Newland AIDC
Scanning Made Simple

OEM Scan Engine

NLS-N1-W

User Guide

Disclaimer

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

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

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Table of Contents

Revision History **3**

Preface **1**

Introduction 1
Chapter Description 1
Explanation of Symbols 2
Explanation of Icons 2

Chapter 1 Getting Started **3**

Introduction 3
Symbologies 3
N1-W Scan Engine 4

Chapter 2 Installation **5**

Introduction 5
Dimensions (unit: mm) 5
Mounting 6
13-PIN FPC Connector 7
Connector Specifications 7
FPC Cable 9
ESD 10
Dust and Dirt 10
Ambient Environment 10
Thermal Considerations 10
Maintenance 11

Chapter 3 Optics **12**

Introduction 12
Sensor 12
Illumination 12
Aimer 12
Window Placement 13
Window Material and Color 14
Coatings and Scratch Resistance 14
Window Size 15
Ambient Light 18
Eye Safety 18
Depth of Field 18

Chapter 4 Electrical Specifications **19**

Power Supply 19

Ripple Noise 19
Interface Pinouts 20
DC Characteristics 21
Operating Voltage 21
Operating Current 22
I/O Voltage 22
Timing Sequence 23
Power Up Timing Sequence 23
Chapter 5 External Reference Circuit 24
External Circuit Design 24
Good Read LED Circuit 24
Beeper Circuit 25
Trigger Circuit 25
External Lgiht Control Circuit 27
Reset Circuit 28
Chapter 6 Auxiliary Tools 29
EVK 29
EasySet 29
UFCOM 30
Chapter 7 Configuration 31
Introduction 31
Barcode Programming 31
Command Programming 31
EasySet Programming 31
Programming Barcode/ Programming Command/Function 32
Use of Programming Barcodes 33
Default Settings 34
Factory Defaults 34
Custom Defaults 34
Query Product Information 35
Query Product Name 35
Query Firmware Version 35
Query Hardware Version 36
Query Product Serial Number 36
Query Manufacturing Date 37
Query OEM Serial Number 37
Query Data Formatter Version 37
Chapter 8 Communication Interface 38

Introduction 38
Adaptive Wired Communication 39
RS-232 Interface 40
Baud Rate 41
Parity Check 42
Data Bit 43
Stop Bit 43
USB HID Keyboard 44
USB Country Keyboard Types 45
Beep on Unknown Character 49
Emulate ALT+Keypad 50
Code Page 51
Unicode Encoding 53
Emulate Keypad with Leading Zero 53
Function Key Mapping 54
ASCII Function Key Mapping Table 55
ASCII Function Key Mapping Table (Continued) 56
Inter-Keystroke Delay 57
Caps Lock 58
Convert Case 59
Emulate Numeric Keypad 60
Fast Mode 62
Polling Rate 63
USB CDC 65
HID POS (POS HID Barcode Scanner) 66
Introduction 66
Access the Engine with Your Program 66
Acquire Scanned Data 67
Send Command to the Engine 67
IBM SurePOS (Tabletop) 68
IBM SurePOS (Handheld) 68
VID/PID 68
Chapter 9 System Settings 69
Scan Mode 69
Decode Session Timeout 70
Image Stabilization Timeout (Sense Mode) 72
Image Change Trigger Sensitivity 73
Scanning Interval (Continuous Mode) 74
Reread Timeout 74
Good Read Delay 76

Scanning Preference 77
Image Flipping 78
Bad Read Message 79
Set Bad Read Message 80
Trigger Commands 80
Modify Start Scanning Command 81
Modify Stop Scanning Command 81
Illumination 83
External Illumination 84
Aiming 85
Good Read LED 86
Good Read LED Duration 86
Power On Beep 88
Good Read Beep 88
Good Read Beep Duration 89
Good Read Beep Frequency 90
Good Read Beep Volume 91
Auto Sleep 92
Chapter 10 Symbologies 93
Introduction 93
Global Settings 93
Enable/Disable All Symbologies 93
Enable/Disable 1D Symbologies 93
Enable/Disable 2D Symbologies 94
1D Twin Code 94
Surround GS1 Application Identifiers (AI's) with Parentheses 96
Code 128 97
Restore Factory Defaults 97
Enable/Disable Code 128 97
Set Length Range for Code 128 98
Transmit Check Character 99
FNC1 Output 99
EAN-8 100
Restore Factory Defaults 100
Enable/Disable EAN-8 100
Transmit Check Character 100
2-Digit Add-On Code 101
5-Digit Add-On Code 102
Add-On Code Required 103
Convert EAN-8 to EAN-13 103

EAN-13 104
Restore Factory Defaults 104
Enable/Disable EAN-13 104
Transmit Check Character 105
2-Digit Add-On Code 105
5-Digit Add-On Code 106
Add-On Code Required 106
EAN-13 Beginning with 290 Add-On Code Required 107
EAN-13 Beginning with 378/379 Add-On Code Required 107
EAN-13 Beginning with 414/419 Add-On Code Required 108
EAN-13 Beginning with 434/439 Add-On Code Required 108
EAN-13 Beginning with 977 Add-On Code Required 109
EAN-13 Beginning with 978 Add-On Code Required 109
EAN-13 Beginning with 979 Add-On Code Required 110
UPC-E 111
Restore Factory Defaults 111
Enable/Disable UPC-E 111
Transmit Check Character 112
2-Digit Add-On Code 112
5-Digit Add-On Code 113
Add-On Code Required 113
Transmit Preamble Character 114
Convert UPC-E to UPC-A 114
UPC-A 115
Restore Factory Defaults 115
Enable/Disable UPC-A 115
Transmit Check Character 115
2-Digit Add-On Code 116
5-Digit Add-On Code 117
Add-On Code Required 118
Transmit Preamble Character 118
Interleaved 2 of 5 119
Restore Factory Defaults 119
Enable/Disable Interleaved 2 of 5 119
Set Length Range for Interleaved 2 of 5 120
Check Character Verification 121
Febraban 122
Disable/Enable Febraban 122
Transmit Delay per Character 122
Transmit Delay per 12 Characters 125

ITF-14 127
Restore Factory Defaults 127
Enable/Disable ITF-14 127
ITF-6 128
Restore Factory Defaults 128
Enable/Disable ITF-6 128
Matrix 2 of 5 129
Restore Factory Defaults 129
Enable/Disable Matrix 2 of 5 129
Set Length Range for Matrix 2 of 5 130
Check Character Verification 131
Code 39 132
Restore Factory Defaults 132
Enable/Disable Code 39 132
Set Length Range for Code 39 133
Check Character Verification 134
Transmit Start/Stop Character 135
Enable/Disable Code 39 Full ASCII 135
Enable/Disable Code 32 (Italian Pharma Code) 136
Code 32 Prefix 136
Transmit Code 32 Start/Stop Character 137
Transmit Code 32 Check Character 137
Codabar 138
Restore Factory Defaults 138
Enable/Disable Codabar 138
Set Length Range for Codabar 139
Check Character Verification 140
Start/Stop Character 141
Code 93 142
Restore Factory Defaults 142
Enable/Disable Code 93 142
Set Length Range for Code 93 143
Check Character Verification 144
GS1-128 (UCC/EAN-128) 145
Restore Factory Defaults 145
Enable/Disable GS1-128 145
Set Length Range for GS1-128 146
Transmit Check Character 147
FNC1 Output 147
GS1 Databar (RSS) 148

Restore Factory Defaults 148
Enable/Disable GS1 Databar 148
Transmit Application Identifier “01” 148
Code 11 149
Restore Factory Defaults 149
Enable/Disable Code 11 149
Set Length Range for Code 11 150
Check Character Verification 151
Transmit Check Character 152
ISBN 153
Restore Factory Defaults 153
Enable/Disable ISBN 153
Set ISBN Format 154
ISSN 154
Restore Factory Defaults 154
Enable/Disable ISSN 155
Industrial 25 156
Restore Factory Defaults 156
Enable/Disable Industrial 25 156
Set Length Range for Industrial 25 157
Check Character Verification 158
Standard 25 159
Restore Factory Defaults 159
Enable/Disable Standard 25 159
Set Length Range for Standard 25 160
Check Character Verification 161
Plessey 162
Restore Factory Defaults 162
Enable/Disable Plessey 162
Set Length Range for Plessey 163
Check Character Verification 164
MSI-Plessey 165
Restore Factory Defaults 165
Enable/Disable MSI-Plessey 165
Set Length Range for MSI-Plessey 166
Check Character Verification 167
Transmit Check Character 168
AIM 128 169
Restore Factory Defaults 169
Enable/Disable AIM 128 169

Set Length Range for AIM 128 170
Transmit Check Character 171
FNC1 Output 171
PDF417 172
Restore Factory Defaults 172
Enable/Disable PDF417 172
Set Length Range for PDF417 173
PDF417 Twin Code 174
Character Encoding 175
PDF417 ECI Output 175
QR Code 176
Restore Factory Defaults 176
Enable/Disable QR Code 176
Set Length Range for QR Code 177
QR Twin Code 178
Character Encoding 179
QR ECI Output 180
URL QR 180
Micro QR Code 180
Restore Factory Defaults 180
Enable/Disable Micro QR 181
Set Length Range for Micro QR 182
Aztec 183
Restore Factory Defaults 183
Enable/Disable Aztec Code 183
Set Length Range for Aztec Code 184
Character Encoding 185
Aztec ECI Output 185
Data Matrix 186
Restore Factory Defaults 186
Enable/Disable Data Matrix 186
Set Length Range for Data Matrix 187
Data Matrix Twin Code 188
Rectangular Barcode 189
Character Encoding 189
Data Matrix ECI Output 190
Chapter 11 Data Formatter 191
Introduction 191
Add a Data Format 191
Programming with Barcodes 191

Programming with Serial Commands 194
Enable/Disable Data Formatter 195
Non-Match Error Beep 196
Data Format Selection 197
Change Data Format for a Single Scan 198
Clear Data Format 199
Query Data Formats 199
Formatter Command Type 6 200
Send Commands 200
Move Commands 203
Search Commands 205
Miscellaneous Commands 208
Chapter 12 Prefix & Suffix 214
Introduction 214
Global Settings 215
Enable/Disable All Prefixes/Suffixes 215
Prefix Sequence 215
Custom Prefix 216
Enable/Disable Custom Prefix 216
Set Custom Prefix 216
AIM ID Prefix 217
Code ID Prefix 218
Restore All Default Code IDs 218
Modify Code ID 219
Custom Suffix 224
Enable/Disable Custom Suffix 224
Set Custom Suffix 224
Data Packing 225
Introduction 225
Data Packing Options 225
Terminating Character Suffix 227
Enable/Disable Terminating Character Suffix 227
Set Terminating Character Suffix 227
Chapter 13 Programming Commands 229
Use of Programming Command 229
Command Syntax 229
Query Commands 229
Responses 230
Examples 230

Read Barcode On/Off 231
Make a Beeping Sound 231
Turn On Good Read LED 231
Turn On Illumination LED 232
Chapter 14 Batch Programming 233
Introduction 233
Create a Batch Command 234
Create a Batch Barcode 234
Use Batch Barcode 235
Appendix 236
Digit Barcodes 236
Save/Cancel Barcodes 239
Factory Defaults Table (ST.G01.1) 240
AIM ID Table(V2022.6) 247
Code ID Table(V1.00.0) 248
Symbology ID Number(V1.00.0) 249
ASCII Table 250
Keyboard Key References 254

Preface

Introduction

This manual provides installation, optics, electrical specifications as well as detailed instructions for setting up and using the NLS-N1-W engine (hereinafter referred to as “the N1-W” or “the engine”).

This guide provides programming instructions for the N1-W. Users can configure the N1-W by scanning the programming barcodes included in this manual.

The N1-W has been properly configured for most applications and can be put into use without further configuration. Users may check Appendix: Factory Defaults Table for reference.

Chapter Description

- ✧ *Chapter 1, Getting Started* : Gives a general description of the N1-W.
- ✧ *Chapter 2, Installation* : Describes how to install the engine, including installation information, connector, cable, ESD, and environmental considerations.
- ✧ *Chapter 3, Optics* : Provides parameters for optics and illumination.
- ✧ *Chapter 4 Electrical Specifications* : Includes the electrical characteristics for the engine and timing sequences.
- ✧ *Chapter 5 External Reference Circuit* : Provide external driver circuit diagrams.
- ✧ *Chapter 6, Auxiliary Tools* : Introduces useful tools you can use to set up the N1-W.
- ✧ *Chapter 7 Configuration* : Introduces the use of programming barcodes and product information query.
- ✧ *Chapter 8 Communication Interface* : Describes how to configure RS-232 and USB communication parameters.
- ✧ *Chapter 9, System Settings* : Describes how to configure general parameters of the N1-W.
- ✧ *Chapter 10, Symbologies* : Lists all compatible symbologies and describes how to configure the relevant parameters.
- ✧ *Chapter 11, Data Formatter* : Explains how to customize scanned data with the advanced data formatter.
- ✧ *Chapter 12, Prefix & Suffix* : Describes how to use prefix and suffix to customize scanned data.
- ✧ *Chapter 13 Programming Commands* : Introduces how to configure the N1-W by serial commands sent from the

host.

✧ *Chapter 14, Batch Programming* : Explains how to integrate a complex programming task into a single barcode.

✧ *Appendix* : Provides factory defaults table and a bunch of frequently used programming barcodes.

Explanation of Symbols

- This symbol indicates lists of required steps.

※ This symbol indicates notes of some parameters.

Explanation of Icons

	This icon indicates auxiliary tools that help users to refer to the manual at ease.
	This icon indicates this information requires extra attention from the reader.
	This icon indicates handy tips that can help you use or configure the engine with ease.
	This icon indicates practical examples that can help you to acquaint yourself with operations.

Chapter 1 Getting Started

Introduction

The N1-W OEM scan engines are armed with CMOS image capturer and the Newland patented UIMG®, a computerized image recognition system-on-chip, featuring fast scanning and accurate decoding on barcodes on virtually any medium - paper, magnetic card, mobile phones and LCD displays.

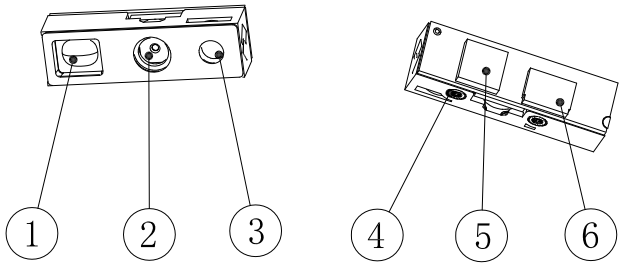
Note: This guide provides general instructions for the installation. Fujian Newland Auto-ID Tech. Co., Ltd. recommends an opto-mechanical engineer should conduct an opto-mechanical analysis before design.

Symbologies

The N1-W can easily read printed barcodes and on-screen barcodes, including:

1D	Code 128, EAN-8, EAN-13, UPC-E, UPC-A, Interleaved 2/5, ITF-14, ITF-6, Matrix 2/5, Code 39, Codabar, Code 93, UCC/EAN-128, GS1 Databar, Code 11, ISBN, ISSN, Industrial 2/5, Standard 2/5, Plessey, MSI-Plessey, AIM 128
2D	PDF 417, QR Code, Micro QR, Data Matrix, Aztec

N1-W Scan Engine



1. Illumination System
2. Lens
3. Aiming System
4. Mounting Hole
5. Label
6. External Interface

Figure 1-1

Chapter 2 Installation

Introduction

This chapter explains how to install the N1-W, including general requirements, housing design, and physical and optical information.

Caution: Do not touch the imaging lens when installing the engine. Be careful not to leave fingerprints on the lens.

Caution: Do not touch the illumination LED during handling. Improper handling may damage the LED.

Dimensions (unit: mm)

23.8(W)×7.5(D)×7.0(H) (max.)

Mounting

The illustrations below show the mechanical mounting dimensions (unit: mm) for the N1-W.

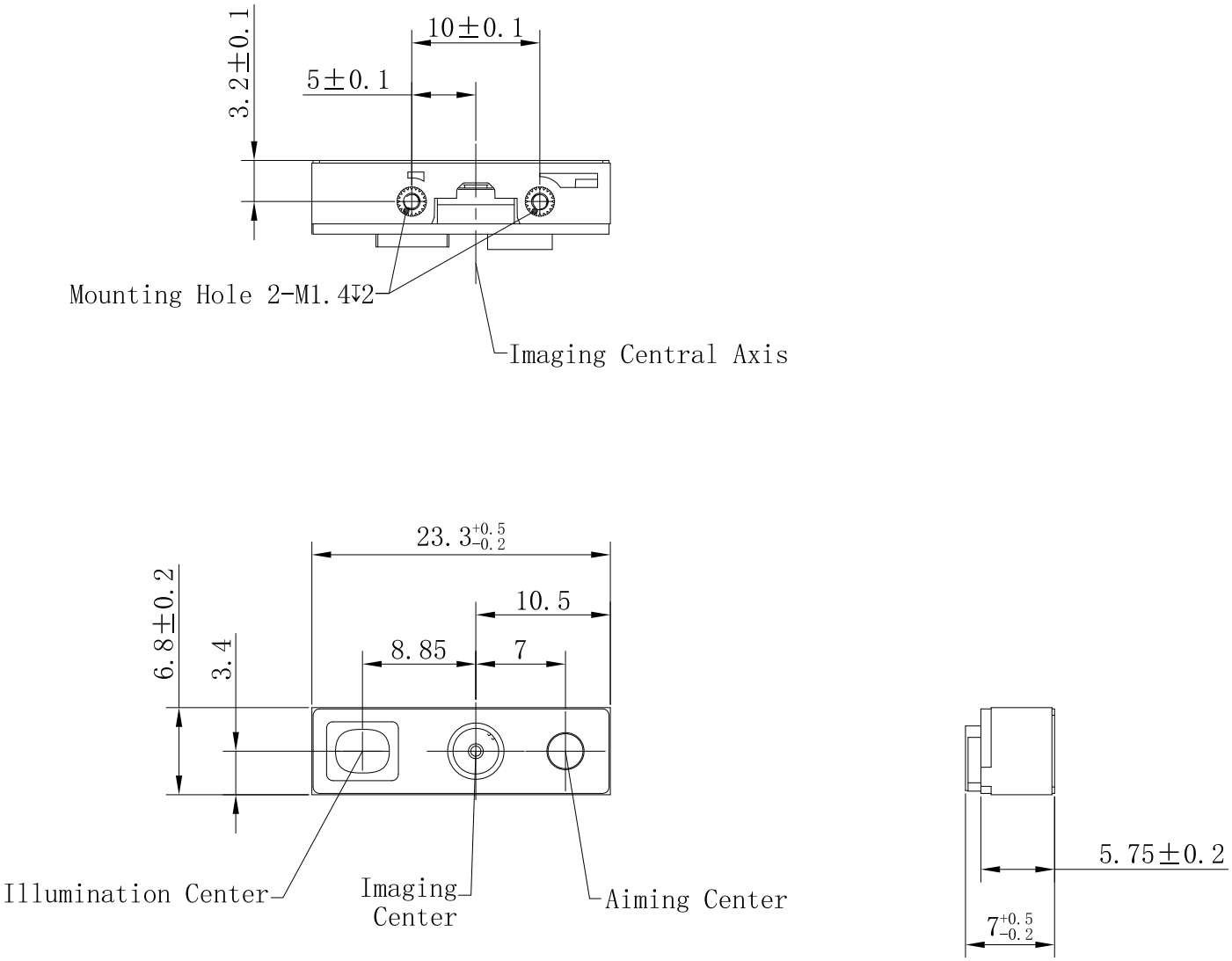


Figure 2-1

13-PIN FPC Connector

The physical interface of the N1-W consists of a 13-pin FPC connector:

- 13-pin FPC connector can be used as TTL-232 interface or USB interface.

The figure below illustrates the position of 13-pin FPC connector on the N1-W decoder board, as well as the pin 1 location.

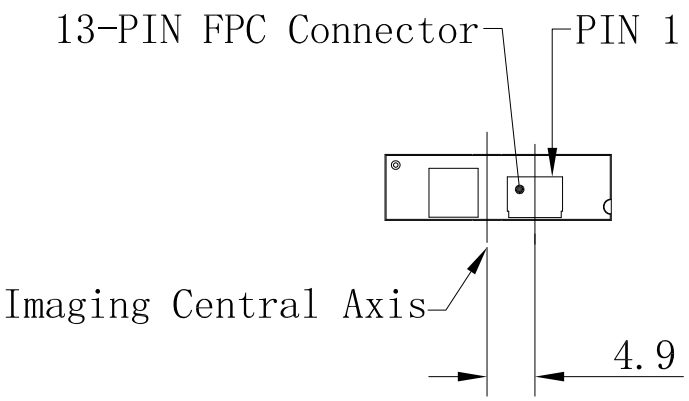


Figure 2-2

Connector Specifications

The N1-W is equipped with a 13-pin FPC connector. The connector is supplied by Hirose Electric Co.,Ltd. Model No.: FH35C-13S-0.3SHW(50). For more information about the connector, please visit the website at https://www.hirose.com/product/p/CL0580-2925-2-50.

