NLS-EM3396 V2

OEM Scan Engine

User Guide

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Revision History

Version	Description	Date
V1.0.0	Initial release.	November 4, 2016
V1.0.1	1. Added the **Specify Decoding Area (Top**, **Bottom**, **Left**, **Right)** feature in Chapter 4. 2. Added **Chapter 10 Batch Programming**. 3. Changed the range of Decode Session Timeout to 100ms – 3,600,000ms. 4. 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**, **Code 32 (Italian Pharma Code)**, **Code 32 Prefix**, **Transmit Code 32 Check Digit** and **Transmit Code 32 Start/Stop Character** features in Chapter 8. Note: Firmware version V1.04.052 or later is required for the new features in items 1 and 2; firmware version V1.04.071 or later is required for the new features in items 3 and 4.	February 13, 2017
V1.0.2	1. Added the “Data Packing” section in Chapter 7. 2. Added the **Enable/Disable PDF417 ECI Output**, **Enable/Disable QR ECI Output**, **Enable/Disable Data Matrix ECI Output** and **Enable/Disable Chinese Sensible Code ECI Output** features in Chapter 8. Note: Firmware version V1.04.074 or later is required for the new feature in item 1; firmware version V1.04.089 or later is required for the new features in item 2.	October 18, 2017
V1.0.3	1. Added the **Reset Timeout On/ Off** features in Chapter 3. 2. Added the **JAN Code for Magazines/ Books**, and **Transmit No Preamble** for UPC-A features in Chapter 8. 3. Modified the “Appendix 1: Factory Defaults Table” and “Appendix 8: ASCII Function Key Mapping Table” in Appendix. Note: Firmware version V1.05.004 or later is required for the new features above.	February 24, 2018
V1.0.4	Corrected the **Enable/Disable JAN Code for Magazines** barcodes in Chapter 8.	October 12, 2018
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V2.0.1	1. Added the Febraban section in Chapter 8.	January 12, 2021

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0006010
Enter Setup

Chapter 1 Getting Started

Introduction

The NLS-EM3396 V2 OEM scan engines (hereinafter referred to as **"the EM3396 V2"** or **"the engine"**), armed with the Newland patented UIMG®, a computerized image recognition system, bring about a new era of 2D barcode scan engines.

The EM3396 V2s' 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 EM3396 V2s support all mainstream 1D and standard 2D barcode symbologies (e.g., PDF417, QR Code M1/M2/Micro and Data Matrix) as well as GS1-DataBar™(RSS) (Limited/Stacked/Expanded versions). It can read barcodes on virtually any medium - paper, plastic card, mobile phones and LCD displays.

This compact, lightweight engine fits easily into even the most space-constrained equipment such as data collectors, meter readers, ticket validators and PDAs.

About This Guide

This guide provides programming instructions for the EM3396 V2. Users can configure the EM3396 V2 by scanning the programming barcodes included in this manual.

The EM3396 V2 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.

Connecting EVK to PC

The EVK tool is provided to assist users in application development for the EM3396 V2. You can connect the EVK to PC via a USB connection or an RS-232 connection. In case of USB connection, a driver is required if PC wants to communicate with the EM3396 V2 and receive decoded data through virtual serial port.

0006000
**** Exit Setup**

0006010

Enter Setup

Barcode Scanning

Powered by area-imaging technology and Newland patented UIMG® technology, the EM3396 V2 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 EM3396 V2 over the barcode.

Barcode Programming

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

If the engine 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.

0006010

Enter Setup

0006000

**** Exit Setup**

Programming barcode data can be transmitted to the Host. 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 engine will automatically disable the transmisison of programming barcode data to the Host.

0002010

Transmit Programming Barcode Data

0002000

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

0006010
Enter Setup

Factory Defaults

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

Note: Use this feature with discretion.

0001000

Restore All Factory Defaults

Custom Defaults

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

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 engine to the factory defaults will not remove the custom defaults from the engine.

0001150

Save as Custom Defaults

0001160

Restore All Custom Defaults

Inquire Product Information

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

9876537

Inquire Product Information

0006000
**** Exit Setup**

0006010
Enter Setup

Chapter 2 Communication Interfaces

The EM3396 V2 provides a TTL-232 interface and a USB interface (optional) to communicate with the host device. The host device can receive scanned data and send commands to control the engine or to access/alter the configuration information of the engine via the interface.

TTL-232 Interface

Serial communication interface is usually used when connecting the engine to a host device (like PC, POS). However, to ensure smooth communication and accuracy of data, you need to set communication parameters (including baud rate, parity check, data bit and stop bit) to match the host device.

The serial communication interface provided by the engine is based on TTL-level signals. TTL-232 can be used for most application architectures. For those requiring RS-232, an external conversion circuit is needed. The conversion circuit is available only to some models.

1100000
**** Serial Communication**

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

Parameter	Factory Default
Serial Communication	Standard TTL-232
Baud Rate	9600
Parity Check	None
Data Bits	8
Stop Bits	1
Hardware Flow Control	None

0006000
**** 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.

0100030

**** 9600**

0100000

1200

0100010

2400

0100020

4800

0100040

14400

0100050

19200

0100060

38400

0100070

57600

0100080

115200

0006000
**** Exit Setup**

0006010
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.

0101000

**** None**

0101010

Even Parity

0101020

Odd Parity

Data Bit

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

0103020

7 Data Bits

0103030

**** 8 Data Bits**

0006000
**** Exit Setup**

0006010
Enter Setup

Data Bit & Parity Check

0105010

7 Data Bits/Even Parity

0105020

7 Data Bits/Odd Parity

0105030

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

0105040

8 Data Bits/Even Parity

0105050

8 Data Bits/Odd Parity

Stop Bit

0102000

**** 1 Stop Bit**

0102010

2 Stop Bits

0006000
**** Exit Setup**

0006010

Enter Setup

USB Interface (Optional)

USB Enumeration

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

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

1100210

Enumeration Using S/N

1100200

**** Enumeration Using “00000000”**

USB HID-KBW

When you connect the engine to the Host via a USB connection, you can enable the **USB HID-KBW** feature by scanning the barcode below. Then engine’s transmission will be simulated as USB keyboard input. The Host receives keystrokes on the virtual keyboard. It works on a Plug and Play basis and no driver is required.

1100020

USB HID-KBW

0006000

**** Exit Setup**

0006010
Enter Setup

USB Country Keyboard Types

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

1103001
**** U.S.**

1103002
Japan

1103003
Denmark

1103004
Finland

1103005
France

1103006
Turkey_F

1103007
Italy

1103008
Norway

0006000
**** Exit Setup**

0006010
Enter Setup

1103222
Spain

1103226
Turkey_Q

1103227
UK

1103209
Austria, Germany

1103202
Belgium

1103220
Russia

1103223
Sweden

1103218
Portugal

0006000
**** Exit Setup**

0006010
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 engine 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.

1103031
Beep on Unknown Character

1103030
**** 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 program custom delay, see **Appendix 5**. The default setting is 10ms.

