

EM2028
Embedded 2D Barcode
Scan Engine



Revisions

Version	Description	Date
V 1.0	Support as from EM2028 firmware Version 3.06.021 and higher.	20100906
V 1.1.1	Renew idle current form 78mA to 115mA.	20110104
V 1.1.2	Add warning :Do not connect a flexible cable to or disconnect a flexible cable from the host interface connector when power is present on the flexible cable.	20110113
V 1.1.3	Renew "ASCII Function Key Mapping Table" of "USB HID-KBW", Correct the setting code of "Enable Reading All 2D ", Correct "EVK2028 Signal Map" L3 and L5 form 0.47uF to 0.47uH	20110701
V 1.1.4	Modify the description for the introduction of Chapter "USB Interface" and also the picture in "USB HID-KBW" .	20110713
V 1.1.5	Add an "ASCII Table" in <i>Appendix</i>	20110905
V 1.1.6	Modify the PIN Definition of Interface J2.	20111025
V1.1.7	Add Window Size Diagram	20130107
V1.1.8	Modify the EVK2028 Signal Map	20130131



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About this guide

Introduction

This User Guide provides installation and programming instructions for the NLS-EM2028 (“EM2028”). Product specification and dimensions are also included.

Chapter Description

About EM2028: The chapter of About EM2028 gives a brief description of the EM2028. It covers the general, overall specifications of the EM2028.

Mechanical Interface: The chapter of Mechanical Interface describes the mechanical interface of the EM2028. It includes the dimensions and locations of EM2028 mechanical components.

Electrical Interface: The chapter of Electrical Interface describes the electrical interface of the EM2028. It mainly explains the EM2028 interface socket and flexible cable. Samples of schematics are also included.

Development Tools: The chapter of EM2028 Development Tools lists the development tools and brief descriptions of the tools.

Programming The Engine:The chapter of Configuration lists all the configurations of EM2028. The configuration can be done through pre-printed configuration barcodes, serial port commands, and/or Quickset, a Newland software package.

Graphic Notations



Tool – Handy item for a task.



Attention – Important subject to be aware of or to avoid.



Tips – Helpful information about a topic or a feature.



Example – Illustration of how to use a feature.



About this guide

Newland Auto-ID Support Center

If you have a problem with your equipment, contact the Newland Support Center in your region. Before calling, have the model number, serial number, and several of your barcodes at hand.

Call the support Center from a phone near the scanning equipment so that the service person can try to talk you through your problem. If the equipment is found to be working properly and the problem is barcode readability, the Support Center will request samples of your bar codes for analysis at our plant.

If your problem cannot be solved over the phone, you may need to return your equipment for servicing. If that is necessary, you will be given specific directions.

Note: Newland Auto-ID Tech. is not responsible for any damages incurred during shipment.

For service information, warranty information or technical assistance contact or call the Support Center listed below. For the latest service information go to <http://www.nlscan.com/en>

If you purchased your Newland product from a Newland Business Partner, contact that Business Partner for Service.





About EM2028

Introduction

EM2028 is an embedded barcode reading engine. Its gray scale CMOS image capturer and the Newland patented **UIMG**, a Computerized Image Recognition System, ensure the fast scanning and decoding accuracy on different barcode media such as paper, plastic card, and metal surface. It can be easily integrated into OEM equipments or systems (hand-held, portable, and mounted) to provide solutions for image capture, barcode reading, and barcode message processing.

EM2028 opens its image acquisition interface and camera control to OEM developers to allow their special integration needs. EM2028 Software Development Kit is provided for easy and quick development of OEM applications.

Highlights of the EM2028

- » Slim size allowing easy embedding into OEM equipments and systems.
- » Outstanding decoding performance for major 1D and 2D barcodes.
- » High performance CPU and image capture module ensuring fast and accurate scans.
- » Easy OEM software development and firmware upgrade.