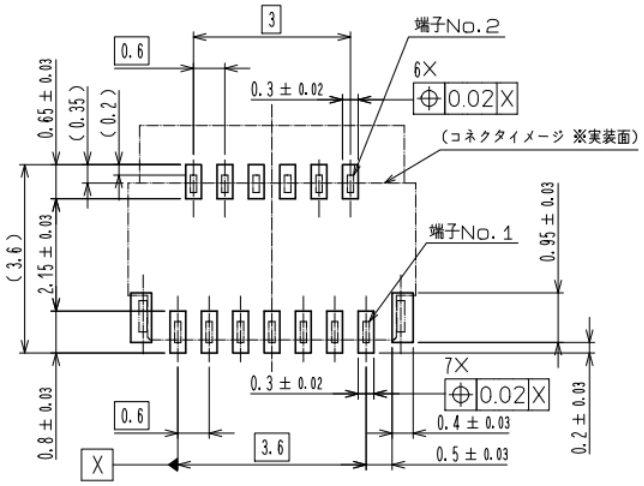


Figure 2-3

Warnings:

1. In order to improve the connecting stability,using the downward connection priority.
2. Do not close the connector before inserting the FPC cable.
3. Please avoid operating the connector more times.

FPC Cable

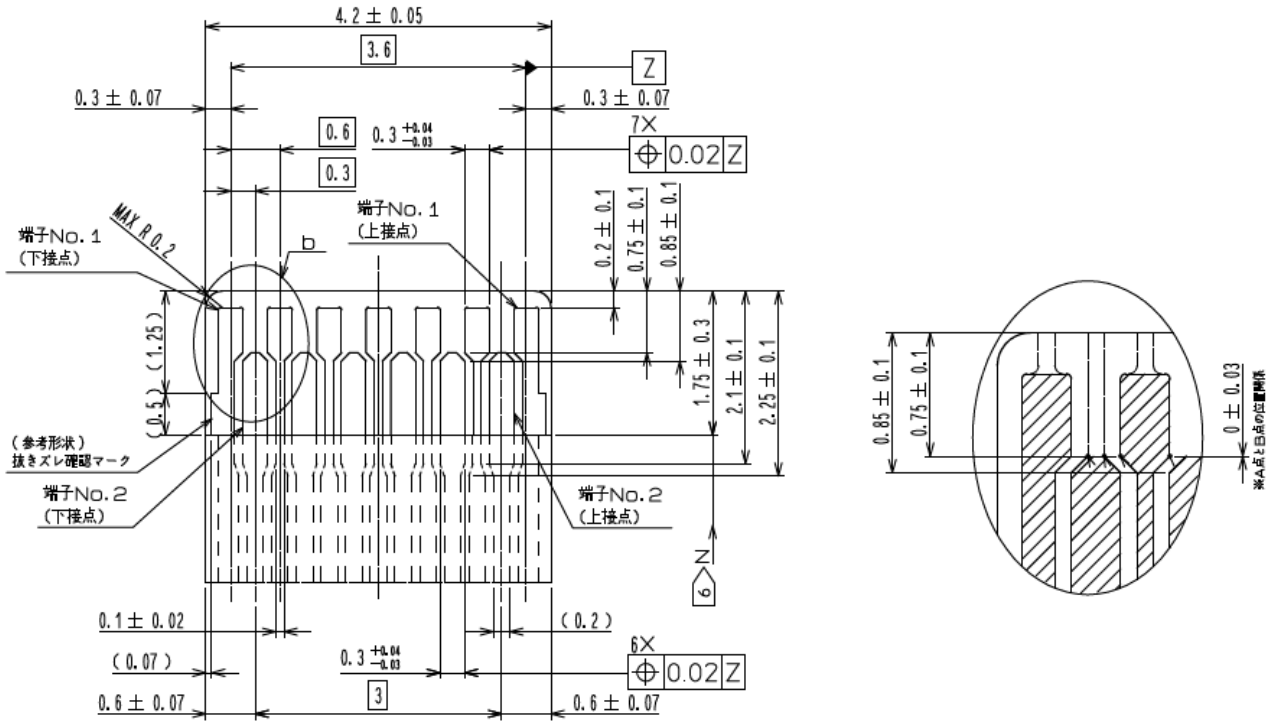


Figure 2-4

ESD

ESD protection has been taken into account when designing the N1-W. The engine is shipped in ESD safe packaging. Always exercise care when handling the engine outside its package. Be sure grounding wrist straps and properly grounded work areas are used.

Dust and Dirt

The N1-W must be sufficiently enclosed to prevent dust particles from gathering on the lens and circuit board. Dust and other external contaminants will eventually degrade the engine's performance.

Ambient Environment

The following environmental requirements should be met to ensure good performance of the N1-W.

Table 2-1

Operating Temperature	-20°C to 55°C
Storage Temperature	-40°C to 70°C
Humidity	5%~95% (non-condensing)

Thermal Considerations

Electronic components in the N1-W will generate heat during the course of their operation. Operating the N1-W in continuous mode for an extended period may cause temperatures to rise on CPU, LEDs, DC-DC, etc. Overheating can degrade image quality and affect scanning performance. Given that, the following precautions should be taken into consideration when integrating the N1-W.

- ✧ Reserve sufficient space for good air circulation in the design.
- ✧ Avoid wrapping the N1-W with thermal insulation materials such as rubber.

Maintenance

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

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

Chapter 3 Optics

Introduction

The N1-W contains:

- a CMOS image sensor and its lens
- a white LED based illumination system and a lens
- a red LED based aiming system and a lens

Sensor

Pixel: 640×480 CMOS

Frame rate: 60fps

Illumination

The N1-W has a white LED for supplementary lighting, making it possible to scan barcodes even in complete darkness. The illumination can be programmed On or Off. Customers can add the external illumination system if needed. The spectral range should be within the visible light.

Aimer

The N1-W contains a red LED aimer to help the user to easily position the target barcode within the engine's field of view to increase scan efficiency. The aimer is on during the decode session and off when the barcode is decoded. The aimer can also be used as a good read LED. And it will be off during the decode session and on after a good read. The aiming pattern can be turned On or Off. It is advisable to turn it on when scanning barcodes in regular circumstances. For applications in the background of different materials and colors or in the strong light or backlight environment, it is advised to turn on or off the aimer according to the actual conditions.

Note: when the engine comes closer to the barcodes, aiming center and imaging center may deviate.

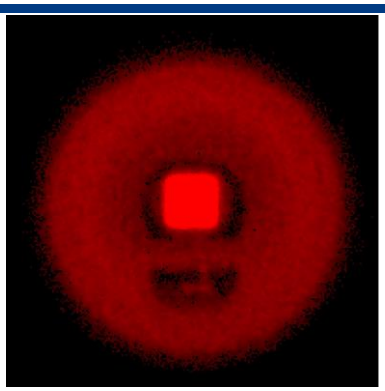


Figure 3-1

Window Placement

The window should be positioned properly to let the illumination and aiming beams pass through as much as possible and no reflections back into the engine (reflections can degrade the reading performance of the engine).

There are two window placement options.

Parallel window – Primary option for imager engines. The following window distance requirements should be satisfied: The maximum distance is measured from the front of the engine housing to the furthest surface of the window. In order to reach better reading performance, the distance from the front of the engine housing to the furthest surface of the window should not exceed a+b (a+b≤3mm), as shown in **Figure 3-2**.

Tilted window. For the tilted window distance requirements, please see **Table 3-1**.

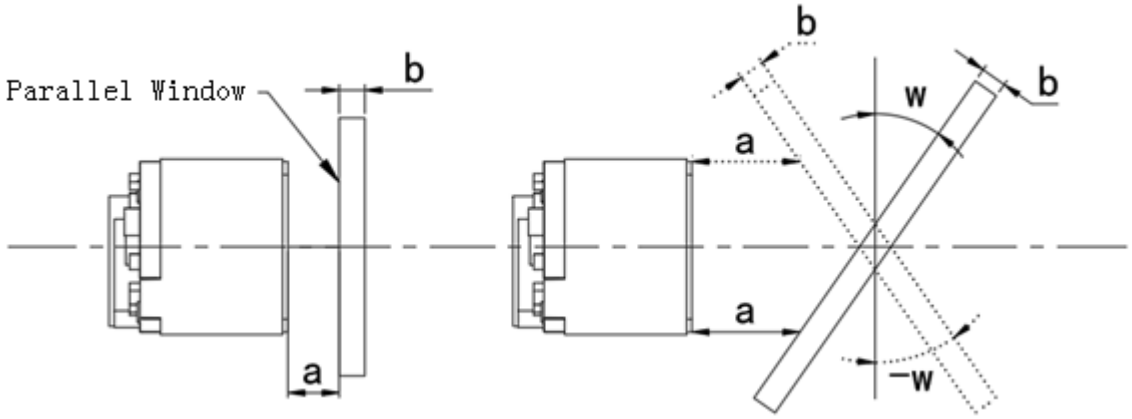


Figure 3-2

Table 3-1

Distance from the front of the engine housing (a)		Thickness of window (b)		
		b=1mm	b=2mm	b=3mm
Angle of tilted window (w)	a≤2mm	a≤2mm	a≤1mm	a=0mm
	a≤1mm	a≤1mm	a≤1mm	a=0mm
	a≤1mm	a≤1mm	a≤1mm	a=0mm
	a≤1mm	a≤1mm	a≤1mm	a=0mm
	a≤20mm	a≤20mm	a≤20mm	a≤20mm

Window Material and Color

Window material must be clear. PMMA and optical glass are recommended. Window material selected for the engine should meet or exceed the specifications specified in **Table 3-2**. When using a clear plastic window, it is recommended to apply anti-reflection (AR) coating on it.

Table 3-2

Specification	Description
Spectral Transmittance	≥92%
Light Wavelength	400-780nm

Coatings and Scratch Resistance

Scratch on the window can greatly reduce the performance of the N1-W. It is suggested to use abrasion resistant window material or coating.

The following introduces two commonly-used types of coatings:

• **Anti-reflection coatings:** Anti-reflection (AR) coatings can be applied to window surfaces to reduce reflected light from the window back into the engine. Multi-layer AR coatings on windows help to achieve less than 0.5% reflectance and covered wavelength is 400-780nm.

• **Scratch resistance coatings:** Scratch resistance coatings require a degree of greater than 5H in its hardness. Coatings can be applied to plastic surfaces to increase the surfaces' abrasion and scratch resistance.

Window Size

The window must not block the field of view and should be sized to accommodate the illumination and FOV envelopes shown below.

Front View:

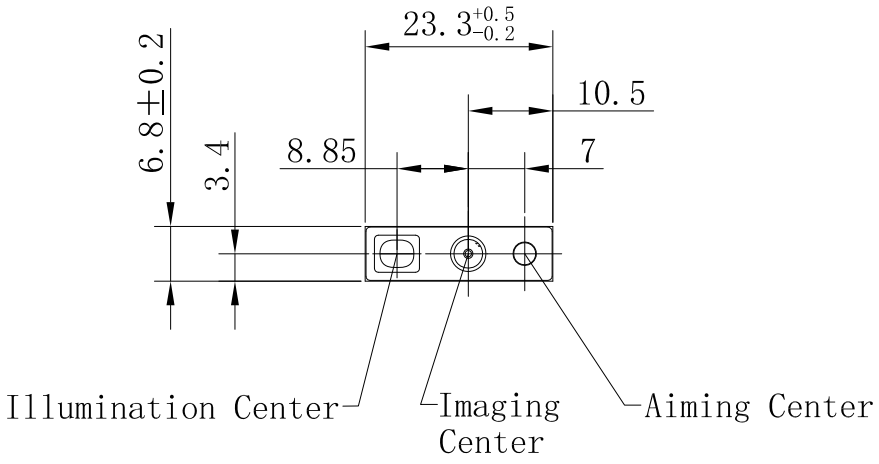


Figure 3-3

Horizontal:

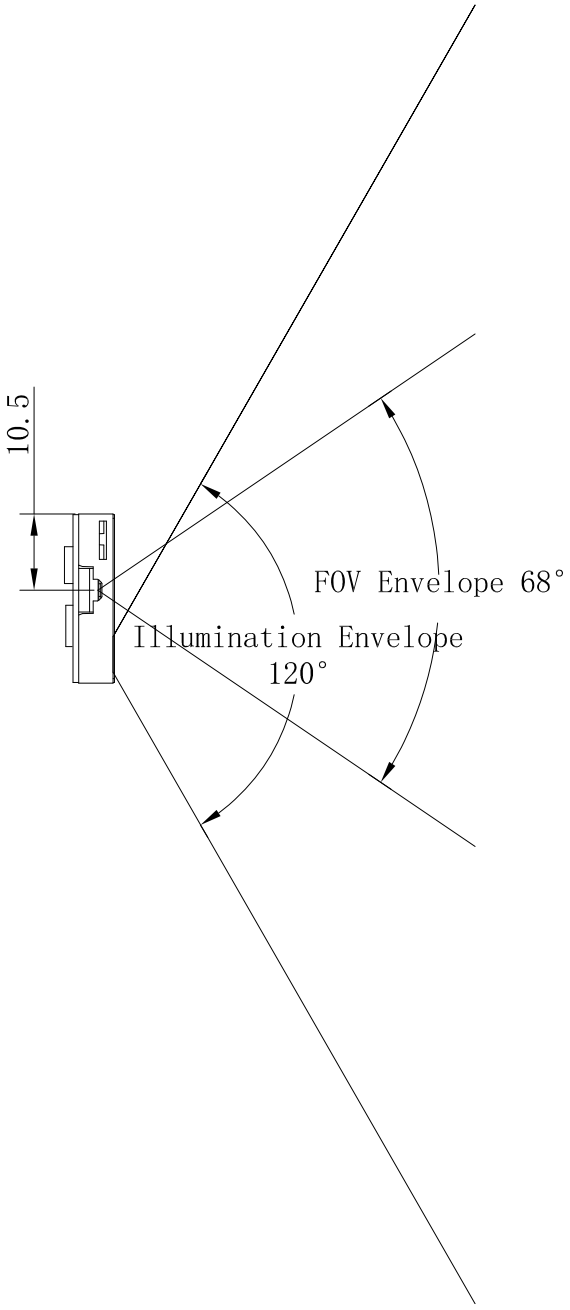


Figure 3-4

Vertical:

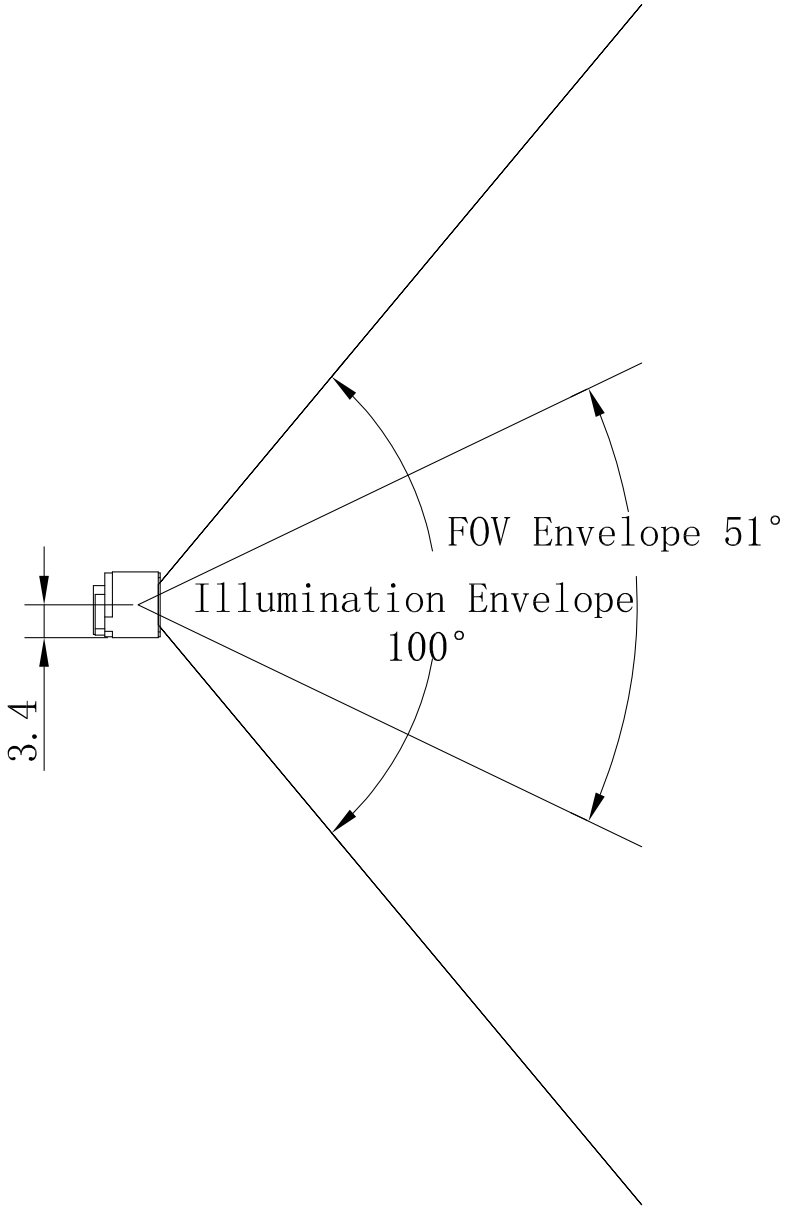


Figure 3-5

Ambient Light

The N1-W shows better performance with ambient light. However, high-frequency pulsed light can result in performance degradation.

Eye Safety

The N1-W uses LEDs to produce illumination beam. The LEDs are bright, but testing has been done to demonstrate that the engine is safe for its intended application under normal usage conditions. The N1-W complies with IEC 62471:2006 for LED safety. However, the user should avoid looking into the beam.

Depth of Field

The tables below list the depth of view tested in the 0lx and 300lx natural light.

Table 3-3

Ambient light: 0lux natural light

Symbology	Near	Far
PDF417 (6.7mil)	25mm	45mm
Code39 (5mil)	25mm	50mm
Data Matrix (10mil)	25mm	45mm
QR Code (15mil)	20mm	60mm

Table 3-4

Ambient light: 300lux natural light

Symbology	Near	Far
PDF417 (6.7mil)	25mm	45mm
Code39 (5mil)	25mm	50mm
Data Matrix (10mil)	25mm	45mm
QR Code (15mil)	20mm	60mm

Chapter 4 Electrical Specifications

Power Supply

Do not power up the N1-W until it is properly connected. Be sure the power is cut off before connecting a cable to or disconnecting a cable from the host interface connector. Hot-plugging could damage the engine.

Unstable power supply or sharp voltage drops or unreasonably short interval between power-ons may lead to unstable performance of the engine. Do not resupply the power immediately after cutting it off.

1. When designing, the user should ensure that the input power of N1-W is fully decoupled. It is recommended to place a 22uF and a 100nF X5R or X7R ceramic capacitor beside the power input pin on the connector which is soldered on the board.

2. Ensure that the input power drops below 0.5V before powering the N1-W on again, otherwise it will lead to abnormal function.

Ripple Noise

To ensure the image quality, a power supply with low ripple noise is needed.

Acceptable ripple range (peak-to-peak)≤100mV

Interface Pinouts

The following table lists the pin functions of the 13-PIN FPC Connector.

Table 4-1

PIN#	Signal	I/O	Function	Note
1	GND	-	Power-supply ground	
2	EXT_TRIG#	I	Trigger signal input	100k Pull-up See Note 1
3	EXT_RST#	I	Reset signal input	See Note 1
4	EXT_DSF	O	Good Read LED output	100k Pull-down See Note 3
5	EXT_BUZ	O	Beeper output	100k Pull-down See Note 4
6	EXT_LIGHT	O	External illumination control signal	See Note 5
7	USB_D+	-	USB_D+ signal	
8	USB_D-	-	USB_D- signal	
9	TTL232_TX	O	TTL level 232 transmit data	
10	TTL232_RX	I	TTL level 232 receive data	
11	GND	-	Power-supply ground	
12	VCC	-	3.3V power input	
13	VCC	-	3.3V power input	

※ I = Input; O = Output; od = Open Drain;

※ 1 The EXT_TRIG# signal is not directly from the MCU pin, so high and low levels are different from other input and output interfaces. When designing the external control module, please refer to I/O Voltage in Table 4-4.

This external trigger signal can be either level trigger or pulse trigger.

Level trigger: A trigger pull activates a decode session. The decode session continues until a barcode is decoded or the trigger is released.

Pulse trigger: When the trigger is pulled and released (pulse width : 50ms), scanning is activated until a barcode is decoded or the decode session timeout expires. The duration can be programmed. To learn how to program the parameter, please see the N1-W user guide.