1103050
No Delay

1103051
Short Delay (20ms)

1103052
Long Delay (40ms)

1103053
Custom Delay

0006000
**** Exit Setup**

0006010
Enter Setup

Convert Case

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

1103040

**** No Case Conversion**

1103043

Invert Upper and Lower Case Characters

1103041

Convert All to Upper Case

1103042

Convert All to Lower Case

Example: When the **Convert All to Lower Case** feature is enabled, barcode data “AbC” is transmitted as “abc”.

0006000
**** Exit 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:** All ASCII characters (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.

1103060
**** Disable**

1103061
Mode 1

1103062
Mode 2

1103063
Mode 3

Example: Supposing US keyboard is selected, barcode data ”AÐF” (65/208/70) is sent as below:

(1) **Mode 1** is enabled:

“A” -- Keystroke “A”

“Ð” -- “ALT Make” + “208” + “ALT Break”

“F” -- Keystroke “F”

(2) **Mode 3** is enabled:

“A” – “ALT Make” + “065” + “ALT Break”

“Ð” -- “ALT Make” + “208” + “ALT Break”

“F” -- “ALT Make” + “070” + “ALT Break”

0006010
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**.

1103140

Enable Function Key Mapping

1103130

**** Disable Function Key Mapping**

Example: Barcode data 0x16

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

0006000
**** Exit Setup**

0006010
Enter Setup

Emulate Numeric Keypad

Do Not Emulate Numeric Keypad 1： Sending a number (0-9) is emulated as keystroke(s) on main keyboard.

Emulate Numeric Keypad 1： Sending a number (0-9) is emulated as keystroke(s) on numeric keypad.

Do Not Emulate Numeric Keypad 2： Sending “+”, “-”, “*” and “/” is emulated as keystroke(s) on main keyboard.

Emulate Numeric Keypad 2： Sending “+”, “-”, “*” and “/” is emulated as keystroke(s) on numeric keypad.

1103110

**** Do Not Emulate Numeric Keypad 1**

1103120

Emulate Numeric Keypad 1

1103150

**** Do Not Emulate Numeric Keypad 2**

1103151

Emulate Numeric Keypad 2

Code Page

In order to support more international characters, the **Code Page** programming feature is provided. 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**.

1103180

Set the Code Page

0006000
**** Exit Setup**

0006010
Enter Setup

USB CDC

If you connect the engine to the Host via a USB connection, the **USB CDC** feature allows the Host to receive data in the way as a serial port does. A driver is required for this feature.

1100060

USB CDC

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 Engine with Your Program

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

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

Acquire Scanned Data

After scanning and decoding a barcode, the engine 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 Engine

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)							

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)
EM3396 V2	USB HID-KBW	1A03	6659
	USB CDC	1A06	6662
	USB HID-POS	1A10	6672

0006010
Enter Setup

Chapter 3 Scan Mode

Batch Mode

If the Batch Mode is enabled, driving the TRIG pin on the host interface connector low activates a round of multiple decode sessions. This round of multiple scans continues until the active trigger signal is no longer present. Rereading the same barcode is not allowed if it was decoded previously in the same round. For good read, the engine transmits decoded data via communication port. To activate another round of multiple scans, the Host needs to first negate the trigger, waits 20ms or longer and then drive the TRIG pin low.

0302003
Batch Mode

0006000
**** Exit Setup**

0006010
Enter Setup

Trigger Mode

If the Trigger Mode is enabled, driving the TRIG pin on the host interface connector low activates a decode session. The session continues until the barcode is decoded or decode session timeout expires or the active trigger signal is no longer present. For good read, the engine transmits decoded data via communication port. To activate another session, the Host needs to first negate the trigger, waits 20ms or longer and then drive the TRIG pin low.

0302000

****Trigger 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. When it is set to 0, the timeout is infinite. The default setting is 3,000ms. To learn how to program this parameter, see **Appendix 5**.

0313000

Decode Session Timeout

0006000
**** Exit Setup**

0006010
Enter Setup

Level Trigger/Pulse Trigger

Level trigger: Decode session is activated and continued by constant active trigger signal. The decode session ends once the barcode is decoded or decode session timeout expires.

Pulse trigger: Decode session is activated by electric pulse of trigger signal. The decode session continues until the barcode is decoded or decode session timeout expires.

0313090
**** Level Trigger**

0313091
Pulse Trigger

Auto Idle

Auto Idle allows the engine in the Trigger Mode to automatically enter the idle mode (the engine's illumination and aimer are both off, and its CPU stops running) after a certain period of inactivity. Receiving trigger signal or communication from the Host can wake the engine from the idle mode, and the engine returns to full operation within 100ms.

0313060
**** Enable Auto Idle**

0313070
Disable Auto Idle

The parameter below specifies how long the engine remains inactive before it is put into the idle mode. It is programmable in 1ms increments from 0ms to 65,535ms. The default setting is 500ms. To learn how to program this parameter, see **Appendix 5**.

0313050
Idle Timeout

0006000
**** Exit Setup**

0006010
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.

Disable Timeout between Decodes (Same Barcode): Allow the engine to re-read same barcode.

Enable Timeout between Decodes (Same Barcode) & **Reset Timeout Off:** Do not allow the engine to re-read same barcode before the timeout between decodes (same barcode) expires.

Enable Timeout between Decodes (Same Barcode) & **Reset Timeout On:** Do not allow the engine to re-read same barcode.

0313161

**** Disable Timeout between Decodes (Same Barcode)**

0313171

Enable Timeout between Decodes (Same Barcode)

0313200

**** Reset Timeout Off**

0313201

Reset Timeout On

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**.

0313010

Timeout between Decodes (Same Barcode)

0006000
**** Exit Setup**

0006010
Enter Setup

Sense Mode

If the Sense Mode is enabled, the engine activates a decode session every time it detects a change in ambient illumination. The decode session continues until the barcode is decoded or the decode session timeout expires.

Driving the TRIG pin on the host interface connector low can also activate a decode session. The decode session continues until the active trigger signal is no longer present or the barcode is decoded or the decode session timeout expires. The trigger signal needs to be negated before the engine is able to monitor ambient illumination again.

0302010

Sense Mode

Decode Session Timeout

This parameter sets the maximum time decode session continues during a scan attempt. If the timeout expires or the barcode is decoded, the engine goes back to monitoring ambient illumination. It is programmable in 1ms increments from 100ms to 3,600,000ms. When it is set to 0, the timeout is infinite. The default setting is 3,000ms. To learn how to program this parameter, see **Appendix 5**.

0313000

Decode Session Timeout

0006000
**** Exit Setup**

0006010
Enter Setup

Image Stabilization Timeout

This parameter defines the amount of time that the engine waits for the image to stabilize to a point that it can be decoded with more accuracy. It is programmable in 1ms increments from 0ms to 1,600ms. The default setting is 500ms.To learn how to program this parameter, see **Appendix 5.**

0313120

Image Stabilization 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

Continue after Good Read

Continue after Good Read: The engine starts next decode session after good read.

Pause after Good Read: The engine starts another round of illumination monitoring and image stabilization after good read.