Unpacking

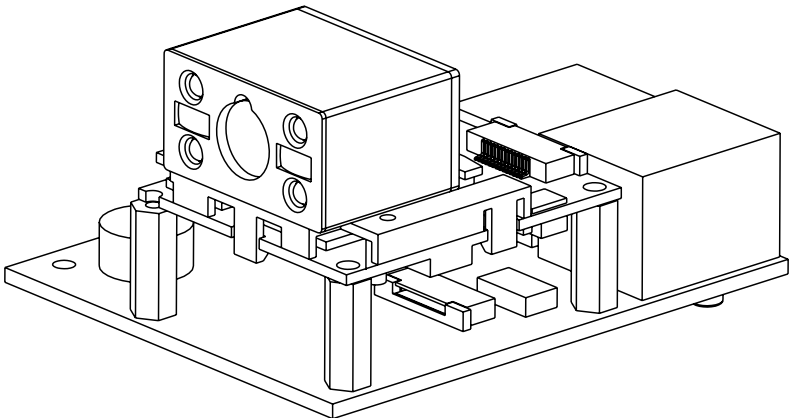
Remove EM2028 and accessories from the package. Check for missing parts and inspect for damage. EM2028 is packed in anti-static bag. Please handle accordingly.



If there is any damage or missing parts, please contact your supplier at once. Keep the original package for return services, if necessary.

Outline of EM2028

The outline of EM2028 is shown below. In the picture EM2028 is equipped in EVK2028.

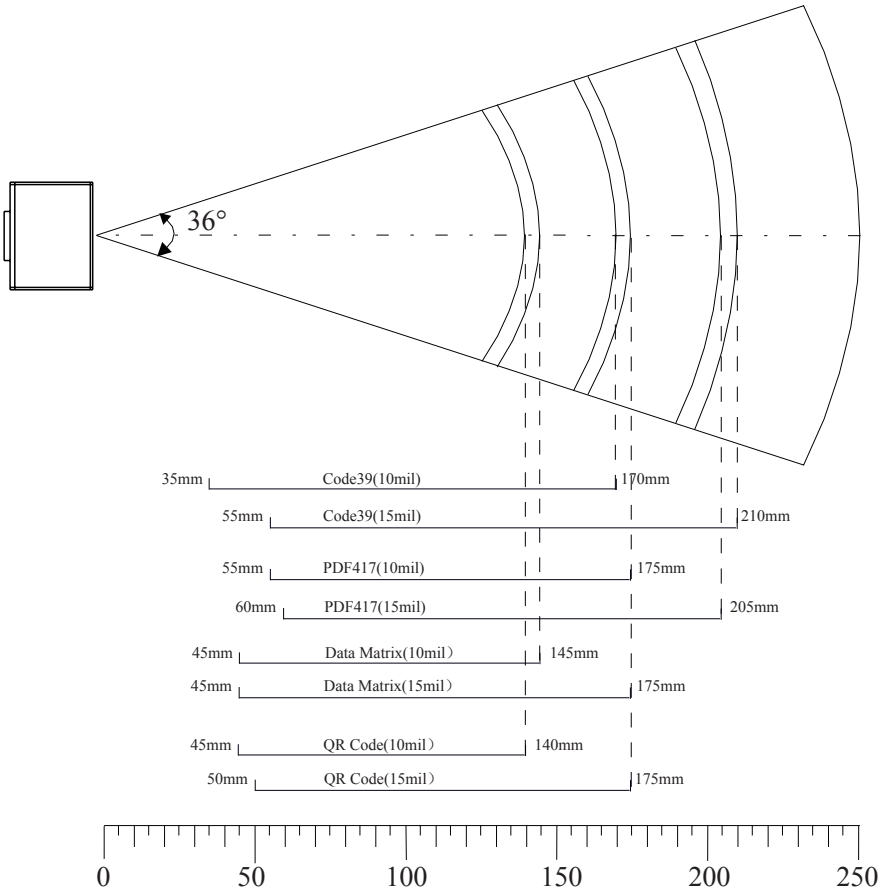


EM2028 (with EVK2028)





The view angle of the camera is 36° . Following figure shows the fields of the view at different distances.





Performance

Image Sensor		752*480 CMOS
Illumination		Red LED 625 ± 10 nm
Symbols	2D	PDF417, QR Code, Data Matrix, Chinese Sensible Code, Aztec Code, Maxicode, MicroPDF417*, etc.
	1D	Code128, EAN-13, EAN-8, Code39, UPC-A, UPC-E, Codabar, Interleaved 2 of 5, ITF-6, ITF-14, ISBN, Code 93, UCC/EAN-128, GS1 Databar, GS1 Composite Code, Matrix 2 of 5, Code11, Industrial 25, Standard 25, Plessey, MSI-Plessey, etc.
	OCR*	ID cards, passports.
Precision		≥ 5mil
	Code 39	35mm~170mm (10mil); 55mm~210mm(15mil)
Depth of Field	PDF417	55mm~175mm(10mil); 60mm~205mm(15mil)
	Data Matrix	45mm~145mm(10mil); 45mm~175mm(15mil)
	QR	45mm~140mm(10mil); 50mm~175mm(15mil)
Symbol Contrast		≥ 25%
Scan Angle**		Roll: 360° ; Pitch: ± 50° ; Skew: ± 50°
Field of View		Horizontal 36° ; Vertical 23°