For the external trigger circuit, please see the “Trigger Circuit” section in Chapter 5.

※ 2 Keep level low above 10ms to reset the engine. If this pin is not used, leave it unconnected.

※ 3 This output signal can be used by an external LED to indicate good read status.

The EXT_DSF pin produces a high output (default duration: 20ms, user-programmable) when a good read occurs. The Good Read LED can be programmed On or Off. To learn how to program these parameters, please see the N1-W user guide.

For the external LED circuit design, please see the “Good Read LED Circuit” section in Chapter 5. If the EXT_DSF pin is not used, leave it unconnected.

※ 4 This output signal can be used by an external beeper circuit to generate audible feedback to the user to indicate power-on and good read statuses.

Power On beep: The EXT_BUZ pin produces a PWM output (duration: 400ms; frequency: 2090Hz, 2630Hz, 3130Hz and 4260Hz.) 215ms after power-on. The beep can be programmed On or Off. To learn how to program the parameter, please see the N1-W user guide.

Good Read beep: The EXT_BUZ pin produces a PWM output (default duration: 80ms; default frequency: 2710Hz) when a good read occurs. The beep can be programmed On or Off. To learn how to program these parameters, please see the N1-W user guide.

For the external beeper circuit design, please see the “Beeper Circuit” section in Chapter 5. If the EXT_BUZ pin is not used, leave it unconnected.

※ 5 Pin 6 is the external illumination control signal. For the external illumination control circuit design, please see the “External Illumination Control Circuit” section in Chapter 5. If the external illumination control signal pin is not used, leave it unconnected.

DC Characteristics

Operating Voltage

Table 4-2

T=25°C

Parameter	Description	Minimum	Typical	Maximum	Unit
VCC	Input Voltage ±5% (3.3V)	3.14	3.3	3.47	V

Operating Current

Table 4-3

T=25°C

Mode		State	Typical	Maximum	Unit
Working Current	RMS [1]	VCC=3.3V	68	150	mA
	PEAK [2]		-	440	mA
Idle Current	RMS [1]		11.8	-	mA
Sleep Current	RMS [1]		-	0.3	mA

1. RMS indicates the RMS value of the current under the stable working state.

2. PEAK indicates the peak current the device reaches.

I/O Voltage

Table 4-4

VCC=3.3 V, GND =0 V, T=25°C

Parameter	Description	Condition	Minimum	Maximum	Unit
VIL	input low level	-	-	0.8	V
VIH	input high level	-	2	-	V
VOL	output low level	Iol= 4mA~16mA	-	0.4	V
VOH	output high level	Ioh= 4mA~16mA	2.4	-	V

Timing Sequence

Power Up Timing Sequence

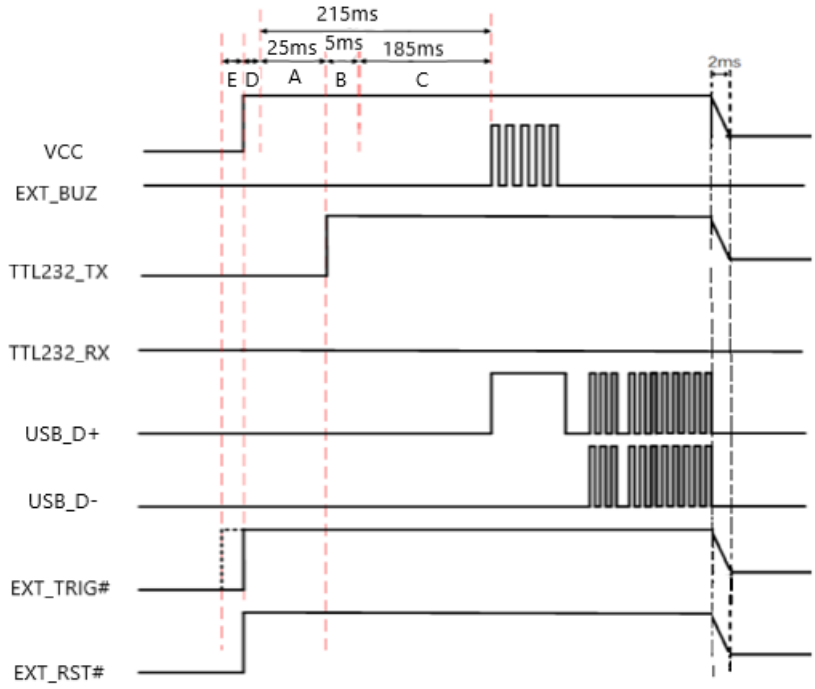


Figure 4-1

1. In the diagram above, it takes **A+B+C** (about 215ms) for the engine to power up: **A** is bootloader execution time (25ms), **B** is kernel boot time (5ms) and **C** is decoding chip initialization time(185ms).
2. D is reset time (300us). If the EXT_RST# signal is not operated when powered on, the startup time should be calculated after VCC_3V3 reaches 3.3V.
3. Ensure that all communication interface data has been transmitted before powering off.
4. The N1-W has a 100k pull-up on the EXT_TRIG# signal. During the period between power-on and bootloader execution, the user should not lower the EXT_TRIG# signal. If EXT_TRIG# signal is set high before power-on, it should meet the duration of E (E=0~1ms) as shown in Figure 4-1. Levels of other signals are kept low during power-on to prevent abnormal function.
5. To ensure that the engine works at a stable level, the minimum interval between removing and resupplying the power must exceed 2s.

Chapter 5 External Reference Circuit

External Circuit Design

Good Read LED Circuit

The circuit below is used to drive an external LED for indicating good read. The EXT_DSF signal is from PIN 4 of the 13-pin FPC connector.

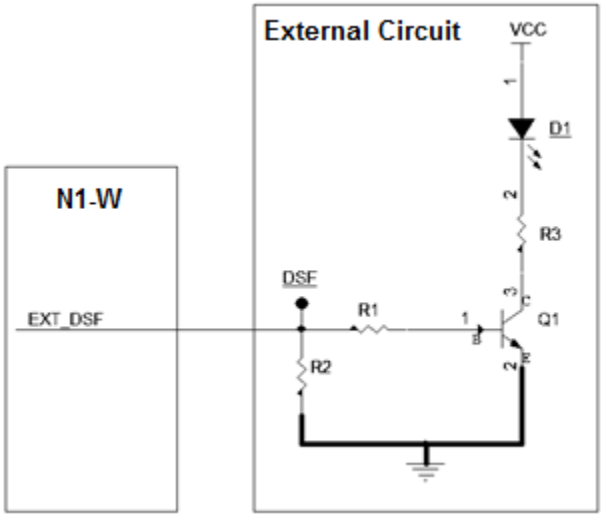


Figure 5-1

Beeper Circuit

The circuit below is used to drive an external beeper. The EXT_BUZ signal is from PIN 5 of the 13-pin FPC connector.

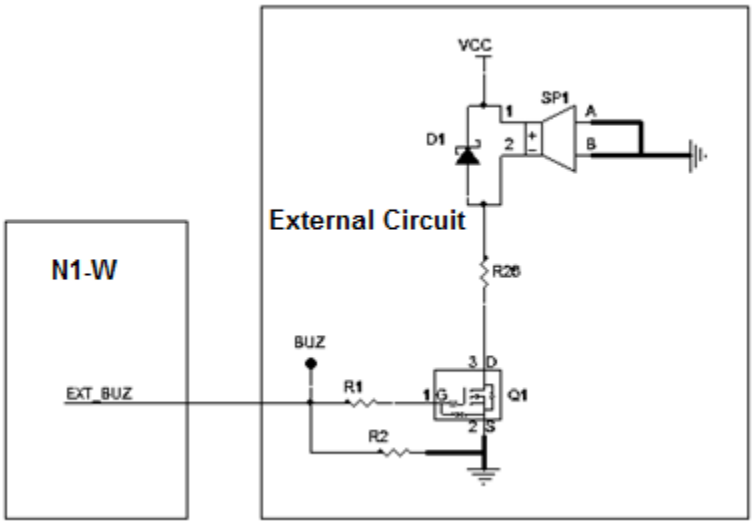


Figure 5-2

Trigger Circuit

The circuit below is used to provide the engine with a signal to trigger a scan and decode session. The EXT_TRIG# signal is from PIN 2 of the 13-pin FPC connector.

The host can adjust the external circuit and its functions based on actual applications. R1 is recommended as 10K-100K and R2 as 33Ω. C1 is used to eliminate the vibration of mechanical keys. Generally, 1nF-10nF ceramic capacitors are recommended. When ESD protection is required, ESD protector can be added to the external circuit like ED1 shown as below.

When using the external IO port as a trigger output, note that high and low levels must meet the requirements provided in Table 4-4. It is recommended to use the default floating or default pull-up IO port as the trigger pin. If you can only use the default pull-down IO port as the trigger pin, refer to the power-on timing sequence in Figure 4-1. When not triggered, ensure that the pin meets the high level requirements inTable 4-4.

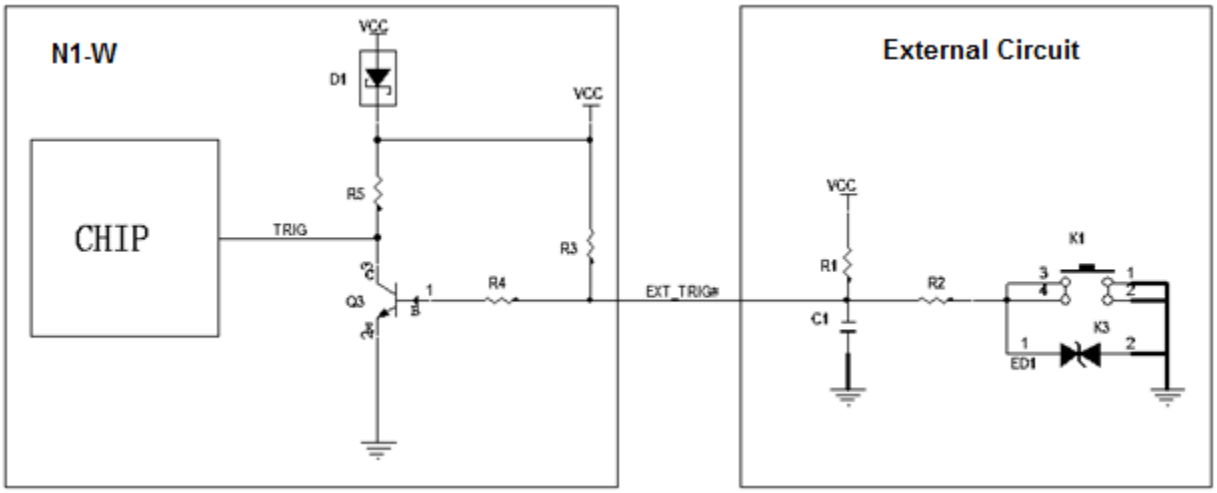

N1-W
VCC
D1
VCC
CHIP
R5
TRIG
R3
Q3
R4
EXT_TRIG#
External Circuit
VCC
R1
R2
K1
C1
K3
ED1

Figure 5-3

External Lgiht Control Circuit

Pin 6 (EXT_LIGHT) on the13-pin FPC connector is the external illumination control signal. I/O is in the Floating state before initialization. When the external illumination is not enabled, I/O is configured as the input pin. When enabled, I/O is the output pin in working mode and input pin in the sleep mode. For external illumination, please refer to the user guide for software configuration. The duration from the EXT_LIGHT signal output to the external illumination should not exceed 100us.

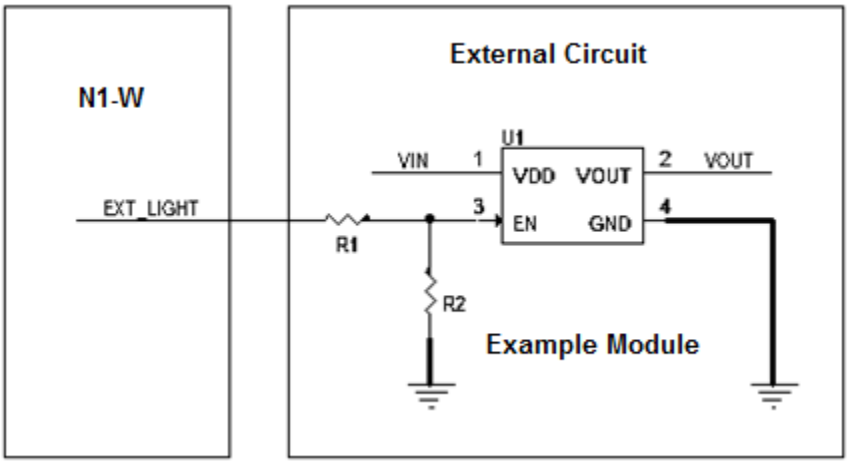


Figure 5-4

Reset Circuit

The circuit below is used to provide a signal to reset the engine. The EXT_RST# signal is from PIN 3 of the 13-pin FPC connector.

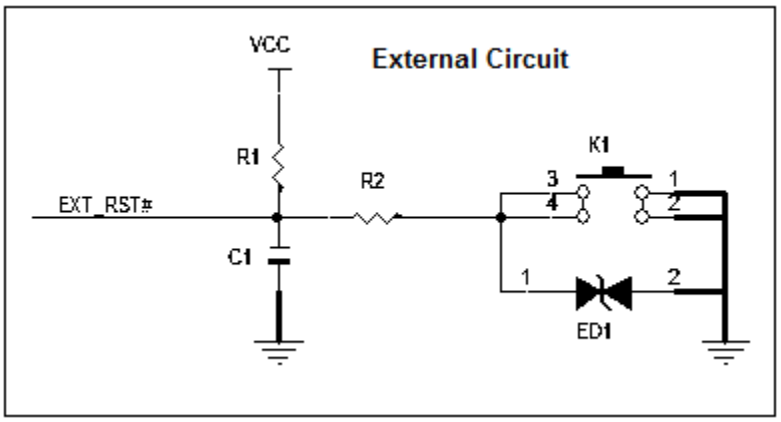


Figure 5-5

Chapter 6 Auxiliary Tools

EVK

The EVK is provided to help users to test and evaluate the N1-W, which contains beeper & beeper driver circuit, LED & LED driver circuit, and trigger, TTL-232 to RS-232 converter, RS-232 & USB interfaces, reserved signal debugging interface, etc. The N1-W can be connected to the EVK via a 13-pin FPC cable to 12-PIN FPC cable.

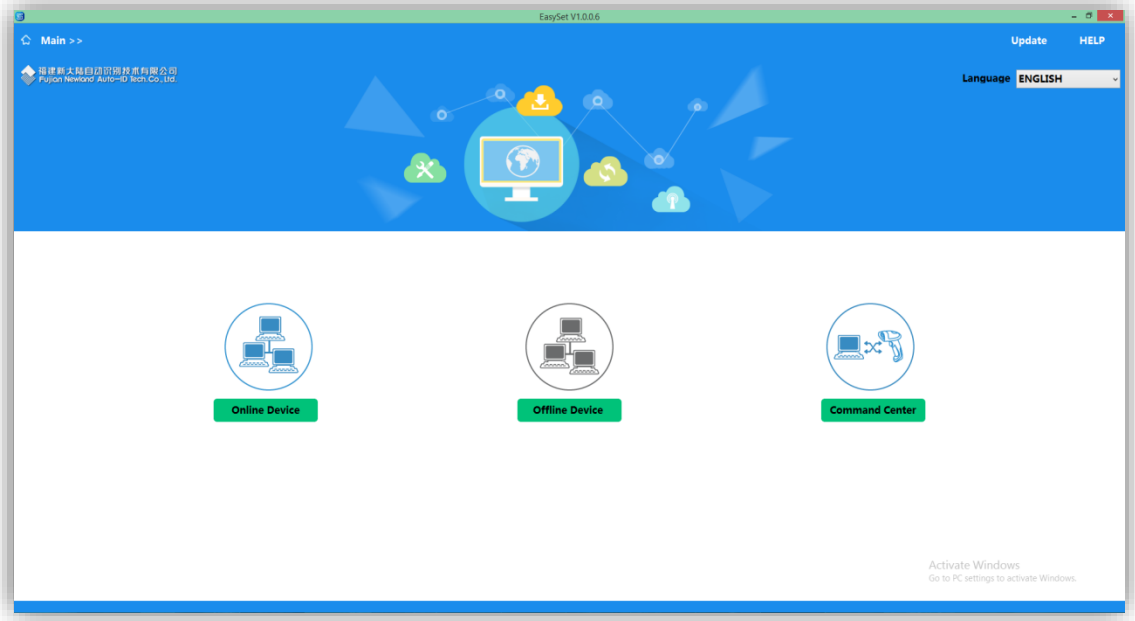
EasySet

EasySet, developed by Fujian Newland Auto-ID Tech. Co., Ltd., is a configuration tool for Newland's 1D/2D handheld barcode scanner, fixed mount barcode scanners and OEM scan engines. Its main features include:

- ✧ View device & configuration information of online device
- ✧ Configure device
- ✧ Update firmware of online device
- ✧ Load/modify existing XML configuration file; save current settings to an XML file
- ✧ Create/print/save programming barcodes to a PDF or Word file
- ✧ View/edit/save image stored on online device in the original image/BMP/JPG/TIFF format
- ✧ Send serial commands to online device and receive device response
- ✧ Supported languages: Chinese and English

EasySet supports 32-bit/64-bit Microsoft WinXP/Win7/Win 8/Win 8.1/Win 10 operating systems.

EasySet can communicate with device via one of the following interface: TTL-232, USB COM Port Emulation (UFCOM driver required), USB CDC (UFCOM driver required), USB DataPipe (UFCOM driver required), USB HID-POS.



UFCOM

UFCOM, developed by Fujian Newland Auto-ID Tech. Co., Ltd., is a virtual serial driver. It is used in conjunction with a USB engine or a scan engine configured as virtual serial port to provide two-way communication between the device and the host. UFCOM can run on all versions of Windows XP ~ Windows 10 x86 & x64, including the contemporary versions of Windows Server. Users can download the driver from the website at: http://down.nlscan.com:82/Release/UFCOM/.

Enter Setup

Chapter 7 Configuration

Introduction

There are three ways to configure the N1-W: Barcode programming, command programming and Easyset programming.

Barcode Programming

The N1-W can be configured by scanning programming barcodes. All user programmable features/options are described along with their programming barcodes/commands in the following sections.

This programming method is most straightforward. However, it requires manually scanning barcodes. As a result, errors are more likely to occur.

Command Programming

The N1-W can also be configured by serial commands sent from the host device.

Users can design an application program to send those command strings to the engines to perform device configuration.

EasySet Programming

Besides the two methods mentioned above, you can conveniently perform engine configuration through EasySet too. EasySet is a Windows-based configuration tool particularly designed for Newland products, enabling users to gain access to decoded data and captured images and to configure engines. For more information about this tool, refer to the *EasySet User Guide*.

**** Exit Setup**

@SETUPE1

Enter Setup

Programming Barcode/ Programming Command/Function

The figure above is an example that shows you the programming barcode and command for the Enter Setup function:

1. The **No Case Conversion** barcode.
2. The **No Case Conversion** command.
3. The description of feature/option.

@SETUPE0

**** Exit Setup**

Enter Setup

Use of Programming Barcodes

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 or a non-programing barcode, or reboot the engine.

Exit Setup

Enter Setup

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

Do Not Transmit Programming Barcode Data

Transmit Programming Barcode Data

**** Exit Setup**

@SETUPE1

Enter Setup

Default Settings

Factory Defaults

Scanning the following barcode can restore the engine to the factory defaults.

You may need to reset all parameters to the factory defaults when:

- ✧ engine is not properly configured so that it fails to decode barcodes.
- ✧ you forget previous configuration and want to avoid its impact.

@FACDEF

Restore All Factory Defaults

Custom Defaults

Scanning the **Restore All Custom Defaults** barcode can reset all parameters to the custom defaults. Scanning the **Save as Custom Defaults** barcode can set the current settings as custom defaults.

Custom defaults are stored in the non-volatile memory.

@CUSSAV

Save as Custom Defaults

@CUSDEF

Restore All Custom Defaults

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

@SETUPE0

**** Exit Setup**

@SETUPE1

Enter Setup

Query Product Information

After scanning the barcode below, the product information (including product name, firmware version, decoder version, hardware version, serial number, OEM serial number and manufacturing date) will be sent to the host device.

