Newland

NLS-FM50

Fixed Mount Barcode Scanner

User Guide

Disclaimer

Please read through the manual carefully before using the product and operate it according to the manual. It is advised that you should keep this manual for future reference.

Do not disassemble the device or remove the seal label from the device, doing so will void the product warranty provided by Fujian Newland Auto-ID Tech. Co., Ltd.

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Revision History

Version	Description	Date
V1.0.0	Initial release.	May 27, 2016
V1.0.1	Added **Chapter 9 Illumination**.	June 1, 2016
V1.0.2	1. Changed the range of Decode Session Timeout to 100ms - 3,600,000ms in Chapter 3. 2. Added the **Aiming** feature in Chapter 9. 3. Added **Chapter 10 Data Formatter** and **Chapter 11 Batch Programming**. **Note:** Firmware version V1.05.011 or later is required for the new features above.	August 30, 2016
V1.0.3	1. Added the **EAN-13 Beginning with 290 Add-On Code Required**, **EAN-13 Beginning with 378/379 Add-On Code Required**, **EAN-13 Beginning with 414/419 Add-On Code Required**, **EAN-13 Beginning with 434/439 Add-On Code Required**, **EAN-13 Beginning with 977 Add-On Code Required**, **EAN-13 Beginning with 978 Add-On Code Required**, **EAN-13 Beginning with 979 Add-On Code Required**, **Febraban** & **Transmit Delay**, **Code 32 (Italian Pharma Code)**, **Code 32 Prefix**, **Transmit Code 32 Check Digit** and **Transmit Code 32 Start/Stop Character** features in Chapter 7. 2. Added the **BA** command (Replace a string with another) in Chapter 10. **Note:** Firmware version V1.05.016 or later is required for the new features above.	November 17, 2016

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Chapter 1 Getting Started

Introduction

The NLS-FM50 fixed mount barcode scanners (hereinafter referred to as "**the FM50 scanner**" or "**the scanner"**), armed with the Newland patented UIMG®, a computerized image recognition system, bring about a new era of 2D barcode scanners.

The FM50 scanners' 2D barcode decoder chip ingeniously blends UIMG® technology and advanced chip design & manufacturing, which significantly simplifies application design and delivers superior performance and solid reliability with low power consumption.

The FM50 scanners can read barcodes on virtually any medium - paper, plastic card, mobile phones and LCD displays. The compact, lightweight baracode scanners fit easily into a variety of space-constrained equipment.

The FM50 scanners support all mainstream 1D and standard 2D barcode symbologies:

2D: PDF417, QR Code and Data Matrix.

1D: EAN-13, EAN-8, UPC-A, UPC-E, ISSN, ISBN, Codabar, Code 128, Code 93, ITF-6, ITF-14, Interleaved 2 of 5, Industrial 2 of 5, Standard 2 of 5, Matrix 2 of 5, GS1 Databar, Code 39, Code 11, MSI-Plessey, Plessey, etc.

About This Guide

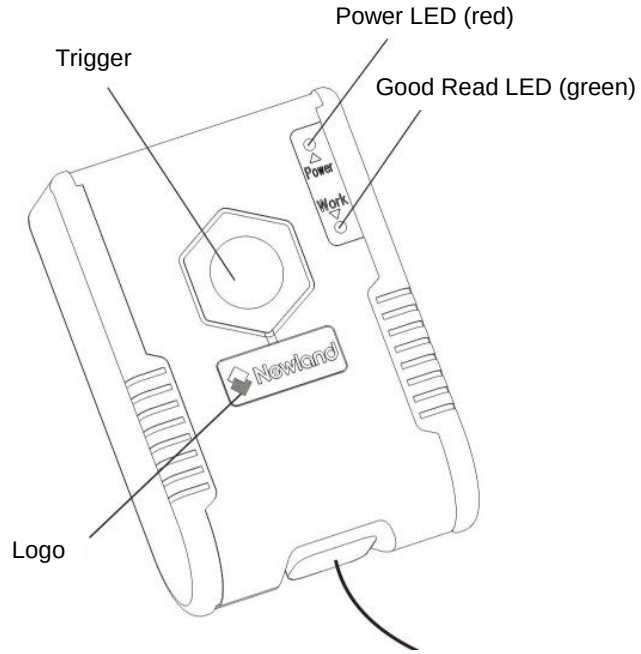
This guide provides programming instructions for the scanner. Users can configure the scanner by scanning the programming barcodes included in this manual.

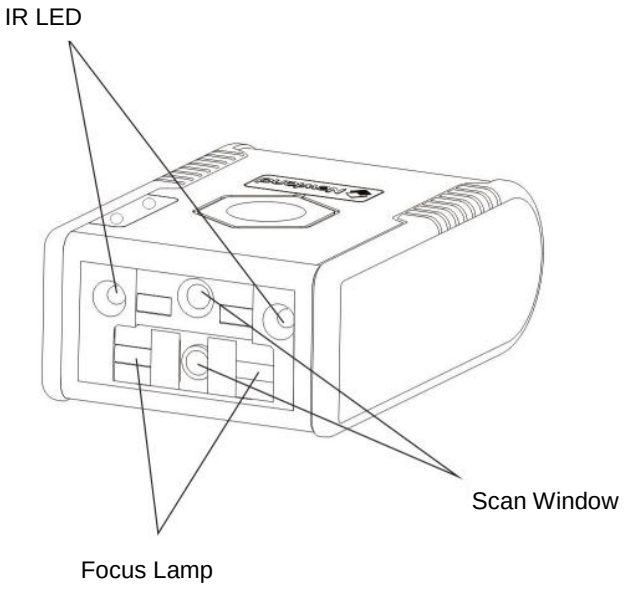
The scanner has been properly configured for most applications and can be put into use without further configuration. Users may check the **Factory Defaults Table** in **Appendix** for reference. Throughout the manual, asterisks (**) indicate factory default values.

Unpacking

Open the package and take out the scanner and its accessories. Check to make sure everything on the packing list is present and intact. If any contents are damaged or missing, please keep the original package and contact your dealer immediately for after-sales service.

FM50 Scanner





Maintenance

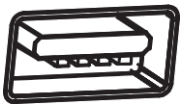
- ✧ The scan window should be kept clean.
- ✧ Do not scratch the scan window.
- ✧ Use soft brush to remove the stain from the scan window.
- ✧ Use the soft cloth to clean the window, such as eyeglass cleaning cloth.
- ✧ Do not spray any liquid on the scan window.
- ✧ Do not use any detergent to clean other parts of the device except for water.

Note: The warranty **DOES NOT** cover damages caused by inappropriate care and maintenance.

Connecting the Scanner to a Host

The FM50 scanner must be connected to a Host in actual application, such as PC, POS or any intelligent terminal with USB or RS-232 port.

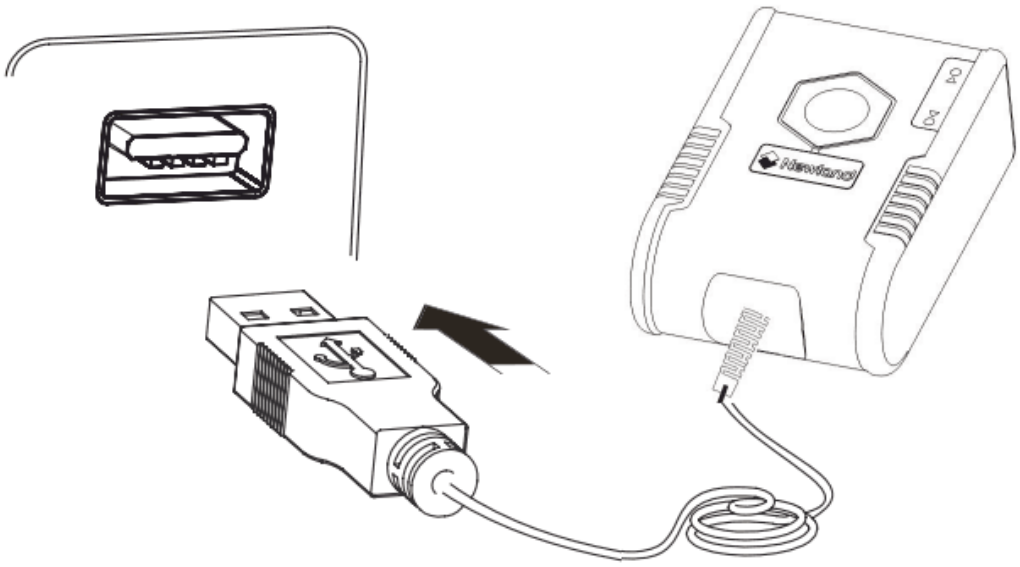
USB

USB port on the Host 

RS-232

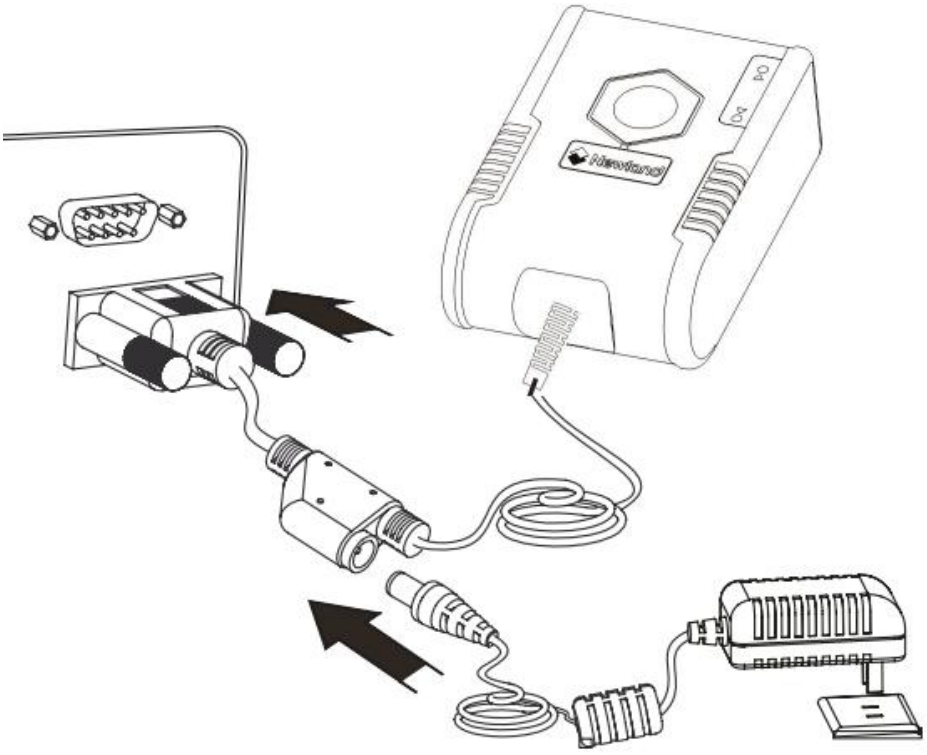
RS-232 port on the Host 

USB Connection



Plug the cable into the USB port on the host.

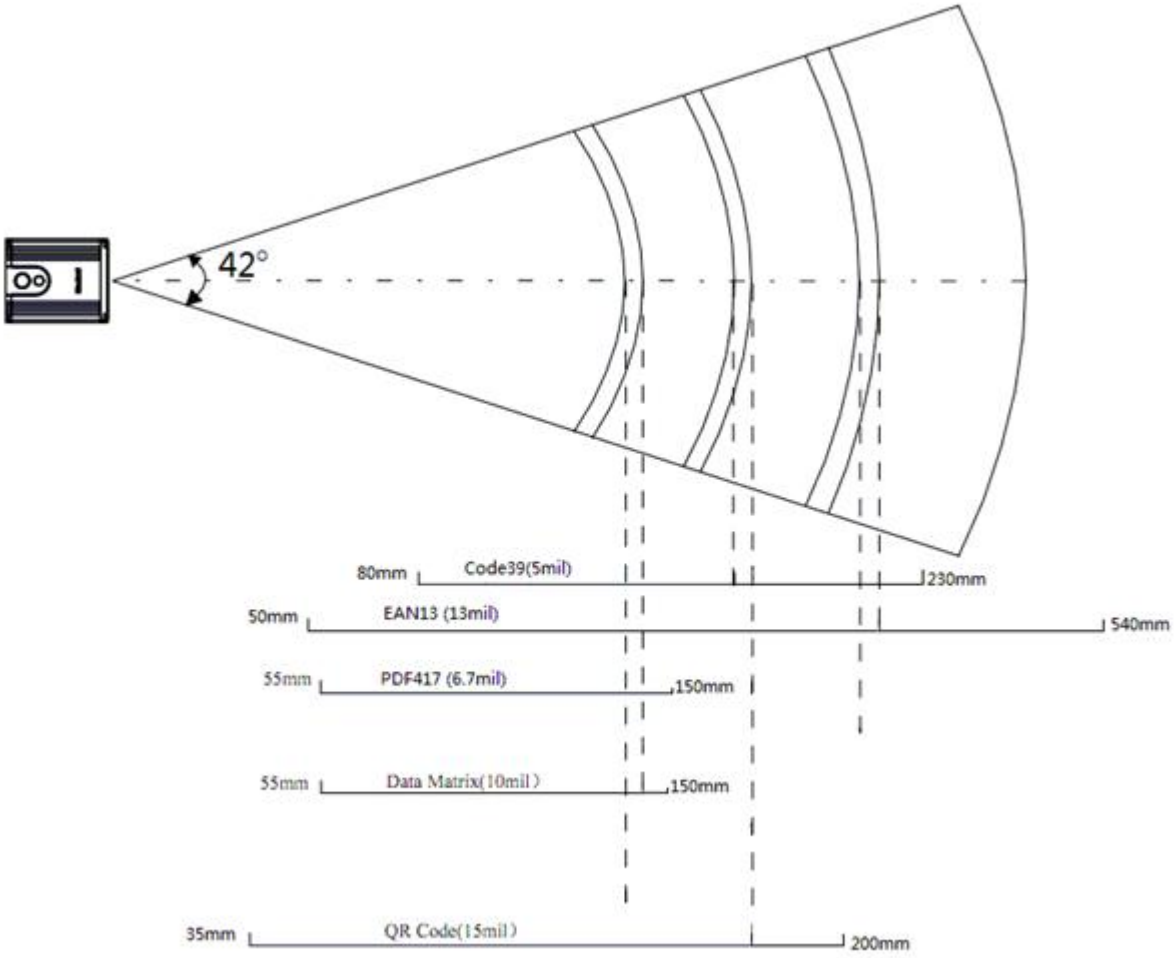
RS-232 Connection



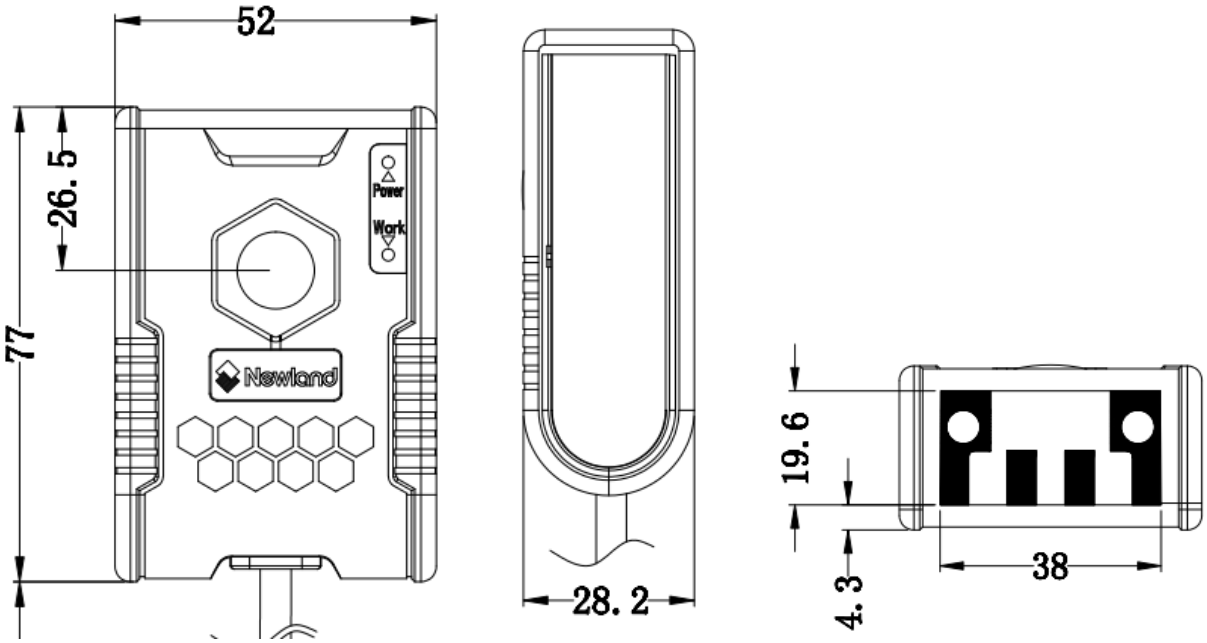
1. Plug the RJ45 connector of the cable into the RS-232 port on the host.