Mechanical/Electrical

Interface		RS232/TTL232, USB (HID-KBW, DataPipe, USB COM Emulation, HID-POS)
Operating Voltage		5.0 ± 10% VDC
Current@5VDC	Operating Current	400mA
	Idle Current	115mA
	Standby Current	18mA
	Low Power	< 1.3mA
Dimensions		30.0(W) *35.0(D)*19.0(H) mm
Weight		14g

Environmental

Operating Temperature		-20°C - +45°C
Storage Temperature		-40°C - +60°C
Humidity		5% - 95% (non-condensing)
Ambient Illumination		0 ~ 100,000 LUX

Certificates

FCC Part15 Class B, CE EMC Class B

*Standard EM2028 does not support Micro PDF417 or OCR, whereas customized EM2028 supports both.

**Test Conditions:

Code39: 3 Bytes; Resolution = 10mil; W:N = 3:1 ; PCS = 0.8 ; Barcode Height = 11mm;

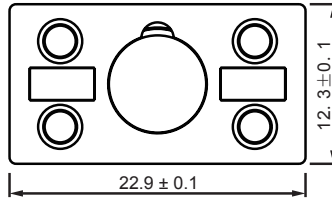
Scan Distance = 120mm; T=23° C; Illumination = 200 LUX





EM2028 Sensor Front View

Following figure 1 shows the dimensions of EM2028 sensor . The figure EM2028 Sensor Front View has the width and height dimensions. The height of the EM2028 sensor is from the bottom of EM2028 sensor to the top of highest component on the topside.

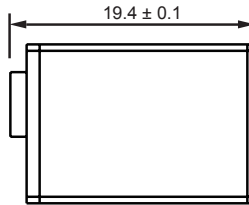


Unit: mm

Figure 1. EM2028 Front View

EM2028 Sensor Left Side View

The figure 2 EM2028 Sensor Left Side View has the length dimensions.

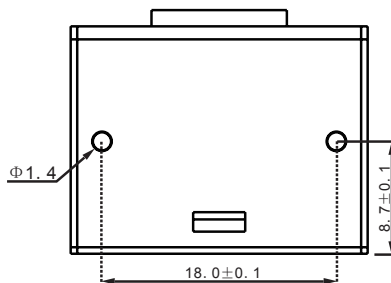


Unit: mm

Figure 2. EM2028 Left Side View

EM2028 Sensor Bottom View

The figure 3 EM2028 Sensor Bottom View has the mounting screw specifications. The mounting screw is M1.4, 1.4 mm screw. The length of the screw into EM2028 must be less than 2 mm.



Unit: mm

Figure 3. EM2028 Bottom View



EM2028 Top View

Following figure 4 shows the dimensions of EM2028 decode board. The figure EM2028 Top View has the width and height dimensions.

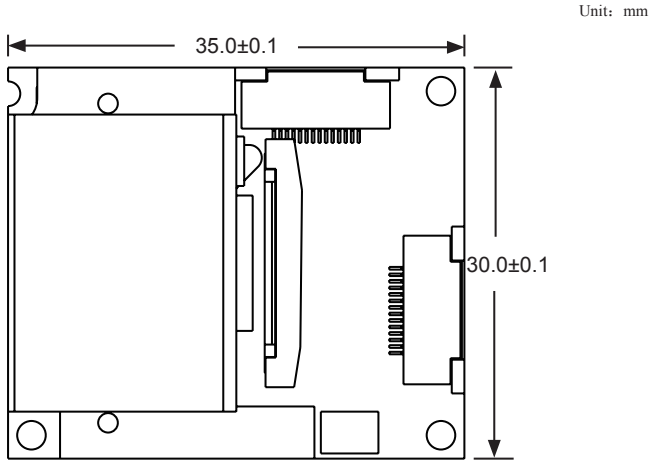


Figure 4. EM2028 Top View

EM2028 Left Side View

The figure 5 EM2028 Left Side View has the height dimensions of decode board and EM2028. The height of EM2028 is from the bottom to the top of highest component on the topside.