@QRYSYS

Query Product Information

Query Product Name

@QRYPDN

Query Product Name

Query Firmware Version

@QRYFWV

Query Firmware Version

@SETUPE0

**** Exit Setup**

@SETUPE1

Enter Setup

Query Hardware Version

Query Hardware Version

Query Product Serial Number

Query Product Serial Number

@SETUPE1

Enter Setup

Query Manufacturing Date

@QRYDAT

Query Manufacturing Date

Query OEM Serial Number

@QRYESN

Query OEM Serial Number

Query Data Formatter Version

@QRYDFM

Query Data Formatter Version

@SETUPE0

**** Exit Setup**


@SETUPE1

Enter Setup

Chapter 8 Communication Interface

Introduction

- ✧ Serial communication interface is usually used when connecting the engine to a host device (like PC, POS). You need to set communication parameters to match the host device.
- ✧ USB HID Keyboard: The engine's transmission is simulated as USB keyboard input with no need for command configuration or a driver. Barcode data could be entered by the virtual keyboard directly and it is also convenient for the host device to receive data.
- ✧ USB CDC: It is compliant with the standard USB CDC class specifications defined by the USB-IF and allows the host device to receive data in the way as a serial port does. A driver is needed when using this feature.
- ✧ HID POS (POS HID Barcode Scanner): It is based on the HID interface, with no need for a custom driver. It excels virtual keyboard and traditional TTL-232 interface in transmission speed.
- ✧ IBM SurePOS: It conforms to IBM (now Toshiba Global Commerce Solutions) 4698 USB engine interface specifications.

When the engine is connected to both USB and RS-232 ports on a host device, it will select the USB connection by default.


@SETUPE0

**** Exit Setup**

Adaptive Wired Communication

When this feature is on, the engine can automatically adapt its communication configuration to the way it is connected to the host device: Automatically enable USB/serial communication when connected to the host device via USB/serial port, respectively.

Note: You must restart the engine before this setting will take effect.

Off

On

@SETUPE1

Enter Setup

RS-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.

RS-232

@SETUPE0

**** 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.

115200

57600

38400

19200

14400

9600

4800

Enter Setup

2400

1200

Parity Check

Set the parity type to match the host requirements.

Odd Parity: If the data contains an odd number of 1 bits, the parity bit value is set to 0.

Even Parity: If the data contains an even number of 1 bits, the parity bit value is set to 0.

None: Select this option when no parity bit is required.

None

Even Parity

Odd Parity

**** Exit Setup**

Data Bit

Set the number of data bits to match the host requirements.

@232DAT1

7 Data Bits

@232DAT0

8 Data Bits

Stop Bit

The stop bit(s) at the end of each transmitted character marks the end of transmission of one character and prepares the receiving device for the next character in the serial data stream. Set the number of stop bits to match the host requirements.

@232STP0

1 Stop Bit

@232STP1

2 Stop Bits

@SETUPE1

Enter Setup

USB HID Keyboard

When the engine is connected to the USB port on a host device, you can enable the USB HID Keyboard feature by scanning the barcode below. Then engine's transmission will be simulated as USB keyboard input. The Host receives keystrokes onthe virtual keyboard. It works on a Plug and Play basis and no driver is required.

@INTERF3

USB HID Keyboard

If the host device allows keyboard input, then no extra software is needed for HID Keyboard input.

USB Country Keyboard Types

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

U.S. (English)

Belgium

Brazil

Canada (French)

Czechoslovakia

Denmark

Finland (Swedish)

@SETUPE1

Enter Setup

@KBWCTY7

France

@KBWCTY8

Germany/ Austria

@KBWCTY9

Greece

@KBWCTY10

Hungary

@KBWCTY11

Israel (Hebrew)

@KBWCTY12

Italy

@KBWCTY13

Latin America/ South America

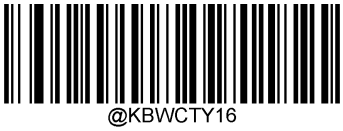
@KBWCTY14

Netherlands (Dutch)

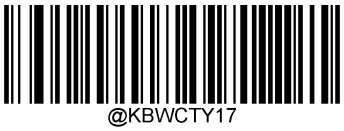
@SETUPE0

**** Exit Setup**

Norway

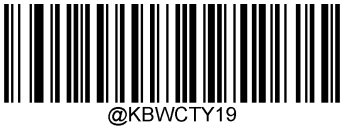


Poland



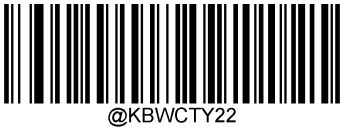
Portugal

Romania

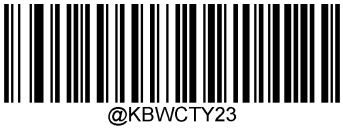


Russia

Slovakia



Spain

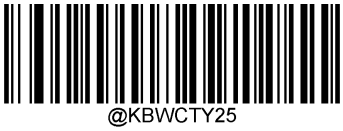


Sweden

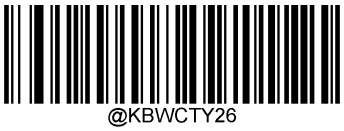
@SETUPE1

Enter Setup

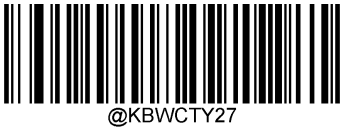
Switzerland (German)



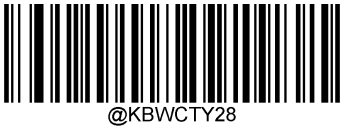
Turkey_F



Turkey_Q



UK



Japan

@SETUPE0

**** 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 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.

Do Not Beep on Unknown Character

Beep on Unknown Character

Supposing French keyboard (Country Code: 7) is selected and barcode data ”AĐF” is being dealted with, the keyboard will fail to locate the “Đ” (0xD0) character and the engine will ignore the character and continue to process the next one.

Do Not Beep on Unknown Character: The engine does not beep and the Host receives “AF”.

Beep on Unknown Character: The engine beeps and the Host still receives “AF”.

If **Emulate ALT+Keypad ON** is selected, **Beep on Unknown Character** does not function.

@SETUPE1

Enter Setup

Emulate ALT+Keypad

When **Emulate ALT+Keypad** is turned on, ASCII characters (0x20 - 0xFF) are sent over the numeric keypad no matter which keyboard type is selected.

1. ALT Make
2. Enter the number corresponding to a desired character on the keypad.
3. ALT Break

After **Emulate ALT+Keypad ON** is selected, you need to choose the code page with which the barcodes were created and to turn **Unicode Encoding** On or Off depending on the encoding used by the application software.

@KBWALT0

Emulate ALT+Keypad OFF

@KBWALT1

Emulate ALT+Keypad ON

Since sending a character involves multiple keystroke emulations, this method appears less efficient.

Supposing **Emulate ALT+Keypad** is ON, **Unicode Encoding** is Off, **Code Page 1252 (West European Latin)** is selected, and **Emulate Keypad with Leading Zero** is Off, barcode data ”AÐF” (65/208/70) is sent as below:

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

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

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

@SETUPE0

**** Exit Setup**

Code Page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the barcode being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, select the code page with which the barcodes were created by scanning the appropriate barcode below. For PDF417, QR Code and Data Matrix, besides setting the code page, you also need to set the character encoding in the “Character Encoding” section in Chapter 6. This feature is only effective when **Emulate ALT+Keypad** is turned on.

Note: Code Page 932, Code Page 936 and Code Page 950 are selectable and respectively supported by different software versions.

Code Page 1252 (West European Latin)

Code Page 1251 (Cyrillic)

Code Page 1250 (Central and East European Latin)

Code Page 1253 (Greek)

Code Page 1254 (Turkish)

Code Page 1255 (Hebrew)

@SETUPE1

Enter Setup

@KBWCPG6

Code Page 1256 (Arabic)

@KBWCPG7

Code Page 1257 (Baltic)

@KBWCPG8

Code Page 1258 (Vietnamese)

@KBWCPG9

Code Page 936 (Simplified Chinese, GB2312,GBK）

@KBWCPG10

Code Page 950 (Traditional Chinese, Big5)

@KBWCPG11

Code Page 874 (Thai)

@KBWCPG12

Code Page 932 (Japanese, Shift-JIS)

@SETUPE0

**** Exit Setup**

Unicode Encoding

Different host program may use different character encodings for handling incoming barcode data. For instance, Microsoft Office Word uses Unicode encoding and therefore you should turn **Unicode Encoding** on, whereas Microsoft Office Excel or Notepad uses Code Page encoding and therefore you should turn **Unicode Encoding** off. This feature is only effective when **Emulate ALT+Keypad** is turned on.

Off

On

Emulate Keypad with Leading Zero

You may turn this feature on to send character sequences sent over the numeric keypad as ISO characters which have a leading zero. For example, ASCII A transmits as “ALT MAKE” 0065 “ALT BREAK”. This feature is only effective when **Emulate ALT+Keypad** is enabled.

On

Off

@SETUPE1

Enter Setup

Function Key Mapping

When **Ctrl+ASCII Mode** is selected, function characters (0x00 - 0x1F) are sent as ASCII sequences.

@KBWFKM0

Disable

@KBWFKM1

Ctrl+ASCII Mode

@KBWFKM2

Alt+Keypad Mode

If **Ctrl+ASCII Mode** is selected and other parameters of USB HID Keyboard adopt factory defaults, barcode data “A<HT>(i.e. Horizontal Tab)F” (0x41/0x09/0x46) is sent as below:

“A” - Keystroke “A”.

<HT> - “Ctrl Make” + Keystroke “I” + “Ctrl Break”

“F” - Keystroke “F”

For some text editors, “Ctrl I” means italic convert. So the output may be “A*F*”.

If **Alt+Keypad Mode** is selected and other parameters of USB HID Keyboard adopt factory defaults, the data above is sent as below:

“A” - Keystroke “A”.

<HT> - “Alt Make” + Keystrokes “009” + “Alt Break”

“F” - Keystroke “F”

@SETUPE0

**** Exit Setup**

ASCII Function Key Mapping Table

ASCII Function	ASCII Value (HEX)	Function Key Mapping Disabled	Ctrl+ASCII
NUL	00	Null	Ctrl+@
SOH	01	Keypad Enter	Ctrl+A
STX	02	Caps Lock	Ctrl+B
ETX	03	ALT	Ctrl+C
EOT	04	Null	Ctrl+D
ENQ	05	CTRL	Ctrl+E
ACK	06	Null	Ctrl+F
BEL	07	Enter	Ctrl+G
BS	08	Left Arrow	Ctrl+H
HT	09	Horizontal Tab	Ctrl+I
LF	0A	Down Arrow	Ctrl+J
VT	0B	Vertical Tab	Ctrl+K
FF	0C	Delete	Ctrl+L
CR	0D	Enter	Ctrl+M
SO	0E	Insert	Ctrl+N
SI	0F	Esc	Ctrl+O
DLE	10	F11	Ctrl+P
DC1	11	Home	Ctrl+Q
DC2	12	Print Screen	Ctrl+R
DC3	13	Backspace	Ctrl+S
DC4	14	tab+shift	Ctrl+T
NAK	15	F12	Ctrl+U
SYN	16	F1	Ctrl+V
ETB	17	F2	Ctrl+W
CAN	18	F3	Ctrl+X
EM	19	F4	Ctrl+Y
SUB	1A	F5	Ctrl+Z
ESC	1B	F6	Ctrl+[
FS	1C	F7	Ctrl+\
GS	1D	F8	Ctrl+]
RS	1E	F9	Ctrl+6
US	1F	F10	Ctrl+-

Enter Setup

ASCII Function Key Mapping Table (Continued)

The last five characters (0x1B~0x1F) in the table above apply to US keyboard layout only. The following chart provides the equivalents of these five characters for other countries.

Country	Ctrl+ASCII					
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+-	

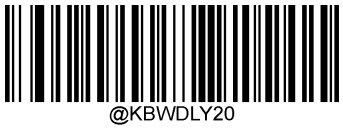
**** Exit Setup**

Inter-Keystroke Delay

This parameter specifies the delay between emulated keystrokes.

No Delay

Long Delay (40ms)



Short Delay (20ms)

@SETUPE1

Enter Setup

Caps Lock

The **Caps Lock On** options can invert upper and lower case characters contained in barcode data. This inversion occurs regardless of the state of Caps Lock key on the host device's keyboard. To disable this feature, scan the appropriate **Caps Lock OFF** barcode below based on your keyboard.

@KBWCAP0

Caps Lock OFF, Non-Japanese Keyboard

@KBWCAP1

Caps Lock ON, Non-Japanese Keyboard

@KBWCAP2

Caps Lock OFF, Japanese Keyboard

@KBWCAP3

Caps Lock ON, Japanese Keyboard

Emulate ALT+Keypad ON/ Convert All to Upper Case/ Convert All to Lower Case prevails over **Caps Lock ON**.

When the **Caps Lock ON** feature is selected, barcode data "AbC" is transmitted as "aBc".

@SETUPE0

**** Exit Setup**

Convert Case

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

No Case Conversion

Convert All to Upper Case

Convert All to Lower Case

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

If **Emulate ALT+Keypad ON** is selected, **Convert All to Lower Case** and **Convert All to Upper Case** do not function.

@SETUPE1

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. The state of Num Lock on the simulated numeric keypad is determined by its equivalent on the host device. If Num Lock on the host device is turned off, the output of simulated numeric keypad is function key instead of number.

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.

@KBWNUM0

Do Not Emulate Numeric Keypad 1

@KBWNUM1

Emulate Numeric Keypad 1

@SETUPE0

**** Exit Setup**

Do Not Emulate Numeric Keypad 2

Emulate Numeric Keypad 2

Emulate ALT+Keypad ON prevails over **Emulate Numeric Keypad**.

Supposing the **Emulate Numeric Keypad 1** feature is enabled:

if Num Lock on the host device is ON, “A4.5” is transmitted as “A4.5”;

if Num Lock on the host device is OFF, “A4.5” is transmitted as “.A”:

1. “A” is sent on main keyboard;
2. “4” is sent as the function key “Cursor Move to Left”;
3. “.” is sent on main keyboard;
4. “5” is not sent as it does not correspond to any function key.

@SETUPE1

Enter Setup

Fast Mode

When **Fast Mode On** is selected, the engine sends characters to the Host faster. If the Host drops characters, turn the Fast Mode off or change the polling rate to a bigger value.

@KBWFAS0

Fast Mode Off

@KBWFAS1

Fast Mode On

@SETUPE0

**** Exit Setup**

Polling Rate

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

1ms

2ms

3ms

4ms

5ms

6ms

7ms

@SETUPE1

Enter Setup

@KBWPOR7

8ms

@KBWPOR8

9ms

@KBWPOR9

10ms

@SETUPE0

**** Exit Setup**

USB CDC

If your engine is connected to the USB port on a host device, the USB CDC feature allows the host device to receive data in the way as a serial port does. A driver is needed when using this feature. You may download it from our website at www.newlandaidc.com.

USB CDC

@SETUPE1

Enter Setup

HID POS (POS HID Barcode Scanner)

Introduction

The 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 TTL-232 interface.

@INTERF5

USB HID-POS

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 www.USB.org.

Acquire Scanned Data

After a barcode is decoded, the engine sends an input report as below:

	Bit							
Byte	7	6	5	4	3	2	1	0
0	Report ID = 0x02							
1	Barcode Length							
2-57	Decoded Data (1-56)							
58-61	Reserved							
62	Newland Symbology Identifier or N/C: 0x00							
63	-	-	-	-	-	-	-	Decoded data continued

Send Command to the Engine

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

	Bit							
Byte	7	6	5	4	3	2	1	0
0	Report ID = 0x04							
1	Length of command							
2-63	Command (1-62)							

@SETUPE1

Enter Setup

IBM SurePOS (Tabletop)

@INTERF6

IBM SurePOS (Tabletop)

IBM SurePOS (Handheld)

@INTERF7

IBM SurePOS (Handheld)

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 range of PIDs are used for each Newland product family. Every PID contains a base number and interface type (keyboard, COM port, etc.).

Product	Interface	PID (Hex)	PID (Dec)
N1-W	USB HID Keyboard	0x1EAB	0x0022
	USB CDC	0x1EAB	0x0006
	HID POS	0x1EAB	0X0010
	IBM SurePOS (Tabletop)	0x1EAB	0x0020
	IBM SurePOS(Handheld)	0x1EAB	0x0021

@SETUPE0

**** Exit Setup**

Chapter 9 System Settings

Scan Mode

Level Mode: A trigger pull activates a decode session. The decode session continues until a barcode is decoded or you release the trigger.

Sense Mode: The engine activates a decode session every time it detects a barcode presented to it. The decode session continues until a barcode is decoded or the decode session timeout expires. **Reread Timeout** can avoid undesired rereading of same barcode in a given period of time. **Sensitivity** can change the Sense Mode's sensibility to changes in images captured. **Image Stabilization Timeout** gives the engine time to adapt to ambient environment after it decodes a barcode and "looks" for another.

Continuous Mode: The engine automatically starts one decode session after another. To suspend/resume barcode reading, simply press the trigger. **Reread Timeout** can avoid undesired rereading of same barcode in a given period of time.

Pulse Mode: When the trigger is pulled and released, scanning is activated until a barcode is decoded or the decode session timeout expires (The decode session timeout begins when the trigger is released).

Batch Mode: A trigger pull activates a round of multiple decode sessions. This round of multiple scans continues until you release the trigger. Rereading the same barcode is not allowed in the same round.


@SETUPE1

Enter Setup


@SCNMOD0

Level Mode


@SCNMOD2

Sense Mode


@SCNMOD3

Continuous Mode


@SCNMOD4

Pulse Mode


@SCNMOD7

Batch Mode

Decode Session Timeout

This parameter sets the maximum time decode session continues during a scan attempt. It is programmable in 1ms increments from 1ms to 3,600,000ms. When it is set to 0, the timeout is infinite. This feature is only applicable to the Pulse, Sense and Level modes.


@ORTSET

Decode Session Timeout


@SETUPE0

**** Exit Setup**

Set the decode session timeout to 1,500ms:

1. Scan the **Enter Setup** barcode.
2. Scan the **Decode Session Timeout** barcode.
3. Scan the numeric barcodes “1”, “5”, “0” and “0” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Exit Setup** barcode.

@SETUPE1

Enter Setup

Image Stabilization Timeout (Sense Mode)

This parameter defines the amount of time the engine will spend adapting to ambient environment after it decodes a barcode and “looks” for another. It is programmable in 1ms increments from 0ms to 3,000ms.

@SENIST

Image Stabilization Timeout

Set the image stabilization timeout to 800ms:

1. Scan the **Enter Setup** barcode.
2. Scan the **Image Stabilization Timeout** barcode.
3. Scan the numeric barcodes “8”, “0” and “0” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Exit Setup** barcode.

Image Change Trigger Sensitivity

This specifies the degree of acuteness of the engine's response to changes in images captured. There are 20 levels to choose from. The smaller the value, the higher the sensitivity and the lower requirement in image change to trigger the engine. You can select an appropriate degree of sensitivity that fits your application environment. This feature is only applicable to the Sense mode.

Low Sensitivity

Medium Sensitivity

High Sensitivity

Enhanced Sensitivity

Custom Sensitivity (Level 1-20)

Set the image change trigger sensitivity to Level 10:

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom Sensitivity** barcode.
3. Scan the numeric barcodes "1" and "0" from the "Digit Barcodes" section in Appendix.
4. Scan the **Save** barcode from the "Save/Cancel Barcodes" section in Appendix.
5. Scan the **Exit Setup** barcode.

@SETUPE1

Enter Setup

Scanning Interval (Continuous Mode)

This parameter sets the duration the engine will stop decoding an image before restarting scanning after a good read.

@SCNINV

Scanning Interval (Continuous Mode)

Reread Timeout

Reread Timeout can avoid undesired rereading of same barcode in a given period of time. This feature is only applicable to the Sense and Continuous modes.

To enable/disable the Reread Timeout, scan the appropriate barcode below.

Enable Reread Timeout: Do not allow the engine to re-read same barcode before the reread timeout expires.

Disable Reread Timeout: Allow the engine to re-read same barcode.

@RRDENA1

Enable Reread Timeout

@RRDENA0

Disable Reread Timeout

The following parameter sets the time interval between two successive reads on same barcode. It is programmable in 1ms increments from 0ms to 3,600,000ms. When it is set to a value greater than 3,000, the timeout for rereading same programming barcode is limited to 3,000ms.

Reread Timeout

Set the reread timeout to 1,000ms:

1. Scan the **Enter Setup** barcode.
2. Scan the **Reread Timeout** barcode.
3. Scan the numeric barcodes “1”, “0”, “0” and “0” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Exit Setup** barcode.

You may wish to restart the reread timeout when the engine encounters the same barcode that was decoded in the last scan session before the reread timeout expires. To enable this feature, scan the **Reread Timeout Reset On** barcode. This feature is only effective when **Reread Timeout** is enabled.

Reread Timeout Reset On

Reread Timeout Reset Off

@SETUPE1

Enter Setup

Good Read Delay

Good Read Delay sets the minimum amount of time before the engine can read another barcode after a good read. This parameter is programmable in 1ms increments from 1ms to 3,600,000ms. Scan the appropriate barcode below to enable or disable the delay.