0313130

**** Pause after Good Read**

0313131

Continue after Good Read

0006000
**** Exit Setup**

0006010
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.

Disable Timeout between Decodes (Same Barcode): Allow the engine to re-read same barcode.

Enable Timeout between Decodes (Same Barcode) & **Reset Timeout Off:** Do not allow the engine to re-read same barcode before the timeout between decodes (same barcode) expires.

Enable Timeout between Decodes (Same Barcode) & **Reset Timeout On:** Do not allow the engine to re-read same barcode.

0313020
**** Disable Timeout between Decodes (Same Barcode)**

0313030
Enable Timeout between Decodes (Same Barcode)

0313200
**** Reset Timeout Off**

0313201
Reset Timeout On

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**.

0313010
Timeout between Decodes (Same Barcode)

0006000
**** Exit Setup**

0006010
Enter Setup

Sensitivity

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

0312010
Medium Sensitivity

0312000
Low Sensitivity

0312020
High Sensitivity

0312030
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 engine to start a decode session. The lower the threshold value, the greater the sensitivity of the engine. The default threshold value is 2.

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

0312040
Threshold Value of Illumination Change (1-16)

0006000
**** Exit Setup**

0006010
Enter Setup

Continuous Mode

This mode enables the engine to scan/capture, decode and transmit over and over again.

When the engine is operating in Continuous Mode, barcode reading can be suspended/resumed through control over the trigger signal. When barcode reading is in progress, negating the trigger signal after having maintained it for 30ms or longer will suspend barcode reading; when barcode reading is suspended, performing the same control over the trigger signal will resume barcode reading.

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. When it is set to 0, the timeout is infinite. 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**

0006010
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.

Disable Timeout between Decodes (Same Barcode): Allow the engine to re-read same barcode.

Enable Timeout between Decodes (Same Barcode) & **Reset Timeout Off:** Do not allow the engine to re-read same barcode before the timeout between decodes (same barcode) expires.

Enable Timeout between Decodes (Same Barcode) & **Reset Timeout On:** Do not allow the engine to re-read same barcode.

0313160

**** Disable Timeout between Decodes (Same Barcode)**

0313170

Enable Timeout between Decodes (Same Barcode)

0313200

**** Reset Timeout Off**

0313201

Reset Timeout On

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**.

0313010

Timeout between Decodes (Same Barcode)

0006000
**** Exit Setup**

0006010
Enter Setup

Chapter 4 Scanning Preferences

Introduction

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

Decode Area

Whole Area Decoding

When this option is enabled, the engine 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**

Specific Area Decoding

The engine attempts to read barcode(s) within a specified decoding area and transmits the barcode that has been first decoded. This option allows the engine 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, specific area decoding in conjunction with appropriate pre-defined decoding area will insure that only the desired barcode is read.

0322010

Specific Area Decoding

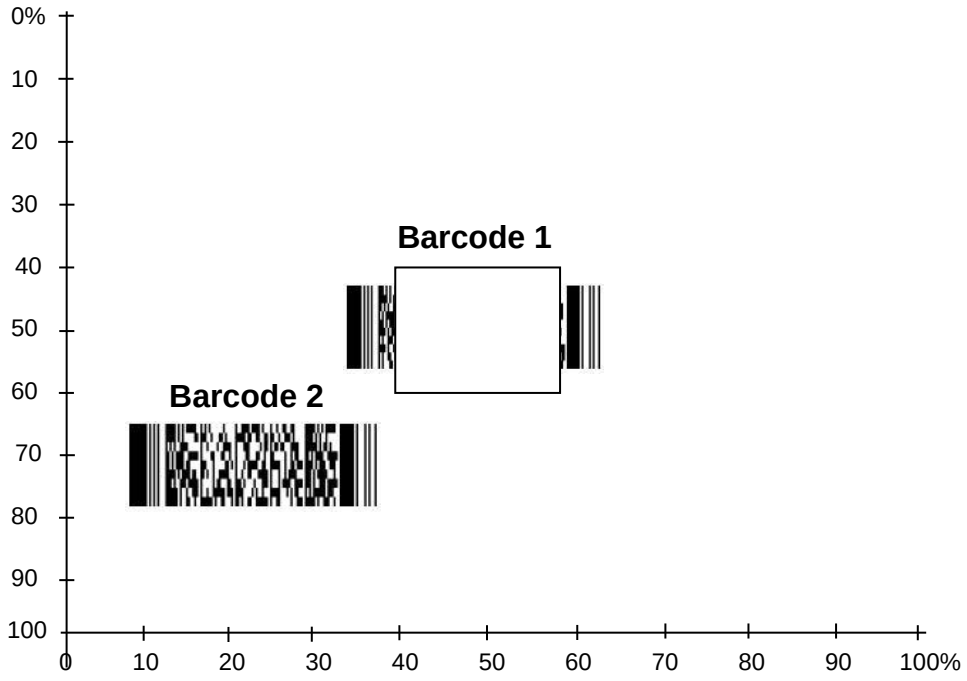
0006000
**** Exit Setup**

Specify Decoding Area

If **Specific Area Decoding** is enabled, the engine only reads barcodes that intersect the predefined decoding area.

The default decoding area is an area of 40% top, 60% bottom, 40% left and 60% right of the engine's field of view, as shown in the figure below. In the following example, the white box is the decoding area. Since Barcode 1 passes through the decoding area, it will be read. Barcode 2 does not pass through the decoding area, so it will not be read.

You can define the decoding area using the **Top of Decoding Area**, **Bottom of Decoding Area**, **Left of Decoding Area** and **Right of Decoding Area** barcodes as well as numeric barcode(s) that represent(s) a desired percentage (0-100). To learn how to program decoding area, see **Appendix 5**.



0006010
Enter Setup

0322030
Top of Decoding Area

0322040
Bottom of Decoding Area

0322050
Left of Decoding Area

0322060
Right of Decoding Area

0006000
**** Exit Setup**

0006010
Enter Setup

Chapter 5 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 keep ON after the engine is powered on.

OFF: Illumination LEDs are OFF all the time.

0200000
**** Normal**

0200020
OFF

0200010
Always ON

0006000
**** 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.

0201000
**** Normal**

0201020
OFF

0201010
Always ON

0006000
**** Exit Setup**

0006010
Enter Setup

Chapter 6 Beep & LED Notifications

Startup Beep

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

0204001
**** Enable Startup Beep**

0204000
Disable Startup Beep

0006000
**** Exit Setup**

0006010
Enter Setup

Good Read Beep for Non-programming Barcode

The engine can provide a PWM output to an external driver circuit to drive a beeper after decoding a non-programming barcode. Scan the appropriate barcode below to enable or disable the emission of good read beep. Beep type (frequency) and volume are also user programmable.

0203010

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

0203000

Good Read Beep Off for Non-programming Barcode

Beep Type

0203020

Type 1

0203022

**** Type 3**

0203021

Type 2

0006000
**** Exit Setup**

0006010
Enter Setup

Beep Volume

0203030
**** Loud**

0203032
Low

0203031
Medium

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 engine 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.