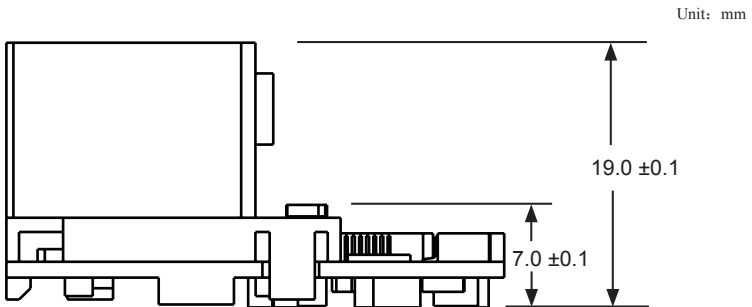


Figure 5. EM2028 Left Side View





Interface Socket

EM2028 uses a 14PIN flexible cable to interface with external device (Host), such as EVK2028, the EM2028 Evaluation Kit. Figure 6 below shows the outline of EM2028 decode board.

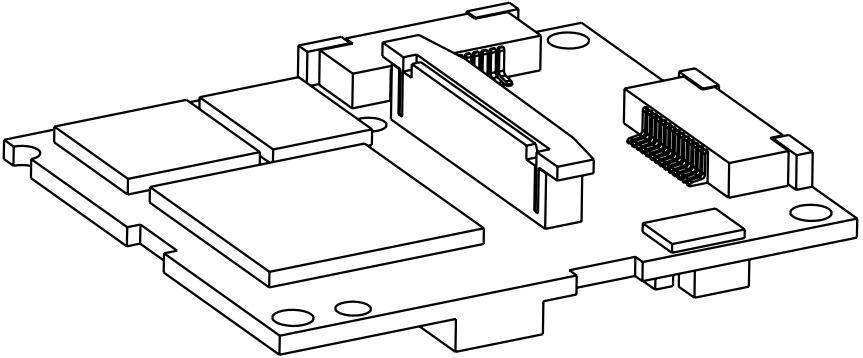
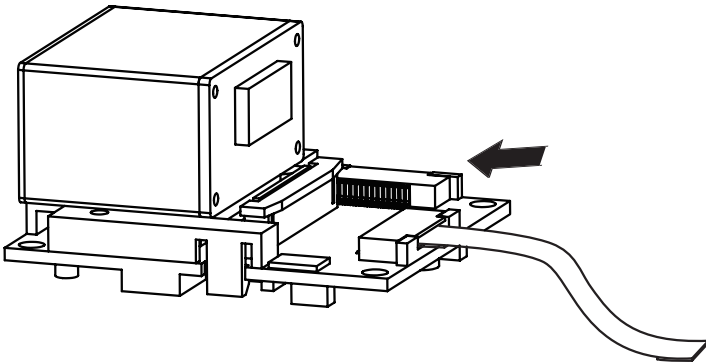


Figure 6. EM2028 Decode Board

Interface Cable

A flexible cable is needed when using EM2028. The 14-Pins end connects to the EM2028 interface socket. The other end connects to external device. Figure below shows how the sample cable is connected to the interface socket.

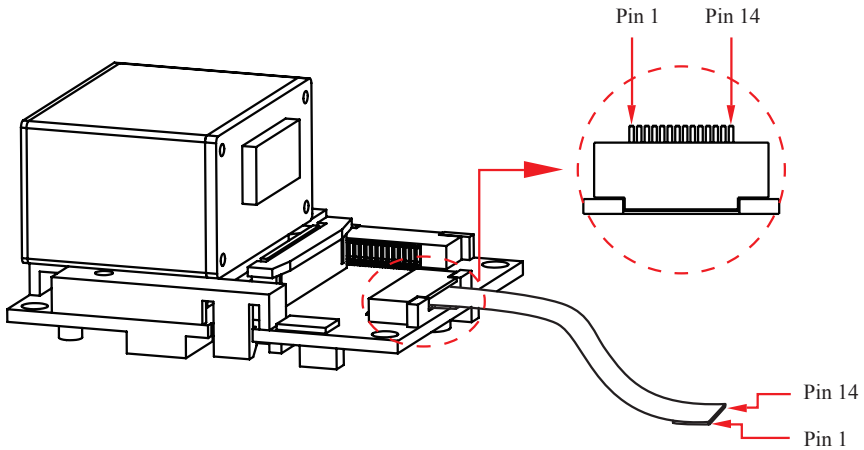


Warning! Do not connect a flexible cable to or disconnect a flexible cable from the host interface connector when power is present on the flexible cable. This could damage the engine.





