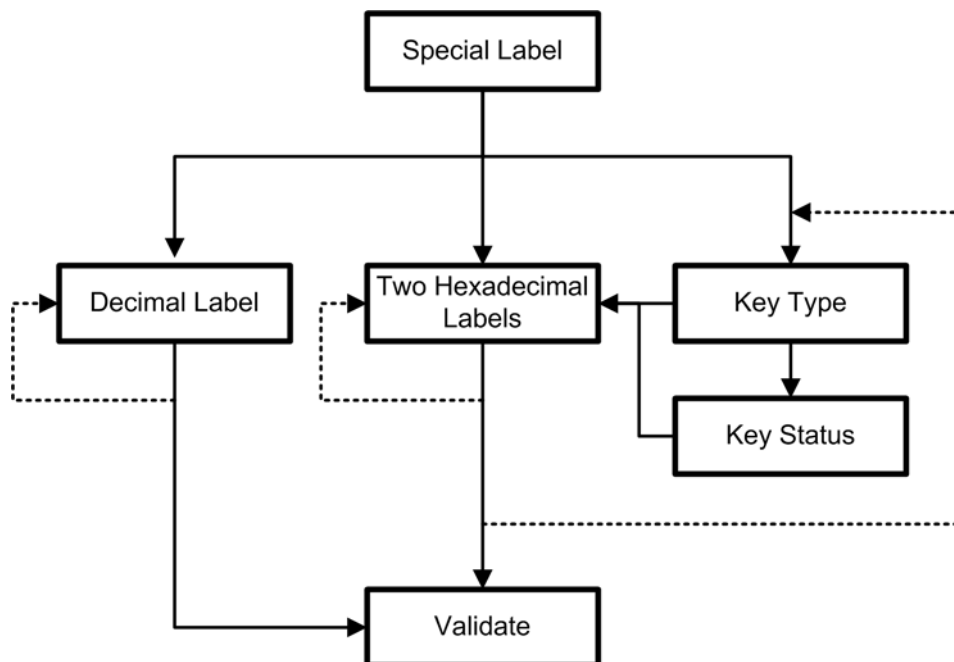
CONFIGURE PARAMETERS

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 to indicate 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" is configured for interface, Key Type and Key Status will then become applicable. You may decide whether or not to change key status when "Normal Key" is selected for Key Type.

To complete the configuration of these special parameters, it requires reading the "Validate" barcode, and the scanner will respond with two beeps (low-high tone) to indicate the input values are validated.


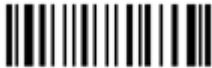








The example below shows how to save your settings as “User Default” so that you may restore user defaults at a later time:

Steps	Action	User 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... <div>Enter Setup </div>	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, <div>*Enable Industrial 25  100307 Save as User Default  109986</div>	The scanner will respond with two beeps (low-high tone) if reading a normal setup barcode.
4	Exit the Configuration Mode... <div>Update  109999</div> OR <div>Abort  109998</div>	Same as for <i>Enter the Configuration Mode</i> .
5	The scanner will automatically restart itself...	Same as for <i>Power on the scanner</i> .
*	When any configuration error occurs...	The scanner will respond with one long beep (low tone).



The example below shows how to set numeric parameters:

Steps	Action	User 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...	The scanner will respond with two beeps (low-high tone) if reading a normal setup barcode.
	For example,	
	<div>Normal setup barcode</div> <div>*Enable Interleaved 25</div>  <div>100309</div>	
	<div>Normal setup barcode</div> <div>Enable Fixed Length(s) ...</div>  <div>100604</div>	
	<div>Special setup barcode</div> <div>Max. Length (*126) Or Fixed Length 1</div>  <div>100606</div>	The scanner will respond with one short beep if reading a special setup barcode such as "Max. Length", indicating the setup requires reading more barcodes.
	<div>Decimal barcodes</div> <div>1</div>  <div>109901</div>	Read the "Decimal Value" barcode(s).
	<div>5</div>  <div>109905</div>	<p>► Refer to Appendix IV "Decimal System"</p>
	<div>Validate</div>  <div>109994</div>	The scanner will respond with two beeps (low-high tone) when the input values are validated.
4	Exit the Configuration Mode...	Same as for <i>Enter the Configuration Mode</i> .
	<div>Update</div>  <div>109999</div> <div>OR</div> <div>Abort</div>  <div>109998</div>	
5	The scanner will automatically restart itself...	Same as for <i>Power on the scanner</i> .



The example below shows how to set string parameters:

Steps	Action	User 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... <div>Enter Setup</div> 	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, <div>Special setup barcodes</div> <div>Configure Prefix</div>  <div>101230</div> <div>*Normal</div>  <div>109926</div> <div>Add Left Alt</div>  <div>109932</div> <div>Hexadecimal barcodes</div> <div>2</div>  <div>109902</div> <div>B</div>  <div>109911</div> <div>Validate</div>  <div>109994</div>	<p>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.</p> <p>When "Keyboard Wedge" is configured for interface, Key Type and Key Status will then become applicable. You may decide whether or not to change key status when "Normal Key" is selected for Key Type.</p> <p>▶ Refer to Appendix III</p> <p>Read the "Hexadecimal Value" barcodes for the desired character string. For example, read "2" and "B" for the scanner to prefix the character "+".</p> <p>▶ Refer to Appendix IV "Hexadecimal System"</p> <p>The scanner will respond with two beeps (low-high tone) when the input values are validated.</p>
4	Exit the Configuration Mode... <div>Update</div>  <div>109999</div> <div>OR</div> <div>Abort</div>  <div>109998</div>	Same as for <i>Enter the Configuration Mode</i> .
5	The scanner will automatically restart itself...	Same as for <i>Power on the scanner</i> .



Update

LIST THE CURRENT SETTINGS

The current settings of all scanner parameters can be sent, via Keyboard Wedge or RS-232, to the host computer for user inspection. The listing includes pages as shown below. You can 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.

List settings regarding Firmware Version, Serial Number, Interface, Buzzer, and Other Scanner Parameters

List Page 1



List settings regarding Prefix, Suffix, and Length Code Setting

List Page 2



List settings regarding Code ID

List Page 3



List settings regarding: Readable Symbolologies

List Page 4



List settings regarding Symbology Parameters (1/3)

List Page 5



List settings regarding Symbology Parameters (2/3)

List Page 6



List settings regarding Symbology Parameters (3/3)

List Page 7



List settings regarding Editing Format 1

List Page 8



List settings regarding Editing Format 2

List Page 9



List settings regarding Editing Format 3

List Page 10



List settings regarding Editing Format 4

List Page 11



109937

List settings regarding Editing Format 5

List Page 12



109938



Update

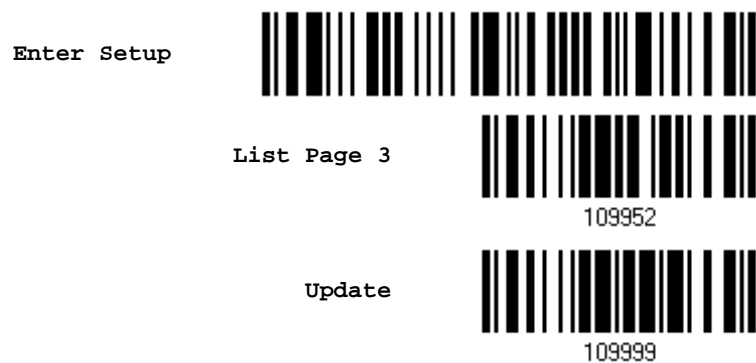
ONE-SCAN SETUP BARCODES

An "One-scan Setup Barcode" does exactly what its name advertises. Scanning one such barcode gets the setting done while saves the hassle of **Enter Setup** and **Update** barcodes scanning. Most setting parameters are supported by One-scan Setup.

To create an "One-scan Setup Barcode":

- ▶ prefixing the setting parameter with "#@" characters
- ▶ suffixing the setting parameter with "#" character

By the example of the setting parameter 109952, the scanner originally needs reading three barcodes to get it set:



With One-scan Setup Barcode #@109952#, setting is done with one scan.

One-Scan Setup Barcode
for 109952



Note: If the scanner reads an Once-scan Setup Barcode that changes the interface, it automatically restarts and sounds a long beep upon scanning, and the LED lights on red and shortly off.



UNDERSTANDING THE BARCODE SCANNER

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

IN THIS CHAPTER

1.1 Power	15
1.2 Transmit Buffer	15
1.3 LED Indicator	16
1.4 Beeper	17
1.5 Send "NR" to Host	19
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1.9 Read Redundancy for All Symbologies	27
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1.13 Effective Decoding Area	31

1.1 POWER

Connect the interface cable between the scanner and your computer.

- ▶ If using the RS-232 cable, you must join the power supply cord 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. However, the host computer may not receive the data immediately if using a low baud rate or waiting for handshake signal (flow control). With the 4 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 4 KB transmit buffer on the scanner can hold as many as 256 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!



1.3 LED INDICATOR

The dual-color LED on top of the scanner is used to provide user feedback. For example, the LED becomes solid red and goes off quickly upon powering on or running out of transmit buffer. You may 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	---	<ul style="list-style-type: none"> ▶ Power on, with one long beep (high tone, LED on for 1 second) ▶ Transmit buffer full, with one long beep (low tone) ▶ RS-232 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 157. For example, read "1" and "5" for the Good Read LED to go off after 150 milliseconds.
- 3) Read the "Validate" barcode on the same page to complete this setting.




1.4 BEEPER

The scanner has a buzzer to provide user feedback in 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 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	
	101009
Minimum Volume	
	101010
Medium Volume	
	101011
*Maximum Volume	
	101012



1.4.2 GOOD READ BEEP

Frequency

8 kHz



*4 kHz



2 kHz



1 kHz



Duration

*Shortest



Shorter



Longer



Longest



1.5 SEND "NR" TO HOST

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

Enable



100267

***Disable**



100266



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.

Scan Mode	Start to Scan				Stop Scanning			
	Always	Press trigger once	Hold trigger	Press trigger twice	Release trigger	Press trigger once	Barcode being read	Timeout
Continuous mode	✓							
Test mode	✓							
Laser mode			✓		✓		✓	✓
Auto Off mode		✓					✓	✓
Auto Power Off mode		✓						✓
Alternate mode		✓				✓		
Aiming mode				✓			✓	✓
Multi-Barcode mode			✓		✓			

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



1.6.1 CONTINUOUS MODE

The scanner is always scanning.