1103031
Beep on Unknown Character

1103030
**** Do Not Beep on Unknown Character**

0006000
**** Exit Setup**

0006010
Enter Setup

Good Read Beep for Programming Barcode

0203041

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

0203040

Good Read Beep Off for Programming Barcode

Good Read LED

0206011

**** Good Read LED ON**

0206010

Good Read LED OFF

0006000
**** Exit Setup**

0006010
Enter Setup

Transmit NGR Message

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

0320010
Transmit NGR Message

0320000
**** 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 (hex) of desired characters and then scan the **Save** barcode.

An NGR message can contain 0-7 characters (ASCII value of character: 0x00-0xFF).

0320020
Edit NGR Message

0006000
**** Exit Setup**

0006010
Enter Setup

Chapter 7 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]

0006000
**** Exit Setup**

0006010
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.

0311010
Enable All Prefixes/Suffixes

0311000
Disable All Prefixes/Suffixes

Prefix Sequences

0317010
Code ID+Custom Prefix+AIM ID

0317040
**** Custom Prefix+Code ID+AIM ID**

0006000
**** Exit Setup**

0006010
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 10 characters.

0305010
Enable Custom Prefix

0305000
**** Disable Custom Prefix**

Set Custom Prefix

To set a custom prefix, scan the **Set Custom Prefix** barcode and the numeric barcodes representing the hexadecimal values of a desired prefix and then scan the **Save** barcode. Refer to **Appendix 4: ASCII Table** for hexadecimal values of characters.

Note: A custom prefix cannot exceed 10 characters.

0300000
Set Custom Prefix

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.
4. Scan the numeric barcodes "4", "3", "4", "F", "4", "4", "4" and "5".
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode.

0006000
**** Exit Setup**

0006010
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 the **"Appendix 2: AIM ID Table"** section). If AIM ID prefix is enabled, the engine will add the symbology identifier before the scanned data after decoding.

0308030
Enable AIM ID Prefix

0308000
**** 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.

0307010
Enable Code ID Prefix

0307000
**** Disable Code ID Prefix**

Restore All Default Code IDs

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

0307020
Restore All Default Code IDs

0006000
**** Exit Setup**

0006010
Enter Setup

Modify Code ID

Code ID of each symbology can be programmed separately. See the following example to learn how to program a Code ID.

Example: Set the Code ID of PDF417 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.
4. Scan the numeric barcodes "7" and "0".
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode.

0005000
Modify PDF417 Code ID

0005030
Modify Data Matrix Code ID

0005010
Modify QR Code ID

0005020
Modify Aztec Code ID

0004020
Modify Code 128 Code ID

0004030
Modify GS1-128 Code ID

0006000
**** Exit Setup**

0006010
Enter Setup

0004210
Modify AIM-128 Code ID

0004040
Modify EAN-8 Code ID

0004050
Modify EAN-13 Code ID

0004060
Modify UPC-E Code ID

0004070
Modify UPC-A Code ID

0004240
Modify ISBN Code ID

0004230
Modify ISSN Code ID

0004130
Modify Code 39 Code ID

0004170
Modify Code 93 Code ID

0004080
Modify Interleaved 2 of 5 Code ID

0006000
**** Exit Setup**

0006010
Enter Setup

0004090
Modify ITF-14 Code ID

0004100
Modify ITF-6 Code ID

0004150
Modify Codabar Code ID

0004250
Modify Industrial 25 Code ID

0004260
Modify Standard 25 Code ID

0004110
Modify Matrix 25 Code ID

0004280
Modify Code 11 Code ID

0004270
Modify Plessey Code ID

0004290
Modify MSI/Plessey Code ID

0004310
Modify GS1 Databar Code ID

0006000
**** Exit Setup**

0006010
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 10 characters.

0306010
Enable Custom Suffix

0306000
** **Disable Custom Suffix**

Set Custom Suffix

To set a custom suffix, scan the **Set Custom Suffix** barcode and the numeric barcodes representing the hexadecimal values of a desired suffix and then scan the **Save** barcode. Refer to **Appendix 4: ASCII Table** for hexadecimal values of characters.

Note: A custom suffix cannot exceed 10 characters.

0301000
Set Custom Suffix

Example: Set the custom suffix 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 Suffix** barcode.
4. Scan the numeric barcodes "4", "3", "4", "F", "4", "4", "4" and "5".
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode.

0006000
**** Exit Setup**

0006010
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 cannot exceed 2 characters.

Enable/Disable Terminating Character Suffix

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

0309010
** **Enable Terminating Character Suffix**

0309000
Disable Terminating Character Suffix

0006000
** **Exit Setup**

0006010
Enter Setup

Set Terminating Character Suffix

The engine 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.

0310010

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

0310020

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 of a desired terminating character and then scan the **Save** barcode. Refer to **Appendix 4: ASCII Table** for hexadecimal values of terminating characters.

Note: A terminating character suffix cannot exceed 2 characters.

0310000

Set 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.
3. Scan the numeric barcodes “0” and “D”.
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode.

0006000
**** Exit Setup**

Data Packing

Introduction

Data packing is designed for a specific group of users who want to have the data packed before transmission. Data packing influences data format, so it is advised to disable this feature when it is not required.

Data Packing Options

Disable Data Packing: Transmit decoded data in raw format (unpacketed).

Enable Data Packing, Format 1: Transmit decoded data with the packet format 1 defined below.

Packet format 1: [STX + ATTR + LEN] + [AL_TYPE + DATA] + [LRC]

STX: 0x02

ATTR: 0x00

LEN: Barcode data length is expressed in 2 bytes ranging from 0x0000 (0) to 0xFFFF (65535).

AL_TYPE: 0x36

DATA: Raw barcode data.

LRC: Check digit.

LRC calculation algorithm: computation sequence: 0xFF+LEN+AL_TYPE+DATA; computation method is XOR, byte by byte.

Enable Data Packing, Format 2: Transmit decoded data with the packet format 2 defined below.

Packet format 2: [STX + ATTR + LEN] + [AL_TYPE] + [Symbology_ID + DATA] + [LRC]

STX: 0x02

ATTR: 0x00

LEN: Symbology ID and barcode data length is expressed in 2 bytes ranging from 0x0000 (0) to 0xFFFF (65535).That means LEN = Data length + 1.

AL_TYPE: 0x3B

Symbology_ID: The ID number of symbology, 1 byte.

DATA: Raw barcode data.

LRC: Check digit. LRC calculation algorithm: computation sequence: 0xFF+LEN+AL_TYPE+Symbology_ID+DATA; computation method is XOR, byte by byte.

