2D barcode Scanner RT350H

User Manual

Revision History

Version	Description	Date
V1.0.1	Initial release.	April 26, 2016

Table Of Contents

Revision History **1**

Table Of Contents **2**

Chapter 1 Getting Started **10**

Introduction 10
About This Guide 10
Barcode Scanning 10
Barcode Programming 10
Factory Defaults 11
Custom Defaults 12

Chapter 2 Communication Interfaces **13**

RS232 Interface 14
Baud Rate 15
USB Interface (Optional) 16
USB Enumeration 16
USB HID-KBW 16
USB Country Keyboard Types 17
Beep on Unknown Character 19
Inter-Keystroke Delay 19
Convert Case 20
Emulate ALT+Keypad 21
Function Key Mapping 22
Emulate Numeric Keypad 23
Code Page 23
USB COM Port Emulation 24
USB HID-POS 24
Introduction 24
Access the Scanner with Your Program 25
Acquire Scanned Data 25
Send Data to the Scanner 25

VID/PID....26
Chapter 3 Scan Mode....27
Trigger Mode....27
Decode Session Timeout....27
Level Trigger/Pulse Trigger....28
Auto Sleep....28
Timeout between Decodes (Same Barcode)....29
Sense Mode....30
Decode Session Timeout....30
Image Stabilization Timeout....30
Continue after Good Read....31
Timeout between Decodes (Same Barcode)....31
Sensitivity....33
Continuous Mode....35
Decode Session Timeout....35
Timeout between Decodes....35
Cellphone Read Mode....36
Chapter 4 Scanning Preferences....37
Introduction....37
Decode Area....37
Whole Area Decoding....37
Central Area Decoding....37
Specify Central Area....38
Chapter 5 Illumination & Aiming....39
Illumination....39
Aiming....40
Chapter 6 Beep & LED Notifications....41
Startup Beep....41
Good Read Beep for Non-programming Barcode....42
Beep Type....42
Beep Volume....43
Beep on Unknown Character....43
Good Read Beep for Programming Barcode....44

Good Read LED 44
Transmit NGR Message 45
Edit NGR Message 45
Chapter 7 Data Formatting 46
General Settings 47
Enable/Disable All Prefix/Suffix 47
Prefix Sequences 47
Custom Prefix 48
Enable/Disable Custom Prefix 48
Set Custom Prefix 48
AIM ID Prefix 49
Code ID Prefix 49
Restore All Default Code IDs 49
Modify Code ID 50
Custom Suffix 53
Enable/Disable Custom Suffix 53
Set Custom Suffix 53
Terminating Character Suffix 54
Enable/Disable Terminating Character Suffix 54
Set Terminating Character Suffix 55
Chapter 8 Symbologies 56
General Settings 56
Enable/Disable All Symbologies 56
Enable/Disable 1D Symbologies 56
Enable/Disable 2D Symbologies 56
Video Reverse 57
1D Symbologies 58
Code 128 58
Restore Factory Defaults 58
Enable/Disable Code 128 58
Set Length Range for Code 128 58
GS1-128 (UCC/EAN-128) 59
Restore Factory Defaults 59
Enable/Disable GS1-128 59
Set Length Range for GS1-128 59

AIM-128 60
Restore Factory Defaults 60
Enable/Disable AIM-128 60
Set Length Range for AIM-128 60
EAN-8 61
Restore Factory Defaults 61
Enable/Disable EAN-8 61
Transmit Check Digit 62
Add-On Code 62
Add-On Code Required 63
EAN-8 Extension 63
EAN-13 64
Restore Factory Defaults 64
Enable/Disable EAN-13 64
Transmit Check Digit 64
Add-On Code 65
Add-On Code Required 65
ISSN 66
Restore Factory Defaults 66
Enable/Disable ISSN 66
Add-On Code 67
Add-On Code Required 67
ISBN 68
Restore Factory Default 68
Enable/Disable ISBN 68
Set ISBN Format 68
Add-On Code 69
Add-On Code Required 69
UPC-E 70
Restore Factory Defaults 70
Enable/Disable UPC-E 70
Transmit Check Digit 70
Add-On Code 71
Add-On Code Required 71
Transmit System Character “0” 72
UPC-E Extension 72