- ▶ After a successful decoding, the removal of barcode is required. It is not allowed to proceed to decode until the decoding delay time has passed.
- ▶ To decode the same barcode repeatedly, move away the barcode and put it back again and again for scanning.

Note: Refer to "Delay between Re-read".

Continuous Mode



Decoding Delay

Set the time interval between each decoding.

*Disable



0.5 sec



1 sec



2 sec



1.6.2 TEST MODE

The scanner is always scanning.

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

Test Mode



1.6.3 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) you release the trigger.

Note: Refer to "Scanning Timeout".

*Laser Mode



1.6.4 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 "Scanning Timeout".

Auto Off Mode



1.6.5 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 "Delay between Re-read" and "Scanning Timeout".

Auto Power Off Mode



1.6.6 ALTERNATE MODE

The scanner will start scanning once the trigger is pressed

- ▶ The scanning won't stop until you press the trigger again.

Alternate Mode



1.6.7 AIMING MODE

The scanner will aim at a barcode once the trigger is pressed, and start scanning when the trigger is pressed again within one second.

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

Aiming Mode



Aiming Timeout

You can 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 157. 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.



1.6.8 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.

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

Multi-Barcode Mode



100209

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](#).



1.7 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

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



100235

- 1) Read the barcode above to specify the time interval before the scan engine times out.
- 2) Read the "[Decimal Value](#)" barcode on page 157. 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 –

- ▶ Continuous mode
- ▶ Auto Power Off mode
- ▶ Alternate mode

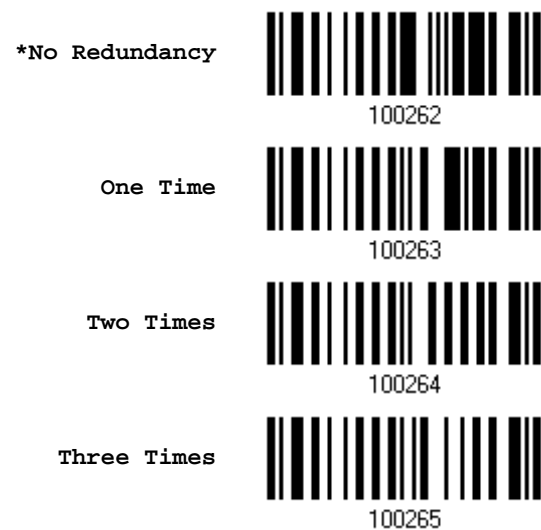


1.9 READ REDUNDANCY FOR ALL SYMBLOGIES

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 you select, the higher the reading security is, and thus, the slower the reading speed becomes. You will have to compromise between reading security and decoding speed.



1.10 ADDON SECURITY FOR UPC/EAN BARCODES

The scanner is capable of decoding a mix of UPC/EAN barcodes with and without addons. The read redundancy (0~30 times) allows changing the number of times to decode a UPC/EAN barcode before transmission. The more redundancy you select, the higher the reading security is, and thus, the slower the reading speed becomes. You 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
(*0~30)



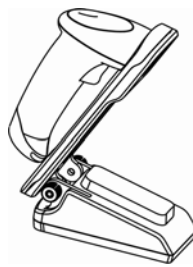
- 1) Read the barcode above to specify the read redundancy for UPC/EAN barcodes. (It is set to 0 by default.)
- 2) Read the "[Decimal Value](#)" barcode on page 157. For example, read "1" and "2" for the scanner to re-read the barcode for 12 times.
- 3) Read the "Validate" barcode on the same page to complete this setting.



1.11 AUTO-SENSE MODE (1500 ONLY)

This mode is only available when you want to seat the scanner in the Auto-Sense Stand. When you enable this mode, it will force the scanner to apply Laser mode as the scan mode. However, it works slightly different from the original Laser mode. Now the scanner will be expecting barcodes as long as it is seated in the Auto-Sense Stand, as shown below. Whenever a barcode is brought within range, the scanner will be able to decode it.

Note: Auto-sense can only be enabled for CCD scanner and will force it to Laser mode. To stop this mode, you may remove the scanner from the stand or have the scanner read the “Disable (Auto-Sense)” barcode below. It will return to Laser mode. If Laser mode is not desired, proceed to select a scan mode best suits your application.



Enable



100271

***Disable**



100270

When the ambient light is too dim to activate the sensor, you may have the scanner read the “High Sensitivity” barcode to improve performance. Starting from firmware version 1.12, it will emit scan beam every 300 milliseconds when “High Sensitivity” is enabled.

High Sensitivity



101469

***Normal**



101468

Note: If the ambient light is under 100 lux, we suggest that you either add lighting or use Continuous mode instead.



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. You can configure the scanner to be able to read negative barcodes.

Enable



100225

***Disable**



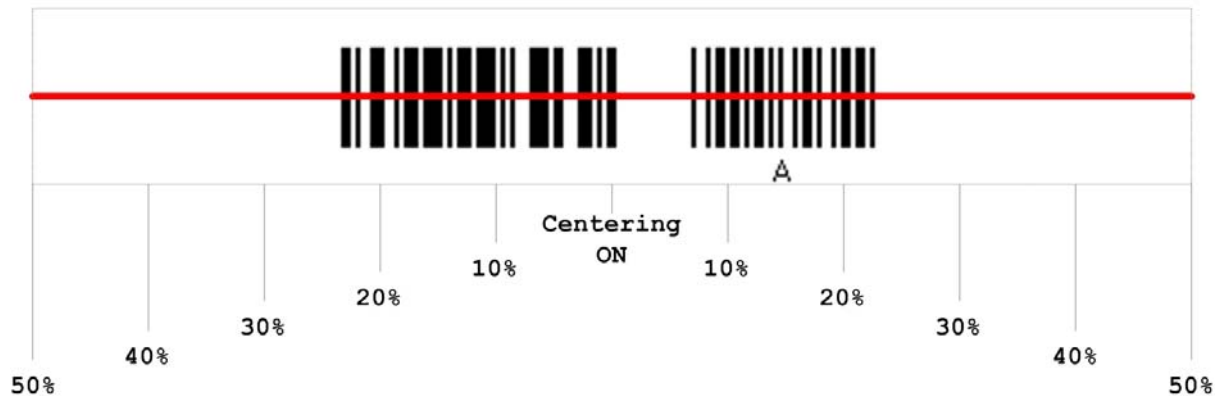
100224



1.13 EFFECTIVE DECODING AREA

By default, the effective decoding area is 100% covered by the scanned area. However, you may narrow down the decoding area to prevent reading the wrong barcode when a number of barcodes are printed closely. The scanner will only read barcodes that appear in the effective decoding area.

Read the barcode "Centering On" and specify the percentage to narrow down the decoding area. For example, read "Left 10%" and then "Right 30%" for the scanner to decode barcode "A" only.



1.13.1 POSITIONING WINDOW

Centering On








*Centering Off




1.13.2 ADJUSTING WINDOW

Percentage for Left Half

*Left 50%	 100280
Left 40%	 100281
Left 30%	 100282
Left 20%	 100283
Left 10%	 100284

Percentage for Right Half

Right 10%	 100288
Right 20%	 100289
Right 30%	 100290
Right 40%	 100291
*Right 50%	 100292



SELECTING OUTPUT INTERFACE

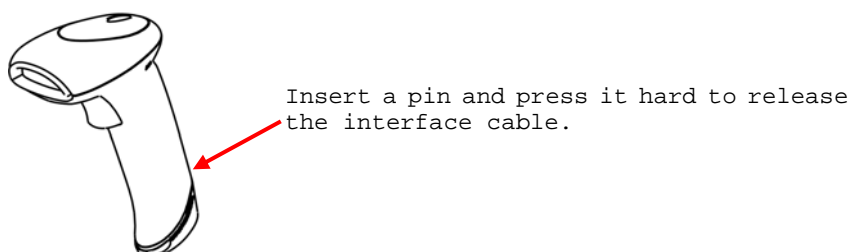
In order to establish a proper connection between your computer and the scanner, we suggest that you follow these instructions –

- 1) Connect the interface cable between the scanner and your computer.
 - ▶ If using the RS-232 cable, join the power supply cord.
- 2) Have the scanner read the “Enter Setup” barcode to enter the configuration mode.
- 3) Have the scanner read the associated barcode to activate the desired interface.

See the following sections for output interfaces supported.

- ▶ If you are connecting the scanner to the USB port of the host computer via USB HID cable (part # 307), refer to [2.1 Keyboard Wedge](#) for related settings.
 - ▶ If you are connecting the scanner to the USB port of the host computer via USB Virtual COM cable (part # 308), refer to [2.2 RS-232](#) related settings.
 - ▶ If you are connecting the scanner to the IBM POS 4683/4694 via the converter cable (part # 346), refer to [2.1 Keyboard Wedge](#) for related settings.
- 4) Have the scanner read the barcodes for related settings.
 - 5) Have the scanner read the “Update” barcode to exit the configuration mode.

Note: By default, the output interface is set to “Keyboard Wedge”.



IN THIS CHAPTER

2.1 Keyboard Wedge	34
2.2 RS-232	45
2.3 Wand Emulation	50



2.1 KEYBOARD WEDGE

The Y cable allows you to connect the scanner to the keyboard input port of PC and you may join 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
Alternate Composing	No
Laptop Support	Disable
Inter-Character Delay	0 (ms)
Inter-Function Delay	0 (ms)



2.1.1 ACTIVATE KEYBOARD WEDGE & SELECT KEYBOARD TYPE

Once Keyboard Wedge interface is activated, a keyboard type must be selected to complete the setting.

Activate Keyboard
Wedge & Select
Keyboard Type...