14PIN Interface Socket Pin Assignment and Definition



Pin	Name	Function
Pin 1	RTS(O)	Request Sending/ Reserved (GPIO available as per order)
Pin 2	CTS(I)	Enable Sending/ Reserved (GPIO available as per order)
Pin 3	VI	DC 5V
Pin 4	GND	Ground
Pin 5	D-	USB Signal
Pin 6	TXD(O)	RS232/CMOS Transmission (Optional, RS232 by default)
Pin 7	D+	USB Signal
Pin 8	RXD (I)	RS232/CMOS Receiving (Optional, RS232 by default)
Pin 9	State(OC)	Power Indicator
Pin 10	BUZ(OC)	Beeper Output
Pin 11	LED2(OC)	Indicator Open Collector Gate Output
Pin 12	nKP_PW (I)	Deep Sleep/Wake
Pin 13	nTrig(I)	Trigger
Pin 14	Reserve	Reserved (GPIO available as per order)

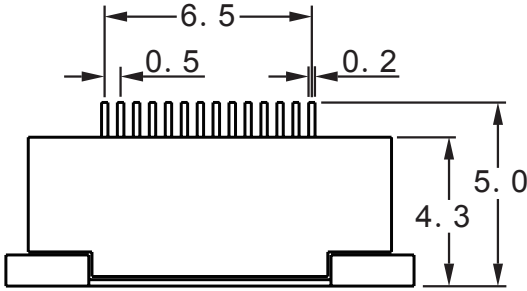
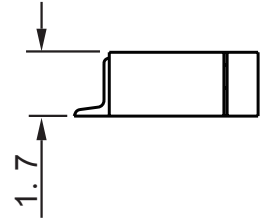
Note: Please refer to chapters “RS232 Interface” and “USB Interface” to get more details about RS232 and USB interfaces.





Schematic of Interface Socket

Unit: mm

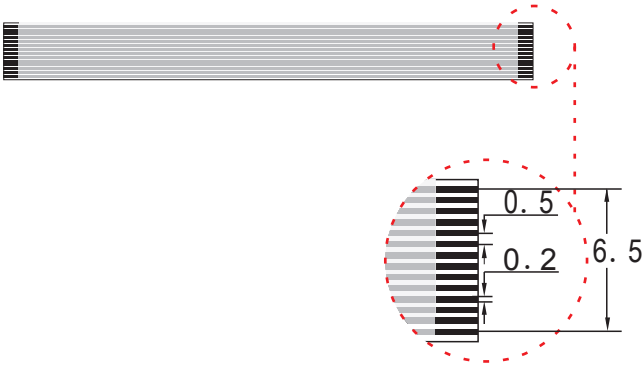




Sample Interface Flexible Cable Specifications

The interface flexible cable is designed by Newland Auto-ID.

Unit: mm





Housing Structure

The housing for the Engine should be wide enough not to put any pressure on the Engine. There should be sufficient space for the flexible cable and stress release of the cable should also be considered.

Scan Window

A scan window is needed to protect camera lens, aiming light, and illumination lights. This scan window design should follow:

- » Housing must not block or shade illumination LED's, aiming light, and camera lens.
- » Use high transparent and scratch resistant material, such as both side hard coated material. Please refer to following specifications:

Item		Specifications	
Dimension	Size (mm)	SIZE 1 ± 1.0%	
	Thickness (mm)	± 10%	
Property	Total light transmittance (%)	≥90% (ASTM D 1008)	
	Haze (%)	<1.0% (ASTM D 1008)	
	Stylus	≥4H (JIS K 5400)	
	Adhesion	Not release	
Appearance	Pinhole particle bubble	0.3~0.5	≤ 5EA
		<0.3	≤ 5EA
	Scratch	≤0.1mm (not crowded)	
		Under 0.05~3mm	≤3EA
Chemical	IPA (80%)	Evaluation after 1 minute dipPing	

- » The gap and angle between housing window and illumination LED (highest point) must ensure that the illumination light should not be reflected into lens by window glass.
- » The window must be perpendicular to the surface of the front plate of the EM2028.