0006010
Enter Setup

0314000

**** Disable Data Packing**

0314010

Enable Data Packing, Format 1

0314070

Enable Data Packing, Format 2

0006000
**** Exit Setup**

0006010
Enter Setup

Chapter 8 Symbologies

Global Settings

Enable/Disable All Symbologies

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

0001020
Enable All Symbologies

0001010
Disable All Symbologies

Enable/Disable 1D Symbologies

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

0001040
Enable 1D Symbologies

0001030
Disable 1D Symbologies

Enable/Disable 2D Symbologies

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

0001060
Enable 2D Symbologies

0001050
Disable 2D Symbologies

0006000
**** Exit Setup**

0006010
Enter Setup

Video Reverse

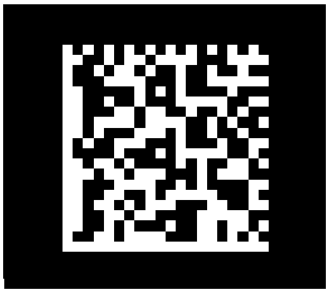
The **Video Reverse** feature only applies to 2D barcodes.

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 is used to allow the engine to read barcodes that are inverted.

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

Video Reverse OFF: Read regular barcodes only.

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

0001021
Video Reverse ON

0001011
**** Video Reverse OFF**

0006000
**** Exit Setup**

0006010
Enter Setup

1D Symbologies

Code 128

Restore Factory Defaults

0400000

Restore the Factory Defaults of Code 128

Enable/Disable Code 128

0400020

**** Enable Code 128**

0400010

Disable Code 128

Set Length Range for Code 128

0400030

Set the Minimum Length

0400040

Set the Maximum Length

0006000
**** 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

0423000

Restore the Factory Defaults of AIM-128

Enable/Disable AIM-128

0423020

**** Enable AIM-128**

0423010

Disable AIM-128

Set Length Range for AIM-128

0423030

Set the Minimum Length

0423040

Set the Maximum Length

0006000
**** Exit Setup**

0006010
Enter Setup

EAN-8

Restore Factory Defaults

0401000

Restore the Factory Defaults of EAN-8

Enable/Disable EAN-8

0401020

**** Enable EAN-8**

0401010

Disable EAN-8

0006000
**** Exit Setup**

0006010
Enter Setup

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.

0401040
**** Transmit EAN-8 Check Digit**

0401030
Do Not Transmit EAN-8 Check Digit

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 engine 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 engine 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.

0006000
**** Exit Setup**

0006010
Enter Setup

Add-On Code Required

When **EAN-8 Add-On Code Required** is selected, the engine 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

0402000

Restore the Factory Defaults of EAN-13

Enable/Disable EAN-13

0402020

**** Enable EAN-13**

0402010

Disable EAN-13

Transmit Check Digit

0402040

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

0402030

Do Not Transmit EAN-13 Check Digit

0006000
**** Exit Setup**

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 engine 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 engine 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 engine 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**

0006010
Enter Setup

EAN-13 Beginning with 290 Add-On Code Required

This setting programs the engine 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.

0402110
**** Do Not Require Add-On Code**

0402120
Require Add-On Code

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

This setting programs the engine 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.

0402130
**** Do Not Require Add-On Code**

0402140
Require Add-On Code

0006000
**** Exit Setup**

0006010
Enter Setup

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

This setting programs the engine 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.

0402150
**** Do Not Require Add-On Code**

0402160
Require Add-On Code

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

This setting programs the engine 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.

0402170
**** Do Not Require Add-On Code**

0402180
Require Add-On Code

0006000
**** Exit Setup**

0006010
Enter Setup

EAN-13 Beginning with 977 Add-On Code Required

This setting programs the engine 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.

0402190
**** Do Not Require Add-On Code**

0402200
Require Add-On Code

EAN-13 Beginning with 978 Add-On Code Required

This setting programs the engine 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.

0402210
**** Do Not Require Add-On Code**

0402220
Require Add-On Code

0006000
**** Exit Setup**

0006010
Enter Setup

EAN-13 Beginning with 979 Add-On Code Required

This setting programs the engine 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.

0402230
**** Do Not Require Add-On Code**

0402240
Require Add-On Code

0006000
**** Exit Setup**

0006010
Enter Setup

ISSN

Restore Factory Defaults

0421000

Restore the Factory Defaults of ISSN

Enable/Disable ISSN

0421020

Enable ISSN

0421010

**** Disable ISSN**

0006000
**** 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 engine 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 engine 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 engine will only read ISSN barcodes that contain add-on codes.

0421070
ISSN Add-On Code Required

0421080
**** ISSN Add-On Code Not Required**

0006000
**** Exit Setup**

0006010
Enter Setup

ISBN

Restore Factory Default

0416000

Restore the Factory Defaults of ISBN

Enable/Disable ISBN

0416020

**** Enable ISBN**

0416010

Disable ISBN

Set ISBN Format

0416030

**** ISBN-13**

0416040

ISBN-10

0006000
**** Exit Setup**

0006010
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.

0416050
Enable 2-Digit Add-On Code

0416060
**** Disable 2-Digit Add-On Code**

0416070
Enable 5-Digit Add-On Code

0416080
**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The engine 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 engine 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 engine will only read ISBN barcodes that contain add-on codes.

0416090
ISBN Add-On Code Required

0416100
**** ISBN Add-On Code Not Required**

0006000
**** Exit Setup**

0006010
Enter Setup

UPC-E

Restore Factory Defaults

0403000

Restore the Factory Defaults of UPC-E

Enable/Disable UPC-E

0403020

**** Enable UPC-E**

0403010

Disable UPC-E

Transmit Check Digit

0403040

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

0403030

Do Not Transmit UPC-E Check Digit

0006000
**** 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.

0403060
Enable 2-Digit Add-On Code

0403050
**** Disable 2-Digit Add-On Code**

0403080
Enable 5-Digit Add-On Code

0403070
**** Disable 5-Digit Add-On Code**

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The engine 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 engine 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 engine will only read UPC-E barcodes that contain add-on codes.

0403130
UPC-E Add-On Code Required

0403140
**** 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

0404000

Restore the Factory Defaults of UPC-A

Enable/Disable UPC-A

0404020

**** Enable UPC-A**

0404010

Disable UPC-A

Transmit Check Digit

0404040

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

0404030

Do Not Transmit UPC-A Check Digit

0006000
**** Exit 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.

0404060

Enable 2-Digit Add-On Code

0404050

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

0404080

Enable 5-Digit Add-On Code

0404070

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

Enable 2-Digit Add-On Code/ Enable 5-Digit Add-On Code: The engine 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 engine 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 engine will only read UPC-A barcodes that contain add-on codes.

0404110

UPC-A Add-On Code Required

0404120

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

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), or transmit no preamble.

0404100
System Character & Country Code

0404090
**** System Character**

0404180
No Preamble

0006000
**** Exit Setup**

0006010
Enter Setup

Interleaved 2 of 5

Restore Factory Defaults

0405000

Restore the Factory Defaults of Interleaved 2 of 5

Enable/Disable Interleaved 2 of 5

0405020

**** Enable Interleaved 2 of 5**

0405010

Disable Interleaved 2 of 5

Set Length Range for Interleaved 2 of 5

0405030

Set the Minimum Length

0405040

Set the Maximum Length

0006000
**** 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 engine transmits Interleaved 2 of 5 barcodes as is.