@GRDENA1

Enable Good Read Delay

@GRDENA0

Disable Good Read Delay

To set the good read delay, scan the barcode below, then set the delay (from 1 to 3,600,000ms) by scanning the digit barcode(s) then scanning the **Save** barcode from the Appendix.

@GRDDUR

Good Read Delay

Set the good read delay to 1,000ms:

1. Scan the **Enter Setup** barcode.
2. Scan the **Good Read Delay** barcode.
3. Scan the numeric barcodes “1”, “0”, “0” and “0” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Exit Setup** barcode.

Scanning Preference

Normal Mode: Select this mode when reading barcodes on paper.

Screen Mode: Select this mode when reading barcodes on the screen.

Barcode Pay Mode: Select this mode when reading barcodes to perform payment transactions.

Normal Mode

Screen Mode

Barcode Pay Mode

@SETUPE1

Enter Setup

Image Flipping

@MIRROR0

Do Not Flip

@MIRROR1

Flip Horizontally

@MIRROR2

Flip Vertically

@MIRROR3

Flip Horizontally & Vertically

@SETUPE0

**** Exit Setup**

Example of image not flipped

Example of image flipped horizontally

Example of image flipped vertically

Example of image flipped horizontally & vertically

Bad Read Message

Scan the appropriate barcode below to select whether or not to send a bad read message (user-programmable) when a good read does not occur before trigger release, or the decode session timeout expires, or the engine receives the **Stop Scanning** command (For more information, see the “Serial Trigger Command” section in this Chapter).

@NGRENA0

Bad Read Message OFF

@NGRENA1

Bad Read Message ON

@SETUPE1

Enter Setup

Set Bad Read Message

A bad read message can contain up to 7 characters (HEX values from 0x00 to 0xFF). To set a bad read message, scan the **Set Bad Read Message** barcode, the numeric barcodes representing the hexadecimal values of desired character(s) and the **Save** barcode.

@NGRSET

Set Bad Read Message

Set the bad read message to "F" (HEX: 0x46):

1. Scan the **Enter Setup** barcode.
2. Scan the **Set Bad Read Message** barcode.
3. Scan the numeric barcodes "4" and "6" from the "Digit Barcodes" section in Appendix.
4. Scan the **Save** barcode from the "Save/Cancel Barcodes" section in Appendix.
5. Scan the **Exit Setup** barcode.

Trigger Commands

When **Enable Trigger Commands** is selected, you can activate and deactivate the engine in the Level mode with serial trigger commands. Sending the **Start Scanning** command (default: **<SOH> T <EOT>**, user-programmable) to the engine in the Level mode activates a decode session. The decode session continues until a barcode is decoded or the decode session timeout expires or the engine receives the **Stop Scanning** command (default: **<SOH> P <EOT>**, user-programmable).

@SCNTCE0

Disable Trigger Commands

@SCNTCE1

Enable Trigger Commands

Modify Start Scanning Command

The **Start Scanning** command can consist of 1-10 characters (HEX values from 0x01 to 0xFF). In this command, the character "?" (HEX: 0x3F) cannot be the first character. The default **Start Scanning** command is **<SOH> T <EOT>**.

@SCNTCT

Modify Start Scanning Command

Set the Start Scanning command to "*T":

1. Scan the **Enter Setup** barcode.
2. Scan the **Modify Start Scanning Command** barcode.
3. Scan the numeric barcodes "2", "A", "5" and "4" from the "Digit Barcodes" section in Appendix.
4. Scan the **Save** barcode from the "Save/Cancel Barcodes" section in Appendix.
5. Scan the **Exit Setup** barcode.

Modify Stop Scanning Command

The **Stop Scanning** command can consist of 1-10 characters (HEX values from 0x01 to 0xFF). In this command, the character "?" (HEX: 0x3F) cannot be the first character. The default **Stop Scanning** command is **<SOH> P <EOT>**.

@SETUPE1

Enter Setup

Modify Stop Scanning Command

Set the Stop Scanning command to "*P":

1. Scan the **Enter Setup** barcode.
2. Scan the **Modify Stop Scanning Command** barcode.
3. Scan the numeric barcodes "2", "A", "5" and "0" from the "Digit Barcodes" section in Appendix.
4. Scan the **Save** barcode from the "Save/Cancel Barcodes" section in Appendix.
5. Scan the **Exit Setup** barcode.

@SETUPE0

**** Exit Setup**

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 on the engine keep on after the engine is powered on.

Off: Illumination LEDs are off all the time.

Normal

Off

Always On

@SETUPE1

Enter Setup

External Illumination

Pin 6 (EXT_LIGHT) on the13-pin FPC connector is the external illumination control signal. Users can design the external illumination LEDs based on actual needs.

Normal: External Illumination LEDs are turned on when starting a decode session and off when stopping barcode reading.

Always On: External Illumination LEDs keep on.

Off: External Illumination LEDs are off when a decode session starts.

@EILSCN0

Off

@EILSCN1

Normal

@EILSCN2

Always On

@SETUPE0

**** Exit Setup**

Aiming

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

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

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

Off: Aiming pattern is off all the time.

Normal

Off

Always On

Enter Setup

Good Read LED

The green LED can be programmed to be On or Off to indicate good read.

On

Off

Good Read LED Duration

This parameter sets the amount of time that the Good Read LED to remain on following a good read. It is programmable in 1ms increments from 1ms to 2,500ms.

**** Exit Setup**

Short (20ms)

Medium (120ms)

Long (220ms)

Prolonged (320ms)

Custom (1 - 2,500ms）

Set the Good Read LED duration to 800ms:

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom** barcode.
3. Scan the numeric barcodes “8”, “0” and “0” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Exit Setup** barcode.

Enter Setup

Power On Beep

The engine can be programmed to beep when it is powered on. Scan the **Off** barcode if you do not want a power on beep.

On

Off

Good Read Beep

Scanning the **Off** barcode can turn off the beep that indicates successful decode; scanning the **On** barcode can turn it back on.

On

Off

**** Exit Setup**

Good Read Beep Duration

This parameter sets the length of the beep the engine emits on a good read. It is programmable in 1ms increments from 20ms to 300ms.

Short (40ms)

Medium (80ms)

Long (120ms)

Custom (20 – 300ms)

Set the Good Read Beep duration to 200ms:

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom** barcode.
3. Scan the numeric barcodes “2”, “0” and “0” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Exit Setup** barcode.

@SETUPE1

Enter Setup

Good Read Beep Frequency

This parameter is programmable in 1Hz increments from 20Hz to 20,000Hz.

@GRBFRQ800

Extra Low (800Hz)

@GRBFRQ1600

Low (1600Hz)

@GRBFRQ2730

Medium (2730Hz)

@GRBFRQ4200

High (4200Hz)

@GRBFRQ

Custom (20 - 20,000Hz)

Set the Good Read Beep frequency to 2,000Hz:

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom** barcode.
3. Scan the numeric barcodes “2”, “0”, “0” and “0” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Exit Setup** barcode.

@SETUPE0

**** Exit Setup**

Good Read Beep Volume

There are 20 volume levels to choose from. The bigger the value, the louder the Good Read Beep.

Loud

Medium

Low

Custom Volume (Level 1-20)

Set the Good Read Beep volume to Level 8:

1. Scan the **Enter Setup** barcode.
2. Scan the **Custom Volume** 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 **Exit Setup** barcode.

@SETUPE1

Enter Setup

Auto Sleep

Auto Sleep allows the engine to automatically enter the sleep mode if no operation or communication is performed for a time period (user programmable). When the engine is in the sleep mode, receiving trigger signal or communication from the Host can awake the engine.

@ATSENA0

Disable Auto Sleep

@ATSENA1

Enable Auto Sleep

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

@ATSDUR

Time Period from Idle to Sleep

Set the Time Period from Idle to Sleep duration to 5s:

6. Scan the **Enter Setup** barcode.
7. Scan the **Time Period from Idle to Sleep** barcode.
8. Scan the numeric barcode “5” from the “Digit Barcodes” section in Appendix.
9. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
10. Scan the **Exit Setup** barcode.

Chapter 10 Symbologies

Introduction

Every symbology (barcode type) has its own unique attributes. This chapter provides programming barcodes for configuring the engine so that it can identify various symbologies. It is recommended to disable those that are rarely used to increase the efficiency of the engine.

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.

Enable All Symbologies

Disable All Symbologies

Enable/Disable 1D Symbologies

Enable 1D Symbologies

Disable 1D Symbologies

Enter Setup

Enable/Disable 2D Symbologies

Enable 2D Symbologies

Disable 2D Symbologies

1D Twin Code

1D twin code is two 1D barcodes of a symbology or of different symbologies paralleled vertically. Both barcodes must have similar specifications and be placed closely together.

There are 3 options for reading 1D twin code:

- **Single 1D Code Only:** Read either 1D code.
- **Twin 1D Code Only:** Read both 1D codes. Transmission sequence: upper 1D code followed by lower 1D code.
- **Both Single & Twin:** Read both 1D codes. If successful, transmit as twin 1D code only. Otherwise, try single 1D code only.

**** Exit Setup**

Single 1D Code Only

Twin 1D Code Only

Both Single & Twin

@SETUPE1

Enter Setup

Surround GS1 Application Identifiers (AI's) with Parentheses

When **Surround GS1 AI's with Parentheses** is selected, each application identifier (AI) contained in scanned data will be enclosed in parentheses in the output message.

@GS1AIP0

Do Not Surround GS1 AI's with Parentheses

@GS1AIP1

Surround GS1 AI's with Parentheses

(01) 0 0614141 99999 6 (10) 10ABCEDF123456

If **Surround GS1 AI's with Parentheses** is selected, the barcode above is output as (01)00614141999996(10)10ABCEDF123456.

If **Do Not Surround GS1 AI's with Parentheses** is selected, the barcode above is output as 0100614141999996 1010ABCEDF123456.

@SETUPE0

**** Exit Setup**

Code 128

Restore Factory Defaults

Restore the Factory Defaults of Code 128

Enable/Disable Code 128

Enable Code 128

Disable Code 128

If the engine fails to identify Code 128 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Code 128** barcode.

@SETUPE1

Enter Setup

Set Length Range for Code 128

The engine can be configured to only decode Code 128 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

@128MIN

Set the Minimum Length

@128MAX

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes Code 128 barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only Code 128 barcodes with that length are to be decoded.

Set the engine to decode Code 128 barcodes containing between 8 and12 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.

Transmit Check Character

Transmit Code 128 Check Character

Do Not Transmit Code 128 Check Character

FNC1 Output

Off

On

@SETUPE1

Enter Setup

EAN-8

Restore Factory Defaults

@EA8DEF

Restore the Factory Defaults of EAN-8

Enable/Disable EAN-8

@EA8ENA1

Enable EAN-8

@EA8ENA0

Disable EAN-8

If the engine fails to identify EAN-8 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable EAN-8** barcode.

Transmit Check Character

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

@EA8CHK2

Transmit EAN-8 Check Character

@EA8CHK1

Do Not Transmit EAN-8 Check Character

@SETUPE0

**** Exit Setup**

2-Digit Add-On Code

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

@EA8AD20

Disable 2-Digit Add-On Code

@EA8AD21

Enable 2-Digit Add-On Code

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

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

@SETUPE1

Enter Setup

5-Digit Add-On Code

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

@EA8AD50

Disable 5-Digit Add-On Code

@EA8AD51

Enable 5-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 5-digit add-on barcode. It can also decode EAN-8 barcodes without 5-digit add-on codes.

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

@SETUPE0

**** Exit 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.

EAN-8 Add-On Code Not Required

EAN-8 Add-On Code Required

Convert EAN-8 to EAN-13

Convert EAN-8 to EAN-13: Convert EAN-8 decoded data to EAN-13 format before transmission. After conversion, the data follows EAN-13 format and is affected by EAN-13 programming selections (e.g., Check Character).

Do Not Convert EAN-8 to EAN-13: EAN-8 decoded data is transmitted as EAN-8 data, without conversion.

Do Not Convert EAN-8 to EAN-13

Convert EAN-8 to EAN-13

@SETUPE1

Enter Setup

EAN-13

Restore Factory Defaults

@E13DEF

Restore the Factory Defaults of EAN-13

Enable/Disable EAN-13

@E13ENA1

Enable EAN-13

@E13ENA0

Disable EAN-13

If the engine fails to identify EAN-13 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable EAN-13** barcode.

@SETUPE0

**** Exit Setup**

Transmit Check Character

@E13CHK2

Transmit EAN-13 Check Character

@E13CHK1

Do Not Transmit EAN-13 Check Character

2-Digit Add-On Code

An EAN-13 barcode can be augmented with a two-digit add-on code to form a new one. In the example below, the part surrounded by blue dotted line is an EAN-13 barcode while the part circled by red dotted line is a two-digit add-on code.

@E13AD20

Disable 2-Digit Add-On Code

@E13AD21

Enable 2-Digit Add-On Code

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

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

@SETUPE1

Enter Setup

5-Digit Add-On Code

An EAN-13 barcode can be augmented with a five-digit add-on code to form a new one. In the example below, the part surrounded by blue dotted line is an EAN-13 barcode while the part circled by red dotted line is a five-digit add-on code.

@E13AD50

Disable 5-Digit Add-On Code

@E13AD51

Enable 5-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 5-digit add-on barcode. It can also decode EAN-13 barcodes without 5-digit add-on codes.

Enable 5-Digit Add-On Code: The engine decodes a mix of EAN-13 barcodes with and without 5-digit 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.

@E13REQ0

EAN-13 Add-On Code Not Required

@E13REQ1

EAN-13 Add-On Code Required

@SETUPE0

**** Exit 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.

Do Not Require Add-On Code

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.

Do Not Require Add-On Code

Require Add-On Code

@SETUPE1

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.

@E134140

Do Not Require Add-On Code

@E134141

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.

@E134340

Do Not Require Add-On Code

@E134341

Require Add-On Code

@SETUPE0

**** Exit 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.

Do Not Require Add-On Code

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.

Do Not Require Add-On Code

Require Add-On Code

@SETUPE1

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.

@E139790

Do Not Require Add-On Code

@E139791

Require Add-On Code

@SETUPE0

**** Exit Setup**

UPC-E

Restore Factory Defaults

Restore the Factory Defaults of UPC-E

Enable/Disable UPC-E

Enable UPC-E

Disable UPC-E

If the engine fails to identify UPC-E barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable UPC-E** barcode.

@SETUPE1

Enter Setup

Transmit Check Character

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

@UPECHK2

Transmit UPC-E Check Character

@UPECHK1

Do Not Transmit UPC-E Check Character

2-Digit Add-On Code

A UPC-E barcode can be augmented with a two-digit add-on code to form a new one. In the example below, the part surrounded by blue dotted line is a UPC-E barcode while the part circled by red dotted line is a two-digit add-on code.

@UPEAD20

Disable 2-Digit Add-On Code

@UPEAD21

Enable 2-Digit Add-On Code

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

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

@SETUPE0

**** Exit Setup**

5-Digit Add-On Code

A UPC-E barcode can be augmented with a five-digit add-on code to form a new one. In the example below, the part surrounded by blue dotted line is a UPC-E barcode while the part circled by red dotted line is a five-digit add-on code.

@UPEAD50

Disable 5-Digit Add-On Code

@UPEAD51

Enable 5-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 5-digit add-on barcode. It can also decode UPC-E barcodes without 5-digit add-on codes.

Enable 5-Digit Add-On Code: The engine decodes a mix of UPC-E barcodes with and without 5-digit 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.

@UPEREQ0

UPC-E Add-On Code Not Required

@UPEREQ1

UPC-E Add-On Code Required

Enter Setup

Transmit Preamble Character

Preamble characters (Country Code and System Character) can be transmitted as part of a UPC-E barcode. Select one of the following options for transmitting UPC-E preamble to the host device: transmit system character only, transmit system character and country code (“0” for USA), or transmit no preamble.

System Character

No Preamble

System Character & Country Code

Convert UPC-E to UPC-A

Convert UPC-E to UPC-A: Convert UPC-E (zero suppressed) decoded data to UPC-A format before transmission. After conversion, the data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Character).

Do Not Convert UPC-E to UPC-A: UPC-E decoded data is transmitted as UPC-E data, without conversion.

Do Not Convert UPC-E to UPC-A

Convert UPC-E to UPC-A

**** Exit Setup**

UPC-A

Restore Factory Defaults

@UPADEF

Restore the Factory Defaults of UPC-A

Enable/Disable UPC-A

@UPAENA1

Enable UPC-A

@UPAENA0

Disable UPC-A

If the engine fails to identify UPC-A barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable UPC-A** barcode.

Transmit Check Character

UPC-A is 13 digits in length with the last one as its check character used to verify the integrity of the data.

@UPACHK2

Transmit UPC-A Check Character

@UPACHK1

Do Not Transmit UPC-A Check Character

@SETUPE1

Enter Setup

2-Digit Add-On Code

A UPC-A barcode can be augmented with a two-digit add-on code to form a new one. In the example below, the part surrounded by blue dotted line is a UPC-A barcode while the part circled by red dotted line is a two-digit add-on code.

@UPAAD20

Disable 2-Digit Add-On Code

@UPAAD21

Enable 2-Digit Add-On Code

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

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

@SETUPE0

**** Exit Setup**

5-Digit Add-On Code

A UPC-A barcode can be augmented with a five-digit add-on code to form a new one. In the example below, the part surrounded by blue dotted line is a UPC-A barcode while the part circled by red dotted line is a five-digit add-on code.

Disable 5-Digit Add-On Code

Enable 5-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 5-digit add-on barcode. It can also decode UPC-A barcodes without 5-digit add-on codes.

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

@SETUPE1

Enter Setup

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.

@UPAREQ0

UPC-A Add-On Code Not Required

@UPAREQ1

UPC-A Add-On Code Required

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, transmit system character and country code (“0” for USA), or transmit no preamble.

@UPAPRE0

No Preamble

@UPAPRE1

System Character

@UPAPRE2

System Character & Country Code

@SETUPE0

**** 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

If the engine fails to identify Interleaved 2 of 5 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Interleaved 2 of 5** barcode.

@SETUPE1

Enter Setup

Set Length Range for Interleaved 2 of 5

The engine can be configured to only decode Interleaved 2 of 5 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

@I25MIN

Set the Minimum Length

@I25MAX

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes Interleaved 2 of 5 barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only Interleaved 2 of 5 barcodes with that length are to be decoded.

Set the engine to decode Interleaved 2 of 5 barcodes containing between 8 and12 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.

Check Character Verification

A check character is optional for Interleaved 2 of 5 and can be added as the last character. 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 Character After Verification:** The engine checks the integrity of all Interleaved 2 of 5 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.
- ✧ **Transmit Check Character After Verification:** The engine checks the integrity of all Interleaved 2 of 5 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

Since Interleaved 2 of 5 must always have an even number of digits, a zero may need to be added as the first digit when the check character is added. The check character is automatically generated when making Interleaved 2 of 5 barcodes.

Disable

Do Not Transmit Check Character After Verification

Transmit Check Character After Verification

If the **Do Not Transmit Check Character 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 character excluded will not be decoded. (For example, when the **Do Not Transmit Check Character 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 character cannot be read.)

@SETUPE1

Enter Setup

Febraban

Disable/Enable Febraban

@I25FBB0

Disable Febraban

@I25FBB1

Enable Febraban, Do Not Expand

@I25FBB2

Enable Febraban, Expand

Transmit Delay per Character

Transmit Delay per Character applies to both Expanded and Unexpanded Febraban. This feature is available only when USB HID Keyboard is enabled.

@FEBSEN0

Disable Transmit Delay per Character

@FEBSEN1

Enable Transmit Delay per Character

You may select an appropriate delay value from the options below as per your actual needs.

0ms

5ms

10ms

15ms

20ms

25ms

30ms

35ms

@SETUPE1

Enter Setup

@FEBSDT40

40ms

@FEBSDT45

45ms

@FEBSDT50

50ms

@FEBSDT55

55ms

@FEBSDT60

60ms

@FEBSDT65

65ms

@FEBSDT70

70ms

@FEBSDT75

75ms

@SETUPE0

**** Exit Setup**

Transmit Delay per 12 Characters

Transmit Delay per 12 Characters applies to Expanded Febraban only. This feature is available only when USB HID Keyboard is enabled.


@FEBMEN0

Disable Transmit Delay per 12 Characters


@FEBMEN1

Enable Transmit Delay per 12 Characters

You may select an appropriate delay value from the options below as per your actual needs.


@FEBMDT0

0ms


@FEBMDT1

300ms


@FEBMDT2

400ms

@SETUPE1

Enter Setup

@FEBMDT3

500ms

@FEBMDT4

600ms

@FEBMDT5

700ms

@FEBMDT6

800ms

@FEBMDT7

900ms

@SETUPE0

**** 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 character.

ITF-14 priority principle: For the Interleaved 2 of 5 barcodes with a length of 14 characters and the last character as the check character, the ITF-14 configurations shall take precedence over the Interleaved 2 of 5 settings.