- 1) Read the aforelisted barcode to activate Keyboard Wedge.
- 2) Read the "[Decimal Value](#)" barcode on page 157 to select the keyboard type. Refer to the table below for the corresponding number
- 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)	18	PS55 001-3
2	PCAT (French)	19	PS55 001-8A
3	PCAT (German)	20	PS55 002-1, 003-1
4	PCAT (Italian)	21	PS55 002-81, 003-81
5	PCAT (Swedish)	22	PS55 002-2, 003-2
6	PCAT (Norwegian)	23	PS55 002-82, 003-82
7	PCAT (UK)	24	PS55 002-3, 003-3
8	PCAT (Belgium)	25	PS55 002-8A, 003-8A
9	PCAT (Spanish)	26	IBM 3477 Type 4 (Japanese)
10	PCAT (Portuguese)	27	PS2-30
11	PS55 A01-1	28	IBM 34XX/319X, Memorex Telex 122 Keys
12	PS55 A01-2 (Japanese)	29	User-defined table
13	PS55 A01-3	30	PCAT (Turkish)
14	PS55 001-1	31	PCAT (Hungarian)
15	PS55 001-81	32	PCAT (Swiss)
16	PS55 001-2	33	PCAT (Danish)
17	PS55 001-82		



2.1.2 KEYBOARD SETTINGS

- ▶ Alphabets Layout
- ▶ Digits Layout
- ▶ Capital Lock Type
- ▶ Capital Lock Setting
- ▶ Alphabets Transmission
- ▶ Digits 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.

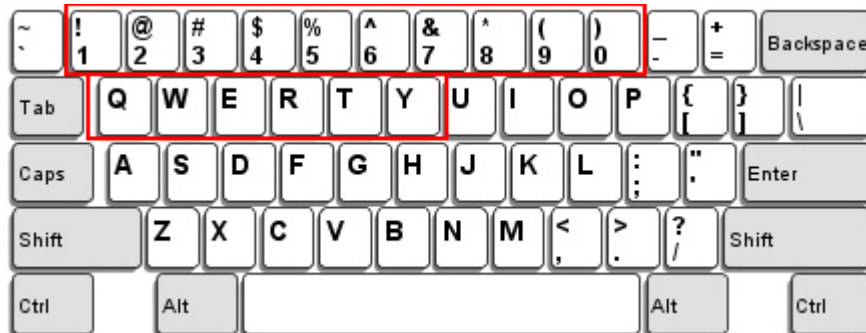


Note: This setting only works when the keyboard type selected is US keyboard, such as PCAT (US). The Alphabets Layout and Digits Layout setting must match your keyboard.



US Keyboard Style – Normal

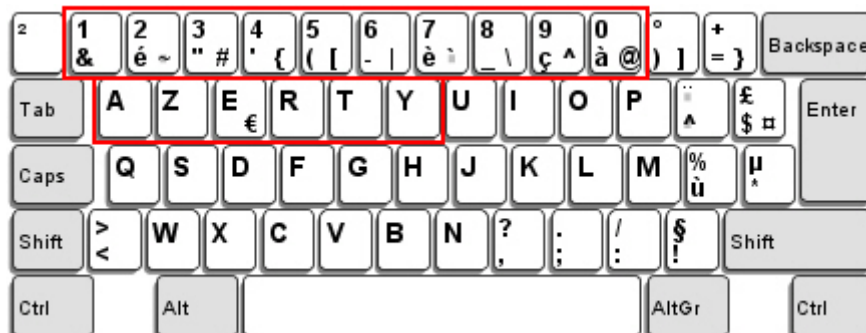
QWERTY layout, which is normally used in western countries.



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

French Keyboard Style – AZERTY

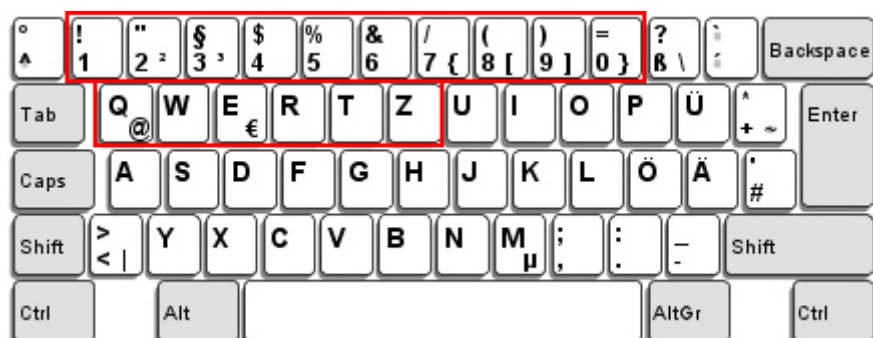
French layout; see below for French Keyboard Style.



- ▶ 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.



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 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.



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



*Capital Lock OFF



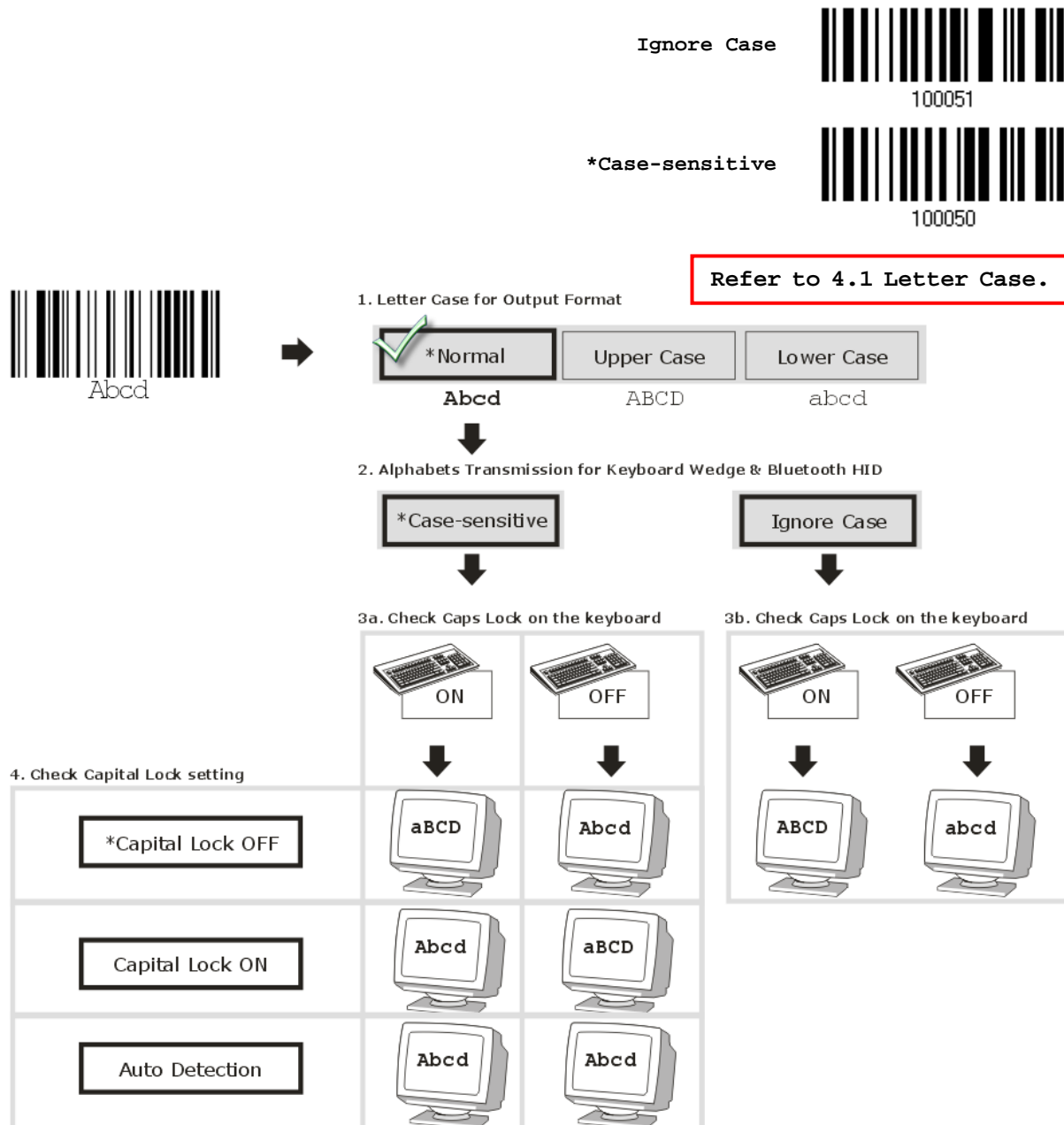
100052



Enter Setup

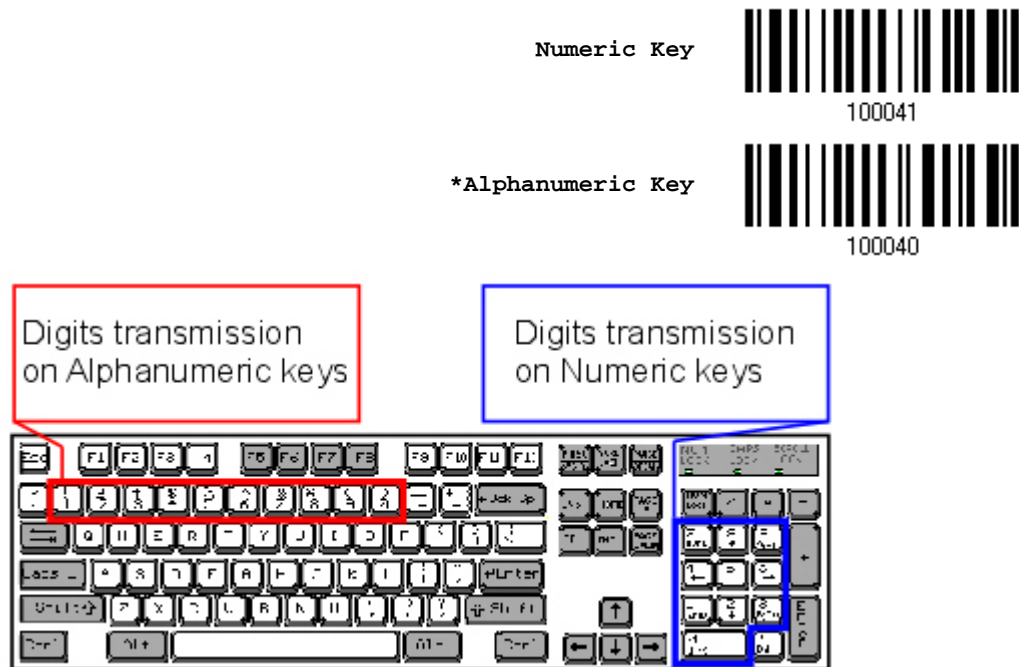
Alphabets Transmission

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.



Digits Transmission

By default, the alphanumeric keypad is used for transmitting digits. Select "Numeric Keypad" if you wish to use the keys on the numeric keypad.



Note: If you select "Numeric Keypad", the Num Lock status of the physical keyboard should be "ON".