UPC-A 73
Restore Factory Defaults 73
Enable/Disable UPC-A 73
Transmit Check Digit 73
Add-On Code 74
Add-On Code Required 74
Transmit Preamble Character “0” 75
Interleaved 2 of 5 76
Restore Factory Defaults 76
Enable/Disable Interleaved 2 of 5 76
Set Length Range for Interleaved 2 of 5 76
Check Digit Verification 77
ITF-14 78
ITF-6 79
Matrix 2 of 5 80
Restore Factory Defaults 80
Enable/Disable Matrix 2 of 5 80
Set Length Range for Matrix 2 of 5 80
Check Digit Verification 81
Industrial 2 of 5 82
Restore Factory Defaults 82
Enable/Disable Industrial 2 of 5 82
Set Length Range for Industrial 2 of 5 82
Check Digit Verification 83
Standard 2 of 5（IATA 2 of 5） 84
Restore Factory Defaults 84
Enable/Disable Standard 25 84
Set Length Range for Standard 25 84
Check Digit Verification 85
Code 39 86
Restore Factory Defaults 86
Enable/Disable Code 39 86
Transmit Start/Stop Character 86
Set Length Range for Code 39 87
Check Digit Verification 87
Enable/Disable Code 39 Full ASCII 87

Codabar....88
Restore Factory Defaults....88
Enable/Disable Codabar....88
Set Length Range for Codabar....88
Check Digit Verification....89
Transmit Start/Stop Character....89
Start/Stop Character Format....90
Code 93....91
Restore Factory Defaults....91
Enable/Disable Code 93....91
Set Length Range for Code 93....91
Check Digit Verification....92
GS1-Databar (RSS)....93
Restore Factory Defaults....93
Enable/Disable GS1 Databar....93
Transmit Application Identifier "01"....93
Code 11....94
Restore Factory Defaults....94
Enable/Disable Code 11....94
Set Length Range for Code 11....94
Transmit Check Digit....95
Check Digit Verification....95
Plessey....96
Restore Factory Defaults....96
Enable/Disable Plessey....96
Set Length Range for Plessey....96
Check Digit Verification....97
MSI-Plessey....98
Restore Factory Defaults....98
Enable/Disable MSI-Plessey....98
Set Length Range for MSI-Plessey....98
Transmit Check Digit....99
Check Digit Verification....99
2D Symbologies....100
PDF 417....100
Restore Factory Defaults....100

Enable/Disable PDF 417 100
Set Length Range for PDF 417 100
PDF 417 Twin Code 101
QR Code 102
Restore Factory Defaults 102
Enable/Disable QR Code 102
Set Length Range for QR Code 102
Micro QR 102
QR Twin Code 103
Data Matrix 105
Restore Factory Defaults 105
Enable/Disable Data Matrix 105
Set Length Range for Data Matrix 105
Rectangular Barcode 106
Mirror Image 106
Data Matrix Twin Code 107
Chinese Sensible Code 108
Restore Factory Defaults 108
Enable/Disable Chinese Sensible Code 108
Set Length Range for Chinese Sensible Code 108

Chapter 9 Image Control 109

Ambient Illumination 109
Image Flipping 110
Flip 111
Flip Vertically 111
Flip Horizontally 111

Chapter 10 Troubleshooting 112

FAQ 112

Appendix 114

Appendix 1: Factory Defaults Table 114
Appendix 2: AIM ID Table 122
Appendix 3: Code ID Table 124
Appendix 4: ASCII Table 125
Appendix 5: Parameter Programming Examples 129

a. Program the Decode Session Timeout....129
b. Program the Time Period from Idle to Sleep....129
c. Program the Image Stabilization Timeout....129
d. Program the Timeout between Decodes (Same Barcode)....130
e. Program the Threshold Value of Illumination Change....130
f. Program the Timeout between Decodes....130
g. Program the Central Area....131
h. Program the Custom Prefix/Suffix....131
i. Program the Terminating Character Suffix....131
j. Program the Code ID....132
k. Program the NGR Message....132
l. Program the Length Range (Maximum/Minimum Lengths) for a Symbology....133
m. Program the Code Page....133
Appendix 6: Digit Barcodes....134
Appendix 7: Save/Cancel Barcodes....136
Appendix 8: ASCII Function Key Mapping Table....137
Appendix 9: Code Pages List....139

Chapter 1 Getting Started

Introduction

The RT350H supports 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.

About This Guide

This guide provides programming instructions for the RT350H. Users can configure the RT350H by scanning the programming barcodes included in this manual.

The RT350H 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.

Barcode Scanning

Powered by area-imaging technology and RTscan new technology, the RT350H 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 RT350H over the barcode.

Barcode Programming

Scanning the **Enter Setup** barcode can enable the scanner to enter the setup mode. Then you can scan a

0006000
** Exit Setup

number of programming barcodes to configure your scanner. To exit the setup mode, scan the **Exit Setup** barcode.

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

Enter Setup

**** Exit Setup**

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

Restarting the scanner will automatically disable the transmission of programming barcode data to the Host.

Transmit Programming Barcode Data

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

Factory Defaults

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

Note: Use this feature with discretion.

**** Exit Setup**

Restore All Factory Defaults

Custom Defaults

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

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

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

Save as Custom Defaults

Restore All Custom Defaults

**** Exit Setup**

Chapter 2 Communication Interfaces

The RT350H provides a USB interface and a RS2323 interface (optional) to communicate with the host device.