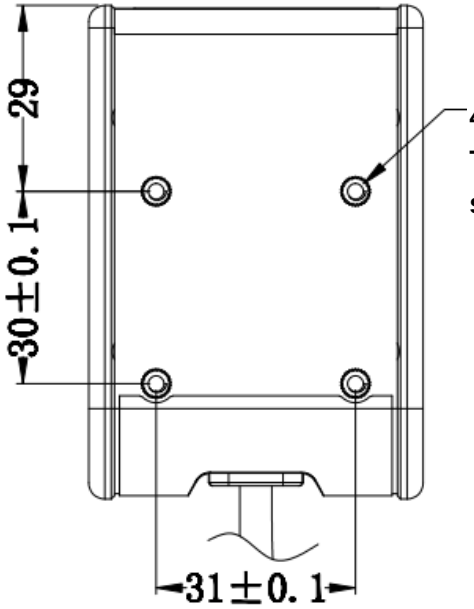
2. Connect the supplied power adaptor to the power connector of the cable.

Depth of Field



Dimensions





4-M3 machine screw
The part of screw into the scanner must not exceed 6mm.

Barcode Scanning

Powered by area-imaging technology and Newland patented UIMG® technology, the FM50 features fast scanning and accurate decoding. Barcodes rotated at any angle can still be read with ease. When scanning a barcode, simply center the aiming beam or pattern projected by the scanner over the barcode. The green Good Read LED on the scanner flashes once upon a good read.

Barcode Programming

Scanning the **Enter Setup** barcode can enable the scanner to enter the setup mode. Then you can scan a number of programming barcodes to configure your scanner. To exit the setup mode, scan the **Exit Setup** barcode.

If the scanner has exited the setup mode, only some special programming barcodes, such as the **Enter Setup** barcode and **Restore All Factory Defaults** barcode, can be read.

Enter Setup

**** Exit Setup**

Programming barcode data can be transmitted to the host device. Scan the appropriate barcode below to enable or disable the transmission of programming barcode data (i.e. the characters under programming barcode) to the host.

Restarting the scanner will automatically disable the transmisison of programming barcode data to the host.

Transmit Programming Barcode Data

**** Do Not Transmit Programming Barcode Data**

Factory Defaults

Scanning the following barcode can restore the scanner to the factory defaults. See **Appendix 1: Factory Defaults Table** for more information.

Note: Use this feature with discretion.

Restore All Factory Defaults

Custom Defaults

Custom defaults make it possible to save the frequently-used settings on the scanner.

Scanning the **Save as Custom Defaults** barcode can save the current settings as custom defaults. Once custom default settings are stored, they can be recovered at any time by scanning the **Restore All Custom Defaults** barcode.

Custom defaults are stored in the non-volatile memory. Restoring the scanner to the factory defaults will not remove the custom defaults from the scanner.

Save as Custom Defaults

Restore All Custom Defaults

Inquire Product Information

You can scan the barcode below to inquire the scanner information (such as firmware version, model number, serial number, manufacture date). The result will be sent to the Host.

Inquire Product Information

Enter Setup

Chapter 2 Communication Interfaces

The scanner provides an RS-232 interface and a USB interface to communicate with the host device. The host device can receive scanned data and send commands to control the scanner or to access/alter the configuration information of the scanner via the interface.

**** Exit Setup**

Enter Setup

RS-232 Interface

When the scanner is connected to the RS-232 port of a Host, the port is enabled by default. Howover, you need to set communication parameters (including baud rate, parity check, data bit and stop bit) to match the host device.

Default serial communication parameters are listed below. Make sure all parameters match the host requirements.

Parameter	Factory Default
Baud Rate	9600
Parity Check	None
Data Bits	8
Stop Bits	1
Hardware Flow Control	None

** Exit Setup

0006010

Enter Setup

Baud Rate

Baud rate is the number of bits of data transmitted per second. Set the baud rate to match the Host requirements.

**** 9600**

1200

19200

2400

38400

4800

57600

14400

115200

**** Exit Setup**

Enter Setup

Parity Check

When the number of data bits is set to 7, you can only select either **Even Parity** or **Odd Parity**. The **None** option will be regarded as **Even Parity** in this case.

**** None**

Even Parity

Odd Parity

Data Bit

When the number of data bits is set to 7, you can only select either **Even Parity** or **Odd Parity**.

7 Data Bits

**** 8 Data Bits**

**** Exit Setup**

0006010

Enter Setup

Data Bit & Parity Check

7 Data Bits/Even Parity

7 Data Bits/Odd Parity

**** 8 Data Bits/ No Parity**

8 Data Bits/Even Parity

8 Data Bits/Odd Parity

Stop Bit

**** 1 Stop Bit**

2 Stop Bits

Enter Setup

USB Interface

USB Enumeration

If the scanner is connected to the host defice via a USB connection, the scanner will be enumerated using S/N or “00000000” after power-up. **Enumeration using S/N** enables the host device to distinguish even between scanners of same model. **Enumeration using “00000000”** disables the host device from distinguishing between scanners of same model.

Driver installation is required for each USB device distinguished from others by the host device in the process of enumeration.

Enumeration Using S/N

**** Enumeration Using “00000000”**

USB HID-KBW

When you connect the scanner to the host device via a USB connection, the **USB HID-KBW** feature is enabled by default. Then scanner’s transmission will be simulated as USB keyboard input. The host device receives keystrokes on the virtual keyboard. It works on a Plug and Play basis and no driver is required.

**** USB HID-KBW**

**** Exit Setup**

0006010

Enter Setup

Polling Rate

This parameter specifies the polling rate for a USB keyboard. If the Host drops characters, change the polling rate to a bigger value.

1103170

**** 1ms**

1103171

2ms

1103172

3ms

1103173

4ms

1103174

5ms

1103175

6ms

1103176

7ms

1103177

8ms

1103178

9ms

1103179

10ms

0006000

** **Exit Setup**

Enter Setup

USB Country Keyboard Types

Keyboard layouts vary from country to country. The default setting is U.S. keyboard.

**** U.S.**

Belgium

Brazil

Canada

Czechoslovakia

Denmark

Finland

France

**** Exit Setup**

Enter Setup

Germany, Austria

Greece

Hungary

Israel

Italy

Latin America, South America

Netherlands

Norway

Poland

Portugal

** **Exit Setup**

0006010

Enter Setup

Romania

Russia

Slovakia

Spain

Sweden

Switzerland

Turkey_F

Turkey_Q

UK

Japan

Note: To program the scanner to get proper output for Russian encoded with Windows 1251 or UTF-8 (PDF417/QR Code/Data Matrix), see **Appendix 5**.

0006000

**** Exit Setup**

Enter Setup

Beep on Unknown Character

Due to the differences in keyboard layouts, some characters contained in barcode data may be unavailable on the selected keyboard. As a result, the scanner fails to transmit the unknown characters.

Scan the appropriate barcode below to enable or disable the emission of beep when an unknown character is detected.

Beep on Unknown Character

** **Do Not Beep on Unknown Character**

Inter-Keystroke Delay

This parameter specifies the delay between emulated keystrokes. It is programmable in 5ms increments from 0ms to 75ms. Single-digit values must have a leading zero. To learn how to set custom delay, see **Appendix 5**. The default setting is 10ms.

No Delay

Short Delay (20ms)

Long Delay (40ms)

Custom Delay

** **Exit Setup**

Enter Setup

Convert Case

Scan the appropriate barcode below to convert barcode data to your desired case.

**** No Case Conversion**

Invert Upper and Lower Case Characters

Convert All to Upper Case

Convert All to Lower Case

Example: When the **Invert Upper and Lower Case Characters** feature is enabled, barcode data “AbC” is transmitted as “aBc”.

**** Exit Setup**

Enter Setup

Emulate ALT+Keypad

This feature allows any ASCII character (0x00 - 0xFF) to be sent over the numeric keypad no matter which keyboard type is selected. Since sending a character involves multiple keystroke emulations, this method appears less efficient.

The following options are available:

- **Disable:** No ASCII character is sent in the ALT+Keypad way.
- **Mode 1:** ASCII characters not supported by the selected keyboard type but falling into 0x20~0xFF are sent in the ALT+Keypad way.
- **Mode 2:** ASCII characters falling into 0x20~0xFF are sent in the ALT+Keypad way.
- **Mode 3:** ASCII characters falling into 0x00~0xFF are sent in the ALT+Keypad way.

Note: In the event of a conflict between **Function Key Mapping** and **Mode 3**, **Function Key Mapping** shall govern.

**** Disable**

Mode 1

Mode 2

Mode 3

Example: Supposing US keyboard is selected, barcode data ”AĐF” (65/208/70) is sent as below:
(1) **Mode 1** is enabled:
“A” -- Keystroke “A”
“Đ” -- “ALT Make” + “208” + “ALT Break”
“F” -- Keystroke “F”
(2) **Mode 3** is enabled:
“A” – “ALT Make” + “065” + “ALT Break”
“Đ” -- “ALT Make” + “208” + “ALT Break”
“F” -- “ALT Make” + “070” + “ALT Break”

**** Exit Setup**

Enter Setup

Function Key Mapping

When Function Key Mapping is enabled, function characters (0x00 - 0x1F) are sent as ASCII sequences over the keypad. For more information, see **Appendix 8: ASCII Function Key Mapping Table**.

Enable Function Key Mapping

**** Disable Function Key Mapping**

Example: Barcode data 0x16

 T	Enable Function Key Mapping	Ctrl+V
	Disable Function Key Mapping	F1

**** Exit Setup**

Enter Setup

Emulate Numeric Keypad

When this feature is disabled, sending barcode data is emulated as keystroke(s) on main keyboard.

To enable this feature, scan the **Emulate Numeric Keypad** barcode. Sending a number (0-9) is emulated as keystroke(s) on numeric keypad, whereas sending other characters like “+”, “_”, “*” , “/” and “.” is still emulated as keystrokes on main keyboard.

**** Do Not Emulate Numeric Keypad**

Emulate Numeric Keypad

Code Page

The **Code Page** programming feature is provided to support more international characters. This feature is only effective when ASCII characters are sent in the ALT+Keypad way. Programming a code page requires scanning numeric barcode (For more information, see **Appendix 9: Code Pages List**). The default code page is Windows 1252 (Latin I). To learn how to program it, see **Appendix 5**.

Set the Code Page

**** Exit Setup**

0006010

Enter Setup

USB COM Port Emulation

If you connect the scanner to the host device via a USB connection, the **USB COM Port Emulation** feature allows the Host to receive data in the way as a serial port does. A driver is required for this feature.

1100060

USB COM Port Emulation

USB HID-POS

Introduction

The USB HID-POS interface is recommended for new application programs. It can send up to 56 characters in a single USB report and appears more efficient than keyboard emulation.

Features:

- ✧ HID based, no custom driver required.
- ✧ Way more efficient in communication than keyboard emulation and traditional RS-232 interface.

Note: USB HID-POS does not require a custom driver. However, a HID interface on Windows 98 does. All HID interfaces employ standard driver provided by the operating system. Use defaults when installing the driver.

1100080

USB HID-POS

0006000

**** Exit Setup**

Access the Scanner with Your Program

Use CreateFile to access the scanner as a HID device and then use ReadFile to deliver the scanned data to the application program. Use WriteFile to send data to the scanner.

For detailed information about USB and HID interfaces, go to www.USB.org.

Acquire Scanned Data

After scanning and decoding a barcode, the scanner sends the following input report:

	Bit							
Byte	7	6	5	4	3	2	1	0
0	Report ID = 0x02							
1	Length of the barcode							
2-57	Decoded data (1-56)							
58-60	AIM ID							
61-62	Reserved							
63	-	-	-	-	-	-	-	Decoded Data Continued

Send Data to the Scanner

This output report is used to send data to the device. All programming commands can be used.

	Bit							
Byte	7	6	5	4	3	2	1	0
0	Report ID = 0x04							
1	Length of the output data							
2-63	Output data (1-62)							

Enter Setup

VID/PID

USB uses VID (Vendor ID) and PID (Product ID) to identify and locate a device. The VID is assigned by USB Implementers Forum. Newland's vendor ID is 1EAB (Hex). A PID is assigned to each interface.

Product	Interface	PID (Hex)	PID (Dec)
FM50	USB HID-KBW	1303	4867
	USB COM Port Emulation	1306	4870
	USB HID-POS	1310	4880

** Exit Setup

0006010

Enter Setup

Chapter 3 Scan Mode

Sense Mode

The scanner activates a decode session every time it detects a change in ambient illumination. Decode session continues until the barcode is decoded or the decode session timeout expires.

0302010

**** Sense Mode**

Decode Session Timeout

This parameter sets the maximum time decode session continues during a scan attempt. It is programmable in 1ms increments from 100ms to 3,600,000ms. The default setting is 3,000ms. To learn how to program this parameter, see **Appendix 5**.

0313000

Decode Session Timeout

Timeout between Decodes

This parameter sets the timeout between decode sessions. When a decode session ends, next session will not happen until the timeout between decodes expires. It is programmable in 1ms increments from 0ms to 65,535ms. The default setting is 1,000ms. To learn how to program this parameter, see **Appendix 5**.

0313040

Timeout between Decodes

0006000

**** Exit Setup**

Enter Setup

Timeout between Decodes (Same Barcode)

Timeout between Decodes (Same Barcode) can avoid undesired rereading of same barcode in a given period of time.

To enable/disable the Timeout between Decodes (Same Barcode), scan the appropriate barcode below.

Enable Timeout between Decodes: Do not allow the scanner to re-read same barcode before the timeout between decodes (same barcode) expires.

Disable Timeout between Decodes: Allow the scanner to re-read same barcode.

**** Disable Timeout between Decodes**

Enable Timeout between Decodes

The following parameter sets the timeout between decodes for same barcode. It is programmable in 1ms increments from 0ms to 65,535ms. The default setting is 1,500ms.

To learn how to program this parameter, see **Appendix 5**.

Timeout between Decodes (Same Barcode)

**** Exit Setup**

Enter Setup

Sensitivity

Sensitivity specifies the degree of acuteness of the scanner's response to changes in ambient illumination. The higher the sensitivity, the lower requirement in illumination change to trigger the scanner. You can select an appropriate degree of sensitivity that fits the ambient environment.

Medium Sensitivity

Low Sensitivity

High Sensitivity

Enhanced Sensitivity

If the above four options fail to meet your needs, you may program the threshold value of illumination change.

Illumination changes that reach or surpass the predefined threshold value will cause the scanner to start a decode session. The lower the threshold value, the greater the sensitivity of the scanner. The default threshold value is 2.

To learn how to program this parameter, see **Appendix 5**.