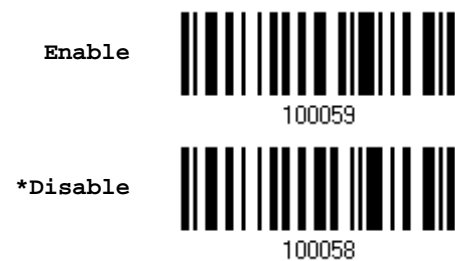
ALT Composing

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.



Laptop Support

By default, laptop support is disabled. It is suggested to enable this feature if you connect the wedge cable to a laptop without an external keyboard being inter-connected.



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)



- 1) Read the barcode above to specify the inter-character delay.
- 2) Read the "[Decimal Value](#)" barcode on page 157 for the desired inter-character delay (millisecond).
- 3) Read the "Validate" barcode on the same page to complete this setting.

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 157 for the desired inter-function delay (millisecond).
- 3) Read the "Validate" barcode on the same page to complete this setting.



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	9600 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



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



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**



100094

Scanner Ready



100095

Data Ready



100096

Invert Data Ready



100097



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 157 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 157 for the desired inter-function delay (millisecond).
- 3) Read the "Validate" barcode on the same page to complete this setting.



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)



100013

- 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 157. 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



100015

*Disable Error Beep



100014

Note: We suggest enabling the error beep so that you will be notified of such data loss and have the scanner re-read data.



2.3 WAND EMULATION

The wand emulation cable allows you to connect the scanner to a data terminal that is expecting input from a wand scanner.

Wand Emulation Settings	Defaults
Normal State	Low
Bar State	High
Module Time	1 (ms)
Margin Time	20 (ms)
Output Format	Normal Output

2.3.1 ACTIVATE WAND EMULATION

Activate
Wand Emulation



2.3.2 NORMAL STATE

By default, the signal level is set to "Low" for the normal state when not transmitting any barcode image (= white spaces in a barcode).

High



*Low



2.3.3 BAR STATE

By default, the signal level is set to "High" for a bar when transmitting a barcode image (= dark bars in a barcode).

*High

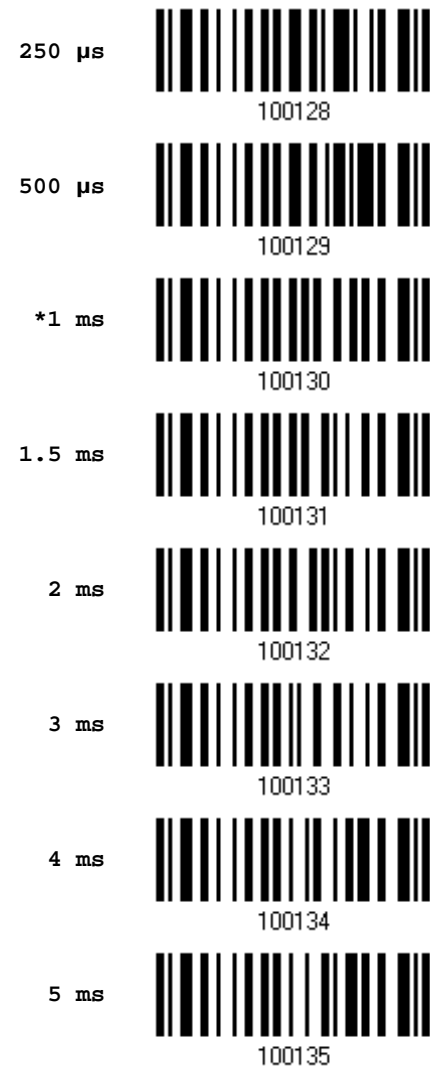


Low



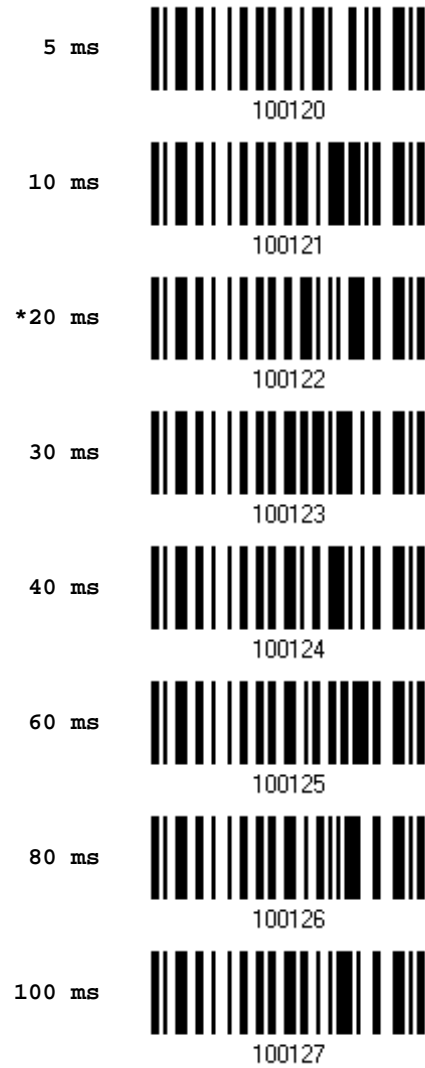
2.3.4 MODULE TIME

By default, it is set to 1 millisecond as the time span for bar and space modules. Select other value for the module time, in units of micro-second or millisecond.



2.3.5 MARGIN TIME

By default, it is set 20 milliseconds as the time span for the change in state for bar and space modules. Select other value for the margin time.



Note: Margin Time is applied only when the signal level for Normal State and Bar State is the same.



2.3.6 OUTPUT FORMAT

By default, the output format is set to "Normal Output" to send data to the terminal in the format of the scanned barcodes, except for GS1 DataBar. By scanning the Code 128 Output barcode below, users can determine all scanned barcodes to be send to the data terminal in the format of Code 128.

*Normal Output



Code 128 Output





CHANGING SYMBOLOGY SETTINGS

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

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3.1 CODABAR

***Enable**



100313

Disable



100312

3.1.1 SECURITY LEVEL

Security Level renders more decoding accuracy giving consideration to barcodes' print quality. The scanner allows you to change the CODABAR security level between high or normal level.

*** High**



100490

Normal



100491

3.1.2 START/STOP CHARACTERS SELECTION

Select one of the four different start/stop character pairs –

*** abcd/abcd**



100436

abcd/tn*e



100437

ABCD/ABCD



100438

ABCD/TN*E



100439



3.1.3 START/STOP TRANSMISSION

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

Transmit Start/Stop Characters


100441


*Do Not Transmit


100440


3.1.4 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


100443

*Do Not Apply


100442

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

3.2 CODE 25 – INDUSTRIAL 25

***Enable**



Disable



3.2.1 SELECT START/STOP PATTERN

This decides the readability of all 2 of 5 symbology variants. For example, flight tickets actually use an Industrial 2 of 5 barcode but with Interleaved 2 of 5 start/stop pattern. In order to read this barcode, the start/stop pattern selection parameter of Industrial 2 of 5 should set to "Interleaved 25".

***Industrial 25
Start/Stop Pattern**



**Interleaved 25
Start/Stop Pattern**



**Matrix 25
Start/Stop Pattern**



3.2.2 VERIFY CHECK DIGIT

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

Verify Industrial 25
Check Digit



100425

*Do Not Verify



100424

3.2.3 TRANSMIT CHECK DIGIT

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

*Transmit
Industrial 25
Check Digit



100427

Do Not Transmit



100426



3.2.4 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.

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

*Enable Max./Min.
Length (0~127)...



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 (*127) or
Fixed Length 1



Min. Length (*4) or
Fixed Length 2



- 3) Read the "[Decimal Value](#)" barcode on page 157 for the desired length.
- 4) Read the "Validate" barcode on the same page to complete this setting.



3.3 CODE 25 – INTERLEAVED 25

***Enable**



100309

Disable



100308

3.3.1 SELECT START/STOP PATTERN

This decides the readability of all 2 of 5 symbology variants. For example, flight tickets actually use an Industrial 2 of 5 barcode but with Interleaved 2 of 5 start/stop pattern. In order to read this barcode, the start/stop pattern selection parameter of Industrial 2 of 5 should be set to "Interleaved 25".

**Industrial 25
Start/Stop Pattern**



100416

***Interleaved 25
Start/Stop Pattern**



100417

**Matrix 25
Start/Stop Pattern**



100418



3.3.2 VERIFY CHECK DIGIT

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

Verify
Interleaved 25
Check Digit



*Do Not Verify



3.3.3 TRANSMIT CHECK DIGIT

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

*Transmit
Interleaved 25
Check Digit



Do Not Transmit



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.

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

*Enable Max./Min.
Length (0~127)...



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 (*126) or
Fixed Length 1



Min. Length (*4) or
Fixed Length 2



- 3) Read the "[Decimal Value](#)" barcode on page 157 for the desired length.
- 4) Read the "Validate" barcode on the same page to complete this setting.



3.4 CODE 25 – MATRIX 25

Enable



100311

*Disable



100310

3.4.1 SELECT START/STOP PATTERN

This decides the readability of all 2 of 5 symbology variants. For example, flight tickets actually use an Industrial 2 of 5 barcode but with Interleaved 2 of 5 start/stop pattern. In order to read this barcode, the start/stop pattern selection parameter of Industrial 2 of 5 should set to "Interleaved 25".

Industrial 25
Start/Stop Pattern



100420

Interleaved 25
Start/Stop Pattern



100421

*Matrix 25
Start/Stop Pattern

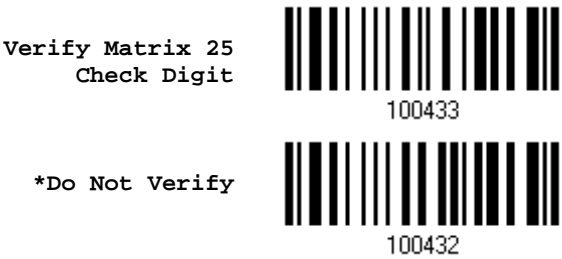


100422



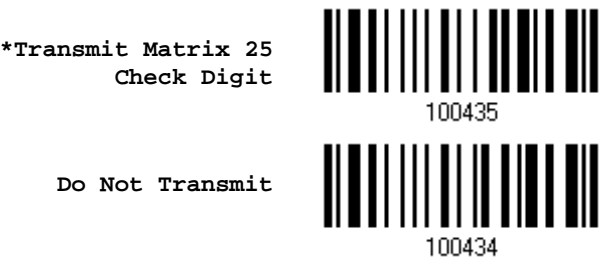
3.4.2 VERIFY CHECK DIGIT

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



3.4.3 TRANSMIT CHECK DIGIT

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



3.4.4 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.