0006000
** Exit Setup

RS232 Interface

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

Parameter	Factory Default
Serial Communication	Standard RS232
Baud Rate	9600
Parity Check	None
Data Bits	8
Stop Bits	1
Hardware Flow Control	None

0006000

** Exit Setup

Baud Rate

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

**** 9600**

1200

19200

2400

38400

4800

57600

14400

115200

**** Exit Setup**

USB Interface (Optional)

USB Enumeration

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

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

Enumeration Using S/N

**** Enumeration Using "00000000"**

USB HID-KBW

When you connect the scanner to the Host via a USB connection, you can enable the **USB HID-KBW** feature by scanning the barcode below. Then scanner'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.

USB HID-KBW

**** Exit 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**

Spain

Turkey_Q

UK

Austria, Germany

Belgium

Russia

Sweden

Portugal

**** Exit Setup**

Beep on Unknown Character

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

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

Beep on Unknown Character

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

Inter-Keystroke Delay

This parameter specifies the delay between emulated keystrokes.

** **No Delay**

Short Delay (20ms)

Long Delay (40ms)

** **Exit Setup**

Convert Case

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

**** No Case Conversion**

Invert Upper and Lower Case Characters

Convert All to Upper Case

Convert All to Lower Case

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

**** 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.

**** Disable**

Mode 1

Mode 2

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”

**** Exit Setup**

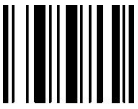
Function Key Mapping

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

Enable Function Key Mapping

**** Disable Function Key Mapping**

Example: Barcode data 0x16

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

**** Exit Setup**

Emulate Numeric Keypad

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

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

**** Do Not Emulate Numeric Keypad**

Emulate Numeric Keypad

Code Page

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**.

Set the Code Page

**** Exit Setup**

USB COM Port Emulation

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

1100060

USB COM Port Emulation

USB HID-POS

Introduction

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

Features:

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

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

1100080

USB HID-POS

0006000

**** Exit Setup**

Access the Scanner with Your Program

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

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

Acquire Scanned Data

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

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

Send Data to the Scanner

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

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

0006000
** Exit Setup

VID/PID

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

Product	Interface	PID (Hex)	PID (Dec)
RT350H	USB HID-KBW	1303	4867
	USB COM Port Emulation	1306	4870
	USB HID-POS	1310	4880

0006000

** Exit Setup

Chapter 3 Scan Mode

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 scanner 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.

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 0ms to 3,600,000ms. The default setting is 3,000ms. To learn how to program this parameter, see **Appendix 5**.

Decode Session Timeout

** Exit 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 Sleep

Auto Sleep allows the scanner in the Trigger Mode to automatically enter the sleep or low power mode if no operation or communication is performed for a time period (user programmable). When the scanner is in the sleep mode, receiving trigger signal or communication from the Host can awake the scanner. The scanner returns to full operation within 100ms.

0313060

**** Enable Auto Sleep**

0313070

Disable Auto Sleep

The parameter below specifies how long the scanner remains idle (no operation or communication occurs) before it is put into sleep 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

Time Period from Idle to Sleep

0006000

**** Exit Setup**

Timeout between Decodes (Same Barcode)

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

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

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

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

**** Disable Timeout between Decodes**

Enable Timeout between Decodes

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

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

Timeout between Decodes (Same Barcode)

**** Exit Setup**

Sense Mode

If the Sense Mode is enabled, the scanner 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 scanner is able to monitor ambient illumination again.

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 scanner goes back to monitoring ambient illumination. It is programmable in 1ms increments from 0ms to 3,600,000ms. The default setting is 3,000ms. To learn how to program this parameter, see **Appendix 5**.

Decode Session Timeout

Image Stabilization Timeout

The image stabilization timeout 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**.

** Exit Setup

Image Stabilization Timeout

Continue after Good Read

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

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

**** Pause after Good Read**

Continue after Good Read

Timeout between Decodes (Same Barcode)

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

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

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

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

**** Exit Setup**

**** Disable Timeout between Decodes**

Enable Timeout between Decodes

**** Exit Setup**

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

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

Timeout between Decodes (Same Barcode)

Sensitivity

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

Medium Sensitivity

Low Sensitivity

High Sensitivity

Enhanced Sensitivity

**** Exit Setup**

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

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

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

Threshold Value of Illumination Change (1-20)

**** Exit Setup**

Continuous Mode

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

When the scanner 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.

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 0ms to 3,600,000ms. The default setting is 3,000ms. To learn how to program this parameter, see **Appendix 5**.

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**.