Do Not Transmit Check Digit After Verification: The engine 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 engine 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.

0405050
**** Disable**

0405060
Do Not Transmit Check Digit After Verification

0405070
Transmit Check Digit After Verification

Note: If the **Do Not Transmit Check Digit After Verification** option is enabled, Interleaved 2 of 5 barcodes with a length that is less than the configured minimum length after having the check digit excluded will not be decoded. (For example, when the **Do Not Transmit Check Digit After Verification** option is enabled and the minimum length is set to 4, Interleaved 2 of 5 barcodes with a total length of 4 characters including the check digit cannot be read.)

0006000
**** Exit Setup**

0006010
Enter Setup

Febraban

Disable/Enable Febraban

0405280
**** Disable Febraban**

0405290
Enable Febraban, Do Not Expand

0405300
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.

0700160
**** Disable Transmit Delay per Character**

0700161
Enable Transmit Delay per Character (70ms)

0700170
**** Disable Transmit Delay per 12 Characters**

0700171
Enable Transmit Delay per 12 Characters (500ms)

0006000
**** Exit 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.

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.

0700162

Custom Transmit Delay per Character

0700172

Custom Transmit Delay per 12 Characters

0006010
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 character.

0405260
Restore the Factory Defaults of ITF-14

0405080
Disable ITF-14

0405090
** **Enable ITF-14 But Do Not Transmit Check Digit**

0405100
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.

0006000
**** Exit Setup**

0006010
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 character.

0405270
Restore the Factory Defaults of ITF-6

0405110
**** Disable ITF-6**

0405120
Enable ITF-6 But Do Not Transmit Check Digit

0405130
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.

0006000
**** 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

0006000
**** Exit Setup**

0006010
Enter Setup

Check Digit Verification

0406050
Disable

0406060
**** Do Not Transmit Check Digit After Verification**

0406070
Transmit Check Digit After Verification

0006000
**** Exit Setup**

0006010
Enter Setup

Industrial 2 of 5

Restore Factory Defaults

0417000

Restore the Factory Defaults of Industrial 2 of 5

Enable/Disable Industrial 2 of 5

0417020

**** Enable Industrial 2 of 5**

0417010

Disable Industrial 2 of 5

Set Length Range for Industrial 2 of 5

0417030

Set the Minimum Length

0417040

Set the Maximum Length

0006000
**** Exit Setup**

0006010
Enter Setup

Check Digit Verification

0417050
**** Disable**

0417070
Transmit Check Digit After Verification

0417060
Do Not Transmit Check Digit After Verification

0006000
**** 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**

0006010
Enter Setup

Check Digit Verification

0418050
**** Disable**

0418070
Transmit Check Digit After Verification

0418060
Do Not Transmit Check Digit After Verification

0006000
**** Exit Setup**

0006010
Enter Setup

Code 39

Restore Factory Defaults

0408000

Restore the Factory Defaults of Code 39

Enable/Disable Code 39

0408020

**** Enable Code 39**

0408010

Disable Code 39

Transmit Start/Stop Character

0408090

Transmit Start/Stop Character

0408080

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

0006000
**** Exit Setup**

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 engine 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**

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.

0408120

**** Disable Code 32**

0408130

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.

0408140

**** Disable Code 32 Prefix**

0408150

Enable Code 32 Prefix

0006010
Enter Setup

Transmit Code 32 Check Digit

Code 32 must be enabled for this parameter to function.

0408180

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

0408190

Transmit Code 32 Check Digit

Transmit Code 32 Start/Stop Character

Code 32 must be enabled for this parameter to function.

0408160

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

0408170

Transmit Code 32 Start/Stop Character

0006000
**** Exit Setup**

0006010
Enter Setup

Codabar

Restore Factory Defaults

0409000

Restore the Factory Defaults of Codabar

Enable/Disable Codabar

0409020

**** Enable Codabar**

0409010

Disable Codabar

Set Length Range for Codabar

0409030

Set the Minimum Length

0409040

Set the Maximum Length

0006000
**** Exit Setup**

0006010
Enter Setup

Check Digit Verification

0409050
**** Disable**

0409070
Transmit Check Digit After Verification

0409060
Do Not Transmit Check Digit After Verification

Transmit Start/Stop Character

0409090
Transmit Start/Stop Character

0409080
**** Do not Transmit Start/Stop Character**

0006000
**** Exit Setup**

0006010
Enter Setup

Start/Stop Character Format

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

0409100

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

0409110

ABCD/TN*E as the Start/Stop Character

0409120

Start/Stop Character in Uppercase

0409130

Start/Stop Character in Lowercase

0006000
**** Exit Setup**

0006010
Enter Setup

Code 93

Restore Factory Defaults

0410000

Restore the Factory Defaults of Code 93

Enable/Disable Code 93

0410020

**** Enable Code 93**

0410010

Disable Code 93

Set Length Range for Code 93

0410030

Set the Minimum Length

0410040

Set the Maximum Length

0006000
**** Exit Setup**

0006010
Enter Setup

Check Digit Verification

0410050
Disable

0410060
**** Do Not Transmit Check Digit After Verification**

0410070
Transmit Check Digit After Verification

0006000
**** Exit Setup**

0006010
Enter Setup

GS1-Databar (RSS)

Restore Factory Defaults

0413000

Restore the Factory Defaults of GS1-Databar

Enable/Disable GS1 Databar

0413020

**** Enable GS1-DataBar**

0413010

Disable GS1-DataBar

Transmit Application Identifier “01”

0413060

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

0413050

Do Not Transmit Application Identifier “01”

0006000
**** Exit Setup**

0006010
Enter Setup

Code 11

Restore Factory Defaults

0415000

Restore the Factory Defaults of Code 11

Enable/Disable Code 11

0415020

**** Enable Code 11**

0415010

Disable Code 11

Set Length Range for Code 11

0415030

Set the Minimum Length

0415040

Set the Maximum Length

0006000
**** 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

0419000

Restore the Factory Defaults of Plessey

Enable/Disable Plessey

0419020

**** Enable Plessey**

0419010

Disable Plessey

Set Length Range for Plessey

0419030

Set the Minimum Length

0419040

Set the Maximum Length

0006000
**** Exit Setup**

0006010
Enter Setup

Check Digit Verification

0419050
Disable

0419060
**** Do Not Transmit Check Digit After Verification**

0419070
Transmit Check Digit After Verification

0006000
**** Exit Setup**

0006010
Enter Setup

MSI-Plessey

Restore Factory Defaults

0420000

Restore the Factory Defaults of MSI-Plessey

Enable/Disable MSI-Plessey

0420020

**** Enable MSI-Plessey**

0420010

Disable MSI-Plessey

Set Length Range for MSI-Plessey

0420030

Set the Minimum Length

0420040

Set the Maximum Length

0006000
**** Exit Setup**

0006010
Enter Setup

Transmit Check Digit

0420100
Transmit Check Digit

0420090
**** Do Not Transmit Check Digit**

Check Digit Verification

0420050
Disable

0420060
**** One Check Digit, MOD10**

0420070
Two Check Digits, MOD10/MOD10

0420080
Two Check Digits, MOD10/MOD11

0006000
**** Exit Setup**

0006010
Enter Setup

2D Symbologies

PDF 417

Restore Factory Defaults

0501000

Restore the Factory Defaults of PDF 417

Enable/Disable PDF 417

0501020

**** Enable PDF 417**

0501010

Disable PDF 417

Set Length Range for PDF 417

0501030

Set the Minimum Length

0501040

Set the Maximum Length

0006000
**** Exit Setup**

0006010
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.