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

*Enable Max./Min.
Length (0~127)...



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 (*127) or
Fixed Length 1



Min. Length (*4) or
Fixed Length 2



- 3) Read the "[Decimal Value](#)" barcode on page 157 for the desired length.
- 4) Read the "Validate" barcode on the same page to complete this setting.



3.5 CODE 39

***Enable**



100301

Disable



100300

3.5.1 TRANSMIT START/STOP CHARACTERS

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

**Transmit Code 39
Start/Stop
Characters**



100403

***Do Not Transmit**



100402

3.5.2 VERIFY CHECK DIGIT

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

**Verify Code 39
Check Digit**



100405

***Do Not Verify**



100404



3.5.3 TRANSMIT CHECK DIGIT

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

*Transmit Code 39
Check Digit



Do Not Transmit



3.5.4 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



3.5.5 SECURITY LEVEL

Security Level renders more decoding accuracy giving consideration to barcodes' print quality. Decide the security level for reading Code 39 barcodes.

*High



Normal



3.6 CODE 93

***Enable**



Disable



3.7 CODE 128

***Enable**



Disable



3.7.1 SECURITY LEVEL

Security Level renders more decoding accuracy giving consideration to barcodes' print quality. Decide the security level for reading Code 128 barcodes.

***High**



Normal



3.8 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



3.8.1 CONVERT TO EAN-13

Decide whether to expand the read EAN-8 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 EAN-8 to
EAN-13



*Do Not Convert



3.8.2 TRANSMIT CHECK DIGIT

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

*Transmit EAN-8
Check Digit



Do Not Transmit



3.8.3 CONVERSION FORMAT

When converting EAN-8 to EAN-13, you can scan the barcode below to decide conversion in default or GTIN-13 format.

*Default Format



GTIN-13 Format



3.9 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**



3.9.1 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



3.9.2 CONVERT TO ISSN

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

Convert EAN-13 to
ISSN



*Do Not Convert



3.9.3 TRANSMIT CHECK DIGIT

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

*Transmit EAN-13
Check Digit

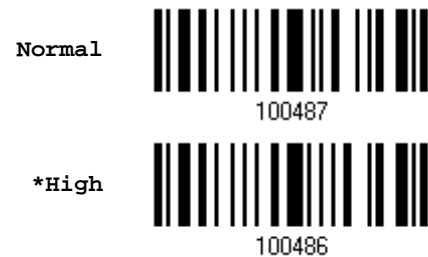


Do Not Transmit



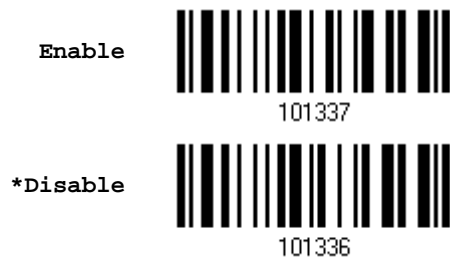
3.9.4 SECURITY LEVEL

Security Level renders more decoding accuracy giving consideration to barcodes' print quality. Decide the security level for reading EAN-13 barcodes.



3.9.5 EAN-13 ADDON MODE (1500 ONLY)

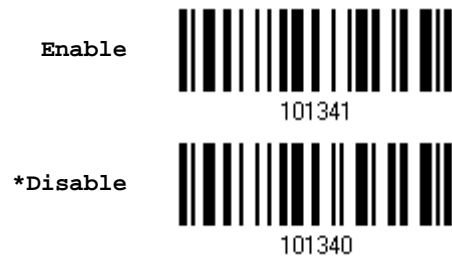
With this EAN-13 Addon Mode enabled, the scanned barcode that begins with 414/419/434/439 is supposed to come with its addons. Otherwise, the reading process fails.



With this EAN-13 Addon Mode enabled, the scanned barcode that begins with 378/379 is supposed to come with its addons. Otherwise, the reading process fails.



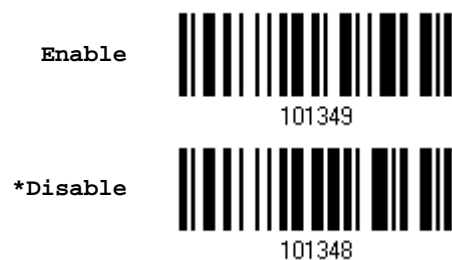
With this EAN-13 Addon Mode enabled, the scanned barcode that begins with 977 is supposed to come with its addons. Otherwise, the reading process fails.



With this EAN-13 Addon Mode enabled, the scanned barcode that begins with 978 is supposed to come with its addons. Otherwise, the reading process fails.



With this EAN-13 Addon Mode enabled, the scanned barcode that begins with 529 is supposed to come with its addons. Otherwise, the reading process fails.



3.9.6 EAN-13 ADDON MODE BUZZER (1500 ONLY)

Decide whether to enable the scanner to sound two descending beeps if the reading process of EAN-13 Addon Mode fails.

Enable



101335

*Disable



101334



3.10 GS1-128 (EAN-128)

***Enable**



101341

Disable



101340

Note: When this setting is disabled, GS1-128 barcodes used to be taken as Code 128. However, starting from firmware version 1.10, GS1-128 barcodes can be decoded only when this setting is enabled.

3.10.1 TRANSMIT CODE ID

Decide whether to include the Code ID ("1C1") in the data being transmitted.

Transmit Code ID



100519

***Do Not Transmit**



100518

3.10.2 FIELD SEPARATOR (GS CHARACTER)

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

**Enable Field
Separator...**



100616

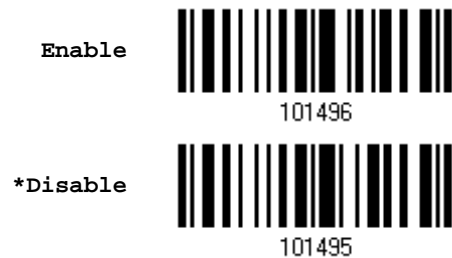
- 1) Read the barcode above to enable field separator.
- 2) Read the "[Hexadecimal Value](#)" barcode on page 158 for the desired character string.
- 3) Read the "Validate" barcode to complete this setting.

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.



3.10.3 GS1 FORMATTING

Decide whether to enable GS1 formatting for GS1-128.



3.10.4 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.



- 1) Read the barcode above to add a mark to the left (AIMark1)/right (AIMark2) of an application ID.
- 2) Read the [“Hexadecimal Value”](#) barcode on page 158 for the desired character. Read ‘00’ if you want to remove the AI mark.
- 3) Read the “Validate” barcode to complete this setting.



3.11 ISBT 128

***Enable**



Disable



3.11.1 ISBT CONCATENATION

Decide whether to decode and concatenate pairs of 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.

▶ **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.

▶ **Disable ISBT Concatenation**

It will not concatenate pairs of ISBT barcodes it encounters.

***Auto-discriminate**



Enable



Disable



3.12 MSI

Enable



100345

*Disable



100344

3.12.1 VERIFY CHECK DIGIT

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

*Single Modulo 10



100448

Double Modulo 10



100449

Modulo 10 & 11



100450

3.12.2 TRANSMIT CHECK DIGIT

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

*Last Digit Not
Transmitted



100452

Both Digits
Transmitted



100453

Both Digits
Not Transmitted



100454



3.12.3 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.

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

*Enable Max./Min.
Length (0~127)...



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 (*127) or
Fixed Length 1



Min. Length (*4) or
Fixed Length 2



- 3) Read the "[Decimal Value](#)" barcode on page 157 for the desired length.
- 4) Read the "Validate" barcode on the same page to complete this setting.



3.13 FRENCH PHARMACODE

Enable



100305

*Disable



100304

3.13.1 TRANSMIT CHECK DIGIT

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

*Transmit
French Pharmacode
Check Digit



100411

Do Not Transmit



100410



3.14 ITALIAN PHARMACODE

Enable



100303

*Disable



100302

3.14.1 TRANSMIT CHECK DIGIT

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

*Transmit
Italian Pharmacode
Check Digit



100409

Do Not Transmit



100408



3.15 PLESSEY

Enable



100347

*Disable



100346

3.15.1 CONVERT TO UK PLESSEY

Decide whether to change each occurrence of the character 'A' to character 'X' in the decoded data.

Convert to UK Plessey



100447

*Do Not Convert



100446

3.15.2 TRANSMIT CHECK DIGIT

Decide whether to include the two check digits in the data being transmitted.

*Transmit Plessey
Check Digits



100445

Do Not Transmit



100444



3.16 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

3.16.1 SELECT CODE ID

Select a desired Code ID to use:

- ▶ "]e0" (GS1 DataBar Code ID)
- ▶ "]c1" (GS1-128 Code ID)

Use "]c1"



100517

*Use "]e0"



100516



3.16.2 GS1 DATABAR OMNIDIRECTIONAL (RSS-14)

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



*Disable



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



Do Not Transmit



Transmit Application ID

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

*Transmit RSS-14
Application ID



Do Not Transmit



Transmit Check Digit

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

*Transmit RSS-14
Check Digit



Do Not Transmit



3.16.3 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



3.16.4 GS1 DATABAR LIMITED (RSS LIMITED)

Enable RSS Limited
(Group III)



100351

*Disable



100350

Transmit Code ID

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

*Transmit
RSS Limited Code ID



100525

Do Not Transmit



100524

Transmit Application ID

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

*Transmit
RSS Limited
Application ID



100531

Do Not Transmit



100530

Transmit Check Digit

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

*Transmit
RSS Limited
Check Digit



100483

Do Not Transmit



100482



3.16.5 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 Value](#)" barcode on page 158 for the desired character string.
- 3) Read the "Validate" barcode to complete this setting.

3.16.6 GS1 FORMATTING

Decide whether to enable GS1 formatting for GS1 DataBar (RSS family).

Enable



*Disable



3.16.7 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 Value](#)" barcode on page 158 for the desired character. Read '00' if you want to remove the AI mark.
- 3) Read the "Validate" barcode to complete this setting.