** Exit Setup

Timeout between Decodes

Cellphone Read Mode

0313140

****Disable Cellphone Read Mode**

0313142

Enable Cellphone Read Mode

0006000

**** Exit Setup**

Chapter 4 Scanning Preferences

Introduction

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

Decode Area

Whole Area Decoding

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

0322000

**** Whole Area Decoding**

Central Area Decoding

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

0322010

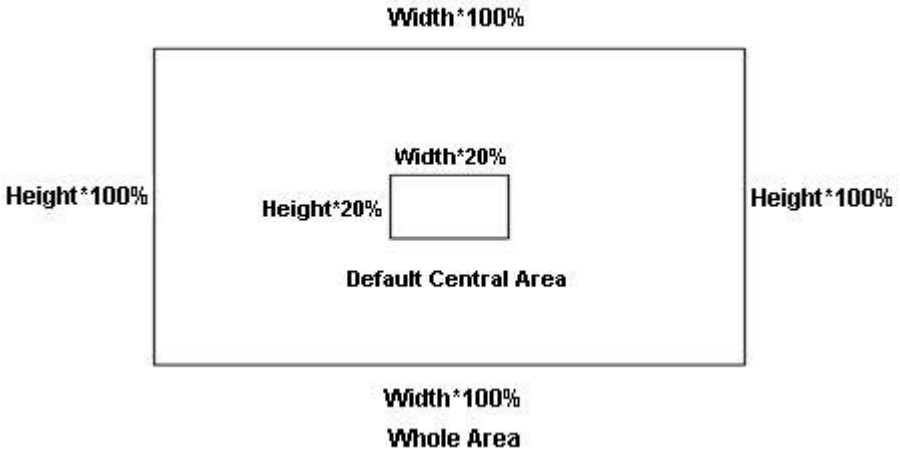
Central Area Decoding

0006000

**** Exit Setup**

Specify Central Area

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



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

0322020

Specify Central Area

0006000

**** Exit Setup**

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 scanner is powered on.

OFF: Illumination LEDs are OFF all the time.

**** Normal**

OFF

Always ON

**** Exit Setup**

Aiming

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

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

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

OFF: Aiming pattern is OFF all the time.

**** Normal**

OFF

Always ON

**** Exit Setup**

Chapter 6 Beep & LED Notifications

Startup Beep

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

**** Enable Startup Beep**

Disable Startup Beep

**** Exit Setup**

Good Read Beep for Non-programming Barcode

The scanner 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.

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

Good Read Beep Off for Non-programming Barcode

Beep Type

Type 1

**** Type 3**

Type 2

**** Exit 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 scanner fails to transmit the unknown characters.

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

1103031

Beep on Unknown Character

1103030

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

0006000

**** Exit Setup**

Good Read Beep for Programming Barcode

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

Good Read Beep Off for Programming Barcode

Good Read LED

**** Good Read LED ON**

Good Read LED OFF

**** Exit Setup**

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.

Transmit NGR Message

**** Do Not Transmit NGR Message**

Edit NGR Message

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

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

Edit NGR Message

**** Exit Setup**

Chapter 7 Data Formatting

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 formatting 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

General Settings

Enable/Disable All Prefix/Suffix

Disable All Prefix/Suffix: Transmit barcode data with no prefix/suffix.

Enable All Prefix/Suffix: Allow user to append Code ID prefix, AIM ID prefix, custom prefix/suffix and terminating character to the barcode data before the transmission.

Enable All Prefix/Suffix

Disable All Prefix/Suffix

Prefix Sequences

Code ID+Custom Prefix+AIM ID

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

**** Exit 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.

Enable Custom Prefix

**** Disable Custom Prefix**

Set Custom Prefix

To set a custom prefix, scan the **Set Custom Prefix** barcode and the numeric barcodes representing the hexadecimal 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 11 characters.

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.

**** Exit 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 scanner will add the symbology identifier before the scanned data after decoding.

Enable AIM ID Prefix

**** Disable AIM ID Prefix**

Code ID Prefix

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

Enable Code ID Prefix

**** Disable Code ID Prefix**

Restore All Default Code IDs

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

Restore All Default Code IDs

**** Exit 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.

Modify PDF417 Code ID

Modify Data Matrix Code ID

Modify QR Code Code ID

Modify Chinese Sensible Code ID

Modify Code 128 Code ID

Modify GS1-128 Code ID

**** Exit 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**

Modify ITF-14 Code ID

Modify ITF-6 Code ID

Modify Codabar Code ID

Modify Industrial 25 Code ID

Modify Standard 25 Code ID

Modify Matrix 25 Code ID

Modify COOP 25 Code ID

Modify Code 11 Code ID

Modify Plessey Code ID

Modify MSI/Plessey Code ID

Modify GS1 Databar Code ID

**** Exit 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.

Enable Custom Suffix

** **Disable Custom Suffix**

Set Custom Suffix

To set a custom suffix, scan the **Set Custom Suffix** barcode and the numeric barcodes representing the hexadecimal 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 11 characters.