0501070
**** Single PDF417 Only**

0501080
Twin PDF417 Only

0501090
Both Single & Twin

Character Encoding

0501350
**** Default Character Encoding**

0501351
UTF-8

0006000
**** Exit Setup**

0006010
Enter Setup

Enable/Disable PDF417 ECI Output

0501341
Disable PDF417 ECI Output

0501340
**** Enable PDF417 ECI Output**

0006000
**** Exit Setup**

0006010
Enter Setup

QR Code

Restore Factory Defaults

0502000

Restore the Factory Defaults of QR Code

Enable/Disable QR Code

0502020

**** Enable QR Code**

0502010

Disable QR Code

Set Length Range for QR Code

0502030

Set the Minimum Length

0502040

Set the Maximum Length

Micro QR

0502110

Enable Micro QR

0502100

**** Disable Micro QR**

0006000
**** 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

Enable/Disable QR ECI Output

0502151
Disable QR ECI Output

0502150
**** Enable QR ECI Output**

0006000
**** Exit Setup**

0006010
Enter Setup

Aztec

Restore Factory Defaults

0503000

Restore the Factory Defaults of Aztec Code

Enable/Disable Aztec Code

0503020

Enable Aztec Code

0503010

**** Disable Aztec Code**

If the scanner fails to identify Aztec Code barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Aztec Code** barcode.

0006000
**** Exit Setup**

0006010
Enter Setup

Set Length Range for Aztec Code

The scanner can be configured to only decode Aztec barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

0503030

Set the Minimum Length (Default: 1)

0503040

Set the Maximum Length (Default: 6144)

Minimum length is not allowed to be greater than maximum length. If you only want to read Aztec barcodes with a specific length, set both minimum and maximum lengths to be that desired length.

Set the scanner to decode Aztec barcodes containing between 8 and 12 characters:

1. Scan the **Enter Setup** barcode.
2. Scan the **Set the Minimum Length** barcode.
3. Scan the numeric barcode “8” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Set the Maximum Length** barcode.
6. Scan the numeric barcodes “1” and “2” from the “Digit Barcodes” section in Appendix.
7. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
8. Scan the **Exit Setup** barcode.

0006000
**** Exit Setup**

0006010
Enter Setup

Character Encoding

0503110
**** Default Character Encoding**

0503111
UTF-8

Aztec ECI Output

0503101
Disable Aztec ECI Output

0503100
**** Enable Aztec ECI Output**

0006000
**** Exit Setup**

0006010
Enter Setup

Data Matrix

Restore Factory Defaults

0504000

Restore the Factory Defaults of Data Matrix

Enable/Disable Data Matrix

0504020

**** Enable Data Matrix**

0504010

Disable Data Matrix

Set Length Range for Data Matrix

0504030

Set the Minimum Length

0504040

Set the Maximum Length

0006000
**** Exit Setup**

0006010
Enter Setup

Rectangular Barcode

0504110
**** Enable Rectangular Barcode**

0504100
Disable Rectangular Barcode

Mirror Image

0504331
**** Decode Mirror Images**

0504330
Do Not Decode Mirror Images

0006000
**** Exit Setup**

0006010
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.

0504070
**** Single Data Matrix Only**

0504080
Twin Data Matrix Only

0504090
Both Single & Twin

Character Encoding

0504350
**** Default Character Encoding**

0504351
UTF-8

0006000
**** Exit Setup**

0006010
Enter Setup

Enable/Disable Data Matrix ECI Output

0504341
Disable Data Matrix ECI Output

0504340
**** Enable Data Matrix ECI Output**

0006000
**** Exit Setup**

0006010
Enter Setup

Chapter 9 Image Control

Image Flipping

The user may get reversed images when the engine is installed in non-standard ways. When it happens, image flipping can be used to right the “wrong”.

The following figures illustrate standard image and three flipped images.

- ✧ Fig.9-1 Standard Image: Image the engine should get when it is installed properly and no reflector is used in its optical imaging system.
- ✧ Fig.9-2 Horizontal Flipped Image: It happens when horizontal reflection occurs along the optical path. To get standard images, enable the **Flip Horizontally** option.
- ✧ Fig.9-3 Vertical Flipped Image: It happens when vertical reflection occurs along the optical path. To get standard images, enable the **Flip Vertically** option.
- ✧ Fig.9-4 Horizontal and Vertical Flipped Image: It happens when the engine is installed upside down. To get standard images, enable the **Flip Horizontally and Vertically** option.

Fig.9-1 Standard Image

Fig.9-2 Horizontal Flipped Image

Fig.9-3 Vertical Flipped Image

Fig.9-4 Horizontal and Vertical Flipped Image

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**

0006010
Enter Setup

Chapter 10 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:

   0200010;0302010;0313000=2000;

2. Generate a batch barcode.

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

0001110

Enable Batch Barcode

0006000
**** Exit 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”**

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**

Use Batch Barcode

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

0006010

Enter Setup

0001110

Enable Batch Barcode

Batch Barcode

0006000

Exit Setup

Chapter 11 Troubleshooting

FAQ

Problem: 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 engine is properly powered up.
2. Send “?” to the engine. If the engine 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 7.

Appendix

Appendix 1: Factory Defaults Table

Parameter		Factory Default	Remark
Programming Barcode			
Barcode Programming		Disabled	
Programming Barcode Data		Do not send	
Communication Settings			
TTL-232	Baud Rate	9600	
	Parity Check	None	
	Data Bit	8	
	Stop Bit	1	
	Hardware Flow Control	No flow control	
HID-KBW (optional)	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 1	Disabled	
	Emulate Numeric Keypad 2	Disabled	
	Code Page	Windows 1252 (Latin I)	
Scan Mode			
Scan Mode		Trigger mode	
Trigger Mode	Decode Session Timeout	3,000ms	Applicable to Trigger mode, Sense mode, Continuous mode. 100~3,600,000ms; 0: Infinite.
	Trigger Condition	Electric level	
	Auto Idle	Enabled	
	Idle Timeout	500ms	0~65,535ms
	Timeout between Decodes (Same Barcode)	Disabled	
		1,500ms	0~65,535ms
	Reset Timeout	Off	