Restore Factory Defaults

Restore the Factory Defaults of ITF-14

Enable/Disable ITF-14

Disable ITF-14

Enable ITF-14 But Do Not Transmit Check Character

Enable ITF-14 and Transmit Check Character

An example of the ITF-14 priority principle: when ITF-14 is enabled and Interleaved 2 of 5 is disabled, the engine only decodes Interleaved 2 of 5 barcodes with a length of 14 characters and the last character as the check character.

@SETUPE1

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.

ITF-6 priority principle: For the Interleaved 2 of 5 barcodes with a length of 6 characters and the last character as the check character, the ITF-6 configurations shall take precedence over the Interleaved 2 of 5 settings.

Restore Factory Defaults

@IT6DEF

Restore the Factory Defaults of ITF-6

Enable/Disable ITF-6

@IT6ENA0

Disable ITF-6

@IT6ENA1

Enable ITF-6 But Do Not Transmit Check Character

@IT6ENA2

Enable ITF-6 and Transmit Check Character

An example of the ITF-6 priority principle: when ITF-6 is enabled and Interleaved 2 of 5 is disabled, the engine only decodes Interleaved 2 of 5 barcodes with a length of 6 characters and the last character as the check character.

@SETUPE0

**** Exit Setup**

Matrix 2 of 5

Restore Factory Defaults

Restore the Factory Defaults of Matrix 2 of 5

Enable/Disable Matrix 2 of 5

Enable Matrix 2 of 5

Disable Matrix 2 of 5

If the engine fails to identify Matrix 2 of 5 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Matrix 2 of 5** barcode.

@SETUPE1

Enter Setup

Set Length Range for Matrix 2 of 5

The engine can be configured to only decode Matrix 2 of 5 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

@M25MIN

Set the Minimum Length

@M25MAX

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes Matrix 2 of 5 barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only Matrix 2 of 5 barcodes with that length are to be decoded.

Set the engine to decode Matrix 2 of 5 barcodes containing between 8 and12 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.

Check Character Verification

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

- **Disable:** The engine transmitsMatrix 2 of 5 barcodes as is.
- **Do Not Transmit Check Character After Verification:** The engine checks the integrity of all Matrix 2 of 5 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.
- **Transmit Check Character After Verification:** The engine checks the integrity of all Matrix 2 of 5 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

Since Matrix 2 of 5 must always have an even number of digits, a zero may need to be added as the first digit when the check character is added. The check character is automatically generated when making Matrix 2 of 5 barcodes.

Disable

Do Not Transmit Check Character After Verification

Transmit Check Character After Verification

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

@SETUPE1

Enter Setup

Code 39

Restore Factory Defaults

Restore the Factory Defaults of Code 39

Enable/Disable Code 39

Enable Code 39

Disable Code 39

If the engine fails to identify Code 39 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Code 39** barcode.

@SETUPE0

**** Exit Setup**

Set Length Range for Code 39

The engine can be configured to only decode Code 39 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

Set the Minimum Length

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes Code 39 barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only Code 39 barcodes with that length are to be decoded.

Set the engine to decode Code 39 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.

@SETUPE1

Enter Setup

Check Character Verification

A check character is optional for Code 39 and can be added as the last character. It is a calculated value used to verify the integrity of the data.

- **Disable:** The engine transmitsCode 39 barcodes as is.
- **Do Not Transmit Check Character After Verification:** The engine checks the integrity of all Code 39 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.
- **Transmit Check Character After Verification:** The engine checks the integrity of all Code 39 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

@C39CHK0

Disable

@C39CHK1

Do Not Transmit Check Character After Verification

@C39CHK2

Transmit Check Character After Verification

If the **Do Not Transmit Check Character After Verification** option is enabled, Code 39 barcodes with a length that is less than the configured minimum length after having the check character excluded will not be decoded. (For example, when the **Do Not Transmit Check Character After Verification** option is enabled and the minimum length is set to 4, Code 39 barcodes with a total length of 4 characters including the check character cannot be read.)

@SETUPE0

**** Exit Setup**

Transmit Start/Stop Character

Code 39 uses an asterisk (*) for both the start and the stop characters. You can choose whether or not to transmit the start/stop characters by scanning the appropriate barcode below.

Do Not Transmit Start/Stop Character

Transmit Start/Stop Character

Enable/Disable Code 39 Full ASCII

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

Disable Code 39 Full ASCII

Enable Code 39 Full ASCII

Enter Setup

Enable/Disable Code 32 (Italian Pharma Code)

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 character verification must be disabled for this parameter to function.

Disable Code 32

Enable Code 32

Code 32 Prefix

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

Disable Code 32 Prefix

Enable Code 32 Prefix

**** Exit Setup**

Transmit Code 32 Start/Stop Character

Code 32 must be enabled for this parameter to function.

Do Not Transmit Code 32 Start/Stop Character

Transmit Code 32 Start/Stop Character

Transmit Code 32 Check Character

Code 32 must be enabled for this parameter to function.

Do Not Transmit Code 32 Check Character

Transmit Code 32 Check Character

@SETUPE1

Enter Setup

Codabar

Restore Factory Defaults

@CBADEF

Restore the Factory Defaults of Codabar

Enable/Disable Codabar

@CBAENA1

Enable Codabar

@CBAENA0

Disable Codabar

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

@SETUPE0

**** Exit Setup**

Set Length Range for Codabar

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

Set the Minimum Length

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes Codabar barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only Codabar barcodes with that length are to be decoded.

Set the engine to decode Codabar 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.

@SETUPE1

Enter Setup

Check Character Verification

A check character is optional for Codabar and can be added as the last character. It is a calculated value used to verify the integrity of the data.

- **Disable:** The engine transmits Codabar barcodes as is.
- **Do Not Transmit Check Character After Verification:** The engine checks the integrity of all Codabar barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.
- **Transmit Check Character After Verification:** The engine checks the integrity of all Codabar barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

@CBACHK0

Disable

@CBACHK1

Do Not Transmit Check Character After Verification

@CBACHK2

Transmit Check Character After Verification

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

@SETUPE0

**** Exit Setup**

Start/Stop Character

You can set the start/stop characters and choose whether or not to transmit the start/stop characters by scanning the appropriate barcode below.

Do Not Transmit Start/Stop Character

Transmit Start/Stop Character

ABCD/ABCD as the Start/Stop Character

ABCD/TN*E as the Start/Stop Character

abcd/abcd as the Start/Stop Character

abcd/tn*e as the Start/Stop Character

@SETUPE1

Enter Setup

Code 93

Restore Factory Defaults

@C93DEF

Restore the Factory Defaults of Code 93

Enable/Disable Code 93

@C93ENA1

Enable Code 93

@C93ENA0

Disable Code 93

If the engine fails to identify Code 93 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Code 93** barcode.

@SETUPE0

**** Exit Setup**

Set Length Range for Code 93

The engine can be configured to only decode Code 93 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

Set the Minimum Length

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes Code 93 barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only Code 93 barcodes with that length are to be decoded.

Set the engine to decode Code 93 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.


@SETUPE1

Enter Setup

Check Character Verification

Check characters are optional for Code 93 and can be added as the last two characters, which are calculated values used to verify the integrity of the data.

Disable: The engine transmits Code 93 barcodes as is.

Do Not Transmit Check Character After Verification: The engine checks the integrity of all Code 93 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the checks will be transmitted except the last two digits, whereas those failing them will not be transmitted.

Transmit Check Character After Verification: The engine checks the integrity of all Code 93 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the checks will be transmitted, whereas those failing them will not be transmitted.


@C93CHK0

Disable


@C93CHK1

Do Not Transmit Check Character After Verification


@C93CHK2

Transmit Check Character After Verification

If the **Do Not Transmit Check Character After Verification** option is enabled, Code 93 barcodes with a length that is less than the configured minimum length after having the two check characters excluded will not be decoded. (For example, when the **Do Not Transmit Check Character After Verification** option is enabled and the minimum length is set to 4, Code 93 barcodes with a total length of 4 characters including the two check characters cannot be read.)


@SETUPE0

**** Exit Setup**

GS1-128 (UCC/EAN-128)

Restore Factory Defaults

Restore the Factory Defaults of GS1-128

Enable/Disable GS1-128

Enable GS1-128

Disable GS1-128

If the engine fails to identify GS1-128 barcodes, you may first try this solution by scanning the **EnterSetup** barcode and then **Enable GS1-128** barcode.

Enter Setup

Set Length Range for GS1-128

The engine can be configured to only decode GS1-128 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

Set the Minimum Length

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes GS1-128 barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only GS1-128 barcodes with that length are to be decoded.

Set the engine to decode GS1-128 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.

**** Exit Setup**

Transmit Check Character

Transmit GS1-128 Check Character

Do Not Transmit GS1-128 Check Character

FNC1 Output

Off

On

@SETUPE1

Enter Setup

GS1 Databar (RSS)

Restore Factory Defaults

@RSSDEF

Restore the Factory Defaults of GS1 Databar

Enable/Disable GS1 Databar

@RSSENA1

Enable GS1 Databar

@RSSENA0

Disable GS1 Databar

If the engine fails to identify GS1 Databar barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable GS1 Databar** barcode.

Transmit Application Identifier “01”

@RSSTAI1

Transmit Application Identifier “01”

@RSSTAI0

Do Not Transmit Application Identifier “01”

@SETUPE0

**** Exit Setup**

Code 11

Restore Factory Defaults

Restore the Factory Defaults of Code 11

Enable/Disable Code 11

Enable Code 11

Disable Code 11

If the engine fails to identify Code 11 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Code 11** barcode.

Enter Setup

Set Length Range for Code 11

The engine can be configured to only decode Code 11 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

Set the Minimum Length

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes Code 11 barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only Code 11 barcodes with that length are to be decoded.

Set the engine to decode Code 11 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.

**** Exit Setup**

Check Character Verification

Check characters are optional for Code 11 and can be added as the last one or two characters, which are calculated values used to verify the integrity of the data.

If the **Disable** option is enabled, the engine transmits Code 11 barcodes as is.

Disable

One Check Character, MOD11

Two Check Characters, MOD11/MOD11

Two Check Characters, MOD11/MOD9

One Check Character, MOD11 (Len<=10)

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

One Check Character, MOD11 (Len<=10)

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

@SETUPE1

Enter Setup

Transmit Check Character

@C11TCK0

Do Not Transmit Code 11 Check Character

@C11TCK1

Transmit Code 11 Check Character

If you select a check character algorithm and the **Do Not Transmit Check Character** option, Code 11 barcodes with a length that is less than the configured minimum length after having the check character(s) excluded will not be decoded. (For example, when the **One Check Character, MOD11** and **Do Not Transmit Check Character** options are enabled and the minimum length is set to 4, Code 11 barcodes with a total length of 4 characters including the check character cannot be read.)

@SETUPE0

**** Exit Setup**

ISBN

Restore Factory Defaults

Restore the Factory Defaults of ISBN

Enable/Disable ISBN

Enable ISBN

Disable ISBN

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

Enter Setup

Set ISBN Format

ISBN-10

ISBN-13

ISSN

Restore Factory Defaults

Restore the Factory Defaults of ISSN

**** Exit Setup**

Enable/Disable ISSN

Enable ISSN

Disable ISSN

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

@SETUPE1

Enter Setup

Industrial 25

Restore Factory Defaults

@L25DEF

Restore the Factory Defaults of Industrial 25

Enable/Disable Industrial 25

@L25ENA1

Enable Industrial 25

@L25ENA0

Disable Industrial 25

If the engine fails to identify Industrial 25 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Industrial 25** barcode.

Set Length Range for Industrial 25

The engine can be configured to only decode Industrial 25 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

Set the Minimum Length

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes Industrial 25 barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only Industrial 25 barcodes with that length are to be decoded.

Set the engine to decode Industrial 25 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.

@SETUPE1

Enter Setup

Check Character Verification

A check character is optional for Industrial 25 and can be added as the last character. It is a calculated value used to verify the integrity of the data.

- **Disable:** The engine transmits Industrial 25 barcodes as is.
- **Do Not Transmit Check Character After Verification:** The engine checks the integrity of all Industrial 25 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.
- **Transmit Check Character After Verification:** The engine checks the integrity of all Industrial 25 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

@L25CHK0

Disable

@L25CHK1

Do Not Transmit Check Character After Verification

@L25CHK2

Transmit Check Character After Verification

If the **Do Not Transmit Check Character After Verification** option is enabled, Industrial 25 barcodes with a length that is less than the configured minimum length after having the check character excluded will not be decoded. (For example, when the **Do Not Transmit Check Character After Verification** option is enabled and the minimum length is set to 4, Industrial 25 barcodes with a total length of 4 characters including the check character cannot be read.)

Standard 25

Restore Factory Defaults

Restore the Factory Defaults of Standard 25

Enable/Disable Standard 25

Enable Standard 25

Disable Standard 25

If the engine fails to identify Standard 25 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Standard 25** barcode.

@SETUPE1

Enter Setup

Set Length Range for Standard 25

The engine can be configured to only decode Standard 25 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

@S25MIN

Set the Minimum Length

@S25MAX

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes Standard 25 barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only Standard 25 barcodes with that length are to be decoded.

Set the engine to decode Standard 25 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.

Check Character Verification

A check character is optional for Standard 25 and can be added as the last character. It is a calculated value used to verify the integrity of the data.

- **Disable:** The engine transmits Standard 25 barcodes as is.
- **Do Not Transmit Check Character After Verification:** The engine checks the integrity of all Standard 25 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted except the last digit, whereas those failing it will not be transmitted.
- **Transmit Check Character After Verification:** The engine checks the integrity of all Standard 25 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

Disable

Do Not Transmit Check Character After Verification

Transmit Check Character After Verification

If the **Do Not Transmit Check Character After Verification** option is enabled, Standard 25 barcodes with a length that is less than the configured minimum length after having the check character excluded will not be decoded. (For example, when the **Do Not Transmit Check Character After Verification** option is enabled and the minimum length is set to 4, Standard 25 barcodes with a total length of 4 characters including the check character cannot be read.)

@SETUPE1

Enter Setup

Plessey

Restore Factory Defaults

@PLYDEF

Restore the Factory Defaults of Plessey

Enable/Disable Plessey

@PLYENA1

Enable Plessey

@PLYENA0

Disable Plessey

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

Set Length Range for Plessey

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

Set the Minimum Length

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes Plessey barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only Plessey barcodes with that length are to be decoded.

Set the engine to decode Plessey 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.

@SETUPE1

Enter Setup

Check Character Verification

Check characters are optional for Plessey and can be added as the last two characters, which are calculated values used to verify the integrity of the data.

- **Disable:** The engine transmits Plessey barcodes as is.
- **Do Not Transmit Check Character After Verification:** The engine checks the integrity of all Plessey barcodes to verify that the data complies with the check character algorithm. Barcodes passing the checks will be transmitted except the last two digits, whereas those failing them will not be transmitted.
- **Transmit Check Character After Verification:** The engine checks the integrity of all Plessey barcodes to verify that the data complies with the check character algorithm. Barcodes passing the checks will be transmitted, whereas those failing them will not be transmitted.

@PLYCHK0

Disable

@PLYCHK1

Do Not Transmit Check Character After Verification

@PLYCHK2

Transmit Check Character After Verification

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

MSI-Plessey

Restore Factory Defaults

Restore the Factory Defaults of MSI-Plessey

Enable/Disable MSI-Plessey

Enable MSI-Plessey

Disable MSI-Plessey

If the engine fails to identify MSI-Plessey barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable MSI-Plessey** barcode.

Enter Setup

Set Length Range for MSI-Plessey

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

Set the Minimum Length

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes MSI-Plessey barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only MSI-Plessey barcodes with that length are to be decoded.

Set the engine to decode MSI-Plessey 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.

**** Exit Setup**

Check Character Verification

Check characters are optional for MSI-Plessey and can be added as the last one or two characters, which are calculated values used to verify the integrity of the data.

If the **Disable** option is enabled, the engine transmits MSI-Plessey barcodes as is.

Disable

One Check Character, MOD10

Two Check Characters, MOD10/MOD10

Two Check Characters, MOD10/MOD11

@SETUPE1

Enter Setup

Transmit Check Character

@MSITCK1

Transmit MSI-Plessey Check Character

@MSITCK0

Do Not Transmit MSI-Plessey Check Character

If you select a check character algorithm and the **Do Not Transmit Check Character** option, MSI-Plessey barcodes with a length that is less than the configured minimum length after having the check character(s) excluded will not be decoded. (For example, when the **One Check Character, MOD10** and **Do Not Transmit Check Character** options are enabled and the minimum length is set to 4, MSI-Plessey barcodes with a total length of 4 characters including the check character cannot be read.)

@SETUPE0

**** Exit Setup**

AIM 128

Restore Factory Defaults

Restore the Factory Defaults of AIM 128

Enable/Disable AIM 128

Enable AIM 128

Disable AIM 128

If the engine fails to identify AIM 128 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable AIM 128** barcode.

Enter Setup

Set Length Range for AIM 128

The engine can be configured to only decode AIM 128 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

Set the Minimum Length

Set the Maximum Length

If minimum length is set to be greater than maximum length, the engine only decodes AIM 128 barcodes with either the minimum or maximum length. If minimum length is same as maximum length, only AIM 128 barcodes with that length are to be decoded.

Set the engine to decode AIM 128 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.

**** Exit Setup**

Transmit Check Character

Transmit AIM 128 Check Character

Do Not Transmit AIM 128 Check Character

FNC1 Output

Off

On

@SETUPE1

Enter Setup

PDF417

Restore Factory Defaults

Restore the Factory Defaults of PDF417

Enable/Disable PDF417

Enable PDF417

Disable PDF417

If the engine fails to identify PDF417 barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable PDF417** barcode.

@SETUPE0

**** Exit Setup**

Set Length Range for PDF417

The engine can be configured to only decode PDF417 barcodes with lengths that fall between (inclusive) the minimum and maximum lengths. To accomplish it, you need to set the minimum and maximum lengths.

Set the Minimum Length

Set the Maximum Length

Minimum length is not allowed to be greater than maximum length. If you only want to read PDF417 barcodes with a specific length, set both minimum and maximum lengths to be that desired length.

Set the engine to decode PDF417 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.

@SETUPE1

Enter Setup

PDF417 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.

@PDFDOU0

Single PDF417 Only

@PDFDOU1

Twin PDF417 Only

@PDFDOU2

Both Single & Twin

@SETUPE0

**** Exit Setup**

Character Encoding

Default Character Encoding

UTF-8

Automatically Select UTF-8 or Code Page

PDF417 ECI Output

Disable PDF417 ECI Output

Enable PDF417 ECI Output

@SETUPE1

Enter Setup

QR Code

Restore Factory Defaults

@QRCDEF

Restore the Factory Defaults of QR Code

Enable/Disable QR Code

@QRCENA1

Enable QR Code

@QRCENA0

Disable QR Code

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

Set Length Range for QR Code

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

Set the Minimum Length

Set the Maximum Length

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

Set the engine to decode QR Code 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.

@SETUPE1

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. Transmission sequence: left (upper) QR code followed by right (lower) QR code.
- ✧ **Both Single & Twin:** Read both QR codes. If successful, transmit as twin QR only. Otherwise, try single QR only.

@QRCDOU0

Single QR Only

@QRCDOU1

Twin QR Only

@QRCDOU2

Both Single & Twin

@SETUPE0

**** Exit Setup**

Character Encoding

Default Character Encoding

UTF-8

Automatically Select UTF-8 or Code Page

Enter Setup

QR ECI Output

Disable QR ECI Output

Enable QR ECI Output

URL QR

URL QR code refers to QR code whose barcode data begins with the http or HTTP.

Disable URL QR

Enable URL QR

Micro QR Code

Restore Factory Defaults

**** Exit Setup**

@MQRDEF

Restore the Factory Defaults of Micro QR

Enable/Disable Micro QR

@MQRENA1

Enable Micro QR

@MQRENA0

Disable Micro QR

If the engine fails to identify Micro QR barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Micro QR** barcode.

Enter Setup

Set Length Range for Micro QR

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

Set the Minimum Length

Set the Maximum Length

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

Set the engine to decode Micro QR Code 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.

**** Exit Setup**

Aztec

Restore Factory Defaults

Restore the Factory Defaults of Aztec Code

Enable/Disable Aztec Code

Enable Aztec Code

Disable Aztec Code

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

Enter Setup

Set Length Range for Aztec Code

The engine 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.

Set the Minimum Length

Set the Maximum Length

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 engine 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.