3.17 TELEPEN

Enable Telepen



100353

*Disable



100352

3.17.1 TELEPEN OUTPUT – FULL ASCII/NUMERIC

Decide whether to support Telepen in full ASCII code. By default, it supports ASCII mode.

- ▶ AIM Telepen (Full ASCII) includes all the alphanumeric and special characters.

Original Telepen
(Numeric)



100485

*AIM Telepen



100484



3.18 UPC-A

UPC-A

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



100339

Disable



100338

UPC-A Addon 2

Enable UPC-A Addon 2



100341

***Disable**



100340

UPC-A Addon 5

Enable UPC-A Addon 5



100343

***Disable**



100342



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



100459

*Do Not Convert



100458

3.18.2 TRANSMIT SYSTEM NUMBER

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

*Transmit UPC-A
System Number



100477

Do Not Transmit



100476

3.18.3 TRANSMIT CHECK DIGIT

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

*Transmit UPC-A
Check Digit



100469

Do Not Transmit



100468



3.19 UPC-E

UPC-E

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



Disable



UPC-E Addon 2

Enable UPC-E Addon 2



***Disable**



UPC-E Addon 5

Enable UPC-E Addon 5



***Disable**



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



100479

*System Number 0 Only



100478

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



100457

*Do Not Convert



100456



3.19.3 TRANSMIT SYSTEM NUMBER

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

Transmit UPC-E
System Number



*Do Not Transmit



3.19.4 TRANSMIT CHECK DIGIT

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

*Transmit UPC-E
Check Digit



Do Not Transmit



DEFINING OUTPUT FORMAT

You may configure in which format the collected data will be output to the host computer. Barcode 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]


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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


101202

Upper Case


101203

Lower Case


101204

4.2 CHARACTER SUBSTITUTION

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

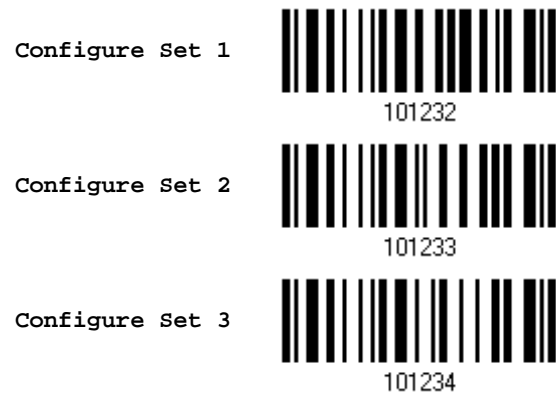
- ▶ The first character will be replaced by the second character(s).
- ▶ Up to three sets of character substitution can be configured.
- ▶ If “Keyboard Wedge” is configured for interface, [Key Type](#) and [Key Status](#) will then become applicable. You may decide whether or not to apply Key Status when “Normal Key” is selected for Key Type.

Key Type		Key Status
Scan Code	Only 1 scan code value is allowed. Refer to 4.2.1 Select a Set for Character Substitution .	N/A
Normal Key	Up to 3 character strings are allowed.	<ul style="list-style-type: none">▶ 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.



4.2.1 SELECT A SET FOR CHARACTER SUBSTITUTION



- 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 158 for the desired character substitution. 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

If you want to 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

If you want to 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.)



4.2.2 SYBBOLOGIES 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**



101253

Do Not Apply



101252

Character Substitution for Code 39

***Apply**



101241

Do Not Apply



101240

Character Substitution for Code 93

***Apply**



101255

Do Not Apply



101254

Character Substitution for Code 128

***Apply**



101257


Do Not Apply



101256



Character Substitution for GS1-128

*Apply	 101259
Do Not Apply	 101258

Character Substitution for ISBT 128

*Apply	 101293
Do Not Apply	 101292

Character Substitution for EAN-8 (No Addon)

*Apply	 101267
Do Not Apply	 101266

Character Substitution for EAN-8 Addon 2

*Apply	 101269
Do Not Apply	 101268

Character Substitution for EAN-8 Addon 5

*Apply	 101271
Do Not Apply	 101270



Character Substitution for EAN-13 (No Addon)

*Apply	 101273
Do Not Apply	 101272

Character Substitution for EAN-13 Addon 2

*Apply	 101275
Do Not Apply	 101274

Character Substitution for EAN-13 Addon 5

*Apply	 101277
Do Not Apply	 101276

Character Substitution for French Pharmacode

*Apply	 101245
Do Not Apply	 101244

Character Substitution for Italian Pharmacode

*Apply	 101243
Do Not Apply	 101242



Character Substitution for Industrial 25

*Apply	
	101247
Do Not Apply	
	101246

Character Substitution for Interleaved 25

*Apply	
	101249
Do Not Apply	
	101248

Character Substitution for Matrix 25

*Apply	
	101251
Do Not Apply	
	101250

Character Substitution for MSI

*Apply	
	101285
Do Not Apply	
	101284

Character Substitution for Plessey

*Apply	
	101287
Do Not Apply	
	101286



Character Substitution for GS1 DataBar

*Apply	
	101291
Do Not Apply	
	101290

Character Substitution for Telepen

*Apply	
	101289
Do Not Apply	
	101288

Character Substitution for UPC-A (No Addon)

*Apply	
	101279
Do Not Apply	
	101278

Character Substitution for UPC-A Addon 2


*Apply	
	101281
Do Not Apply	
	101280

Character Substitution for UPC-A Addon 5

*Apply	
	101283
Do Not Apply	
	101282



Character Substitution for UPC-E (No Addon)

*Apply	 101261
Do Not Apply	 101260

Character Substitution for UPC-E Addon 2

*Apply	 101263
Do Not Apply	 101262

Character Substitution for UPC-E Addon 5

*Apply	 101265
Do Not Apply	 101264



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" 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 4 scan code values are allowed.	N/A
Normal Key	Up to 8 character strings are allowed.	<ul style="list-style-type: none"> ▶ 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 158 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.



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 that you can select one and make necessary changes on it.

- ▶ If "Keyboard Wedge" 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	Only 1 scan code value is allowed.	N/A
Normal Key	Up to 2 character strings are allowed.	<ul style="list-style-type: none"> ▶ 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



Code ID options	Set 1	Set 2	Set 3	Set 4	Set 5
Code 39	A	C	Y	M	A
Italian Pharmacode	A	C	Y	M	A
French 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
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
Plessey	W	W	E	Q	P
Telepen	Z	---	---	---	---



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 158 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
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
French Pharmacode



101452

Configure Code ID for
Italian Pharmacode



101451

Configure Code ID for
Industrial 25



101453



Configure Code ID for
Interleaved 25



101454

Configure Code ID for
Matrix 25



101455

Configure Code ID for
MSI



101463

Configure Code ID for
Plessey



101464

Configure Code ID for
Telepen



101465

Configure Code ID for
UPC-A



101462

Configure Code ID for
UPC-E



101459

4.4.3 CLEAR CODE ID SETTINGS

Clear All Code ID
Settings



109960



4.5 LENGTH CODE

A two-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 Code 93

Apply



*Do Not Apply



Length Code for Code 128

Apply



*Do Not Apply



Length Code for GS1-128 & GS1 DataBar

Apply



101419

*Do Not Apply



101418

Length Code for ISBT 128

Apply



101435

*Do Not Apply



101434

Length Code for EAN-8

Apply



101423

*Do Not Apply



101422

Length Code for EAN-13

Apply



101425

*Do Not Apply



101424

Length Code for French Pharmacode

Apply



101405

*Do Not Apply



101404



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 MSI

Apply



101429

*Do Not Apply



101428



Length Code for Plessey

Apply



101431

*Do Not Apply



101430

Length Code for Telepen

Apply



101433

*Do Not Apply



101432

Length Code for UPC-A

Apply



101427

*Do Not Apply



101426

Length Code for UPC-E

Apply



101421

*Do Not Apply



101420



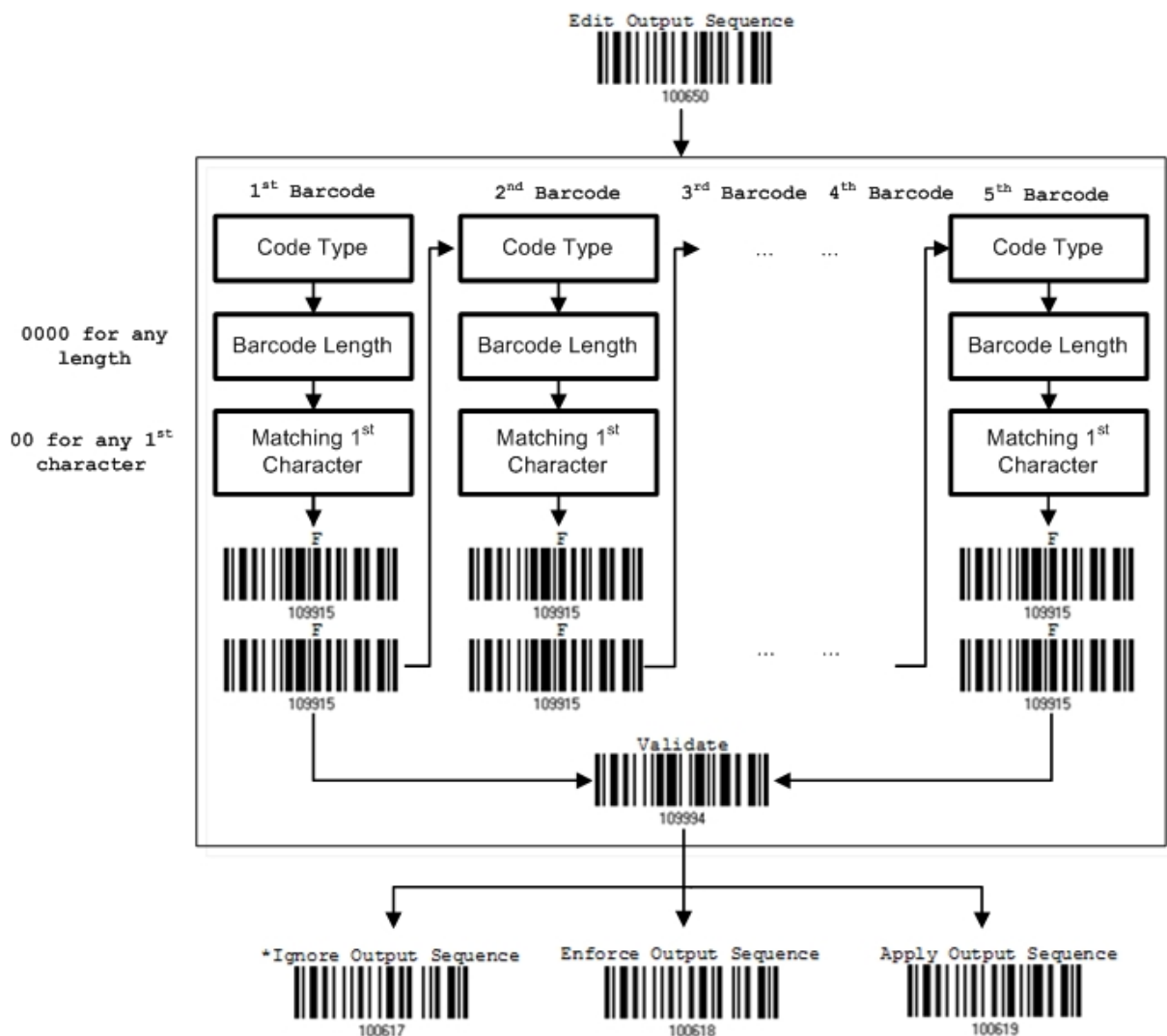
4.6 MULTI-BARCODE EDITOR

The Multi-Barcode Editor allows you to decide the output sequence of a concatenation of barcodes. Up to five barcodes can be specified. When you enable this mode, it will force the scanner to apply Laser mode as the scan mode.