Threshold Value of Illumination Change (1-20)

**** Exit Setup**

0006010

Enter Setup

Continuous Mode

If the Continuous mode is enabled, the scanner automatically starts one decode session after another. To suspend/resume barcode reading, simply press the trigger.

0302020

Continuous Mode

Decode Session Timeout

This parameter sets the maximum time decode session continues during a scan attempt. It is programmable in 1ms increments from 100ms to 3,600,000ms. The default setting is 3,000ms. To learn how to program this parameter, see **Appendix 5**.

0313000

Decode Session Timeout

Timeout between Decodes

This parameter sets the timeout between decode sessions. When a decode session ends, next session will not happen until the timeout between decodes expires. It is programmable in 1ms increments from 0ms to 65,535ms. The default setting is 1,000ms. To learn how to program this parameter, see **Appendix 5**.

0313040

Timeout between Decodes

Enter Setup

Timeout between Decodes (Same Barcode)

Timeout between Decodes (Same Barcode) can avoid undesired rereading of same barcode in a given period of time.

To enable/disable the Timeout between Decodes (Same Barcode), scan the appropriate barcode below.

Enable Timeout between Decodes: Do not allow the scanner to re-read same barcode before the timeout between decodes (same barcode) expires.

Disable Timeout between Decodes: Allow the scanner to re-read same barcode.

**** Disable Timeout between Decodes**

Enable Timeout between Decodes

The following parameter sets the timeout between decodes for same barcode. It is programmable in 1ms increments from 0ms to 65,535ms. The default setting is 1,500ms.

To learn how to program this parameter, see **Appendix 5**.

Timeout between Decodes (Same Barcode)

**** Exit Setup**

0006010

Enter Setup

Chapter 4 Scanning Preferences

Introduction

This chapter contains information as to how to adapt your scanner to various applications with preference setting. For instance, to narrow the field of view of the scanner to make sure it reads only those barcodes intended by the user.

Decode Area

Whole Area Decoding

When this option is enabled, the scanner attempts to decode barcode(s) within its field of view, from the center to the periphery, and transmits the barcode that has been first decoded.

0322000

**** Whole Area Decoding**

Central Area Decoding

The scanner attempts to decode barcode(s) within a specified central area and transmits the barcode that has been first decoded. This option allows the scanner to narrow its field of view to make sure it reads only those barcodes intended by the user. For instance, if multiple barcodes are placed closely together, central area decoding in conjunction with appropriate pre-defined central area will insure that only the desired barcode is read.

0322010

Central Area Decoding

0006000

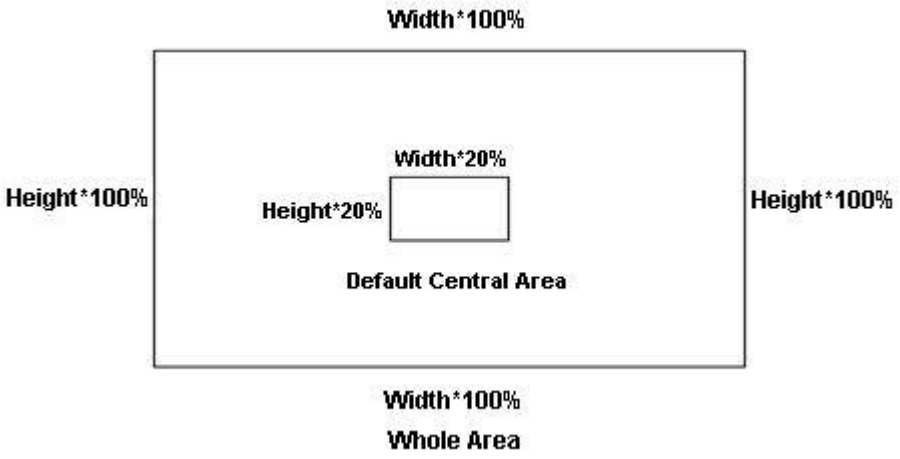
**** Exit Setup**

0006010

Enter Setup

Specify Central Area

The default central area is a (Width*20%) by (Height*20%) area in the center of the scanner's field of view, as shown in the figure below. You can define the central area by scanning the **Specify Central Area** barcode and numeric barcode(s) corresponding to a desired percentage (1-100). If Central Area Decoding is enabled by scanning the **Central Area Decoding** barcode, the scanner only reads barcodes that intersect the predefined central area.



To learn how to program this parameter, see the **"Appendix 5: Parameter Programming Examples".**

0322020

Specify Central Area

0006000

**** Exit Setup**

Enter Setup

Chapter 5 Beep & LED Notifications

Startup Beep

If startup beep is enabled, the scanner will beep after being turned on.

**** Enable Startup Beep**

Disable Startup Beep

Good Read Beep for Non-programming Barcode

Scan the appropriate barcode below to enable or disable the emission of beep when a non-programming barcode is decoded . Beep type (frequency) and volume are also user programmable.

**** Good Read Beep On for Non-programming Barcode**

Good Read Beep Off for Non-programming Barcode

**** Exit Setup**

0006010

Enter Setup

Beep Type

Type 1

**** Type 3**

Type 2

Beep Volume

**** Loud**

Low

Medium

0006000

**** Exit Setup**

Enter Setup

Beep on Unknown Character

Due to the differences in keyboard layouts, some characters contained in barcode data may be unavailable on the selected keyboard (USB HID-KBW). As a result, the scanner fails to transmit the unknown characters.

Scan the appropriate barcode below to enable or disable the emission of beep when an unknown character is detected.

Beep on Unknown Character

**** Do Not Beep on Unknown Character**

Good Read Beep for Programming Barcode

**** Good Read Beep On for Programming Barcode**

Good Read Beep Off for Programming Barcode

Good Read LED

**** Good Read LED ON**

Good Read LED OFF

**** Exit Setup**

Enter Setup

Transmit NGR (Not Good Read) Message

Scan a barcode below to select whether or not to transmit a user-defined NGR (Not Good Read) message when a barcode cannot be decoded.

Transmit NGR Message

**** Do Not Transmit NGR Message**

Edit NGR Message

To edit an NGR message, scan the **Edit NGR Message** barcode and the numeric barcodes corresponding to the ASCII values (decimal) of desired characters and then scan the **Save** barcode.

An NGR message can contain 0-7 characters (ASCII value of character: 0-255).

Edit NGR Message

**** Exit Setup**

Enter Setup

Chapter 6 Prefix & Suffix

In many applications, barcode data needs to be edited and distinguished from one another.

Usually AIM ID and Code ID can be used as identifiers, but in some special cases customized prefix and terminating character suffix like Carriage Return or Line Feed can also be the alternatives.

Data editing may include:

- ✧ Append AIM ID/Code ID/custom prefix before the decoded data
- ✧ Append custom suffix after the decoded data
- ✧ Append terminating character to the end of the data

The following formats can be used when editing barcode data:

- ✧ [Code ID] + [Custom Prefix] + [AIM ID] + [DATA] + [Custom Suffix] + [Terminating Character]
- ✧ [Custom Prefix] + [Code ID] + [AIM ID] + [DATA] + [Custom Suffix] + [Terminating Character]

Note: [DATA] must be transmitted while user can decide whether to transmit any of the rest parts.

**** Exit Setup**

Enter Setup

Global Settings

Enable/Disable All Prefixes/Suffixes

- ✧ **Disable All Prefixes/Suffixes:** Transmit barcode data with no prefix/suffix.
- ✧ **Enable All Prefixes/Suffixes:** Allow user to append Code ID prefix, AIM ID prefix, custom prefix/suffix and terminating character to the barcode data before the transmission.

Enable All Prefixes/Suffixes

Disable All Prefixes/Suffixes

Prefix Sequences

Code ID+Custom Prefix+AIM ID

**** Custom Prefix+Code ID+AIM ID**

**** Exit Setup**

Enter Setup

Custom Prefix

Enable/Disable Custom Prefix

If custom prefix is enabled, you are allowed to append to the data a user-defined prefix that cannot exceed 11 characters.

Enable Custom Prefix

**** Disable Custom Prefix**

Set Custom Prefix

To set a custom prefix, scan the **Set Custom Prefix** barcode and the numeric barcodes representing the hexadecimal value(s) of a desired prefix and then scan the **Save** barcode. Refer to **Appendix 4: ASCII Table** for hexadecimal values of characters. To view a setting example, see **Appendix 5: Parameter Programming Examples**.

Note: A custom prefix cannot exceed 11 characters.

Set Custom Prefix

**** Exit Setup**

Enter Setup

AIM ID Prefix

AIM (Automatic Identification Manufacturers) IDs and ISO/IEC 15424 standards define symbology identifiers and data carrier identifiers. (For the details, see **Appendix 2: AIM ID Table**. If AIM ID prefix is enabled, the scanner will add the symbology identifier before the scanned data after decoding.

Enable AIM ID Prefix

**** Disable AIM ID Prefix**

Code ID Prefix

Code ID can also be used to identify barcode type. Unlike AIM ID, Code ID is user programmable. Code ID can only consist of one or two English letters.

Enable Code ID Prefix

**** Disable Code ID Prefix**

Restore All Default Code IDs

For the information of default Code IDs, see **Appendix 3: Code ID Table**.

Restore All Default Code IDs

**** Exit Setup**

Enter Setup

Modify Code ID

To change the Code ID of a symbology, scan the appropriate **Modify Code ID** barcode below and the numeric barcodes representing the hexadecimal value of a desired Code ID and then scan the **Save** barcode. Refer to **Appendix 4: ASCII Table** for hexadecimal values of characters. To view a setting example, see **Appendix 5: Parameter Programming Examples**.

Modify PDF417 Code ID

Modify Data Matrix Code ID

Modify QR Code Code ID

Modify Chinese Sensible Code ID

Modify Code 128 Code ID

Modify GS1-128 Code ID

Modify AIM-128 Code ID

Modify EAN-8 Code ID

Modify EAN-13 Code ID

Modify UPC-E Code ID

**** Exit Setup**

Enter Setup

Modify UPC-A Code ID

Modify ISBN Code ID

Modify ISSN Code ID

Modify Code 39 Code ID

Modify Code 93 Code ID

Modify Interleaved 2 of 5 Code ID

Modify ITF-14 Code ID

Modify ITF-6 Code ID

Modify Codabar Code ID

Modify Industrial 25 Code ID

** **Exit Setup**

Enter Setup

Modify Standard 25 Code ID

Modify Matrix 25Code ID

Modify COOP 25 Code ID

Modify Code 11

Modify Plessey Code ID

Modify MSI/Plessey Code ID

Modify GS1 Databar Code ID

**** Exit Setup**

Enter Setup

Custom Suffix

Enable/Disable Custom Suffix

If custom suffix is enabled, you are allowed to append to the data a user-defined suffix that cannot exceed 11 characters.

Enable Custom Suffix

** **Disable Custom Suffix**

Set Custom Suffix

To set a custom suffix, scan the **Set Custom Suffix** barcode and the numeric barcodes representing the hexadecimal value(s) of a desired prefix and then scan the **Save** barcode. Refer to **Appendix 4: ASCII Table** for hexadecimal values of characters. To view a setting example, see **Appendix 5: Parameter Programming Examples**.

Note: A custom prefix cannot exceed 11 characters.

Set Custom Suffix

****Exit Setup**

Enter Setup

Terminating Character Suffix

A terminating character can be used to mark the end of data, which means nothing can be added after it.

A terminating character suffix can contain 1-7 characters.

Enable/Disable Terminating Character Suffix

To enable/disable terminating character suffix, scan the appropriate barcode below.

** **Enable Terminating Character Suffix**

Disable Terminating Character Suffix

** **Exit Setup**

0006010

Enter Setup

Set Terminating Character Suffix

The scanner provides a shortcut for setting the terminating character suffix to CR (0x0D) or CRLF (0x0D,0x0A) and enabling it by scanning the appropriate barcode below.

**** Terminating Character CR (0x0D)**

Terminating Character CRLF (0x0D,0x0A)

To set a terminating character suffix, scan the **Set Terminating Character Suffix** barcode and the numeric barcodes representing the hexadecimal value(s) of a desired terminating character and then scan the **Save** barcode. Refer to **Appendix 4: ASCII Table** for hexadecimal values of terminating characters. To view a setting example, see **Appendix 5: Parameter Programming Examples**.

Note: A terminating character suffix cannot exceed 7 characters.

Set Terminating Character Suffix

Enter Setup

Chapter 7 Symbologies

Global Settings

Enable/Disable All Symbologies

If the **Disable All Symbologies** feature is enabled, the scanner will not be able to read any non-programming barcodes except the programming barcodes.

Enable All Symbologies

Disable All Symbologies

Enable/Disable 1D Symbologies

If the **Disable 1D Symbologies** feature is enabled, the scanner will not be able to read any 1D barcodes.

Enable 1D Symbologies

Disable 1D Symbologies

Enable/Disable 2D Symbologies

If the **Disable 2D Symbologies** feature is enabled, the scanner will not be able to read any 2D barcodes.

Enable 2D Symbologies

Disable 2D Symbologies

**** Exit Setup**

0006010

Enter Setup

Video Reverse

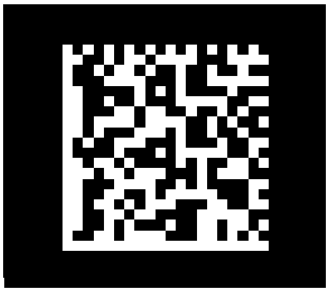
The **Video Reverse** feature only applies to 2D barcodes.

Regular barcode: Dark image on a bright background.

Inverse barcode: Bright image on a dark background.

The examples of regular barcode and inverse barcode are shown below.

Regular Barcode



Inverse Barcode

Video Reverse allows the scanner to read barcodes that are inverted.

Video Reverse ON: Read both regular barcodes and inverse barcodes.

Video Reverse OFF: Read regular barcodes only.

The scanner shows a slight decrease in scanning speed when Video Reverse is ON.

0001021

Video Reverse ON

0001011

**** Video Reverse OFF**

0006000

** **Exit Setup**

Enter Setup

1D Symbologies

Code 128

Restore Factory Defaults

Restore the Factory Defaults of Code 128

Enable/Disable Code 128

**** Enable Code 128**

Disable Code 128

Set Length Range for Code 128

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

0006010

Enter Setup

GS1-128 (UCC/EAN-128)

Restore Factory Defaults

0412000

Restore the Factory Defaults of GS1-128

Enable/Disable GS1-128

0412020

** **Enable GS1-128**

0412010

Disable GS1-128

Set Length Range for GS1-128

0412030

Set the Minimum Length

0412040

Set the Maximum Length

0006000

** **Exit Setup**

0006010

Enter Setup

AIM-128

Restore Factory Defaults

Restore the Factory Defaults of AIM-128

Enable/Disable AIM-128

**** Enable AIM-128**

Disable AIM-128

Set Length Range for AIM-128

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

Enter Setup

EAN-8

Restore Factory Defaults

Restore the Factory Defaults of EAN-8

Enable/Disable EAN-8

**** Enable EAN-8**

Disable EAN-8

Transmit Check Digit

EAN-8 is 8 digits in length with the last one as its check digit used to verify the integrity of the data.

**** Transmit EAN-8 Check Digit**

Do Not Transmit EAN-8 Check Digit

**** Exit Setup**

0006010

Enter Setup

Add-On Code

An EAN-8 barcode can be augmented with a two-digit or five-digit add-on code to form a new one. In the examples below, the part surrounded by blue dotted line is an EAN-8 barcode while the part circled by red dotted line is add-on code.

0401060

Enable 2-Digit Add-On Code

0401050

**** Disable 2-Digit Add-On Code**

0401080

Enable 5-Digit Add-On Code

0401070

**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The scanner decodes a mix of EAN-8 barcodes with and without 2-digit/5-digit add-on codes.