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.

** **Exit Setup**

Terminating Character Suffix

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

A terminating character suffix can contain one or two characters.

Enable/Disable Terminating Character Suffix

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

** **Enable Terminating Character Suffix**

Disable Terminating Character Suffix

** **Exit Setup**

Set Terminating Character Suffix

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

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

Terminating Character CRLF (0x0D,0x0A)

To set a terminating character suffix, scan the **Set Terminating Character Suffix** barcode and the numeric barcodes representing the hexadecimal value 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 7 characters.

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.

**** Exit Setup**

Chapter 8 Symbologies

General Settings

Enable/Disable All Symbologies

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

Enable All Symbologies

Disable All Symbologies

Enable/Disable 1D Symbologies

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

Enable 1D Symbologies

Disable 1D Symbologies

Enable/Disable 2D Symbologies

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

Enable 2D Symbologies

Disable 2D Symbologies

** Exit Setup

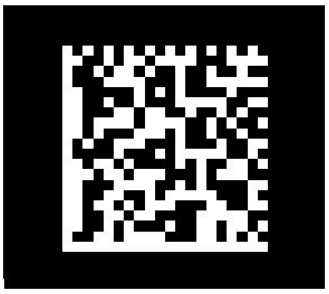
Video Reverse

Regular barcode: Dark image on a bright background.

Inverse barcode: Bright image on a dark background.

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

Regular Barcode



Inverse Barcode

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

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

Video Reverse OFF: Read regular barcodes only.

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

0001021

Video Reverse ON

0001011

**** Video Reverse OFF**

0006000

**** Exit Setup**

1D Symbologies

Code 128

Restore Factory Defaults

Restore the Factory Defaults of Code 128

Enable/Disable Code 128

**** Enable Code 128**

Disable Code 128

Set Length Range for Code 128

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

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**

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**

EAN-8

Restore Factory Defaults

Restore the Factory Defaults of EAN-8

Enable/Disable EAN-8

**** Enable EAN-8**

Disable EAN-8

**** Exit 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.

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

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.

Enable 2-Digit Add-On Code

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

Enable 5-Digit Add-On Code

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

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

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

**** Exit Setup**

Add-On Code Required

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

EAN-8 Add-On Code Required

**** 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.

Enable EAN-8 Zero Extend

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

**** Exit 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**

Add-On Code

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

0402060

Enable 2-Digit Add-On Code

0402050

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

0402080

Enable 5-Digit Add-On Code

0402070

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

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

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

Add-On Code Required

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

0402090

EAN-13 Add-On Code Required

0402100

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

0006000

**** Exit Setup**

ISSN

Restore Factory Defaults

0421000

Restore the Factory Defaults of ISSN

Enable/Disable ISSN

0421020

Enable ISSN

0421010

**** Disable ISSN**

0006000

**** Exit 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.

Enable 2-Digit Add-On Code

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

Enable 5-Digit Add-On Code

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

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

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

Add-On Code Required

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

ISSN Add-On Code Required

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

**** Exit Setup**

ISBN

Restore Factory Default

Restore the Factory Defaults of ISBN

Enable/Disable ISBN

**** Enable ISBN**

Disable ISBN

Set ISBN Format

**** ISBN-13**

ISBN-10

**** Exit Setup**

Add-On Code

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

Enable 2-Digit Add-On Code

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

Enable 5-Digit Add-On Code

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

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

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

Add-On Code Required

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

ISBN Add-On Code Required

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

**** Exit Setup**

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**

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 scanner decodes a mix of UPC-E barcodes with and without 2-digit/5-digit add-on codes.

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

Add-On Code Required

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

0403130

UPC-E Add-On Code Required

0403140

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

0006000

**** Exit Setup**

Transmit System Character "0"

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

**** Transmit System Character "0"**

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.

Enable UPC-E Extend

**** Disable UPC-E Extend**

**** Exit 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.

Enable 2-Digit Add-On Code

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

Enable 5-Digit Add-On Code

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

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

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

Add-On Code Required

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

UPC-A Add-On Code Required

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

**** Exit Setup**

Transmit Preamble Character “0”

Transmit Preamble Character “0”

**** Do not Transmit Preamble Character “0”**

Note: The preamble character “0” usually does not appear in printed UPC-A barcodes.