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



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 158 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	4F (O)	EAN-8 with Addon 5
41 (A)	Code 39	50 (P)	EAN-13
42 (B)	Italian Pharmacode	51 (Q)	EAN-13 with Addon 2
43 (C)	French Pharmacode	52 (R)	EAN-13 with Addon 5
44 (D)	Industrial 25	53 (S)	MSI
45 (E)	Interleaved 25	54 (T)	Plessey
46 (F)	Matrix 25	55 (U)	GS1-128 (EAN-128)
47 (G)	Codabar (NW7)	56 (V)	UPC-A
48 (H)	Code 93	57 (W)	UPC-A with Addon 2
49 (I)	Code 128	58 (X)	UPC-A with Addon 5
4A (J)	UPC-E0 / UPC-E1		
4B (K)	UPC-E with Addon 2	5A (Z)	Telepen
4C (L)	UPC-E with Addon 5	5B ([)	GS1 DataBar (RSS)
4D (M)	EAN-8		
4E (N)	EAN-8 with Addon 2		

- 3) Barcode Length setting – read the [“Decimal Value”](#) barcode on page 157 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 158 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 158 (“FF”) to complete the setting of each barcode.
- 6) Read the “Validate” barcode to end the editing of the barcode set.



4.6.2 ACTIVATE THE CONCATENATION OF BARCODES

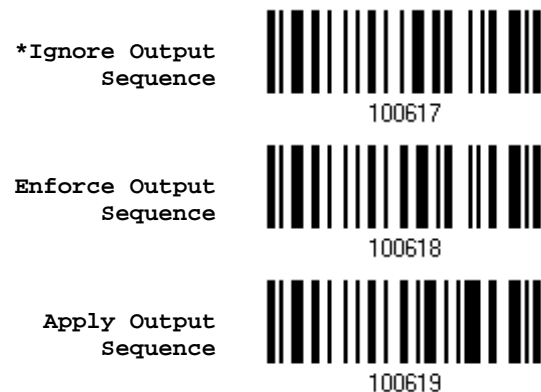
By default, the output sequence editing of the concatenation of barcodes is not applied.

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).



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 your application.



4.7 REMOVAL OF SPECIAL CHARACTER

You can only specify 1 character, but it will remove every matching character encountered from the starting position of barcode data until a different character is met. For example, if it is configured to remove the character "0" (hex value is "30"), 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



101470

- 1) Read the barcode above to remove the specified character.
- 2) Read the "[Hexadecimal Value](#)" barcode on page 158 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.



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.

[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	

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5.1 ACTIVATING EDITING FORMATS

5.1.1 ACTIVATE EDITING FORMATS

If you have already configured any editing format before, you may directly apply the editing format. If not, you must start with configuring an editing format first, and then, activate the editing format when it is desired in use.

Editing Format 1

Enable



101301

***Disable**



101300

Editing Format 2

Enable



101303

***Disable**



101302

Editing Format 3

Enable



101305

***Disable**



101304

Editing Format 4

Enable



101307

***Disable**



101306



Editing Format 5



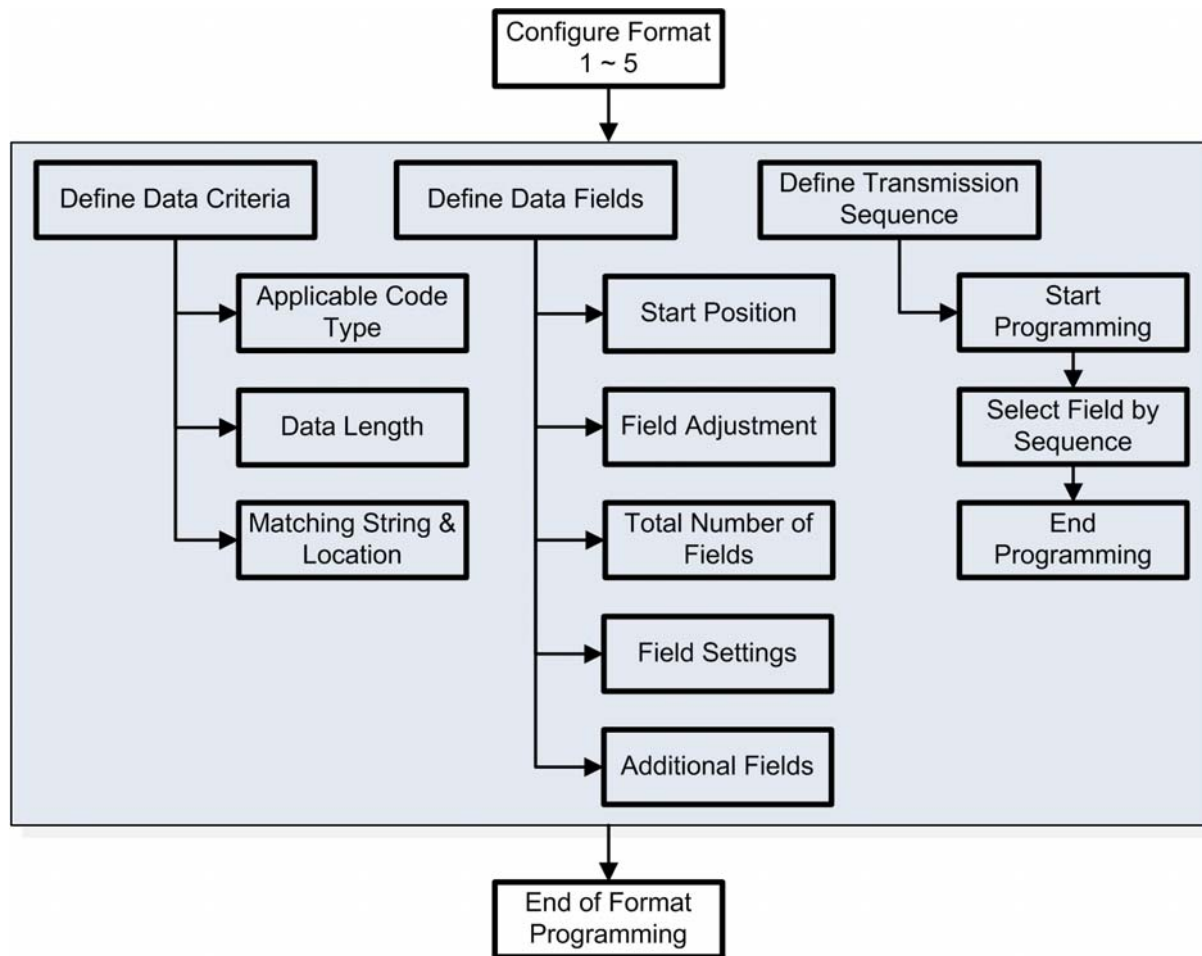
5.1.2 EXCLUSIVE DATA EDITING

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.



5.2 HOW TO CONFIGURE EDITING FORMATS

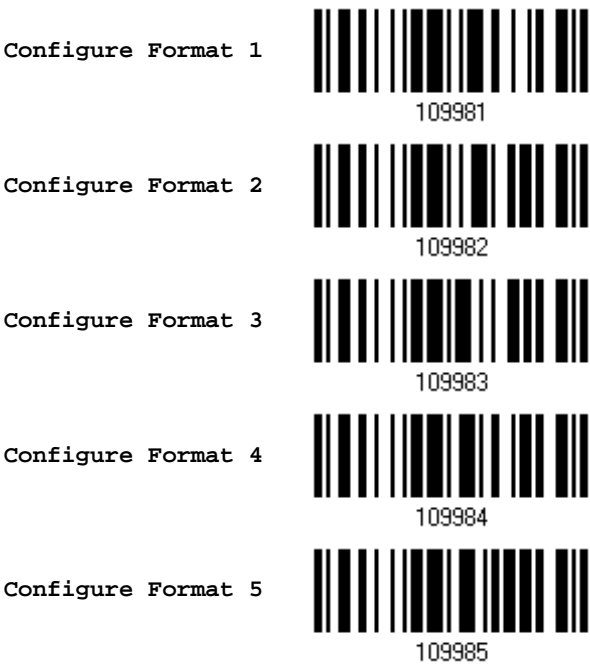


5.2.1 SELECT FORMAT TO CONFIGURE

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.



Note: Before you complete the programming of an editing format, if you have the scanner read any barcode for parameters other than those pertaining to the editing format, it will automatically abort the programming process.

End Programming Format

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



5.2.2 RESTORE DEFAULT FORMAT

You may 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



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, if having been configured and enabled. For quick configuration, you may first clear all, and then select the desired symbologies.



Note: You must have at least one symbology selected.