Parameter		Factory Default	Remark
Sense Mode	Decode Session Timeout	3,000ms	Applicable to Trigger mode, Sense mode, Continuous mode. 100~3,600,000ms; 0: Infinite.
	Image Stabilization Timeout	500ms	0~1,600ms
	Timeout between Decodes	1000ms	Applicable to Sense mode and Continuous mode. 0~65,535ms
	Operation after Good Read	Pause after good read	
	Timeout between Decodes (Same Barcode)	Disabled	
		1,500ms	0~65,535ms
	Reset Timeout	Off	
	Threshold Value of Illumination Change	2	1~16
Continuous Mode	Decode Session Timeout	3,000ms	Applicable to Trigger mode, Sense mode, Continuous mode. 100~3,600,000ms; 0: Infinite.
	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
	Reset Timeout	Off	
Scanning Preferences			
Decode Area		Whole Area Decoding	
Specify Decoding Area		40% top, 60% bottom, 40% left, 60% right	
Illumination & Aiming			
Illumination		Normal	
Aiming		Normal	
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
Data Packing	Disable Data Packing	
Image Control		
Image Flipping	Do not flip	
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		

Parameter	Factory Default	Remark
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	
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	
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	

Parameter	Factory Default	Remark
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	
Transmit Delay per 12 Characters	Disabled	
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	
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	

Parameter	Factory Default	Remark
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/ABCD	
Maximum Length	127	
Minimum Length	2	
Code 93		
Code 93	Enabled	
Check Digit Verification	Enabled	
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, MOD 11	
Check Digit	Do not transmit	

Parameter	Factory Default	Remark
Maximum Length	127	
Minimum Length	2	
Plessey		
Plessey	Enabled	
Check Digit Verification	Enabled	
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	1	
MSI-*Plessey*		
MSI-Plessey	Enabled	
Check Digit Verification	One check digit, MOD10	
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	2	
PDF417		
PDF417	Enabled	
Maximum Length	2710	
Minimum Length	1	
PDF417 Twin Code	Read single PDF417 only	
Character Encoding	Default Character Encoding	
PDF417 ECI Output	Enabled	
QR Code		
QR Code	Enabled	
Micro QR	Disabled	
Maximum Length	6144	
Minimum Length	1	
QR Twin Code	Read single QR only	
Character Encoding	Default Character Encoding	
QR ECI Output	Enabled	
Aztec		
Aztec Code	Disabled	
Maximum Length	6144	
Minimum Length	1	
Character Encoding	Default Character Encoding	
Aztec ECI Output	Enabled	

Parameter	Factory Default	Remark
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	
Data Matrix ECI Output	Enabled	

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	EAN-8 + 2-Digit Add-On Code
	]E4	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	MOD10; do not transmit check digit
	]R9	MOD10; transmit check digit
Code 39	]A0	Transmit barcodes as is; Full ASCII disabled; no check digit verification
	]A1	MOD43; transmit check digit
	]A3	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	MOD11; transmit check digit
	]H1	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	MOD10; transmit check digit
	]M1	MOD10; do not transmit check digit
	]M7	MOD10/ MOD11; do not transmit check digit
	]M8	MOD10/ MOD11; transmit check digit
	]M9	No check digit verification
Matrix 2 of 5	]X0	Specified by the manufacturer
	]X1	No check digit verification
	]X2	MOD10; transmit check digit
	]X3	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
Aztec	]z0	

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, Febraban	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
Aztec	z
Data Matrix	u

Appendix 4: Symbology ID Number

Symbology	ID Number
Code 128	002
GS1-128 (UCC/EAN-128)	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
Industrial25	025
Standard25	026
Plessey	027
Code 11	028
MSI-Plessey	029
GS1 Databar (RSS)	031
PDF417	032
QR Code	033
Aztec	034
Data Matrix	035

Appendix 5: 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 6: 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".
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

b. Program the Idle Timeout

Example: Set the idle timeout to 500ms

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

c. Program the Image Stabilization Timeout

Example: Set the image stabilization timeout to 500ms

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

d. 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".
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

e. 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".
4. Scan the **Save** barcode.
5. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

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

g. Program the Decoding Area

Example: Set the decoding area to 20% top, 80% bottom, 20% left and 80% right.

1. Scan the **Enter Setup** barcode.
2. Scan the **Specific Area Decoding** barcode. (See the **"Specific Area Decoding"** section in Chapter 4)
3. Scan the **Top of Decoding Area** barcode. (See the **"Specify Decoding Area"** section in Chapter 4)
4. Scan the numeric barcodes "2" and "0".
5. Scan the **Save** barcode.
6. Scan the **Bottom of Decoding Area** barcode.
7. Scan the numeric barcodes "8" and "0".
8. Scan the **Save** barcode.
9. Scan the **Left of Decoding Area** barcode.
10. Scan the numeric barcodes "2" and "0".
11. Scan the **Save** barcode.
12. Scan the **Right of Decoding Area** barcode.
13. Scan the numeric barcodes "8" and "0".
14. Scan the **Save** barcode.
15. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

h. 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. (See the **"Set Custom Prefix"** section in Chapter 6)
4. Scan the numeric barcodes "4", "3", "4", "F", "4", "4", "4" and "5".
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

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

j. 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. (See the **"Modify Code ID"** section in Chapter 6)
4. Scan the numeric barcodes "7" and "0".
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

k. 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. (See the **"Edit NGR Message"** section in Chapter 5)
4. Scan the numeric barcodes "2", "1", "4", "5", "5", "2", "5" and "2".
5. Scan the **Save** barcode.
6. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

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

Note: If minimum length is set to be greater than maximum length, the engine 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 engine 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. (See the **"Set Length Range for Code 128"** section in Chapter 7)
3. Scan the numeric barcode "8".
4. Scan the **Save** barcode.
5. Scan the **Set the Maximum Length** barcode. (See the **"Set Length Range for Code 128"** section in Chapter 7)
6. Scan the numeric barcodes "1" and "2".
7. Scan the **Save** barcode.
8. Scan the **Exit Setup** barcode. (If you still need to program other parameter/feature, skip this step.)

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

n. 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. (See the **"Inter-Keystroke Delay"** section in Chapter 2)
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.)

o. Program the engine 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 8.
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.)

p. Program the engine 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 8.
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.)

q. 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 8)
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.)

r. 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 8)
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 7: Digit Barcodes

0-9

0000000

0

0000010

1

0000020

2

0000030

3

0000040

4

0000050

5

0000060

6

0000070

7

0000080

8

0000090

9

A-F

0000100

A

0000110

B

0000120

C

0000130

D

0000140

E

0000150

F

Appendix 8: 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 engine is still in the setup mode.

0000160

Save

0000170

Delete the Last Digit

0000180

Delete All Digits

0000190

Cancel

Appendix 9: ASCII Function Key Mapping Table

ASCII Function	ASCII Value (HEX)	No Function Key Mapping	Function Key Mapping
NUL (Null char.)	00	Null	Ctrl+@
SOH (Start of Header)	01	Keypad Enter	Ctrl+A
STX (Start of Text)	02	Caps Lock	Ctrl+B
ETX (End of Text)	03	ALT	Ctrl+C
EOT (End of Transmission)	04	Null	Ctrl+D
ENQ (Enquiry)	05	CTRL	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 10: Code Pages List

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

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Newland

Newland Auto-ID Tech. Co., Ltd.