**** Exit Setup**

Interleaved 2 of 5

Restore Factory Defaults

Restore the Factory Defaults of Interleaved 2 of 5

Enable/Disable Interleaved 2 of 5

**** Enable Interleaved 2 of 5**

Disable Interleaved 2 of 5

Set Length Range for Interleaved 2 of 5

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

Check Digit Verification

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

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

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

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

**** Disable**

Do Not Transmit Check Digit After Verification

Transmit Check Digit After Verification

**** Exit Setup**

ITF-14

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

Restore the Factory Defaults of ITF-14

Disable ITF-14

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

Enable ITF-14 and Transmit Check Digit

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

** **Exit Setup**

ITF-6

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

Restore the Factory Defaults of ITF-6

**** Disable ITF-6**

Enable ITF-6 But Do Not Transmit Check Digit

Enable ITF-6 and Transmit Check Digit

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

**** Exit Setup**

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**

Check Digit Verification

Disable

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

Transmit Check Digit After Verification

**** Exit 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**

Check Digit Verification

0417050

**** Disable**

0417070

Transmit Check Digit After Verification

0417060

Do Not Transmit Check Digit After Verification

0006000

**** Exit Setup**

Standard 2 of 5（IATA 2 of 5）

Restore Factory Defaults

Restore the Factory Defaults of Standard 25

Enable/Disable Standard 25

**** Enable Standard 25**

Disable Standard 25

Set Length Range for Standard 25

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

Check Digit Verification

0418050

**** Disable**

0418070

Transmit Check Digit After Verification

0418060

Do Not Transmit Check Digit After Verification

0006000

**** Exit 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**

Set Length Range for Code 39

Set the Minimum Length

Set the Maximum Length

Check Digit Verification

**** Disable**

Transmit Check Digit After Verification

Do Not Transmit Check Digit After Verification

Enable/Disable Code 39 Full ASCII

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

**** Enable Code 39 Full ASCII**

Disable Code 39 Full ASCII

**** Exit Setup**

Codabar

Restore Factory Defaults

Restore the Factory Defaults of Codabar

Enable/Disable Codabar

**** Enable Codabar**

Disable Codabar

Set Length Range for Codabar

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

Check Digit Verification

**** Disable**

Transmit Check Digit After Verification

Do Not Transmit Check Digit After Verification

Transmit Start/Stop Character

Transmit Start/Stop Character

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

**** Exit Setup**

Start/Stop Character Format

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

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

ABCD/TN*E as the Start/Stop Character

Start/Stop Character in Uppercase

Start/Stop Character in Lowercase

**** Exit Setup**

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**

Check Digit Verification

Disable

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

Transmit Check Digit After Verification

**** Exit 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**

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**

Transmit Check Digit

Transmit Check Digit

**** Do Not Transmit Check Digit**

Check Digit Verification

Disable

**** One Check Digit, MOD11**

Two Check Digits, MOD11/MOD11

Two Check Digits, MOD11/MOD9

One Check Digit, MOD11 (Len<=10)
Two Check Digits, MOD11/MOD11 (Len>10)

One Check Digit, MOD11 (Len<=10)
Two Check Digits, MOD11/MOD9 (Len>10)

**** Exit 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**

Check Digit Verification

Disable

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

Transmit Check Digit After Verification

**** Exit 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**

Transmit Check Digit

Transmit Check Digit

**** Do Not Transmit Check Digit**

Check Digit Verification

Disable

**** One Check Digit, MOD10**

Two Check Digits, MOD10/MOD10

Two Check Digits, MOD10/MOD11

**** Exit Setup**

2D Symbologies

PDF 417

Restore Factory Defaults

Restore the Factory Defaults of PDF 417

Enable/Disable PDF 417

**** Enable PDF 417**

Disable PDF 417

Set Length Range for PDF 417

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

PDF 417 Twin Code

PDF417 twin code is 2 PDF417 barcodes paralleled vertically or horizontally. Two of them must have the same direction and similar specifications and be placed closely together.

There are 3 options for reading PDF417 twin codes:

Single PDF417 Only: Read either PDF417 code.

Twin PDF417 Only: Read both PDF417 codes.

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

**** Single PDF417 Only**

Twin PDF417 Only

Both Single & Twin

Transmission order of twin code

Order 1: Transmit the one containing more information first.

Order 2: Transmit the one containing less information first.

**** Order 1**

Order 2

**** Exit 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**

QR Twin Code

QR twin code is 2 QR barcodes paralleled vertically or horizontally. Two of them must have the same direction and 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.

**** Single QR Only**

Twin QR Only

Both Single & Twin

**** Exit Setup**

Transmission order of twin code

Order 1: Transmit the one containing more information first.

Order 2: Transmit the one containing less information first.

Order 3: If the twin code is paralleled horizontally, transmite the one on the left first; if it is paralleled vertically, transmit the one in the upper position first.

Order 1

Order 2

**** Order 3**

**** Exit Setup**

Data Matrix

Restore Factory Defaults

Restore the Factory Defaults of Data Matrix

Enable/Disable Data Matrix

**** Enable Data Matrix**

Disable Data Matrix

Set Length Range for Data Matrix

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

Rectangular Barcode

**** Enable Rectangular Barcode**

Disable Rectangular Barcode

Mirror Image

**** Decode Mirror Images**

Do Not Decode Mirror Images

**** Exit Setup**

Data Matrix Twin Code

Data Matrix twin code is 2 Data Matrix barcodes paralleled vertically or horizontally. Two of them must have the same direction and similar specifications and be placed closely together.