Disable 2-Digit Add-On Code/ Disable 5-Digit Add-On Code: The scanner decodes EAN-8 and ignores the add-on code when presented with an EAN-8 plus add-on barcode. It can also decode EAN-8 barcodes without add-on codes.


0006010

Enter Setup

Add-On Code Required

When **EAN-8 Add-On Code Required** is selected, the scanner will only read EAN-8 barcodes that contain add-on codes.


0401110

EAN-8 Add-On Code Required


0401120

**** EAN-8 Add-On Code Not Required**

EAN-8 Extension

Disable EAN-8 Zero Extend: Transmit EAN-8 barcodes as is.

Enable EAN-8 Zero Extend: Add five leading zeros to decoded EAN-8 barcodes to extend to13 digits.


0401100

Enable EAN-8 Zero Extend


0401090

**** Disable EAN-8 Zero Extend**


0006000

**** Exit Setup**

0006010

Enter Setup

EAN-13

Restore Factory Defaults

Restore the Factory Defaults of EAN-13

Enable/Disable EAN-13

**** Enable EAN-13**

Disable EAN-13

Transmit Check Digit

**** Transmit EAN-13 Check Digit**

Do Not Transmit EAN-13 Check Digit

0006010

Enter Setup

Add-On Code

An EAN-13 barcode can be augmented with a two-digit or five-digit add-on code to form a new one.

0402060

Enable 2-Digit Add-On Code

0402050

**** Disable 2-Digit Add-On Code**

0402080

Enable 5-Digit Add-On Code

0402070

**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The scanner decodes a mix of EAN-13 barcodes with and without 2-digit/5-digit add-on codes.

Disable 2-Digit Add-On Code/ Disable 5-Digit Add-On Code: The scanner decodes EAN-13 and ignores the add-on code when presented with an EAN-13 plus add-on barcode. It can also decode EAN-13 barcodes without add-on codes.

Add-On Code Required

When **EAN-13 Add-On Code Required** is selected, the scanner will only read EAN-13 barcodes that contain add-on codes.

0402090

EAN-13 Add-On Code Required

0402100

**** EAN-13 Add-On Code Not Required**

0006000

**** Exit Setup**

Enter Setup

EAN-13 Beginning with 290 Add-On Code Required

This setting programs the scanner to require an add-on code (2-digit or 5-digit) on EAN-13 barcodes that begin with “290”. The following settings can be programmed:

Require Add-On Code: All EAN-13 barcodes that begin with “290” must have a 2-digit or 5-digit add-on code. The EAN-13 barcode with the add-on code is then transmitted. If the required add-on code is not found, the EAN-13 barcode is discarded.

Do Not Require Add-On Code: If you have selected **Require Add-On Code**, and you want to disable this feature, scan **Do Not Require Add-On Code**. EAN-13 barcodes are handled, depending on your selection for the “Add-On Code Required” feature.

**** Do Not Require Add-On Code**

Require Add-On Code

EAN-13 Beginning with 378/379 Add-On Code Required

This setting programs the scanner to require an add-on code (2-digit or 5-digit) on EAN-13 barcodes that begin with a “378” or “379”. The following settings can be programmed:

Require Add-On Code: All EAN-13 barcodes that begin with a “378” or “379” must have a 2-digit or 5-digit add-on code. The EAN-13 barcode with the add-on code is then transmitted. If the required add-on code is not found, the EAN-13 barcode is discarded.

Do Not Require Add-On Code: If you have selected **Require Add-On Code**, and you want to disable this feature, scan **Do Not Require Add-On Code**. EAN-13 barcodes are handled, depending on your selection for the “Add-On Code Required” feature.

**** Do Not Require Add-On Code**

Require Add-On Code

**** Exit Setup**

Enter Setup

EAN-13 Beginning with 414/419 Add-On Code Required

This setting programs the scanner to require an add-on code (2-digit or 5-digit) on EAN-13 barcodes that begin with a “414” or “419”. The following settings can be programmed:

Require Add-On Code: All EAN-13 barcodes that begin with a “414” or “419” must have a 2-digit or 5-digit add-on code. The EAN-13 barcode with the add-on code is then transmitted. If the required add-on code is not found, the EAN-13 barcode is discarded.

Do Not Require Add-On Code: If you have selected **Require Add-On Code**, and you want to disable this feature, scan **Do Not Require Add-On Code**. EAN-13 barcodes are handled, depending on your selection for the “Add-On Code Required” feature.

**** Do Not Require Add-On Code**

Require Add-On Code

EAN-13 Beginning with 434/439 Add-On Code Required

This setting programs the scanner to require an add-on code (2-digit or 5-digit) on EAN-13 barcodes that begin with a “434” or “439”. The following settings can be programmed:

Require Add-On Code: All EAN-13 barcodes that begin with a “434” or “439” must have a 2-digit or 5-digit add-on code. The EAN-13 barcode with the add-on code is then transmitted. If the required add-on code is not found, the EAN-13 barcode is discarded.

Do Not Require Add-On Code: If you have selected **Require Add-On Code**, and you want to disable this feature, scan **Do Not Require Add-On Code**. EAN-13 barcodes are handled, depending on your selection for the “Add-On Code Required” feature.

**** Do Not Require Add-On Code**

Require Add-On Code

***** Exit Setup**

Enter Setup

EAN-13 Beginning with 977 Add-On Code Required

This setting programs the scanner to require an add-on code (2-digit or 5-digit) on EAN-13 barcodes that begin with “977”. The following settings can be programmed:

Require Add-On Code: All EAN-13 barcodes that begin with “977” must have a 2-digit or 5-digit add-on code. The EAN-13 barcode with the add-on code is then transmitted. If the required add-on code is not found, the EAN-13 barcode is discarded.

Do Not Require Add-On Code: If you have selected **Require Add-On Code**, and you want to disable this feature, scan **Do Not Require Add-On Code**. EAN-13 barcodes are handled, depending on your selection for the “Add-On Code Required” feature.

**** Do Not Require Add-On Code**

Require Add-On Code

EAN-13 Beginning with 978 Add-On Code Required

This setting programs the scanner to require an add-on code (2-digit or 5-digit) on EAN-13 barcodes that begin with “978”. The following settings can be programmed:

Require Add-On Code: All EAN-13 barcodes that begin with “978” must have a 2-digit or 5-digit add-on code. The EAN-13 barcode with the add-on code is then transmitted. If the required add-on code is not found, the EAN-13 barcode is discarded.

Do Not Require Add-On Code: If you have selected **Require Add-On Code**, and you want to disable this feature, scan **Do Not Require Add-On Code**. EAN-13 barcodes are handled, depending on your selection for the “Add-On Code Required” feature.

**** Do Not Require Add-On Code**

Require Add-On Code

**** Exit Setup**

Enter Setup

EAN-13 Beginning with 979 Add-On Code Required

This setting programs the scanner to require an add-on code (2-digit or 5-digit) on EAN-13 barcodes that begin with “979”. The following settings can be programmed:

Require Add-On Code: All EAN-13 barcodes that begin with “979” must have a 2-digit or 5-digit add-on code. The EAN-13 barcode with the add-on code is then transmitted. If the required add-on code is not found, the EAN-13 barcode is discarded.

Do Not Require Add-On Code: If you have selected **Require Add-On Code**, and you want to disable this feature, scan **Do Not Require Add-On Code**. EAN-13 barcodes are handled, depending on your selection for the “Add-On Code Required” feature.

**** Do Not Require Add-On Code**

Require Add-On Code

**** Exit Setup**

0006010

Enter Setup

ISSN

Restore Factory Defaults

Restore the Factory Defaults of ISSN

Enable/Disable ISSN

Enable ISSN

**** Disable ISSN**

**** Exit Setup**

0006010

Enter Setup

Add-On Code

An ISSN barcode can be augmented with a two-digit or five-digit add-on code to form a new one.


0421030

Enable 2-Digit Add-On Code


0421040

**** Disable 2-Digit Add-On Code**


0421050

Enable 5-Digit Add-On Code


0421060

**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The scanner decodes a mix of ISSN barcodes with and without 2-digit/5-digit add-on codes.

Disable 2-Digit Add-On Code/ Disable 5-Digit Add-On Code: The scanner decodes ISSN and ignores the add-on code when presented with an ISSN plus add-on barcode. It can also decode ISSN barcodes without add-on codes.

Add-On Code Required

When **ISSN Add-On Code Required** is selected, the scanner will only read ISSN barcodes that contain add-on codes.


0421070

ISSN Add-On Code Required


0421080

**** ISSN Add-On Code Not Required**

0006010

Enter Setup

ISBN

Restore Factory Default

Restore the Factory Defaults of ISBN

Enable/Disable ISBN

**** Enable ISBN**

Disable ISBN

Set ISBN Format

**** ISBN-13**

ISBN-10

**** Exit Setup**

Enter Setup

Add-On Code

An ISBN barcode can be augmented with a two-digit or five-digit add-on code to form a new one.

Enable 2-Digit Add-On Code

**** Disable 2-Digit Add-On Code**

Enable 5-Digit Add-On Code

**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The scanner decodes a mix of ISBN barcodes with and without 2-digit/5-digit add-on codes.

Disable 2-Digit Add-On Code/ Disable 5-Digit Add-On Code: The scanner decodes ISBN and ignores the add-on code when presented with an ISBN plus add-on barcode. It can also decode ISBN barcodes without add-on codes.

Add-On Code Required

When **ISBN Add-On Code Required** is selected, the scanner will only read ISBN barcodes that contain add-on codes.

ISBN Add-On Code Required

**** ISBN Add-On Code Not Required**

**** Exit Setup**

Enter Setup

UPC-E

Restore Factory Defaults

Restore the Factory Defaults of UPC-E

Enable/Disable UPC-E

**** Enable UPC-E**

Disable UPC-E

Transmit Check Digit

**** Transmit UPC-E Check Digit**

Do Not Transmit UPC-E Check Digit

**** Exit Setup**

0006010

Enter Setup

Add-On Code

A UPC-E barcode can be augmented with a two-digit or five-digit add-on code to form a new one.

Enable 2-Digit Add-On Code

**** Disable 2-Digit Add-On Code**

Enable 5-Digit Add-On Code

**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The scanner decodes a mix of UPC-E barcodes with and without 2-digit/5-digit add-on codes.

Disable 2-Digit Add-On Code/ Disable 5-Digit Add-On Code: The scanner decodes UPC-E and ignores the add-on code when presented with a UPC-E plus add-on barcode. It can also decode UPC-E barcodes without add-on codes.

Add-On Code Required

When **UPC-E Add-On Code Required** is selected, the scanner will only read UPC-E barcodes that contain add-on codes.

UPC-E Add-On Code Required

**** UPC-E Add-On Code Not Required**

0006000

**** Exit Setup**

0006010

Enter Setup

Transmit System Character “0”

The first character of UPC-E barcode is the system character “0”.


0403100

**** Transmit System Character “0”**


0403090

Do Not Transmit System Character “0”

UPC-E Extension

Disable UPC-E Extend: Transmit UPC-E barcodes as is.

Enable UPC-E Extend: Extend UPC-E barcodes to make them compatible in length to UPC-A.


0403120

Enable UPC-E Extend


0403110

**** Disable UPC-E Extend**

0006000

**** Exit Setup**

0006010

Enter Setup

UPC-A

Restore Factory Defaults

Restore the Factory Defaults of UPC-A

Enable/Disable UPC-A

**** Enable UPC-A**

Disable UPC-A

Transmit Check Digit

**** Transmit UPC-A Check Digit**

Do Not Transmit UPC-A Check Digit

**** Exit Setup**

Enter Setup

Add-On Code

A UPC-A barcode can be augmented with a two-digit or five-digit add-on code to form a new one.

Enable 2-Digit Add-On Code

**** Disable 2-Digit Add-On Code**

Enable 5-Digit Add-On Code

**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The scanner decodes a mix of UPC-A barcodes with and without 2-digit/5-digit add-on codes.

Disable 2-Digit Add-On Code/ Disable 5-Digit Add-On Code: The scanner decodes UPC-A and ignores the add-on code when presented with a UPC-A plus add-on barcode. It can also decode UPC-A barcodes without add-on codes.

Add-On Code Required

When **UPC-A Add-On Code Required** is selected, the scanner will only read UPC-A barcodes that contain add-on codes.

UPC-A Add-On Code Required

**** UPC-A Add-On Code Not Required**

**** Exit Setup**

0006010

Enter Setup

Transmit Preamble Character

Preamble characters (Country Code and System Character) can be transmitted as part of a UPC-A barcode. Select one of the following options for transmitting UPC-A preamble to the host device: transmit system character only or transmit system character and country code (“0” for USA).

0404100

System Character & Country Code

0404090

**** System Character**

0006000

**** Exit Setup**

0006010

Enter Setup

Interleaved 2 of 5

Restore Factory Defaults

Restore the Factory Defaults of Interleaved 2 of 5

Enable/Disable Interleaved 2 of 5

**** Enable Interleaved 2 of 5**

Disable Interleaved 2 of 5

Set Length Range for Interleaved 2 of 5

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

0006010

Enter Setup

Check Digit Verification

A check digit is optional for Interleaved 2 of 5 and can be added as the last digit. It is a calculated value used to verify the integrity of the data.

Disable: The scanner transmits Interleaved 2 of 5 barcodes as is.

Do Not Transmit Check Digit After Verification: The scanner checks the integrity of all Interleaved 2 of 5 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.

Transmit Check Digit After Verification: The scanner checks the integrity of all Interleaved 2 of 5 barcodes to verify that the data complies with the check digit algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

**** Disable**

Do Not Transmit Check Digit After Verification

Transmit Check Digit After Verification

**** Exit Setup**

Enter Setup

Febraban

Disable/Enable Febraban

**** Disable Febraban**

Enable Febraban, Do Not Expand

Enable Febraban, Expand

Transmit Delay

This feature is available only when USB HID-KBW is enabled. **Transmit Delay per Character** applies to both Expanded and Unexpanded Febraban while **Transmit Delay per 12 Characters** applies to Expanded Febraban only.

**** Disable Transmit Delay per Character**

Enable Transmit Delay per Character (70ms)

**** Disable Transmit Delay per 12 Characters**

Enable Transmit Delay per 12 Characters (500ms)

**** Exit Setup**

0006010

Enter Setup

Custom Transmit Delay per Character: This parameter is programmable in 5ms increments from 0ms to 75ms. To set it, scan the **Custom Transmit Delay per Character** barcode and two numeric barcodes that represent a desired value. Single-digit values must have a leading zero. See **Appendix 5** for more information. The default value is 70ms.

Custom Transmit Delay per 12 Characters: To set this parameter, scan the **Custom Transmit Delay per 12 Characters** barcode and a numeric barcode (0-7, which represent 0ms, 300ms, 400ms, 500ms, 600ms, 700ms, 800ms and 900ms, respectively). See **Appendix 5** for more information. The default value is 700ms.

0700162

Custom Transmit Delay per Character

0700172

Custom Transmit Delay per 12 Characters

0006000

**** Exit Setup**

Enter Setup

ITF-14

ITF-14 is a special kind of Interleaved 2 of 5 with a length of 14 characters and the last character as the check digit.

Restore the Factory Defaults of ITF-14

Disable ITF-14

** **Enable ITF-14 But Do Not Transmit Check Digit**

Enable ITF-14 and Transmit Check Digit

Note: It is advisable not to enable ITF-14 and Interleaved 2 of 5 at the same time.

**** Exit Setup**

Enter Setup

ITF-6

ITF-6 is a special kind of Interleaved 2 of 5 with a length of 6 characters and the last character as the check digit.

Restore the Factory Defaults of ITF-6

**** Disable ITF-6**

Enable ITF-6 But Do Not Transmit Check Digit

Enable ITF-6 and Transmit Check Digit

Note: It is advisable not to enable ITF-6 and Interleaved 2 of 5 at the same time.