Editing Format for Codabar

*Apply	 101513
Do Not Apply	 101512



Editing Format for Code 39

*Apply	 101501
Do Not Apply	 101500



Editing Format for Code 93

*Apply	 101515
Do Not Apply	 101514

Editing Format for Code 128

*Apply	 101517
Do Not Apply	 101516

Editing Format for GS1-128 & GS1 DataBar



*Apply	 101519
Do Not Apply	 101518





Editing Format for ISBT 128

*Apply	
	101553
Do Not Apply	
	101552



Editing Format for EAN-8

*Apply	
	101527
Do Not Apply	
	101526



Editing Format for EAN-8 Addon 2

*Apply	
	101529
Do Not Apply	
	101528

Editing Format for EAN-8 Addon 5

*Apply	
	101531
Do Not Apply	
	101530

Editing Format for EAN-13

*Apply	
	101533
Do Not Apply	
	101532



Editing Format for EAN-13 Addon 2

***Apply**



101535

Do Not Apply



101534

Editing Format for EAN-13 Addon 5

***Apply**



101537

Do Not Apply



101536

Editing Format for French Pharmacode

***Apply**



101505

Do Not Apply



101504

Editing Format for Italian Pharmacode

***Apply**



101503

Do Not Apply



101502

Editing Format for Industrial 25

***Apply**



101507

Do Not Apply





101506





Editing Format for Interleaved 25

*Apply	
	101509
Do Not Apply	
	101508



Editing Format for Matrix 25

*Apply	
	101511
Do Not Apply	
	101510


Editing Format for MSI

*Apply	
	101545
Do Not Apply	
	101544

Editing Format for Plessey

*Apply	
	101547
Do Not Apply	
	101546

Editing Format for Telepen

*Apply	
	101549
Do Not Apply	
	101548



Editing Format for UPC-A

***Apply**



101539

Do Not Apply



101538

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



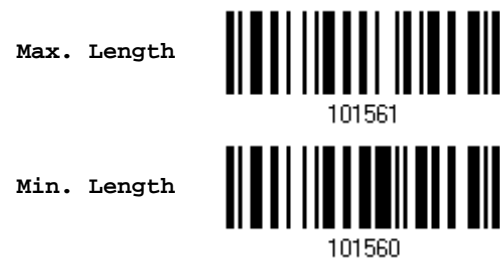
Update

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.

- ▶ You may specify a value from 0 to 254.
- ▶ 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.



- 2) Read the "[Decimal Value](#)" barcode on page 157 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. You may 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.
- ▶ You may specify a value from 1 to 254 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 158 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.

Location of Matching
String...



- 5) Read the "[Decimal Value](#)" barcode on page 157 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



101600

From Tail



101601

5.4.2 FIELD ADJUSTMENT

You may 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



101602

Set length to adjust
fields... (*0)



101603

- 1) Read the barcode above to adjust field by length.
- 2) Read the "[Decimal Value](#)" barcode on page 157 for the desired field length.
- 3) Read the "Validate" barcode on the same page to complete this setting.



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	 101590
Two Fields	 101591
Three Fields	 101592
Four Fields	 101593
Five Fields	 101594
Six Fields	 101595

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.



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. You may discard it.

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 158 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 157 for the desired field length.
3. Read the "Validate" barcode on the same page to complete this setting.



Field 2 Setting

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

Select
Field Separator
to Divide Field 2...


101571

- 2. Read the ["Hexadecimal Value"](#) barcode on page 158 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


101569

Discard Separator


101568

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


101570

- 2. Read the ["Decimal Value"](#) barcode on page 157 for the desired field length.
- 3. Read the "Validate" barcode on the same page to complete this setting.



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 158 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 157 for the desired field length.
3. Read the "Validate" barcode on the same page to complete this setting.



Field 4 Setting

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

Select
Field Separator
to Divide Field 4...


101579

- 2. Read the ["Hexadecimal Value"](#) barcode on page 158 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


101577

Discard Separator


101576

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


101578

- 2. Read the ["Decimal Value"](#) barcode on page 157 for the desired field length.
- 3. Read the "Validate" barcode on the same page to complete this setting.



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 158 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 157 for the desired field length.
3. Read the "Validate" barcode on the same page to complete this setting.



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" 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.	<ul style="list-style-type: none">▶ 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...



Additional Field 2...



Additional Field 3...



Additional Field 4...



Additional Field 5...



2. Read the "[Hexadecimal Value](#)" barcode on page 158 for the desired additional field.
3. Read the "Validate" barcode to complete this setting.



5.4.5 PAUSE FIELD SETTING

Pause Field Time

You can 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 157. 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.



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.



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



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...



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.



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:

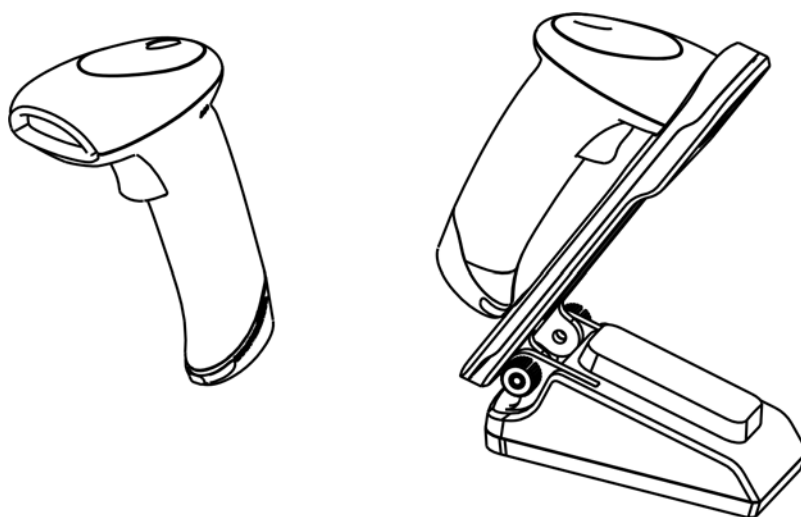
- ▶ The item number goes first, then a TAB character, followed by the date code, then another TAB character, and finally the quantity information.

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.



SPECIFICATIONS



Optical Characteristics		1500, 1500WA	1502
Scan Engine		Non-contact type	Non-contact type
Optical Sensor		CCD, 2500 pixels	Laser
Light Source		Visible red LED	Visible laser diode
Physical Characteristics			
Switch		Tactile switch	
Indication		Dual-color LED (Red/Green) and beeper	
Interface Options		Keyboard Wedge, RS-232, Wand Emulation	
Weight		Approx. 145 g	Approx. 148 g
Power Adaptor			
Input		AC 100~240 V, 50/60 Hz	
Output		DC 5V, 1A	
Power Consumption	Standby	30 mA	
	Operating	170 mA	
Operating Temperature		0 °C to 40 °C	



Environmental Characteristics			
Temperature	Operating	0 °C to 50 °C	
	Storage	-20 °C to 60 °C	
Humidity (Non-condensing)	Operating	10% to 90%	
	Storage	5% to 95%	
Resistance			
Impact Resistance		1.5 m, 5 drops per 6 sides	1.2 m, 5 drops per 6 sides
Splash / Dust Resistance		IP 30	
Electrostatic Discharge		± 15 kV air discharge, ± 8 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”)			
USB HID Cable (307)		✓	✓
USB Virtual COM Cable (308)		✓	✓
IBM 4683/4694 Cable (346)		✓	✓
Auto-Sense Stand		✓	✓
RS-232 Cable		✓	✓
Keyboard Wedge Cable		✓	✓
Wand Emulation Cable		✓	✓



FIRMWARE UPGRADE

- 1) 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.
- 2) 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



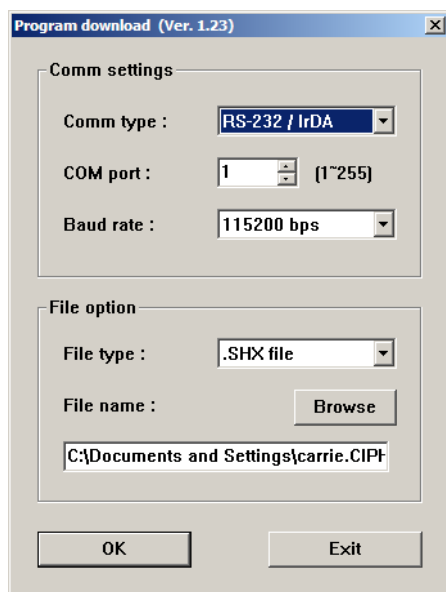
Download



109997

- 3) Run the download utility "ProgLoad.exe" on your computer.

Kernel Program	User Program
K1500_V*.shx	STD1500_V*.shx



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

Note: The output interface will be reset to your previous settings, which may be Keyboard Wedge, RS-232 or Wand Emulation.





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


109952



Serial Command

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

Note: After configuring the scanner, you may 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"



#@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

You may run HyperTerminal.exe on the host computer to send serial commands to the scanner via RS-232.

- ▶ 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: You can configure more than one scanner connected to the host via RS-232. To identify the scanner, you may send the serial command to have it respond with a beep.



KEYBOARD WEDGE TABLE

	0	1	2	3	4	5	6	7	8
0		F2	SP	0	@	P	`	p	⑩
1	INS	F3	!	1	A	Q	a	q	⑪
2	DLT	F4	"	2	B	R	b	r	⑫
3	Home	F5	#	3	C	S	c	s	⑬
4	End	F6	\$	4	D	T	d	t	⑭
5	Up	F7	%	5	E	U	e	u	⑮
6	Down	F8	&	6	F	V	f	v	⑯
7	Left	F9	'	7	G	W	g	w	⑰
8	BS	F10	(	8	H	X	h	x	⑱
9	HT	F11	)	9	I	Y	i	y	⑲
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) ⑩~⑲: Digits of numeric keypad.
 (2) CR*/ENTER*: ENTER key on the numeric keypad.



KEY TYPE & STATUS

KEY TYPE

If "Keyboard Wedge" is configured for interface, Key Type and Key Status will then become applicable.

*Normal



109926

Scan Code



109936

KEY STATUS

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

Add Shift



109930

Add Left Ctrl



109931

Add Right Ctrl



109933

Add Left Alt



109932

Add Right Alt



109934



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 158 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 158 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 158 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 158 for "4", "1" (= "A").
4. Read the "Add Left Ctrl" barcode.
5. Read the "[Hexadecimal Value](#)" barcode on page 158 for "2", "4" (= "\$").
6. Read the "Validate" barcode to complete this setting.





NUMERAL SYSTEMS

DECIMAL SYSTEM

Decimal


















Validate the Values



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



Validate the Values



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	