**** Exit Setup**

Character Encoding

@AZTENC0

Default Character Encoding

@AZTENC1

UTF-8

@AZTENC2

Automatically Select UTF-8 or Code Page

Aztec ECI Output

@AZTECI0

Disable Aztec ECI Output

@AZTECI1

Enable Aztec ECI Output

@SETUPE1

Enter Setup

Data Matrix

Restore Factory Defaults

@DMCDEF

Restore the Factory Defaults of Data Matrix

Enable/Disable Data Matrix

@DMCENA1

Enable Data Matrix

@DMCENA0

Disable Data Matrix

If the engine fails to identify Data Matrix barcodes, you may first try this solution by scanning the **Enter Setup** barcode and then **Enable Data Matrix** barcode.

@SETUPE0

**** Exit Setup**

Set Length Range for Data Matrix

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

Set the Minimum Length

Set the Maximum Length

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

Set the engine to decode Data Matrix 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.

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 sequence: left (upper) Data Matrix code followed by right (lower) Data Matrix code.
- ✧ **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**

Rectangular Barcode

Data Matrix has two formats:

Square barcodes having the same amount of modules in length and width: 10*10, 12*12.... 144*144.

Rectangular barcodes having different amounts of models in length and width: 6*16, 6*14...14*22.

Enable Rectangular Barcode

Disable Rectangular Barcode

Character Encoding

Default Character Encoding

UTF-8

Automatically Select UTF-8 or Code Page

@SETUPE1

Enter Setup

Data Matrix ECI Output

@DMCECI0

Disable Data Matrix ECI Output

@DMCECI1

Enable Data Matrix ECI Output

@SETUPE0

**** Exit Setup**

Chapter 11 Data Formatter

Introduction

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

Normally, when you scan a barcode, it gets outputted automatically; however, when you create a format, you must use a "send" command (see the "Send Commands" section in this chapter) within the format programming to output data. Multiple data formats can be programmed into the engine. The maximum size of all data formats created is 2048 characters. By default, the data formatter is disabled. Enable it when required. If you have changed data format settings, and wish to clear all formats and return to the factory defaults, scan the **Default Data Format** code below.

Default Data Format

Add a Data Format

Data format is used to edit barcode data. When you create a data format, you must select one of the four labels (Format_0, Format_1, Format_2 and Format_3) for your data format, specify the application scope of data format (such as barcode type and data length) and include formatter commands. Multiple data formats may be created using the same label. When scanned data does not match your data format requirements, you will hear the non-match error beep (if the non-match error beep is ON).

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

Programming with Barcodes

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

@SETUPE1

Enter Setup

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

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

Add Data Format

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

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

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

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

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

Step 8: Enter formatter command
Refer to the “Formatter Command Type 6” section in this chapter. Scan the alphanumeric barcodes that represent the command you need to edit data. For example, when a command is F141, you should scan F141.

Step 9: Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix to save your data format.

@SETUPE0

**** Exit Setup**

Example: Program a Format_0 data format using formatter command type 6, Code 128 containing 10 characters applicable, send all characters followed by “A”.

1. Scan the **Enter Setup** barcode	Enter the Setup mode
2. Scan the **Add Data Format** barcode	Add a data format
3. Scan the **0** barcode	Select Format_0 as the label
4. Scan the **6** barcode	Select formatter command type 6
5. Scan the **9** barcode three times	All interface types applicable
6. Scan the barcodes **002**	Only Code 128 applicable
7. Scan the barcodes **0010**	Only a length of 10 characters applicable
8. Scan the alphanumeric barcodes **F141**	Send all characters followed by “A” (HEX: 41)
9. Scan the **Save** barcode	Save the data format

To streamline the programming process, you may as well generate a batch barcode by inputting the command (e.g. **@DFMADD069990020010F141;**) used to create a data format. See the “Use Batch Barcode” section in Chapter 9 to learn how to put a batch barcode into use.

When creating multiple data formats sharing a label, the formats are separated from each other by a vertical bar (|) in the batch command, e.g. **@DFMADD069990029999F141|069990039999F142|169990049999F143;**.

Enter Setup

Programming with Serial Commands

A data format can also be created by serial commands (HEX) sent from the host device. **All commands must be entered in uppercase letters**.

The syntax consists of the following elements:

Prefix: "~<SOH>0000" (HEX: **7E 01 30 30 30 30**), 6 characters.

Storage type: "@" (HEX: **40**) or "#" (HEX: **23**), 1 character. "@" means permanent setting which will not be lost by removing power from the engine or rebooting it; "#" means temporary setting which will be lost by removing power from the engine or rebooting it.

Add Data Format Command: "DFMADD" (HEX: **44 46 4D 41 44 44**), 6 characters.

Data format label: "0" (HEX: **30**) or "1" (HEX: **31**) or "2" (HEX: **32**) or "3" (HEX: **33**), 1 character. "0", "1", "2" and "3" represent Format_0, Format_1, Format_2 and Format_3 respectively.

Formatter command type: "6" (HEX: **36**), 1 character.

Interface type: "999" (HEX: **39 39 39**), 3 characters.

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

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

Formatter commands: The command string used to edit data. For more information, see the "Formatter Command Type 6" section in this chapter.

Suffix: ";<ETX>" (HEX: **3B 03**), 2 characters.

Example: Program a Format_0 data format using formatter command type 6, Code 128 containing 10 characters applicable, send all characters followed by "A".

Enter: **7E 01 30 30 30 30 40 44 46 4D 41 44 44 30 36 39 39 39 30 30 33 39 39 39 39 46 31 34 31 3B 03**
(~<SOH>0000@DFMADD069990020010F141;<ETX>)

Response: **02 01 30 30 30 30 40 44 46 4D 41 44 44 30 36 39 39 39 30 30 33 39 39 39 39 46 31 34 31 06 3B 03**
(<STX><SOH>0000@DFMADD069990020010F141<ACK>;<ETX>)

When creating multiple data formats sharing a label, the formats are separated from each other by a vertical bar (|) in the serial command.
Example: ~<SOH>0000@DFMADD069990020010F141|069990039999F142|069990049999F143;<ETX>

**** Exit Setup**

Enable/Disable Data Formatter

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

Disable Data Formatter

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

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

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

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

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

@SETUPE1

Enter Setup

@DFMENA1

Enable Data Formatter, Required, Keep Prefix/Suffix

@DFMENA2

Enable Data Formatter, Required, Drop Prefix/Suffix

@DFMENA3

Enable Data Formatter, Not Required, Keep Prefix/Suffix

@DFMENA4

Enable Data Formatter, Not Required, Drop Prefix/Suffix

Non-Match Error Beep

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

@DFMTON0

Non-Match Error Beep Off

@DFMTON1

Non-Match Error Beep On

@SETUPE0

**** Exit Setup**

Data Format Selection

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

Format_0

Format_1

Format_2

Format_3

Enter Setup

Change Data Format for a Single Scan

You can switch between data formats for a single scan. The next barcode is scanned using the data format selected here, then reverts to the format you have selected above.

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

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

Single Scan – Format_0

Single Scan – Format_1

Single Scan – Format_2

Single Scan – Format_3

**** Exit Setup**

Clear Data Format

There are two methods to remove data format created from your engine:

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

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

Clear All

Clear One

Query Data Formats

You may scan the appropriate barcode below to get the information of data format(s) created by you or preset by manufacturer. For instance, if you have added Format_0 as per the example in the “Add a Data Format” section in this chapter, scanning the **Query Current Data Formats** barcode, you will get the result: **Data Format0:069990020010F141;**.

Query Current Data Formats

Query Preset Data Formats

@SETUPE1

Enter Setup

Formatter Command Type 6

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

Send Commands

F1 Send all characters

Syntax=F1xx (xx: The insert character’s hex value)
Include in the output message all of the characters from the input message, starting from current cursor position, followed by an insert character.

F2 Send a number of characters

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

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

F2 Example: Send a number of characters

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

Command string: **F2100D**

F2 is the “Send a number of characters” command

10 is the number of characters to send

0D is the hex value for a CR

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

@SETUPE0

**** Exit Setup**

F3 Send all characters up to a particular character

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

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

F3 Example: Send all characters up to a particular character

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

Command string: **F3440D**

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

44 is the hex value for a "D"

0D is the hex value for a CR

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

E9 Send all but the last characters

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

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

F4 Insert a character multiple times

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

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

@SETUPE1

Enter Setup

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

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

Command string: **E908F40902**

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

08 is the number of characters at the end to ignore

F4 is the “Insert a character multiple times” command

09 is the hex value for a horizontal tab

02 is the number of time the tab character is sent

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

B3 Insert symbology name

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

B4 Insert barcode length

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

B3 and B4 Example: Insert the symbology name and length

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

Command string: **B3F42001B4F42001F10D**

B3 is the “Insert symbology name” command

F4 is the “Insert a character multiple times” command

20 is the hex value for a space

01 is the number of time the space character is sent

B4 is the “Insert barcode length” command

F4 is the “Insert a character multiple times” command

20 is the hex value for a space

01 is the number of time the space character is sent

F1 is the “Send all characters” command

0D is the hex value for a CR

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

Move Commands

F5 Move the cursor forward a number of characters

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

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

@SETUPE1

Enter Setup

F5 Example: Move the cursor forward and send the data

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

Command string: **F503F10D**

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

03 is the number of characters to move the cursor

F1 is the “Send all characters” command

0D is the hex value for a CR

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

F6 Move the cursor backward a number of characters

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

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

F7 Move the cursor to the beginning

Syntax＝F7

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

EA Move the cursor to the end

Syntax＝EA

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

@SETUPE0

**** Exit Setup**

Search Commands

F8 Search forward for a character

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

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

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

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

Command string: **F844F10D**

F8 is the "Search forward for a character" command

44 is the hex value for "D"

F1 is the "Send all characters" command

0D is the hex value for a CR

The data is output as: **DEFGHIJ**

<CR>

F9 Search backward for a character

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

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

@SETUPE1

Enter Setup

B0 Search forward for a string

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

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

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

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

Command string: **B00003464748F10D**

B0 is the “Search forward for a string” command

0003 is the string length (3 characters)

46 is the hex value for “F”

47 is the hex value for “G”

48 is the hex value for “H”

F1 is the “Send all characters” command

0D is the hex value for a CR

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

B1 Search backward for a string

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

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

@SETUPE0

**** Exit Setup**

E6 Search forward for a non-matching character

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

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

E6 Example: Remove zeros at the beginning of barcode data

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

Command string: **E630F10D**

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

30 is the hex value for 0

F1 is the "Send all characters" command

0D is the hex value for a CR

The data is output as: **37692**

<CR>

E7 Search backward for a non-matching character

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

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

@SETUPE1

Enter Setup

Miscellaneous Commands

FB Suppress characters

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

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

FB Example: Remove spaces in barcode data

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

Command string: **FB0120F10D**

FB is the “Suppress characters” command

01 is the number of the characters to be suppressed

20 is the hex value for a space

F1 is the “Send all characters” command

0D is the hex value for a CR

The data is output as: **34567890**

<CR>

E4 Replace characters

Syntax＝E4nnxx$_1$xx$_2$yy$_1$yy$_2$…zz$_1$zz$_2$(nn: The total count of the number of characters (characters to be replaced plus replacement characters; xx$_1$: The characters to be replaced, xx$_2$: The replacement characters, continuing through zz$_1$ and zz$_2$)

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

@SETUPE0

**** Exit Setup**

E4 Example: Replace zeros with CRs in barcode data

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

Command string: **E402300DF10D**

E4 is the “Replace characters” command

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

30 is the hex value for 0

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

F1 is the “Send all characters” command

0D is the hex value for a CR

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

@SETUPE1

Enter Setup

BA Replace a string with another

Syntax＝BAnn$NN_1SS_1NN_2SS_2$

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

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

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

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

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

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

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

cd123abc23bc12ab232

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

Command string: **BA0002323303414243F100**

BA is the "Replace a string with another" command

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

02 is the length of the string to be replaced

@SETUPE0

**** Exit Setup**

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

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

03 is the length of the replacement string

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

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

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

F1 is the “Send all characters” command

00 is the hex value for a NUL

The data is output as: **cd1ABCabcABCbc12abABC2**

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

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

Command string: **BA0102323300F100**

BA is the “Replace a string with another” command

01 is the count of replacements to be made

02 is the length of the string to be replaced

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

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

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

F1 is the “Send all characters” command

00 is the hex value for a NUL

The data is output as: **cd1abc23bc12ab232**

Enter Setup

EF Insert a delay

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

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

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

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

Command string: **F20500EF0200E900**

F2 is the “Send a number of characters” command

05 is the number of characters to send

00 is the hex value for a Null character

EF is the “Insert a delay” command

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

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

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

**** Exit Setup**

B5 Insert key strokes

Syntax=B5nnssxx (nn: The number of keys pressed (without key modifiers); ss: the key modifier from the table below; xx: the key number from the “Unicode Key Maps” in Appendix.)

Insert a key stroke or combination of key strokes. Key strokes are dependent on your keyboard (see the “Unicode Key Maps” in Appendix). This command can only be used with USB HID Keyboard.

Key Modifiers	
No Key Modifier	00
Shift Left	01
Shift Right	02
Alt Left	04
Alt Right	08
Control Left	10
Control Right	20

For example, B501001F inserts an “a” on a U.S. style keyboard. B5 = the command, 01 = number of keys pressed (without the key modifier), 00 is No Key Modifier, and 1F is the “a” key. If an “A” were to be inserted, B501011F or B501021F would be entered.

If there are two keystrokes, the syntax would change from Syntax=B5nnssxx for one keystroke to Syntax=B5nnssxxssxx. An example that would insert “aA” is as follows: B502001F011F.

Note: Key modifiers can be added together when needed. Example: Shift Left + Alt Left + Control Left =15.

@SETUPE1

Enter Setup

Chapter 12 Prefix & Suffix

Introduction

A 1D barcode could contain digits, letters, symbols, etc. A 2D barcode could contain more data, such as Chinese characters and other multi-byte characters. However, in real applications, they do not and should not have all information we need, such as barcode type, data acquisition time and delimiter, in order to keep the barcodes short and flexible.

Preffix and suffix are how to fulfill the needs mentioned above. They can be added, removed and modified while the original barcode data remains intact.

Barcode processing procedure:

1. Edit data with Data Formatter
2. Append prefix/suffix
3. Pack data
4. Append terminating character

@SETUPE0

**** Exit Setup**

Global Settings

Enable/Disable All Prefixes/Suffixes

Disable All Prefixes/Suffixes: Transmit barcode data with no prefix/suffix.

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

Disable All Prefixes/Suffixes

Enable All Prefixes/Suffixes

Prefix Sequence

Code ID+ Custom +AIM ID

Custom + Code ID + AIM ID

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. For example, if the custom prefix is “AB” and the barcode data is “123”, the Host will receive “AB123”.

Disable Custom Prefix

Enable Custom Prefix

Set Custom Prefix

To set a custom prefix, scan the **Set Custom Prefix** barcode then the numeric barcodes corresponding to the hexadecimal value of a desired prefix then the **Save** barcode.

Note: A custom prefix cannot exceed 10 characters.

Set Custom Prefix

Set the custom prefix to “CODE” (HEX: 0x43/0x4F/0x44/0x45):

1. Scan the **Enter Setup** barcode.
2. Scan the **Set Custom Prefix** barcode.
3. Scan the numeric barcodes “4”, “3”, “4”, “F”, “4”, “4”, “4” and “5” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Enable Custom Prefix** barcode.
6. Scan the **Exit Setup** barcode.

**** Exit Setup**

AIM ID Prefix

AIM (Automatic Identification Manufacturers) ID defines symbology identifier (For the details, see the “AIM ID Table” section in Appendix). If AIM ID prefix is enabled, the engine will add the symbology identifier before the scanned data after decoding.

Disable AIM ID Prefix

Enable AIM ID Prefix

AIM ID is not user programmable.

Enter Setup

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.

Disable Code ID Prefix

Enable Code ID Prefix

Restore All Default Code IDs

For the information of default Code IDs, see the “Code ID Table” section in Appendix.

Restore All Default Code IDs

**** Exit Setup**

Modify Code ID

See the examples below to learn how to modify a Code ID and restore the default Code IDs of all symbologies.

Modify PDF417 Code ID to be “p” (HEX: 0x70):

1. Scan the **Enter Setup** barcode.
2. Scan the **Modify PDF417 Code ID** barcode.
3. Scan the numeric barcodes “7” and “0” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Exit Setup** barcode.

Restore the default Code IDs of all symbologies:

1. Scan the **Enter Setup** barcode.
2. Scan the **Restore All Default Code IDs** barcode**.**
3. Scan the **Exit Setup** barcode.

@SETUPE1

Enter Setup

1D symbologies:

@CID002

Modify Code 128 Code ID

@CID003

Modify GS1-128 Code ID

@CID004

Modify EAN-8 Code ID

@CID005

Modify EAN-13 Code ID

@CID006

Modify UPC-E Code ID

@CID007

Modify UPC-A Code ID

@CID008

Modify Interleaved 2 of 5 Code ID

@SETUPE0

**** Exit Setup**

Modify ITF-14 Code ID

Modify ITF-6 Code ID

Modify Matrix 2 of 5 Code ID

Modify Code 39 Code ID

Modify Codabar Code ID

Modify Code 93 Code ID

Modify AIM 128 Code ID

@SETUPE1

Enter Setup

@CID023

Modify ISSN Code ID

@CID024

Modify ISBN Code ID

@CID025

Modify Industrial 25 Code ID

@CID026

Modify Standard 25 Code ID

@CID027

Modify Plessey Code ID

@CID028

Modify Code 11 Code ID

@CID029

Modify MSI-Plessy Code ID

@CID031

Modify GS1 Databar Code ID

@SETUPE0

**** Exit Setup**

2D symbologies:

Modify PDF417 Code ID

Modify QR Code ID

Modify Aztec Code ID

Modify Data Matrix Code ID

Modify Micro QR Code ID

@SETUPE1

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. For example, if the custom suffix is “AB” and the barcode data is “123”, the Host will receive “123AB”.

@CSUENA0

Disable Custom Suffix

@CSUENA1

Enable Custom Suffix

Set Custom Suffix

To set a custom suffix, scan the **Set Custom Suffix** barcode then the numeric barcodes corresponding to the hexadecimal value of a desired suffix then the **Save** barcode.

Note: A custom suffix cannot exceed 10 characters.

@CSUSET

Set Custom Suffix

Set the custom suffix to “CODE” (HEX: 0x43/0x4F/0x44/0x45):

1. Scan the **Enter Setup** barcode.
2. Scan the **Set Custom Suffix** barcode.
3. Scan the numeric barcodes “4”, “3”, “4”, “F”, “4”, “4”, “4” and “5” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Enable Custom Suffix** barcode.
6. Scan the **Exit Setup** barcode.

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

  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.

Enter Setup

Disable Data Packing

Enable Data Packing, Format 1

Enable Data Packing, Format 2

**** Exit Setup**

Terminating Character Suffix

Enable/Disable Terminating Character Suffix

A terminating character such as carriage return (CR) or carriage return/line feed pair (CRLF) can only be used to mark the end of data, which means nothing can be added after it.

Disable Terminating Character Suffix

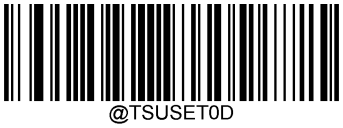
Enable Terminating Character Suffix

Set Terminating Character Suffix

To set a terminating character suffix, scan the **Set Terminating Character Suffix** barcode then the numeric barcodes corresponding to the hexadecimal value of a desired terminating character then the **Save** barcode.

Note: A terminating character suffix cannot exceed 2 characters.

Set Terminating Character Suffix



Set Terminating Character to CR (0x0D)

Set Terminating Character to CRLF (0x0D,0x0A)

@SETUPE1

Enter Setup

Set the terminating character suffix to 0x0A:

1. Scan the **Enter Setup** barcode.
2. Scan the **Set Terminating Character Suffix** barcode.
3. Scan the numeric barcodes “0” and “A” from the “Digit Barcodes” section in Appendix.
4. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.
5. Scan the **Enable Terminating Character Suffix** barcode.
6. Scan the **Exit Setup** barcode.

@SETUPE0

**** Exit Setup**

Chapter 13 Programming Commands

Use of Programming Command

Besides the barcode programming method, the scanner can also be configured by serial commands (HEX) sent from the host device. **All commands must be entered in uppercase letters**.

Command Syntax

Prefix StorageType Tag SubTag {Data} [,SubTag {Data}] [;Tag SubTag {Data}] […] Suffix

Prefix: "~<SOH>0000" (HEX: **7E 01 30 30 30 30**), 6 characters.

StorageType: "@" (HEX: **40**) or "#" (HEX: **23**), 1 character. "@" means permanent setting which will not be lost by removing power from the scanner or rebooting it; "#" means temporary setting which will be lost by removing power from the scanner or rebooting it.

Tag: A 3-character case-sensitive field that identifies the desired command group. For example, all USB HID Keyboard configuration settings are identified with a Tag of KBW.

SubTag: A 3-character case-sensitive field that identifies the desired parameter within the tag group. For example, the SubTag for the keyboard layout is CTY.