There are 3 options for reading Data Matrix twin codes:

Single Data Matrix Only: Read either Data Matrix code.

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

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

**** Single Data Matrix Only**

Twin Data Matrix Only

Both Single & Twin

**** Exit Setup**

Chinese Sensible Code

Restore Factory Defaults

Restore the Factory Defaults of Chinese Sensible Code

Enable/Disable Chinese Sensible Code

Enable Chinese Sensible Code

**** Disable Chinese Sensible Code**

Set Length Range for Chinese Sensible Code

Set the Minimum Length

Set the Maximum Length

**** Exit Setup**

Chapter 9 Image Control

Ambient Illumination

Ambient lighting conditions may vary from one operating environment to another, such as fluorescent lit warehouses or sunlit open spaces. Fluorescent lights may flicker when using AC power source in 50-60Hz. Usually indoor illuminance is around 1,000 lux while outdoor illuminance may reach 60,000 lux or even over 100,000 lux.

Two options are provided for ambient illumination settings:

Normal Illuminance: applicable to most indoor/outdoor environments.

High Illuminance: applicable to special enviroments with super-intense light source.

Change to this settings will not take effect until the scanner reboots or wakes up from sleep.

**** Normal Illuminance (0~60000lux)**

High Illuminance (60000~120000lux)

**** Exit Setup**

Image Flipping

The user may get reversed images when the scanner 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.8-1 Standard Image: Image the scanner should get when it is installed properly and no reflector is used in its optical imaging system.
- ✧ Fig.8-2 Horizontal Flipped Image: It happens when horizontal reflection occurs along the optical path. To get standard images, enable the **Flip Horizontally** option.
- ✧ Fig.8-3 Vertical Flipped Image: It happens when vertical reflection occurs along the optical path. To get standard images, enable the **Flip Vertically** option.
- ✧ Fig.8-4 Horizontal and Vertical Flipped Image: It happens when the scanner is installed upside down. To get standard images, enable the **Flip Horizontally and Vertically** option.

Fig.8-1 Standard Image

Fig.8-2 Horizontal Flipped Image

Fig.8-3 Vertical Flipped Image

Fig.8-4 Horizontal and Vertical Flipped Image

0006000
** Exit Setup

Flip

**** Do Not Flip**

Flip Vertically

Flip Horizontally

Flip Horizontally and Vertically

Flip Vertically

Flip Vertically

Do Not Flip Vertically

Flip Horizontally

Flip Horizontally

Do Not Flip Horizontally

**** Exit Setup**

Chapter 10 Troubleshooting

FAQ

Problem: Some barcodes cannot be read.

Solution:

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

Problem: Incorrect output.

Solution:

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

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

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

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

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

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

Problem: Illumination and aiming beams are OFF.

Solution:

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

Problem: Carriage Return/Line Feed settings.

Solution: See the **"Terminating Character Suffix"** section in Chapter 7.

Appendix

Appendix 1: Factory Defaults Table

Parameter		Factory Default	Remark
Programming Barcode			
Barcode Programming		Disabled	
Programming Barcode Data		Do not send	
Communication Settings			
RS232	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	No delay	
	Beep on Unknown Character	Do not beep	
	Emulate ALT + Keypad	Disabled	
	Function Key Mapping	Disabled	
	Emulate Numeric Keypad	Disabled	
	Code Page	Windows 1252 (Latin I)	
Scan Mode			
Trigger Mode	Decode Session Timeout	3,000ms	Applicable to a Trigger mode, Sense mode, Continuous mode. 0~3,600,000ms
	Trigger Condition	Electric level	
	Auto Sleep	Enabled	
	Time Period from Idle to Sleep	500ms	0~65,535ms
	Timeout between Decodes	Disabled	
	(Same Barcode)	1,500ms	0~65,535ms

Parameter		Factory Default	Remark
Sense Mode	Decode Session Timeout	3,000ms	Applicable to Trigger mode, Sense mode, Continuous mode. 0~3,600,000ms
	Image Stabilization Timeout	500ms	0~1,600ms
	Operation after Good Read	Pause after good read	
	Timeout between Decodes (Same Barcode)	Disabled	
		1,500ms	0~65,535ms
	Threshold Value of Illumination Change	2	1~20
Continuous Mode	Decode Session Timeout	3,000ms	Applicable to Trigger mode, Sense mode, Continuous mode. 0~3,600,000ms
	Timeout between Decodes	1000ms	0~65,535ms
Cellphone Read Mode		Disabled	
Scanning Preferences			
Decode Area		Whole Area Decoding	
Central Area		20%	
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
Data Formatting		
Prefix Sequence	Custom Prefix+Code ID+AIM ID	
Custom Prefix	Disabled	
	None	
AIM ID Prefix	Disabled	
Code ID Prefix	Disabled	
Custom Suffix	Disabled	
	None	
Terminating Character Suffix	Enabled	
	0x0D	Carriage Return
Image Control		
Ambient Illumination	Normal illuminance	
Image Flipping	Do not flip	