**** Exit Setup**

0006010

Enter Setup

Matrix 2 of 5

Restore Factory Defaults

0406000

Restore the Factory Defaults of Matrix 2 of 5

Enable/Disable Matrix 2 of 5

0406020

Enable Matrix 2 of 5

0406010

**** Disable Matrix 2 of 5**

Set Length Range for Matrix 2 of 5

0406030

Set the Minimum Length

0406040

Set the Maximum Length

0006010

Enter Setup

Check Digit Verification

Disable

**** Do Not Transmit Check Digit After Verification**

Transmit Check Digit After Verification

**** Exit Setup**

0006010

Enter Setup

Industrial 2 of 5

Restore Factory Defaults

Restore the Factory Defaults of Industrial 2 of 5

Enable/Disable Industrial 2 of 5

**** Enable Industrial 2 of 5**

Disable Industrial 2 of 5

Set Length Range for Industrial 2 of 5

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

0006010

Enter Setup

Check Digit Verification

**** Disable**

Transmit Check Digit After Verification

Do Not Transmit Check Digit After Verification

**** Exit Setup**

0006010

Enter Setup

Standard 2 of 5（IATA 2 of 5）

Restore Factory Defaults

0418000

Restore the Factory Defaults of Standard 25

Enable/Disable Standard 25

0418020

**** Enable Standard 25**

0418010

Disable Standard 25

Set Length Range for Standard 25

0418030

Set the Minimum Length

0418040

Set the Maximum Length

0006000

**** Exit Setup**

Enter Setup

Check Digit Verification

**** Disable**

Transmit Check Digit After Verification

Do Not Transmit Check Digit After Verification

**** Exit Setup**

0006010

Enter Setup

Code 39

Restore Factory Defaults

Restore the Factory Defaults of Code 39

Enable/Disable Code 39

**** Enable Code 39**

Disable Code 39

Transmit Start/Stop Character

Transmit Start/Stop Character

**** Do not Transmit Start/Stop Character**

0006010

Enter Setup

Set Length Range for Code 39

0408030

Set the Minimum Length

0408040

Set the Maximum Length

Check Digit Verification

0408050

**** Disable**

0408070

Transmit Check Digit After Verification

0408060

Do Not Transmit Check Digit After Verification

Enable/Disable Code 39 Full ASCII

The scanner can be configured to identify all ASCII characters by scanning the appropriate barcode below.

0408110

**** Enable Code 39 Full ASCII**

0408100

Disable Code 39 Full ASCII

0006000

**** Exit Setup**

Enter Setup

Enable/Disable Code 32

Code 32 is a variant of Code 39 used by the Italian pharmaceutical industry. Scan the appropriate bar code below to enable or disable Code 32. Code 39 must be enabled and Code 39 check digit verification must be disabled for this parameter to function.

**** Disable Code 32**

Enable Code 32

Code 32 Prefix

Scan the appropriate bar code below to enable or disable adding the prefix character “A” to all Code 32 barcodes. Code 32 must be enabled for this parameter to function.

**** Disable Code 32 Prefix**

Enable Code 32 Prefix

**** Exit Setup**

Enter Setup

Transmit Code 32 Check Digit

Code 32 must be enabled for this parameter to function.

**** Do Not Transmit Code 32 Check Digit**

Transmit Code 32 Check Digit

Transmit Code 32 Start/Stop Character

Code 32 must be enabled for this parameter to function.

**** Do Not Transmit Code 32 Start/Stop Character**

Transmit Code 32 Start/Stop Character

**** Exit Setup**

Enter Setup

Codabar

Restore Factory Defaults

Restore the Factory Defaults of Codabar

Enable/Disable Codabar

**** Enable Codabar**

Disable Codabar

Set Length Range for Codabar

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

0006010

Enter Setup

Check Digit Verification

**** Disable**

Transmit Check Digit After Verification

Do Not Transmit Check Digit After Verification

Transmit Start/Stop Character

Transmit Start/Stop Character

**** Do not Transmit Start/Stop Character**

Enter Setup

Start/Stop Character Format

You can choose your desired start/stop character format by scanning the appropriate barcode below.

**** ABCD/ABCD as the Start/Stop Character**

ABCD/TN*E as the Start/Stop Character

Start/Stop Character in Uppercase

Start/Stop Character in Lowercase

**** Exit Setup**

0006010

Enter Setup

Code 93

Restore Factory Defaults

Restore the Factory Defaults of Code 93

Enable/Disable Code 93

**** Enable Code 93**

Disable Code 93

Set Length Range for Code 93

Set the Minimum Length

Set the Maximum Length

0006000

**** Exit Setup**

0006010

Enter Setup

Check Digit Verification

Disable

**** Do Not Transmit Check Digit After Verification**

Transmit Check Digit After Verification

0006010

Enter Setup

GS1-Databar (RSS)

Restore Factory Defaults

Restore the Factory Defaults of GS1-Databar

Enable/Disable GS1 Databar

**** Enable GS1-DataBar**

Disable GS1-DataBar

Transmit Application Identifier “01”

**** Transmit Application Identifier “01”**

Do Not Transmit Application Identifier “01”

0006000

**** Exit Setup**

Enter Setup

Code 11

Restore Factory Defaults

Restore the Factory Defaults of Code 11

Enable/Disable Code 11

**** Enable Code 11**

Disable Code 11

Set Length Range for Code 11

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**


0006010

Enter Setup

Transmit Check Digit


0415120

Transmit Check Digit


0415110

**** Do Not Transmit Check Digit**

Check Digit Verification


0415050

Disable


0415060

**** One Check Digit, MOD11**


0415070

Two Check Digits, MOD11/MOD11


0415080

Two Check Digits, MOD11/MOD9


0415090

One Check Digit, MOD11 (Len<=10)

Two Check Digits, MOD11/MOD11 (Len>10)


0415100

One Check Digit, MOD11 (Len<=10)

Two Check Digits, MOD11/MOD9 (Len>10)


0006000

**** Exit Setup**

0006010

Enter Setup

Plessey

Restore Factory Defaults

Restore the Factory Defaults of Plessey

Enable/Disable Plessey

**** Enable Plessey**

Disable Plessey

Set Length Range for Plessey

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

Check Digit Verification

0419050

Disable

0419060

**** Do Not Transmit Check Digit After Verification**

0419070

Transmit Check Digit After Verification

0006010

Enter Setup

MSI-Plessey

Restore Factory Defaults

Restore the Factory Defaults of MSI-Plessey

Enable/Disable MSI-Plessey

**** Enable MSI-Plessey**

Disable MSI-Plessey

Set Length Range for MSI-Plessey

Set the Minimum Length

Set the Maximum Length

0006000

**** Exit Setup**

Enter Setup

Transmit Check Digit

Transmit Check Digit

**** Do Not Transmit Check Digit**

Check Digit Verification

Disable

**** One Check Digit, MOD10**

Two Check Digits, MOD10/MOD10

Two Check Digits, MOD10/MOD11

**** Exit Setup**

0006010

Enter Setup

2D Symbologies

PDF 417

Restore Factory Defaults

Restore the Factory Defaults of PDF 417

Enable/Disable PDF 417

**** Enable PDF 417**

Disable PDF 417

Set Length Range for PDF 417

Set the Minimum Length

Set the Maximum Length

0006000

**** Exit Setup**

Enter Setup

PDF 417 Twin Code

PDF417 twin code is 2 PDF417 barcodes paralleled vertically or horizontally. They must both be either regular or inverse barcodes. They must have similar specifications and be placed closely together.

There are 3 options for reading PDF417 twin codes:

Single PDF417 Only: Read either PDF417 code.

Twin PDF417 Only: Read both PDF417 codes.

Both Single & Twin: Read both PDF417 codes. If successful, transmit as twin PDF417 only. Otherwise, try single PDF417 only.

**** Single PDF417 Only**

Twin PDF417 Only

Both Single & Twin

Character Encoding

**** Default Character Encoding**

UTF-8

** Exit Setup**

0006010

Enter Setup

QR Code

Restore Factory Defaults

Restore the Factory Defaults of QR Code

Enable/Disable QR Code

**** Enable QR Code**

Disable QR Code

Set Length Range for QR Code

Set the Minimum Length

Set the Maximum Length

Micro QR

**** Enable Micro QR**

Disable Micro QR

**** Exit Setup**

0006010

Enter Setup

QR Twin Code

QR twin code is 2 QR barcodes paralleled vertically or horizontally. They must both be either regular or inverse barcodes. They must have similar specifications and be placed closely together.

There are 3 options for reading QR twin codes:

Single QR Only: Read either QR code.

Twin QR Only: Read both QR codes.

Both Single & Twin: Read both QR codes. If successful, transmit as twin QR only. Otherwise, try single QR only.

0502070

**** Single QR Only**

0502080

Twin QR Only

0502090

Both Single & Twin

Character Encoding

0502160

**** Default Character Encoding**

0502161

UTF-8

0006000

**** Exit Setup**

0006010

Enter Setup

Data Matrix

Restore Factory Defaults

Restore the Factory Defaults of Data Matrix

Enable/Disable Data Matrix

**** Enable Data Matrix**

Disable Data Matrix

Set Length Range for Data Matrix

Set the Minimum Length

Set the Maximum Length

0006010

Enter Setup

Rectangular Barcode

**** Enable Rectangular Barcode**

Disable Rectangular Barcode

Mirror Image

**** Decode Mirror Images**

Do Not Decode Mirror Images

0006000

**** Exit Setup**

Enter Setup

Data Matrix Twin Code

Data Matrix twin code is 2 Data Matrix barcodes paralleled vertically or horizontally. They must both be either regular or inverse barcodes. They must have similar specifications and be placed closely together.

There are 3 options for reading Data Matrix twin codes:

Single Data Matrix Only: Read either Data Matrix code.

Twin Data Matrix Only: Read both Data Matrix codes. Transmission order: Data Matrix code on the left (in the upper position) followed by the one on the right (in the lower position).

Both Single & Twin: Read both Data Matrix codes. If successful, transmit as twin Data Matrix only. Otherwise, try single Data Matrix only.

**** Single Data Matrix Only**

Twin Data Matrix Only

Both Single & Twin

Character Encoding

**** Default Character Encoding**

UTF-8

**** Exit Setup**

0006010

Enter Setup

Chapter 8 Image Control

Image Flipping

You may flip the image captured by the scanner to meet actual need by scanning the appropriate barcode on the next page. The following figures illustrate original image and three flipped images.

Original Image

Image Flipped Horizontally

Image Flipped Vertically

Image Flipped Horizontally and Vertically

0006000

** **Exit Setup**

0006010

Enter Setup

Flip

0202000

**** Do Not Flip**

0202030

Flip Vertically

0202031

Flip Horizontally

0202032

Flip Horizontally and Vertically

Flip Vertically

0202033

Flip Vertically

0202034

Do Not Flip Vertically

Flip Horizontally

0202035

Flip Horizontally

0202036

Do Not Flip Horizontally

0006000

**** Exit Setup**

Enter Setup

Chapter 9 Illumination & Aiming

Illumination

A couple of illumination options are provided to improve the lighting conditions during every image capture:

Normal: Illumination LEDs are turned on during image capture.

Always ON: Illumination LEDs turn dim when the scanner is in idle state; they grow brighter gradually when the scanner is triggered to scan.

OFF: Illumination LEDs are OFF all the time.

**** Normal**

OFF

Always ON

**** Exit Setup**

0006010

Enter Setup

Aiming

When scanning/capturing image, the engine projects an aiming pattern which allows positioning the target barcode within its field of view and thus makes decoding easier.

Normal: The engine projects an aiming pattern only during barcode scanning/capture.

Always ON: Aiming pattern is constantly ON after the engine is powered on.

OFF: Aiming pattern is OFF all the time.

**** Normal**

OFF

Always ON

0006010

Enter Setup

Chapter 10 Data Formatter

Introduction

You may use the Data Formatter to modify the scanner's output. For example, you can use the Data Formatter to insert characters at certain points in barcode data or to suppress/ replace/ send certain characters in barcode data as it is scanned.

Normally, when you scan a barcode, it gets outputted automatically; however, when you create a format, you must use a "send" command (see the **"Send Commands"** section in this chapter) within the format programming to output data. The maximum size of formatter commands in a data format is 112 characters. By default, the data formatter is disabled. Enable it when required. If you have changed data format settings, and wish to clear all formats and return to the factory defaults, scan the **Default Data Format** code below.

**** Default Data Format**

Add a Data Format

Data format is used to edit barcode data only. You can program up to four data formats, i.e. Format_0, Format_1, Format_2 and Format_3. When you create a data format, you must specify the application scope of your data format (such as barcode type and data length) and include formatter commands. When scanned data does not match your data format requirements, you will hear the non-match error beep (if the non-match error beep is ON).

There are two methods to program a data format: Programming with barcodes and programming with a batch command.

0006000

**** Exit Setup**

0006010

Enter Setup

Programming with Barcodes

The following explains how to program a data format by scanning the specific barcodes. Scanning any irrelevant barcode or failing to follow the setting procedure will result in programming failure. To find the alphanumeric barcodes needed to create a data format, see **Appendix 6: Digit Barcodes**.

Step 1: Scan the **Enter Setup** barcode.

Step 2: Scan the **Add Data Format** barcode.

Add Data Format

Step 3: Select data format.
Scan a numeric barcode **0** or **1** or **2** or **3** to set this to Format_0 or Format_1 or Format_2 or Format_3.

Step 4: Select formatter command type.
Specify what type of formatter commands will be used. Scan a numeric barcode “6” to select formatter command type 6. (See the **“Formatter Command Type 6”** section in this chapter for more information)

Step 5: Set interface type
Scan **999** for any interface type.

Step 6: Set Symbology ID Number
Refer to **Appendix 10: Symbology ID Number** and find the ID number of the symbology to which you want to apply the data format. Scan three numeric barcodes for the symbology ID number. If you wish to create a data format for all symbologies, scan **999**.

Step 7: Set barcode data length
Specify what length of data will be acceptable for this symbology. Scan the four numeric barcodes that represent the data length. 9999 is a universal number, indicating all lengths. For example, 32 characters should be entered as 0032.

Enter Setup

Step 8: Enter formatter command

Refer to the **"Formatter Command Type 6"** section in this chapter. Scan the alphanumeric barcodes that represent the command you need to edit data. For example, when a command is F141, you should scan F141. A command can contain up to 112 characters.

Step 9: Scan the **Save** barcode from **Appendix 7: Save/Cancel Barcodes** to save your data format.

Example: Program format_0 using formatter command type 6, Code 128 containing 10 characters applicable, send all characters followed by "A".

1. Scan the **Enter Setup** barcode	Enter the Setup mode
2. Scan the **Add Data Format** barcode	Add a data format
3. Scan the **0** barcode	Select format_0
4. Scan the **6** barcode	Select formatter command type 6
5. Scan the **9** barcode three times	All interface types applicable
6. Scan the barcodes **002**	Only Code 128 applicable
7. Scan the barcodes **0010**	Only a length of 10 characters applicable
8. Scan the alphanumeric barcodes **F141**	Send all characters followed by "A" (hex: 41)
9. Scan the **Save** barcode	Save the data format

**** Exit Setup**

Enter Setup

Programming with a Batch Command

A data format can also be created by a batch command sent from the host device.

Syntax: “nls0323000” + “=” + Double Quotation Mark (”) + Parameter Value + Double Quotation Mark (”) + “;”

Parameter Value consists of the following elements:

Data format: 0~3 (1 character). 0, 1, 2 and 3 represent Format_0, Format_1, Format_2 and Format_3 respectively.

Formatter command type: 6 (1 character).

Interface type: 999 (3 characters).

Symbology ID Number: The ID number of the symbology to which you want to apply the data format (3 characters). 999 indicates all symbologies.

Data length: The length of data that will be acceptable for this symbologyrs (4 characters). 9999 indicates all lengths. For example, 32 characters should be entered as 0032.

Formatter commands: The command string used to edit data (max. 112 characters). For more information, see the **“Formatter Command Type 6”** section.