Data: The value for a feature or parameter setting, identified by the Tag and SubTag.

Suffix: ";<ETX>" (HEX: **3B 03**), 2 characters.

Multiple commands can be issued within one Prefix/Suffix sequence. For configuration commands, only the **Tag**, **SubTag**, and **Data** fields must be repeated for each command in sequence. If an additional command is to be applied to the same Tag, then the command is separated with a comma (,) and only the **SubTag** and **Data** fields of the additional commands are issued. If the additional command requires a different **Tag** field, the command is separated from previous command by a semicolon (;).

Query Commands

For query commands, the entry in the **Data** field in the syntax above is one of the following characters means:

* (HEX: **2A**) What is the scanner's current value for the setting(s).

& (HEX: **26**) What is the factory default value for the setting(s).


@SETUPE1

Enter Setup

^ (HEX: **5E**) What is the range of possible values for the setting(s).

The value of the **StoreType** field in a query command can be either "@" (HEX: **40**) or "#" (HEX: **23**).

A query command with the **SubTag** field omitted means to query all the settings concerning a tag. For example, to query all the current settings about Code 11, you should enter **7E 01 30 30 30 30 40 43 31 31 2A 3B 03** (i.e. ~<SOH>0000@C11*;<ETX>).

Responses

Different from command sequence, the prefix of a response consists of the six characters of "<STX><SOH>0000" (HEX: **02 01 30 30 30 30**).

The scanner responds to serial commands with one of the following three responses:

<ACK> (HEX: **06**) Indicates a good command which has been processed.

<NAK> (HEX: **15**) Indicates a good configuration command with its **Data** field entry out of the allowable range for this Tag and SubTag combination (e.g. an entry for an inter-keystroke delay of 100 when the field will only allow 2 digits), or an invalid query command.

<ENQ> (HEX: **05**) Indicates an invalid Tag or SubTag command.

When responding, the scanner echoes back the command sequence with the status character above inserted directly before each of the punctuation marks (the comma or semicolon) in the command.

Examples

Example 1: Enable Code 11, set the minimum and maximum lengths to 12 and 22 respectively.

Enter: **7E 01 30 30 30 30 40 43 31 31 45 4E 41 31 2C 4D 49 4E 31 32 2C 4D 41 58 32 32 3B 03**
(~<SOH>0000@C11ENA1,MIN12,MAX22;<ETX>)

Response: **02 01 30 30 30 30 40 43 31 31 45 4E 41 31 06 2C 4D 49 4E 31 32 06 2C 4D 41 58 32 32 06 3B 03**
(<STX><SOH>0000@C11ENA1<ACK>,MIN12<ACK>,MAX22<ACK>;<ETX>)

Example 2: Query the current minimum and maximum lengths of Code 11.

Enter: **7E 01 30 30 30 30 40 43 31 31 4D 49 4E 2A 2C 4D 41 58 2A 3B 03**
(~<SOH>0000@C11MIN*,MAX*;<ETX>)

Response: **02 01 30 30 30 30 40 43 31 31 4D 49 4E 31 32 06 2C 4D 41 58 32 32 06 3B 03**
(<STX><SOH>0000@C11MIN12<ACK>,MAX22<ACK>;<ETX>)


@SETUPE0

**** Exit Setup**

Read Barcode On/Off

Sending the Read Barcode Off command **~<SOH>0000#SCNENA0;<ETX>** to the engine can disable it from reading barcode, and the engine is unable to scan barcode unless you send the Read Barcode On command **~<SOH>0000#SCNENA1;<ETX>** to it or power cycle it. By default, Read Barcode is On.

Make a Beeping Sound

You may wish to force the engine to beep upon a command sent from the host. A beeping sound is made to gain a user's attention to an error or other important event.

BEEPONxxxFyyyTnnV (xxx: The desired frequency, 1-20,000Hz; yyy: The desired duration, 1-10,000ms; nn: The desired volume level, 1-20 (lowest-loudest))

Example: Make a 50ms beep at 2,000Hz with volume level set to 20

Enter: ~<SOH>0000#BEEPON2000F50T20V;<ETX>

Response: <STX><SOH>0000#BEEPON2000F50T20V<ACK>;<ETX>

Turn On Good Read LED

You may turn on the external Good Read LED of the engine for a certain period of time with a command sent from the host. Note that the engine **cannot** scan barcodes when it is executing this command. The duration is from 10 to 10000ms.

Command for querying whether the engine supports this feature: LEDONS* or LEDONS&
Returning LEDONS<ACK> indicates the engine supports this feature.

Command for querying the range of possible values for the setting: LEDONS^
Returning LEDONS**-2**C**10-10000**D <ACK> indicates the range for the length of time the LED stays lit is 10-10000ms.

Example: Turn on the Good Read LED for 1,000ms

Enter: ~<SOH>0000#LEDONS2C1000D;<ETX>
Response: <STX><SOH>0000#LEDONS2C1000D<ACK>;<ETX>

Enter Setup

Turn On Illumination LED

You may turn on the internal illumination LED on the engine for a certain period of time with a command sent from the host. Note that the engine **cannot** scan barcodes when it is executing this command. The duration is from 10 to 10000ms.

Command for querying whether the engine supports this feature: LEDONI* or LEDONI&
Returning LEDONI<ACK> indicates the engine supports this feature.

Command for querying the range of possible values for the setting: LEDONI^
Returning LEDONI**-0**C**10-10000**D <ACK> indicates the range for the length of time the LED stays lit is 10-10000ms.

Example: Turn on the illumination LED for 1,000ms

Enter: ~<SOH>0000#LEDONI0C1000D;<ETX>
Response: <STX><SOH>0000#LEDONI0C1000D<ACK>;<ETX>

**** Exit Setup**

Chapter 14 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**, **Sense Mode**, **Decode Session Timeout** = 2s:

1. Input the commands:

   @ILLSCN2;SCNMOD2;ORTSET2000;

2. Generate a batch barcode.

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

@BATCHS

Enable Batch Barcode

@SETUPE1

Enter Setup

Create a Batch Command

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

For more information, refer to the “Use of Programming Command” section in Chapter 3.

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:

   @ILLSCN2;SCNMOD2;ORTSET2000;

2. Generate a PDF417 batch barcode.

@SETUPE0

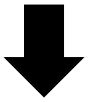
**** Exit Setup**

Use Batch Barcode

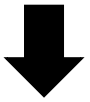
To put a batch barcode into use, scan the following barcodes. (Use the example above.)

Enter Setup

Enable Batch Barcode



Batch Barcode



Exit Setup

Appendix

Digit Barcodes

0~9

0

1

2

3

4

5

6

7

8

9

A~F

A

B

C

D

E

F

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.

Save

Cancel

Delete the Last Digit

Delete All Digits

Factory Defaults Table (ST.G01.1)

Parameter	Factory Default	Remark
System Settings		
Barcode Programming	Disabled (Exit Setup)	
Programming Barcode Data	Do not transmit	
Scan Mode	Level Mode	
Decode Session Timeout	3000ms	1-3,600,000ms; 0: Infinite
Image Stabilization Timeout (Sense Mode)	500ms	0-3,000ms
Image Change Trigger Sensitivity	6	
Scanning Interval	0	
Reread Timeout	Disabled, 50ms	1-3,600,000ms
Reread Timeout Reset	Off	
Good Read Delay	Disabled, 500ms	1-3,600,000ms
Scanning Preference	Normal Mode	
Image Flipping	Do Not Flip	
Bad Read Message	Off	
	NG	1-7 characters
Trigger Commands	Disabled	
Start Scanning Command	<SOH> T <EOT>	
Stop Scanning Command	<SOH> P <EOT>	
Illumination	Normal	
External Illumination	Off	
Aiming	On	
Good Read LED	On	
Good Read LED Duration	20ms	
Power On Beep	On	
Good Read Beep	On	
Good Read Beep Duration	Medium (80ms)	
Good Read Beep Frequency	Medium (2730Hz)	
Good Read Beep Volume	Loud	
Auto Sleep	Disabled	
Time Period from Idle to Sleep	3s	
Default Interface	USB CDC	
RS-232 Interface		

Baud Rate	9600	
Parity Check	None	
Data Bits	8	
Stop Bits	1	
USB Interface		
USB Country Keyboard	US keyboard	USB HID Keyboard
Beep on Unknown Character	Off	USB HID Keyboard
Emulate ALT+Keypad	Off	USB HID Keyboard
Code Page	Code Page 1252 (West European Latin)	USB HID Keyboard
Unicode Encoding	Off	USB HID Keyboard
Emulate Keypad with Leading Zero	On	USB HID Keyboard
Function Key Mapping	Disable	USB HID Keyboard
Inter-Keystroke Delay	No Delay	USB HID Keyboard
Caps Lock	Caps Lock OFF, non-Japanese Keyboard	USB HID Keyboard
Convert Case	No Case Conversion	USB HID Keyboard
Emulate Numeric Keypad 1	Off	USB HID Keyboard
Emulate Numeric Keypad 2	Off	USB HID Keyboard
Fast Mode	Off	USB HID Keyboard
Polling Rate	4ms	USB HID Keyboard
Adaptive Wired Communication	On	
Symbologies		
Global Settings		
1D Twin Code	Single 1D Code Only	
Surround GS1 AI’s with Parentheses	Do Not Surround GS1 AI’s with Parentheses	
Code 128		
Code 128	Enabled	
Maximum Length	48	
Minimum Length	1	
Check Character	Do Not Transmit	
FNC1 Output	On	
EAN-8		
EAN-8	Enabled	
Check Character	Transmit	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	

Add-On Code	Not Required	
Convert EAN-8 to EAN-13	Disabled	
EAN-13		
EAN-13	Enabled	
Check Character	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	
UPC-E		
UPC-E	Enabled	
Check Character	Transmit	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
Add-On Code	Not Required	
Transmit Preamble Character	System Character	
Convert UPC-E to UPC-A	Disabled	
UPC-A		
UPC-A	Enabled	
Check Character	Transmit	
2-Digit Add-On Code	Disabled	
5-Digit Add-On Code	Disabled	
Add-On Code	Not Required	
Transmit Preamble Character	System Character	
Interleaved 2 of 5		
Interleaved 2 of 5	Enabled	

Maximum Length	80	
Minimum Length	6	No less than 4
Check Character Verification	Disabled	
Febraban		
Febraban	Disabled	
Transmit Delay per Character	Disabled	
	70ms	
Transmit Delay per 12 Characters	Disabled	
	500ms	
ITF-14		
ITF-14	Disabled	
ITF-6		
ITF-6	Disabled	
Matrix 2 of 5		
Matrix 2 of 5	Enabled	
Maximum Length	80	
Minimum Length	4	No less than 4
Check Character Verification	Disabled	
Code 39		
Code 39	Enabled	
Maximum Length	48	
Minimum Length	1	
Check Character Verification	Disabled	
Start/Stop Character	Do not transmit	
Code 39 Full ASCII	Disabled	
Code 32 Pharmaceutical (PARAF)	Disabled	
Code 32 Prefix	Disabled	
Code 32 Start/Stop Character	Do not transmit	
Code 32 Check Character	Do not transmit	
Codabar		
Codabar	Enabled	
Maximum Length	60	
Minimum Length	2	
Check Character Verification	Disabled	
Start/Stop Character	Do not transmit	

	ABCD/ABCD	
Code 93		
Code 93	Disabled	
Maximum Length	48	
Minimum Length	1	No less than 1
Check Character Verification	Do Not Transmit Check Character After Verification	
GS1-128 (UCC/EAN-128)		
GS1-128	Enabled	
Maximum Length	48	
Minimum Length	1	
Check Character	Do Not Transmit	
FNC1 Output	On	
GS1 Databar		
GS1 Databar	Disabled	
Application Identifier “01”	Transmit	
Code 11		
Code 11	Disabled	
Maximum Length	48	
Minimum Length	4	No less than 4
Check Character Verification	Disabled	
Check Character	Transmit	
ISBN		
ISBN	Enabled	
Set ISBN Format	ISBN-10	
ISSN		
ISSN	Disabled	
Industrial 25		
Industrial 25	Disabled	
Maximum Length	48	
Minimum Length	6	No less than 4
Check Character Verification	Disabled	
Standard 25		
Standard 25	Disabled	
Maximum Length	48	

Minimum Length	6	No less than 4
Check Character Verification	Disabled	
Plessey		
Plessey	Disabled	
Maximum Length	48	
Minimum Length	4	No less than 4
Check Character Verification	Disabled	
MSI-Plessey		
MSI-Plessey	Disabled	
Maximum Length	48	
Minimum Length	4	No less than 4
Check Character Verification	One Check Character, MOD10	
Check Character	Transmit	
AIM 128		
AIM 128	Disabled	
Maximum Length	48	
Minimum Length	1	
Check Character	Do Not Transmit	
FNC1 Output	On	
PDF417		
PDF417	Enabled	
Maximum Length	6144	
Minimum Length	1	
PDF417 Twin Code	Single PDF417 Only	
Character Encoding	Default Character Encoding	
PDF417 ECI Output	Enabled	
QR Code		
QR Code	Enabled	
Maximum Length	6144	
Minimum Length	1	
QR Twin Code	Single QR Only	
Character Encoding	Default Character Encoding	
QR ECI Output	Enabled	
URL QR	Enabled	
Micro QR Code		

Micro QR	Enabled	
Maximum Length	6144	
Minimum Length	1	
Aztec		
Aztec Code	Disabled	
Maximum Length	6144	
Minimum Length	1	
Character Encoding	Default Character Encoding	
Aztec ECI Output	Enabled	
Data Matrix		
Data Matrix	Enabled	
Maximum Length	6144	
Minimum Length	1	
Data Matrix Twin Code	Single Data Matrix Only	
Rectangular Barcode	Enabled	
Character Encoding	Default Character Encoding	
Data Matrix ECI Output	Enabled	
Data Formatter		
Data Formatter	Disabled	
Non-Match Error Beep	Off	
Data Format Selection	Format_0	
Prefix & Suffix		
All Prefixes/Suffixes	Disabled	
Prefix Sequence	Code ID+ Custom+ AIM ID	
Custom Prefix	Disabled	
AIM ID Prefix	Disabled	
Code ID Prefix	Disabled	
Custom Suffix	Disabled	
Data Packing	Disable Data Packing	
Terminating Character Suffix	Disabled	

AIM ID Table(V2022.6)

Symbology	AIM ID	Possible AIM ID Modifiers (m)
Code 128	]C0	
GS1-128 (UCC/EAN-128)	]C1	
EAN-8	]E4	
EAN-13	]E0	
EAN-13 with Addon	]E3	
UPC-E	]E0	
UPC-E with Addon	]E3	
UPC-A	]E0	
UPC-A with Addon	]E3	
Interleaved 2 of 5	]Im	0，1，3
ITF-14	]Im	1，3
ITF-6	]Im	1，3
Matrix 2 of 5	]X0	
Code 39	]Am	0，1，3，4，5，7
Codabar	]Fm	0，2，4
Code 93	]G0	
AIM 128	]C2	
ISSN	]X0	
ISBN	]X0，]E0，]E3	
Industrial 25	]S0	
Standard 25	]Rm	0，1，3
Plessey	]P0	
Code 11	]Hm	0，1，3
MSI Plessey	]Mm	0，1
GS1 Databar(RSS）	]e0	
PDF417	]Lm	0-5
QR Code	]Qm	0-6
Aztec	]zm	0-9， A-C
Data Matrix	]dm	0-6
Micro QR	]Qm	0-6

Code ID Table(V1.00.0)

Symbology	Code ID
Code 128	j
GS1-128 (UCC/EAN-128)	j
EAN-8	d
EAN-13	d
UPC-E	c
UPC-A	c
Interleaved 2 of 5, Febraban	e
ITF-14	e
ITF-6	e
Matrix 2 of 5	v
Code 39	b
Codabar	a
Code 93	i
AIM 128	X
ISSN	g
ISBN	B
Industrial 25	I
Standard 25	f
Plessey	n
Code 11	H
MSI Plessey	m
GS1 Databar (RSS)	R
PDF417	r
QR Code	s
Aztec	z
Data Matrix	u
Micro QR	X

Symbology ID Number(V1.00.0)

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, Febraban	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
Micro QR	043

ASCII Table

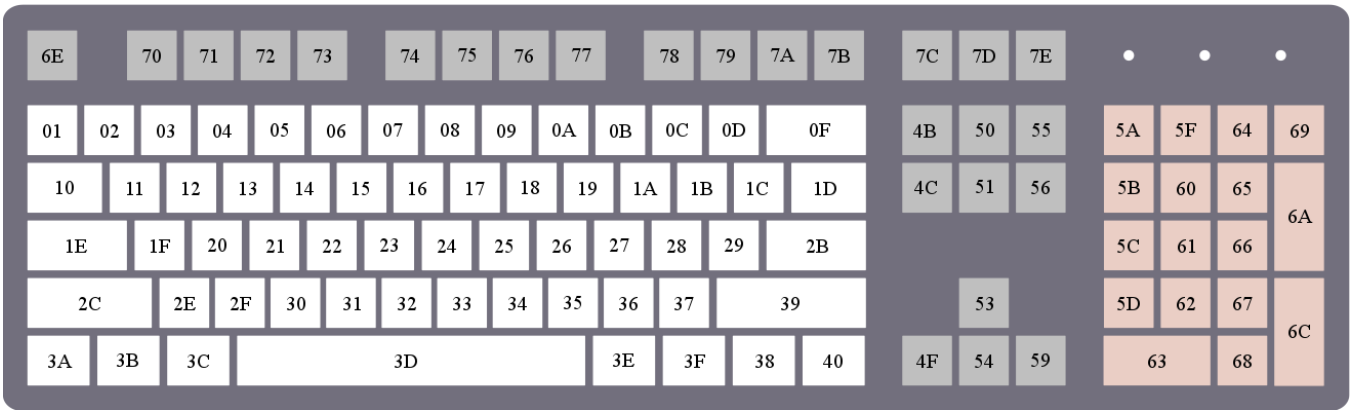
Hex	Dec	Char
00	0	NUL (Null char.)
01	1	SOH (Start of Header)
02	2	STX (Start of Text)
03	3	ETX (End of Text)
04	4	EOT (End of Transmission)
05	5	ENQ (Enquiry)
06	6	ACK (Acknowledgment)
07	7	BEL (Bell)
08	8	BS (Backspace)
09	9	HT (Horizontal Tab)
0a	10	LF (Line Feed)
0b	11	VT (Vertical Tab)
0c	12	FF (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)

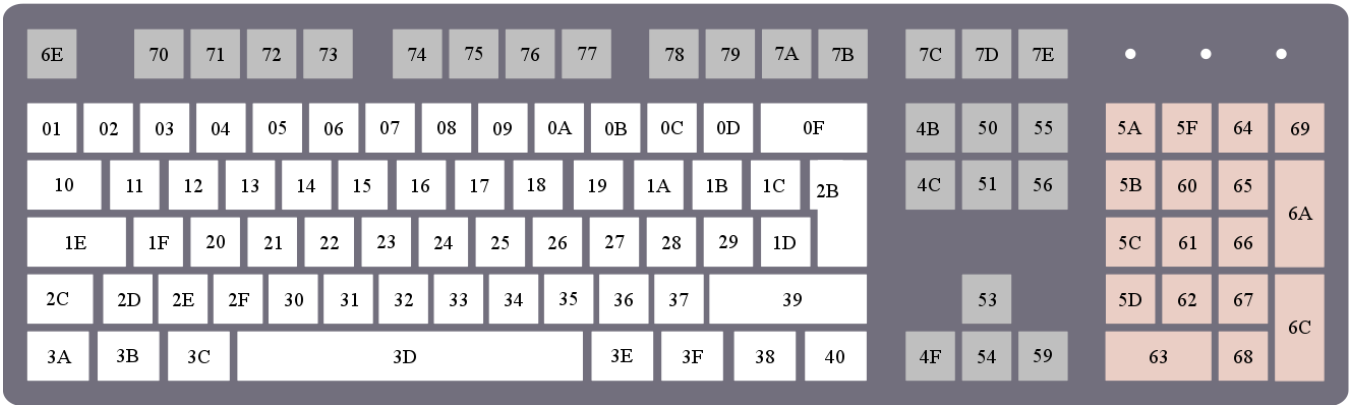
Hex	Dec	Char
3e	62	> (Greater Than)
3f	63	? (Question Mark)
40	64	@ (AT Symbol)
41	65	A
42	66	B
43	67	C
44	68	D
45	69	E
46	70	F
47	71	G
48	72	H
49	73	I
4a	74	J
4b	75	K
4c	76	L
4d	77	M
4e	78	N
4f	79	O
50	80	P
51	81	Q
52	82	R
53	83	S
54	84	T
55	85	U
56	86	V
57	87	W
58	88	X
59	89	Y
5a	90	Z
5b	91	[(Left/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

Keyboard Key References



104 Key U.S. Style Keyboard



105 Key European Style Keyboard

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