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

Parameter	Factory Default	Remark
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	
Preamble Character “0”	Do not transmit	
Interleaved 2 of 5		
Interleaved 2 of 5	Enabled	
Check Digit Verification	Disabled	
Check Digit	Do not transmit	
Maximum Length	100	
Minimum Length	6	
ITF-6		
ITF-6	Disabled	
Check Digit	Do not transmit	

Parameter	Factory Default	Remark
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	
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	
Maximum Length	127	
Minimum Length	1	

Parameter	Factory Default	Remark
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	1	
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, MOD11	
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	2	
Plessey		
Plessey	Enabled	
Check Digit Verification	Enabled	
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	1	

Parameter	Factory Default	Remark
MSI-*Plessey*		
MSI-Plessey	Enabled	
Check Digit Verification	One check digit, MOD10	
Check Digit	Do not transmit	
Maximum Length	127	
Minimum Length	2	
PDF 417		
PDF 417	Enabled	
Maximum Length	2710	
Minimum Length	1	
PDF 417 Twin Code	Read single PDF417 only	
Transmission Order of Twin Code	Order 1	
QR Code		
QR Code	Enabled	
Micro QR	Enabled	
Maximum Length	7089	
Minimum Length	1	
QR Twin Code	Read single QR only	
Transmission Order of Twin Code	Order 3	
Data Matrix		
Data Matrix	Enabled	
Rectangular Barcode	Enabled	
Mirror Image	Decode	
Maximum Length	3116	
Minimum Length	1	
DM Twin Code	Read single DM only	
Chinese Sensible Code		
Chinese Sensible Code	Disabled	
Maximum Length	7827	
Minimum Length	1	

Appendix 2: AIM ID Table

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

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

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

Appendix 3: Code ID Table

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

Appendix 4: ASCII Table

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

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

Hex	Dec	Char
3e	62	> (Greater Than)

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

Hex	Dec	Char
5e	94	^ (Caret / Circumflex)
5f	95	_ (Underscore)
60	96	' (Grave Accent)

61	97	A
62	98	b
63	99	C
64	100	D
65	101	E
66	102	F
67	103	G
68	104	H
69	105	I
6a	106	J
6b	107	K
6c	108	L
6d	109	M
6e	110	N
6f	111	O
70	112	P
71	113	Q
72	114	R
73	115	S
74	116	T
75	117	U
76	118	V
77	119	W
78	120	X
79	121	Y
7a	122	Z
7b	123	{ (Left/ Opening Brace)
7c	124	| (Vertical Bar)
7d	125	} (Right/Closing Brace)
7e	126	~ (Tilde)
7f	127	DEL (Delete)

Appendix 5: Parameter Programming Examples

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

a. Program the Decode Session Timeout

Example: Set the decode session timeout to 1500ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Decode Session Timeout** barcode. (See the **"Decode Session Timeout"** section in Chapter 3)
3. Scan the numeric barcodes "1", "5", "0" and "0".
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 Time Period from Idle to Sleep

Example: Set the time period from idle to sleep to 500ms

1. Scan the **Enter Setup** barcode.
2. Scan the **Time Period from Idle to Sleep** barcode. (See the **"Auto Sleep"** 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 Central Area

Example: Set the percentage of central area to 20%

1. Scan the **Enter Setup** barcode.
2. Scan the **Specify Central Area** barcode.
3. Scan the numeric barcodes "2" 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.)

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

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

1. Scan the **Enter Setup** barcode.
2. Scan the **Set the Minimum Length** barcode. (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.)

Appendix 6: Digit Barcodes

0-9

0

5

1

6

2

7

3

8

4

9

A-F

A

B

C

D

E

F

Appendix 7: Save/Cancel Barcodes

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

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

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

Save

Delete the Last Digit

Delete All Digits

Cancel

Appendix 8: ASCII Function Key Mapping Table

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

ASCII Function Key Mapping Table (Continued)

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

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

Appendix 9: Code Pages List

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

If need any technical support, feel free to contact our technical support department:
Support Department
.....
RTSCAN TECHNOLOGY LIMITED
Add: F/7, Block C,Ying Da Li Park, Futian Tax-Free Trade Zone,Shenzhen, China
Tel: +86-755-32909260
E-mail: support@rtscan.net