Note: A batch command used to create a data format must conform to the syntax above. Returned value 0x06 indicates success; returned value 0x15 indicates failure.

To streamline the programming process, you may as well generate a batch barcode by inputting the batch command (e.g. **0323000=“069990020010F141”;**) used to create a data format. See the **“Use Batch Barcode”** section in Chapter 11 to learn how to put a batch barcode into use.

Example 1: Program format_0 using formatter command type 6, Code 128 containing 10 characters applicable, send all characters followed by “A”.

Batch command: **nls0323000=“069990020010F141”;**

Example 2: Program format_0 using formatter command type 6, all symbologies, all lengths applicable, send the first 5 characters in barcode, wait for 1s, send the next 6 characters, wait for 1s, then send the rest of the barcode data.

Batch command: **nls0323000=“069999999999F20500EF0200F20600EF0200E900”;**

0006010

Enter Setup

Enable Data Format

After enabling the Data Formatter, you may select a data format you want to use by scanning the appropriate barcode below.

0323030

**** Format_0**

0323031

Format_1

0323032

Format_2

0323033

Format_3

Change Data Format for a Single Scan

You can switch between data formats for a single scan. The next barcode is scanned using the data format selected here, then reverts to the format you have selected above. For example, you may have set your scanner to the data format you saved as Format_3. You can switch to Format_1 for a single trigger pull by scanning the **Single Scan – Format_1** barcode below. The next barcode that is scanned uses Format_1, then reverts back to Format_3.

Note: This setting will be lost by removing power from the scanner, or turning off/ rebooting the device.

0323050

Single Scan – Format_0

0323051

Single Scan – Format_1

0323052

Single Scan – Format_2

0323053

Single Scan – Format_3

0006000

**** Exit Setup**

0006010

Enter Setup

Enable/Disable Data Formatter

When Data Formatter is disabled, the data format you have enabled becomes invalid.

0323020

**** Disable Data Formatter**

You may wish to require the data to conform to a data format you have created. The following settings can be applied to your data format:

Enable Data Formatter, Required, Keep Prefix/Suffix: Scanned data that meets your data format requirements is modified accordingly and gets outputted along with prefixes and suffixes (if prefix and suffix are enabled). Any data that does not match your data format requirements generates an error beep (if Non-Match Error Beep is turned ON) and the data in that barcode is not transmitted.

Enable Data Formatter, Required, Drop Prefix/Suffix: Scanned data that meets your data format requirements is modified accordingly and gets outputted without prefixes and suffixes (even if prefix and suffix are enabled). Any data that does not match your data format requirements generates an error beep (if Non-Match Error Beep is turned ON) and the data in that barcode is not transmitted.

Enable Data Formatter, Not Required, Keep Prefix/Suffix: Scanned data that meets your data format requirements is modified accordingly and gets outputted along with prefixes and suffixes (if prefix and suffix are enabled). Barcode data that does not match your data format requirements is transmitted as read along with prefixes and suffixes (if prefix and suffix are enabled).

Enable Data Formatter, Not Required, Drop Prefix/Suffix: Scanned data that meets your data format requirements is modified accordingly and gets outputted without prefixes and suffixes (even if prefix and suffix are enabled). Barcode data that does not match your data format requirements is transmitted as read along with prefixes and suffixes (if prefix and suffix are enabled).

Enter Setup

Enable Data Formatter, Required, Keep Prefix/Suffix

Enable Data Formatter, Required, Drop Prefix/Suffix

Enable Data Formatter, Not Required, Keep Prefix/Suffix

Enable Data Formatter, Not Required, Drop Prefix/Suffix

Non-Match Error Beep

If Non-Match Error Beep is turned ON, the scanner generates an error beep when a barcode is encountered that does not match your required data format.

**** Non-Match Error Beep ON**

Non-Match Error Beep OFF

Clear Data Format

There are two methods to remove data format from your scanner:

Delete one data format: Scan the **Clear One** barcode, a numeric barcode (0-3) and the **Save** barcode. For example, to delete Format_2, you should scan the **Clear One** barcode, the **2** barcode and the **Save** barcode.

Delete all data formats: Scan the **Clear All** barcode.

Clear All

Clear One

**** Exit Setup**

0006010

Enter Setup

Query Data Formats

You may scan the following barcode to get the information of data format(s) you have created. For instance, if you have added Format_0 as per the example in the **"Programming with Barcodes"** section in this chapter, then the query result will be **Data Format 0:069990020010F141;**.

Query Data Formats

0006010

Enter Setup

Formatter Command Type 6

When working with the Data Formatter, a virtual cursor is moved along your input data string. The following commands are used to both move this cursor to different positions, and to select, replace, and insert data into the final output. For the hex value of ASCII characters involved in the commands, refer to **Appendix 4: ASCII Table**.

Send Commands

F1 Send all characters

Syntax=F1xx (xx: The insert character's hex value)

Include in the output message all of the characters from the input message, starting from current cursor position, followed by an insert character.

F2 Send a number of characters

Syntax=F2nnxx (nn: The numeric value (00-99) for the number of characters; xx: The insert character's hex value)

Include in the output message a number of characters followed by an insert character. Start from the current cursor position and continue for "nn" characters or through the last character in the input message, followed by character "xx."

F2 Example: Send a number of characters

Send the first 10 characters from the barcode above, followed by a carriage return.

Command string: **F2100D**

F2 is the "Send a number of characters" command

10 is the number of characters to send

0D is the hex value for a CR

The data is output as: **1234567890**
<CR>

0006010

Enter Setup

F3 Send all characters up to a particular character

Syntax=F3ssxx (ss: The particular character's hex value; xx: The insert character's hex value)

Include in the output message all characters from the input message, starting with the character at the current cursor position and continuing to, but not including, the particular character "ss," followed by character "xx." The cursor is moved forward to the "ss" character.

F3 Example: Send all characters up to a particular character

Using the barcode above, send all characters up to but not including "D," followed by a carriage return.

Command string: **F3440D**

F3 is the "Send all characters up to a particular character" command

44 is the hex value for a "D"

0D is the hex value for a CR

The data is output as: **1234567890ABC**
<CR>

E9 Send all but the last characters

Syntax=E9nn (nn: The numeric value (00-99) for the number of characters that will not be sent at the end of the message)

Include in the output message all but the last "nn" characters, starting from the current cursor position. The cursor is moved forward to one position past the last input message character included.

F4 Insert a character multiple times

Syntax=F4xxnn (xx: The insert character's hex value; nn: The numeric value (00-99) for the number of times it should be sent)

Send "xx" character "nn" times in the output message, leaving the cursor in the current position.

0006010

Enter Setup

E9 and F4 Example: Send all but the last characters, followed by 2 tabs

Send all characters except for the last 8 from the barcode above, followed by 2 tabs.

Command string: **E908F40902**

E9 is the “Send all but the last characters” command

08 is the number of characters at the end to ignore

F4 is the “Insert a character multiple times” command

09 is the hex value for a horizontal tab

02 is the number of times the tab character is sent

The data is output as: **1234567890AB<tab><tab>**

B3 Insert symbology name

Insert the name of the barcode’s symbology in the output message, without moving the cursor.

B4 Insert barcode length

Insert the barcode’s length in the output message, without moving the cursor. The length is expressed as a numeric string and does not include leading zeros.

0006010

Enter Setup

B3 and B4 Example: Insert the symbology name and length

Send the symbology name and length before the barcode data from the barcode above. Break up these insertions with spaces. End with a carriage return.

Command string: **B3F42001B4F42001F10D**

B3 is the “Insert symbology name” command

F4 is the “Insert a character multiple times” command

20 is the hex value for a space

01 is the number of time the space character is sent

B4 is the “Insert barcode length” command

F4 is the “Insert a character multiple times” command

20 is the hex value for a space

01 is the number of time the space character is sent

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **Code128 20 1234567890ABCDEFGHIJ**
<CR>

Move Commands

F5 Move the cursor forward a number of characters

Syntax=F5nn (nn: The numeric value (00-99) for the number of characters the cursor should be moved ahead)

Move the cursor ahead “nn” characters from current cursor position.

F5 Example: Move the cursor forward and send the data

Move the cursor forward 3 characters, then send the rest of the barcode data from the barcode above. End with a carriage return.

Command string: **F503F10D**

F5 is the “Move the cursor forward a number of characters” command

03 is the number of characters to move the cursor

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **4567890ABCDEFGHIJ**
<CR>

F6 Move the cursor backward a number of characters

Syntax=F6nn (nn: The numeric value (00-99) for the number of characters the cursor should be moved back)

Move the cursor back “nn” characters from current cursor position.

F7 Move the cursor to the beginning

Syntax＝F7

Move the cursor to the first character in the input message.

EA Move the cursor to the end

Syntax＝EA

Move the cursor to the last character in the input message.

0006010

Enter Setup

Search Commands

F8 Search forward for a character

Syntax＝F8xx (xx: The search character's hex value)

Search the input message forward for "xx" character from the current cursor position, leaving the cursor pointing to the "xx" character.

F8 Example: Send barcode data that starts after a particular character

Search for the letter "D" in barcodes and send all the data that follows, including the "D". Using the barcode above:

Command string: **F844F10D**

F8 is the "Search forward for a character" command

44 is the hex value for "D"

F1 is the "Send all characters" command

0D is the hex value for a CR

The data is output as: **DEFGHIJ**

<CR>

F9 Search backward for a character

Syntax＝F9xx (xx: The search character's hex value)

Search the input message backward for "xx" character from the current cursor position, leaving the cursor pointing to the "xx" character.

0006010

Enter Setup

B0 Search forward for a string

Syntax=B0nnnnS (nnnn: The string length (up to 9999); S: The ASCII hex value of each character in the string)

Search forward for “S” string from the current cursor position, leaving cursor pointing to “S” string. For example, B0000454657374 will search forward for the first occurrence of the 4-character string “Test.”

B0 Example: Send barcode data that starts after a string of characters

Search for the letters “FGH” in barcodes and send all the data that follows, including “FGH.” Using the barcode above:

Command string: **B00003464748F10D**

B0 is the “Search forward for a string” command

0003 is the string length (3 characters)

46 is the hex value for “F”

47 is the hex value for “G”

48 is the hex value for “H”

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **FGHIJ**
<CR>

B1 Search backward for a string

Syntax＝B1nnnnS (nnnn: The string length (up to 9999); S: The ASCII hex value of each character in the string)

Search backward for “S” string from the current cursor position, leaving cursor pointing to “S” string. For example, B1000454657374 will search backward for the first occurrence of the 4-character string “Test.”

E6 Search forward for a non-matching character

Syntax=E6xx (xx: The search character's hex value)

Search the input message forward for the first non-"xx" character from the current cursor position, leaving the cursor pointing to the non-"xx" character.

E6 Example: Remove zeros at the beginning of barcode data

This example shows a barcode that has been zero filled. You may want to ignore the zeros and send all the data that follows. E6 searches forward for the first character that is not zero, then sends all the data after, followed by a carriage return. Using the barcode above:

Command string: **E630F10D**

E6 is the "Search forward for a non-matching character" command

30 is the hex value for 0

F1 is the "Send all characters" command

0D is the hex value for a CR

The data is output as: **37692**

<CR>

E7 Search backward for a non-matching character

Syntax＝E7xx (xx: The search character's hex value)

Search the input message backward for the first non-"xx" character from the current cursor position, leaving the cursor pointing to the non-"xx" character.

0006010

Enter Setup

Miscellaneous Commands

FB Suppress characters

Syntax＝FBnnxxyy..zz (nn: The numeric value (00-15) for the number of suppressed characters; xxyy..zz: The hex value of the characters to be suppressed)

Suppress all occurrences of up to 15 different characters, starting at the current cursor position, as the cursor is advanced by other commands.

FB Example: Remove spaces in barcode data

This example shows a barcode that has spaces in the data. You may want to remove the spaces before sending the data. Using the barcode above:

Command string: **FB0120F10D**

FB is the “Suppress characters” command

01 is the number of the characters to be suppressed

20 is the hex value for a space

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **34567890**

<CR>

0006010

Enter Setup

E4 Replace characters

Syntax＝E4nn$xx_1xx_2yy_1yy_2…zz_1zz_2$ (nn: The total count of the number of characters (characters to be replaced plus replacement characters; xx_1: The characters to be replaced, xx_2: The replacement characters, continuing through zz_1 and zz_2)

Replace up to 15 characters in the output message, without moving the cursor.

E4 Example: Replace zeros with CRs in barcode data

If the barcode has characters that the host application does not want included, you can use the E4 command to replace those characters with something else. In this example, you will replace the zeros in the barcode above with carriage returns.

Command string: **E402300DF10D**

E4 is the “Replace characters” command

02 is the total count of characters to be replaced, plus the replacement characters (0 is replaced by CR, so total characters=2)

30 is the hex value for 0

0D is the hex value for a CR (the character that will replace the 0)

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **1234**
5678
ABC
<CR>

0006000

**** Exit Setup**

0006010

Enter Setup

BA Replace a string with another

Syntax＝BAnn$NN_1SS_1NN_2SS_2$

nn: The count of replacements to be made, if nn=00 or nn>=the number of occurrences of a string to be replaced, then replace all occurrences of that string.

NN_1: The length of the string to be replaced, NN_1>0.

SS_1: The ASCII hex value of each character in the string to be replaced.

NN_2: The length of replacement string, NN_2>=0. To replace string "SS_1" with NUL (i.e. delete string "SS_1"), you should set NN_2 to 00 and leave out SS_2.

SS_2: The ASCII hex value of each character in the replacement string

From the current cursor position, search forward for the occurrence of "SS_1" string (of length "NN_1") and replace the string with "SS_2" string (of length "NN_2") in the output message until every "SS_1" string is replaced or the count of replacements made reaches "nn" times, without moving the cursor.

BA Example: Replace "23"s with "ABC"s in barcode data

cd123abc23bc12ab232

If the barcode has a string of characters that the host application does not want included, you can use the BA command to replace the string with something else. In this example, you will replace the "23"s in the barcode above with "ABC"s.

Command string: **BA0002323303414243F100**

BA is the "Replace a string with another" command

00 is the count of replacements to be made, 00 means to replace all occurrences of that string

02 is the length of the string to be replaced

32 is the hex value for 2 (character in the string to be replaced)

33 is the hex value for 3 (character in the string to be replaced)

03 is the length of the replacement string

41 is the hex value for A (character in the replacement string)

42 is the hex value for B (character in the replacement string)

43 is the hex value for C (character in the replacement string)

F1 is the “Send all characters” command

00 is the hex value for a NUL

The data is output as: **cd1ABCabcABCbc12abABC2**

BA Example: Remove only the first occurrence of “23”s in barcode data

If the barcode has a string of characters that the host application wants removed, you can use the BA command to replace the string with NUL. In this example, you will remove the first occurrence of “23” in the barcode above.

Command string: **BA0102323300F100**

BA is the “Replace a string with another” command

01 is the count of replacements to be made

02 is the length of the string to be replaced

32 is the hex value for 2 (character in the string to be replaced)

33 is the hex value for 3 (character in the string to be replaced)

00 is the length of the replacement string, 00 means to replace the string to be replaced with NUL

F1 is the “Send all characters” command

00 is the hex value for a NUL

The data is output as: **cd1abc23bc12ab232**

Enter Setup

EF Insert a delay

Syntax＝EFnnnn (nnnn: The delay in 5ms increments, up to 9999)

Inserts a delay of up to 49,995 milliseconds (in multiples of 5), starting from the current cursor position. This command can only be used with USB HID-KBW.

EF Example: Insert a delay of 1s in between the 5th and 6th character

Send the first 5 characters in a barcode, wait for 1s, then send the rest of the barcode data.

Command string: **F20500EF0200E900**

F2 is the “Send a number of characters” command

05 is the number of characters to send

00 is the hex value for a Null character

EF is the “Insert a delay” command

0200 is the delay value (5msX200=1000ms=1s)

E9 is the “Send all but the last characters” command

00 is the number of characters that will not be sent at the end of the message

**** Exit Setup**

0006010

Enter Setup

Chapter 11 Batch Programming

Introduction

Batch programming enables users to integrate a batch of commands into a single batch barcode.

Listed below are batch programming rules:

1. Command format: Command + “=” + Parameter Value.
2. Each command is terminated by a semicolon (;). Note that there is no space between a command and its terminator semicolon.
3. Use the barcode generator software to generate a 2D batch barcode.

Example: Create a batch barcode for **Illumination Always On** (0200010), **Sense Mode** (0302010), **Decode Session Timeout** (0313000) = 2s:

1. Input the commands:

   0200030;0302010;0313000=2000;

2. Generate a batch barcode.

   When setting up a scanner with the above configuration, scan the **Enable Batch Barcode** barcode and then the batch barcode generated.

0001110

Enable Batch Barcode

0006000

**** Exit Setup**

Enter Setup

Create a Batch Command

A batch command may contain a number of individual commands each of which is terminated by a semicolon (;).

Command Structure: Command (+ “=” + Parameter Value)

4 command syntaxes are described as below:

1. Syntax 1: Command

This syntax applies to most configuration situations.

Example:

Set the Baud Rate to 38400bps: **0100060**
Enable the Sense Mode: **0302010**

2. Syntax 2: Command + “=” + Decimal Digit(s)

This syntax applies to the options/features programming which requires the entry of parameter value (decimal), such as the Maximum/Minimum Length, Decode Session Timeout, Timeout between Decodes (Same Barcode) and Sensitivity.

Example:

Set the Decode Session Timeout to 3000ms: **0313000=3000**
Set the Sensitivity to (level) 10: **0312040=10**

3. Syntax 3: Command + “=” + Hexadecimal Digit(s) (e.g., 0x101A, 0x2C03)

This syntax applies to the features/options programming like the Custom Prefix/Suffix, Terminating Character Suffix, Code ID Suffix, which requires the entry of parameter value (hexadecimal).

Example:
Set the Terminating Character Suffix to CR/LF: **0310000=0x0D0A**

4. Syntax 4: Command + “=” + Double Quotation Marks

For situations where the parameter value is visible character in Syntax 3, this syntax is also appropriate.

Example:
Set the Custom Prefix to AUTO-ID: **0300000=“AUTO-ID”**

**** Exit Setup**

0006010

Enter Setup

Create a Batch Barcode

Batch barcodes can be produced in the format of PDF417, QR Code or Data Matrix.

Example: Create a batch barcode for **Illumination Always On**, **Sense Mode**, **Decode Session Timeout** = 2s:

1. Input the following commands:

   0200010;0302010;0313000=2000;

2. Generate a QR batch barcode.

0006000

**** Exit Setup**

Enter Setup

Use Batch Barcode

To put a batch barcode into use, scan the following barcodes. (Use the example above.)

Enter Setup

Enable Batch Barcode

Batch Barcode

Exit Setup

Chapter 12 Troubleshooting

FAQ

Problem: Some barcodes cannot be read.

Solution:

1. Find out the barcode type and verify that the barcode type is enabled. If the barcode parameters include check digit verification, select the Disable option.
2. If you do not know the barcode type, enable all symbologies.
3. If they are inverse barcodes (bright images on a dark background), enable the Video Reverse feature.

Problem: Incorrect output.

Solution:

1. If this problem happens to all barcodes and additional characters appear before/after barcode data, disable all prefix/suffix.
2. If this problem only happens to some barcodes and matches one of the following situations:

a) incomplete barcode data: Enable the check digit verification.

b) both the first and last characters are asterisks (*): Disable the transmission of start/stop characters of Code 39.

c) “a” transmitted as “+A”: Enable Code 39 Full ASCII.

Problem: Barcodes can be read, but cannot be displayed.

Solution: Verify that the serial port parameter (such as baud rate, data bit and stop bit) settings match the host requirements.

Problem: Illumination and aiming beams are OFF.

Solution:

1. Verify that the scanner is properly powered up.
2. Send “?” to the scanner. If the scanner returns a reply of “!”, then send programming commands to turn on illumination and aimer.

Problem: Carriage Return/Line Feed settings.

Solution: See the **“Terminating Character Suffix”** section in Chapter 6.

Appendix

Appendix 1: Factory Defaults Table

Parameter		Factory Default	Remark
Programming Barcode			
Barcode Programming		Disabled	
Programming Barcode Data		Do not send	
Communication Settings			
RS-232	Baud Rate	9600	
	Parity Check	None	
	Data Bits	8	
	Stop Bits	1	
	Hardware Flow Control	No flow control	
HID-KBW	Polling Rate	1ms	
	USB Country Keyboard Type	U.S.	
	Convert Case	No conversion	
	Inter-Keystroke Delay	10ms	
	Beep on Unknown Character	Do not beep	
	Emulate ALT + Keypad	Disabled	
	Function Key Mapping	Disabled	
	Emulate Numeric Keypad	Disabled	
	Code Page	Windows 1252 (Latin I)	
Scan Mode			
Default Scan Mode		Sense mode	

Parameter		Factory Default	Remark
Sense Mode	Decode Session Timeout	3,000ms	Applicable to Sense mode, and Continuous mode. 100~3,600,000ms
	Timeout between Decodes	1000ms	Applicable to Sense mode and Continuous mode. 0~65,535ms
	Timeout between Decodes (Same Barcode)	Disabled	
		1,500ms	0~65,535ms
	Threshold Value of Illumination Change	2	1~20
Continuous Mode	Decode Session Timeout	3,000ms	Applicable to Sense mode and Continuous mode. 100~3,600,000ms
	Timeout between Decodes	1000ms	Applicable to Sense mode and Continuous mode. 0~65,535ms
	Timeout between Decodes (Same Barcode)	Disabled	
		1,500ms	0~65,535ms
Scanning Preferences			
Decode Area		Whole Area Decoding	
Central Area		20%	
Beep & LED Notifications			
Startup Beep		Enabled	
Good Read Beep for Non-Programming Barcode	Notification	Enabled	
	Beep Type	Type 3	
	Beep Volume	Loud	
Good Read Beep for Programming Barcode		Enabled	
Good Read LED		Enabled	
NGR (Not Good Read) Message		Do not transmit	
		None	

Parameter	Factory Default	Remark
Prefix & Suffix		
Prefix Sequence	Custom Prefix+Code ID+AIM ID	
Custom Prefix	Disabled	
	None	
AIM ID Prefix	Disabled	
Code ID Prefix	Disabled	
Custom Suffix	Disabled	
	None	
Terminating Character Suffix	Enabled	
	0x0D	Carriage Return
Image Control		
Image Flipping	Do not flip	
Illumination		
Illumination	Normal	
Aiming	Normal	
Data Formatter		
Data Formatter	Disabled	
Enable Data Format	Format_0	
Non-Match Error Beep	On	

Parameter	Factory Default	Remark
Symbologies		
Video Reverse	Disabled	Applicable to all symbologies.
Code 128		
Code 128	Enabled	
Maximum Length	127	
Minimum Length	1	
GS1-128 (UCC/EAN-128)		
GS1-128	Enabled	
Maximum Length	127	
Minimum Length	1	
AIM-128		
AIM-128	Enabled	
Maximum Length	127	
Minimum Length	1	
EAN-8		
EAN-8	Enabled	
Check Digit	Transmit	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
Add-On Code	Not required	
Extend to EAN-13	Disabled	
EAN-13		
EAN-13	Enabled	
Check Digit	Transmit	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
Add-On Code	Not required	
EAN-13 Beginning with 290 Add-On Code Required	Do Not Require Add-On Code	
EAN-13 Beginning with 378/379 Add-On Code Required	Do Not Require Add-On Code	

Parameter	Factory Default	Remark
EAN-13 Beginning with 414/419 Add-On Code Required	Do Not Require Add-On Code	
EAN-13 Beginning with 434/439 Add-On Code Required	Do Not Require Add-On Code	
EAN-13 Beginning with 977 Add-On Code Required	Do Not Require Add-On Code	
EAN-13 Beginning with 978 Add-On Code Required	Do Not Require Add-On Code	
EAN-13 Beginning with 979 Add-On Code Required	Do Not Require Add-On Code	
ISSN		
ISSN	Disabled	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
Add-On Code	Not required	
ISBN		
ISBN	Enabled	
ISBN Format	ISBN-13	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
Add-On Code	Not required	
UPC-E		
UPC-E	Enabled	
Check Digit	Transmit	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
Add-On Code	Not required	
Extend to UPC-A	Disabled	
System Character “0”	Transmit	
UPC-A		
UPC-A	Enabled	
Check Digit	Transmit	

Parameter	Factory Default	Remark
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
Add-On Code	Not required	
System Character	Transmit	
Country Code	Do not transmit	
Interleaved 2 of 5		
Interleaved 2 of 5	Enabled	
Check Digit Verification	Disabled	
Check Digit	Do not transmit	
Maximum Length	100	
Minimum Length	6	
Febraban		
Febraban	Disabled	
Transmit Delay per Character	Disabled	
	70ms	
Transmit Delay per 12 Characters	Disabled	
	500ms	
ITF-6		
ITF-6	Disabled	
Check Digit	Do not transmit	
ITF-14		
ITF-14	Enabled	
Check Digit	Do not transmit	
Matrix 2 of 5		
Matrix 2 of 5	Disabled	
Check Digit Verification	Enabled	
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	6	
Industrial 2 of 5		
Industrial 2 of 5	Enabled	
Check Digit Verification	Disabled	
Check Digit	Do not transmit	

Parameter	Factory Default	Remark
Maximum Length	127	
Minimum Length	6	
Standard 2 of 5		
Standard 2 of 5	Enabled	
Check Digit Verification	Disabled	
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	6	
Code 39		
Code 39	Enabled	
Check Digit Verification	Disabled	
Check Digit	Do not transmit	
Start/Stop Character	Do not transmit	
Code 39 Full ASCII	Enabled	
Code 32	Disabled	
Code 32 Prefix	Disabled	
Code 32 Check Digit	Do not transmit	
Code 32 Start/Stop Character	Do not transmit	
Maximum Length	127	
Minimum Length	2	
Codabar		
Codabar	Enabled	
Check Digit Verification	Disabled	
Check Digit	Do not transmit	
Start/Stop Character	Do not transmit	
Start/Stop Character Format	ABCD/ABC	
Maximum Length	127	
Minimum Length	2	
Code 93		
Code 93	Enabled	
Check Digit Verification	Enabled	

Parameter	Factory Default	Remark
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	3	
GS1 Databar		
GS1 Databar	Enabled	
Application Identifier “01”	Transmit	
Code 11		
Code 11	Enabled	
Check Digit Verification	One check digit,	
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	2	
Plessey		
Plessey	Enabled	
Check Digit Verification	Enabled	
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	1	

Parameter	Factory Default	Remark
MSI-*Plessey*		
MSI-Plessey	Enabled	
Check Digit Verification	One check digit, MOD10	
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	2	
PDF 417		
PDF 417	Enabled	
Maximum Length	2710	
Minimum Length	1	
PDF 417 Twin Code	Read single PDF417 only	
Character Encoding	Default Character Encoding	
QR Code		
QR Code	Enabled	
Micro QR	Enabled	
Maximum Length	7089	
Minimum Length	1	
QR Twin Code	Read single QR only	
Character Encoding	Default Character Encoding	
Data Matrix		
Data Matrix	Enabled	
Rectangular Barcode	Enabled	
Mirror Image	Decode	
Maximum Length	3116	
Minimum Length	1	
DM Twin Code	Read single DM only	
Character Encoding	Default Character Encoding	

Appendix 2: AIM ID Table

Symbology	AIM ID	Remark
EAN-13	]E0	Standard EAN-13
	]E3	EAN-13 + 2/5-Digit Add-On Code
EAN-8	]E4	Standard EAN-8
	]E4…]E1…	EAN-8 + 2-Digit Add-On Code
	]E4…]E2…	EAN-8 + 5-Digit Add-On Code
UPC-E	]E0	Standard UPC-E
	]E3	UPC-E + 2/5-Digit Add-On Code
UPC-A	]E0	Standard UPC-A
	]E3	UPC-A + 2/5-Digit Add-On Code
Code 128	]C0	Standard Code 128
GS1-128 (UCC/EAN-128)	]C1	FNC1 is the character right after the start character
AIM-128	]C2	FNC1 is the 2nd character after the start character
ISBT-128	]C4	
Interleaved 2 of 5	]I0	No check digit verification
	]I1	Transmit check digit after verification
	]I3	Do not transmit check digit after verification
ITF-6	]I1	Transmit check digit
	]I3	Do not transmit check digit
ITF-14	]I1	Transmit check digit
	]I3	Do not transmit check digit
Industrial 2 of 5	]S0	Not specified
Standard 2 of 5	]R0	No check digit verification
	]R8	One check digit, MOD10; do not transmit check digit
	]R9	One check digit, MOD10; transmit check digit
Code 39	]A0	Transmit barcodes as is; Full ASCII disabled; no check digit verification
	]A1	One check digit, MOD43; transmit check digit
	]A3	One check digit, MOD43; do not transmit check digit
	]A4	Full ASCII enabled; no check digit verification
	]A5	Full ASCII enabled; transmit check digit
	]A7	Full ASCII enabled; do not transmit check digit
Codabar	]F0	Standard Codabar
	]F2	Transmit check digit after verification
	]F4	Do not transmit check digit after verification

Symbology	AIM ID	Remark
Code 93	]G0	Standard Code 93
Code 11	]H0	One check digit, MOD11; transmit check digit
	]H1	Two check digits, MOD11/MOD11; transmit check digit
	]H3	Do not transmit check digit after verification
	]H9	No check digit verification
GS1-DataBar (RSS)	]e0	Standard GS1-DataBar
Plessey	]P0	Standard Plessey
MSI-Plessey	]M0	One check digit, MOD10; transmit check digit
	]M1	One check digit, MOD10; do not transmit check digit
	]M8	Two check digits
	]M9	No check digit verification
Matrix 2 of 5	]X0	Specified by the manufacturer
	]X1	No check digit verification
	]X2	One check digit, MOD10; transmit check digit
	]X3	One check digit, MOD11; do not transmit check digit
ISBN	]X4	Standard ISBN
ISSN	]X5	Standard ISSN
PDF417	]L0	Comply with 1994 PDF417 specifications
Data Matrix	]d0	ECC000 - ECC140
	]d1	ECC200
	]d2	ECC200, FNC1 is the 1st or 5th character after the start character
	]d3	ECC200, FNC1 is the 2nd or 6th character after the start character
	]d4	ECC200, ECI included
	]d5	ECC200, FNC1 is the 1st or 5th character after the start character,ECI included
	]d6	ECC200, FNC1 is the 2nd or 6th character after the start character,ECI included
QR Code	]Q0	QR1
	]Q1	2005 version, ECI excluded
	]Q2	2005 version, ECI included
	]Q3	QR Code 2005, ECI excluded, FNC1 is the 1st character after the start character
	]Q4	QR Code 2005, ECI included, FNC1 is the 1st character after the start character
	]Q5	QR Code 2005,ECI excluded,FNC1 is the 2nd character after the start character
	]Q6	QR Code 2005, ECI included, FNC1 is the 2nd character after the start character

Reference: ISO/IEC 15424:2008 Information technology – Automatic identification and data capture techniques – Data Carrier Identifiers (including Symbology Identifiers).

Appendix 3: Code ID Table

Symbology	Code ID
Code 128	j
GS1-128 (UCC/EAN-128)	j
AIM-128	f
EAN-8	d
EAN-13	d
ISSN	n
ISBN	B
UPC-E	c
UPC-A	c
Interleaved 2 of 5	e
ITF-6	e
ITF-14	e
Matrix 2 of 5	v
Industrial 2 of 5	D
Standard 2 of 5	s
Code 39	b
Codabar	a
Code 93	i
Code 11	H
Plessey	p
MSI-Plessey	m
GS1 Databar	R
PDF417	r
QR Code	Q
Data Matrix	u

Appendix 4: ASCII Table

Hex	Dec	Char
00	0	NUL (Null char.)
01	1	SOH (Start of Header)
02	2	STX (Start of Text)
03	3	ETX (End of Text)
04	4	EOT (End of Transmission)
05	5	ENQ (Enquiry)
06	6	ACK (Acknowledgment)
07	7	BEL (Bell)
08	8	BS (Backspace)
09	9	HT (Horizontal Tab)
0a	10	LF (Line Feed)
0b	11	VT (Vertical Tab)
0c	12	FF (Form Feed)
0d	13	CR (Carriage Return)
0e	14	SO (Shift Out)
0f	15	SI (Shift In)
10	16	DLE (Data Link Escape)
11	17	DC1 (XON) (Device Control 1)
12	18	DC2 (Device Control 2)
13	19	DC3 (XOFF) (Device Control 3)
14	20	DC4 (Device Control 4)
15	21	NAK (Negative Acknowledgment)
16	22	SYN (Synchronous Idle)
17	23	ETB (End of Trans. Block)
18	24	CAN (Cancel)
19	25	EM (End of Medium)
1a	26	SUB (Substitute)
1b	27	ESC (Escape)
1c	28	FS (File Separator)
1d	29	GS (Group Separator)

Hex	Dec	Char
1e	30	RS (Request to Send)
1f	31	US (Unit Separator)
20	32	SP (Space)
21	33	! (Exclamation Mark)
22	34	" (Double Quote)
23	35	# (Number Sign)
24	36	$ (Dollar Sign)
25	37	% (Percent)
26	38	& (Ampersand)
27	39	` (Single Quote)
28	40	((Left / Opening Parenthesis)
29	41	) (Right / Closing Parenthesis)
2a	42	* (Asterisk)
2b	43	+ (Plus)
2c	44	, (Comma)
2d	45	- (Minus / Dash)
2e	46	. (Dot)
2f	47	/ (Forward Slash)
30	48	0
31	49	1
32	50	2
33	51	3
34	52	4
35	53	5
36	54	6
37	55	7
38	56	8
39	57	9
3a	58	: (Colon)
3b	59	; (Semi-colon)
3c	60	< (Less Than)
3d	61	= (Equal Sign)

Hex	Dec	Char
3e	62	> (Greater Than)
3f	63	? (Question Mark)
40	64	@ (AT Symbol)
41	65	A
42	66	B
43	67	C
44	68	D
45	69	E
46	70	F
47	71	G
48	72	H
49	73	I
4a	74	J
4b	75	K
4c	76	L
4d	77	M
4e	78	N
4f	79	O
50	80	P
51	81	Q
52	82	R
53	83	S
54	84	T
55	85	U
56	86	V
57	87	W
58	88	X
59	89	Y
5a	90	Z
5b	91	[(Left / Opening Bracket)
5c	92	\ (Back Slash)
5d	93	] (Right / Closing Bracket)

Hex	Dec	Char
5e	94	^ (Caret / Circumflex)
5f	95	_ (Underscore)
60	96	' (Grave Accent)
61	97	a
62	98	b
63	99	c
64	100	d
65	101	e
66	102	f
67	103	g
68	104	h
69	105	i
6a	106	j
6b	107	k
6c	108	l
6d	109	m
6e	110	n
6f	111	o
70	112	p
71	113	q
72	114	r
73	115	s
74	116	t
75	117	u
76	118	v
77	119	w
78	120	x
79	121	y
7a	122	z
7b	123	{ (Left/ Opening Brace)
7c	124	| (Vertical Bar)
7d	125	} (Right/Closing Brace)
7e	126	~ (Tilde)
7f	127	DEL (Delete)

Appendix 5: Parameter Programming Examples

The following examples show you how to program parameters by scanning programming barcodes.

a. Program the Decode Session Timeout

Example: Set the decode session timeout to 1500ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Decode Session Timeout** barcode. (See the **"Decode Session Timeout"** section in Chapter 3)
3. Scan the numeric barcodes "1", "5", "0" and "0" from Appendix 6.
4. Scan the **Save** barcode from Appendix 7.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

b. Program the Timeout between Decodes (Same Barcode)

Example: Set the timeout between decodes (same barcode) to 1000ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Timeout between Decodes (Same Barcode)** barcode. (See the **"Timeout between Decodes (Same Barcode)"** section in Chapter 3)
3. Scan the numeric barcodes "1", "0", "0" and "0" from Appendix 6.
4. Scan the **Save** barcode from Appendix 7.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

c. Program the Threshold Value of Illumination Change

Example: Set the threshold value of illumination change to 4

1. Scan the **Enter Setup** barcode.
2. Scan the **Threshold Value of Illumination Change** barcode. (See the **"Sensitivity"** section in Chapter 3)
3. Scan the numeric barcode "4" from Appendix 6.
4. Scan the **Save** barcode from Appendix 7.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

d. Program the Timeout between Decodes

Example: Set the timeout between decodes to 500ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Timeout between Decodes** barcode from the **"Timeout between Decodes"** section in Chapter 3.
3. Scan the numeric barcodes "5","0" and "0" from Appendix 6.
4. Scan the **Save** barcode from Appendix 7.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

e. Program the Central Area

Example: Set the percentage of central area to 20%

1. Scan the **Enter Setup** barcode.
2. Scan the **Specify Central Area** barcode from the **"Specify Central Area"** section in Chapter 4.
3. Scan the numeric barcodes "2" and "0" from Appendix 6.
4. Scan the **Save** barcode from Appendix 7.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

f. Program the Custom Prefix/Suffix

Example: Set the custom prefix to "CODE"

1. Check the hex values of "CODE" in the ASCII Table. ("CODE": 43, 4F, 44, 45)
2. Scan the **Enter Setup** barcode.
3. Scan the **Set Custom Prefix** barcode from the **"Set Custom Prefix"** section in Chapter 6.
4. Scan the numeric barcodes "4", "3", "4", "F", "4", "4", "4" and "5" from Appendix 6.
5. Scan the **Save** barcode from Appendix 7.
6. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

g. Program the Terminating Character Suffix

Example: Set the terminating character suffix to 0x0D

1. Scan the **Enter Setup** barcode.
2. Scan the **Set Terminating Character Suffix** barcode from the **"Set Terminating Character Suffix"** section in Chapter 6.
3. Scan the numeric barcodes "0" and "D" from Appendix 6.
4. Scan the **Save** barcode from Appendix 7.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

h. Program the Code ID

Example: Set the Code ID of PDF 417 to "p"

1. Check the hex value of "p" in the ASCII Table. ("p": 70)
2. Scan the **Enter Setup** barcode.
3. Scan the **Modify PDF417 Code ID** barcode from the **"Modify Code ID"** section in Chapter 6.
4. Scan the numeric barcodes "7" and "0" from Appendix 6.
5. Scan the **Save** barcode from Appendix 7.
6. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

i. Program the NGR Message

Example: Set the NGR message to "!ERR"

1. Check the hex values of "!ERR" in the ASCII Table. ("!ERR": 21, 45, 52, 52)
2. Scan the **Enter Setup** barcode.
3. Scan the **Edit NGR Message** barcode from the **"Edit NGR Message"** section in Chapter 5.
4. Scan the numeric barcodes "2", "1", "4", "5", "5", "2", "5" and "2" from Appendix 6.
5. Scan the **Save** barcode from Appendix 7.
6. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

j. Program the Code Page

Example: Set the code page to Windows 1251 (Cyrillic)

1. Scan the **Enter Setup** barcode.
2. Scan the **Set the Code Page** barcode from the **"Code Page"** section in Chapter 2.
3. Scan the numeric barcode "1" from Appendix 6.
4. Scan the **Save** barcode from Appendix 7.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

k. Program the Length Range (Maximum/Minimum Lengths) for a Symbology

Note: If minimum length is set to be greater than maximum length, the scanner only decodes barcodes with either the minimum or maximum length. If you only want to read barcodes with a specific length, set both minimum and maximum lengths to be that desired length.

Example: Set the scanner to decode Code 128 barcodes containing between 8 and 12 characters

1. Scan the **Enter Setup** barcode.
2. Scan the **Set the Minimum Length** barcode from the **"Set Length Range for Code 128"** section in Chapter 7.
3. Scan the numeric barcode "8" from Appendix 6.
4. Scan the **Save** barcode from Appendix 7.
5. Scan the **Set the Maximum Length** barcode from the **"Set Length Range for Code 128"** section in Chapter 7.
6. Scan the numeric barcodes "1" and "2" from Appendix 6.
7. Scan the **Save** barcode from Appendix 7.
8. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

l. Program the Custom Inter-keystroke Delay

Example: Set the inter-keystroke delay to 5ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom Delay** barcode from the **"Inter-Keystroke Delay"** section in Chapter 2.
3. Scan the numeric barcodes "0" and "5" from Appendix 6.
4. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

m. Program the scanner to get proper output for Russian encoded with Windows 1251

1. Scan the **Enter Setup** barcode.
2. Scan the **Set the Code Page** barcode from the **"Code Page"** section in Chapter 2.
3. Scan the numeric barcode "1" from Appendix 6.
4. Scan the **Save** barcode from Appendix 7.
5. Scan the appropriate **Default Character Encoding** barcode according to the symbology your application needs from the **"Character Encoding"** section in Chapter 7.
6. Scan the **Mode 3** barcode from the **"Emulate ALT+Keypad"** section in Chapter 2.
7. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

n. Program the scanner to get proper output for Russian encoded with UTF-8

1. Scan the **Enter Setup** barcode.
2. Scan the **Set the Code Page** barcode from the **"Code Page"** section in Chapter 2.
3. Scan the numeric barcode "1" from Appendix 6.
4. Scan the **Save** barcode from Appendix 7.
5. Scan the appropriate **UTF-8** barcode according to the symbology your application needs from the **"Character Encoding"** section in Chapter 7.
6. Scan the **Mode 3** barcode from the **"Emulate ALT+Keypad"** section in Chapter 2.
7. Scan the **Exit** Setup barcode. (If you still need to program other parameter/feature, skip this step.)

o. Program the Custom Transmit Delay per Character for Febraban

Example: Set the transmit delay per character to 5ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom Transmit Delay per Character** barcode. (See the **"Transmit Delay"** section in Chapter 7)
3. Scan the numeric barcodes "0" and "5".
4. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

p. Program the Custom Transmit Delay per 12 Characters for Febraban

Example: Set the transmit delay per 12 characters to 600ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom Transmit Delay per 12 Characters** barcode. (See the **"Transmit Delay"** section in Chapter 7)
3. Scan the numeric barcodes "4".
4. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

Appendix 6: Digit Barcodes

0-9

0

5

1

6

2

7

3

8

4

9

A-F

A

B

C

D

E

F

Appendix 7: Save/Cancel Barcodes

After reading numeric barcode(s), you need to scan the **Save** barcode to save the data. If you scan the wrong digit(s), you can either scan the **Cancel** barcode and then start the configuration all over again, or scan the **Delete the Last Digit** barcode and then the correct digit, or scan the **Delete All Digits** barcode and then the digits you want.

For instance, after reading the **Maximum Length** barcode and numeric barcodes “1”, “2” and “3”, you scan:

- **Delete the Last Digit:** The last digit “3” will be removed.
- **Delete All Digits:** All digits “123” will be removed.
- **Cancel:** The maximum length configuration will be cancelled. And the scanner is still in the setup mode.

Save

Delete the Last Digit

Delete All Digits

Cancel

Appendix 8: ASCII Function Key Mapping Table

ASCII Function	ASCII Value (HEX)	No Function Key Mapping	Function Key Mapping
NUL (Null char.)	00	Null	Ctrl+2
SOH (Start of Header)	01	Keypad Enter	Ctrl+A
STX (Start of Text)	02	Caps Lock	Ctrl+B
ETX (End of Text)	03	Null	Ctrl+C
EOT (End of Transmission)	04	Null	Ctrl+D
ENQ (Enquiry)	05	Null	Ctrl+E
ACK (Acknowledgment)	06	Null	Ctrl+F
BEL (Bell)	07	Enter	Ctrl+G
BS (Backspace)	08	Left Arrow	Ctrl+H
HT (Horizontal Tab)	09	Horizontal Tab	Ctrl+I
LF (Line Feed)	0A	Down Arrow	Ctrl+J
VT (Vertical Tab)	0B	Vertical Tab	Ctrl+K
FF (Form Feed)	0C	Delete	Ctrl+L
CR (Carriage Return)	0D	Enter	Ctrl+M
SO (Shift Out)	0E	Insert	Ctrl+N
SI (Shift In)	0F	Esc	Ctrl+O
DLE (Data Link Escape)	10	F11	Ctrl+P
DC1 (XON) (Device Control 1)	11	Home	Ctrl+Q
DC2 (Device Control 2)	12	Print Screen	Ctrl+R
DC3 (XOFF) (Device Control 3)	13	Backspace	Ctrl+S
DC4 (Device Control 4)	14	tab+shift	Ctrl+T
NAK (Negative Acknowledgment)	15	F12	Ctrl+U
SYN (Synchronous Idle)	16	F1	Ctrl+V
ETB (End of Trans. Block)	17	F2	Ctrl+W
CAN (Cancel)	18	F3	Ctrl+X
EM (End of Medium)	19	F4	Ctrl+Y
SUB (Substitute)	1A	F5	Ctrl+Z
ESC (Escape)	1B	F6	See the following table
FS (File Separator)	1C	F7	
GS (Group Separator)	1D	F8	
RS (Request to Send)	1E	F9	
US (Unit Separator)	1F	F10	

ASCII Function Key Mapping Table (Continued)

The function key mappings of the last five characters in the previous table differ from one keyboard layout to another.

Country/ Keyboard Layout	Function Key Mapping				
	1B	1C	1D	1E	1F
United States	Ctrl+[	Ctrl+\	Ctrl+]	Ctrl+6	Ctrl+-
Belgium	Ctrl+[	Ctrl+<	Ctrl+]	Ctrl+6	Ctrl+-
Scandinavia	Ctrl+8	Ctrl+<	Ctrl+9	Ctrl+6	Ctrl+-
France	Ctrl+^	Ctrl+8	Ctrl+$	Ctrl+6	Ctrl+=
Germany		Ctrl+Ã	Ctrl++	Ctrl+6	Ctrl+-
Italy		Ctrl+\	Ctrl++	Ctrl+6	Ctrl+-
Switzerland		Ctrl+<	Ctrl+.	Ctrl+6	Ctrl+-
United Kingdom	Ctrl+[	Ctrl+¢	Ctrl+]	Ctrl+6	Ctrl+-
Denmark	Ctrl+8	Ctrl+\	Ctrl+9	Ctrl+6	Ctrl+-
Norway	Ctrl+8	Ctrl+\	Ctrl+9	Ctrl+6	Ctrl+-
Spain	Ctrl+[	Ctrl+\	Ctrl+]	Ctrl+6	Ctrl+-

Appendix 9: Code Pages List

Numeric Barcode Needed	Code Page
0	Windows 1252 (Latin I)
1	Windows 1251 (Cyrillic)

Appendix 10: Symbology ID Number

Symbology	ID Number
Code 128	002
UCC/EAN128	003
EAN-8	004
EAN-13	005
UPC-E	006
UPC-A	007
Interleaved 2 of 5	008
ITF-14	009
ITF-6	010
Matrix 2 of 5	011
Code 39	013
Codabar	015
Code 93	017
AIM-128	020
ISSN	023
ISBN	024
Industrial 25	025
Standard 25	026
Plessey	027
Code11	028
MSI-Plessey	029
GS1 Databar	031
PDF417	032
QR Code	033
Data Matrix	035

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