Temperature

Electrical and other components generate heat. Especially under continuous operation, the temperature of the Engine will be high. The methods below are for heat concerns:

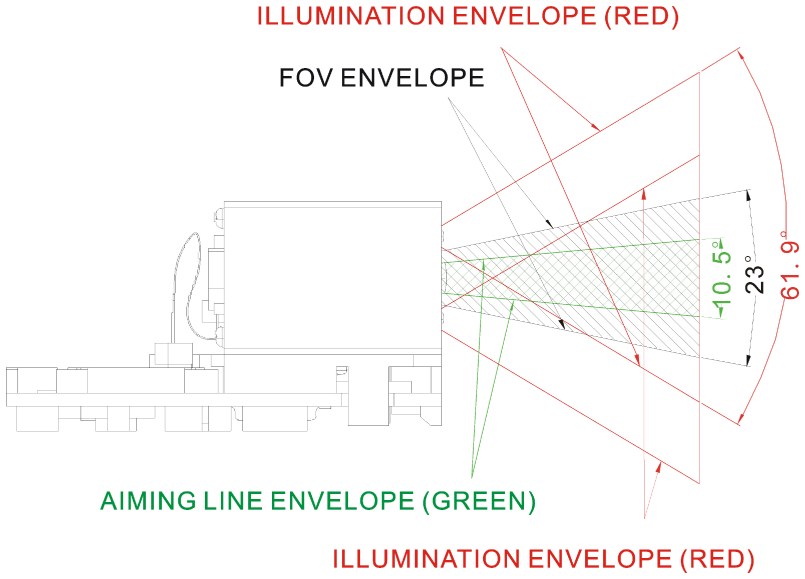
A radiator on top of the engine is recommended

Do not surround or wrap the Engine by rubber or any material that obstruct the heat dissipation.



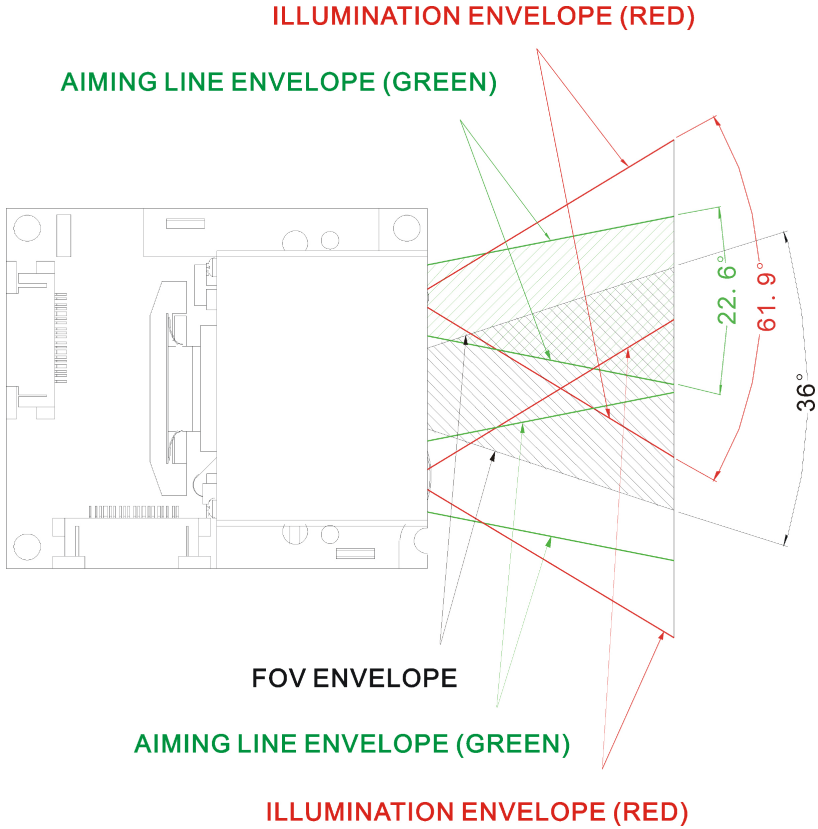


Window Size Diagram: vertical





Window Size Diagram: horizontal



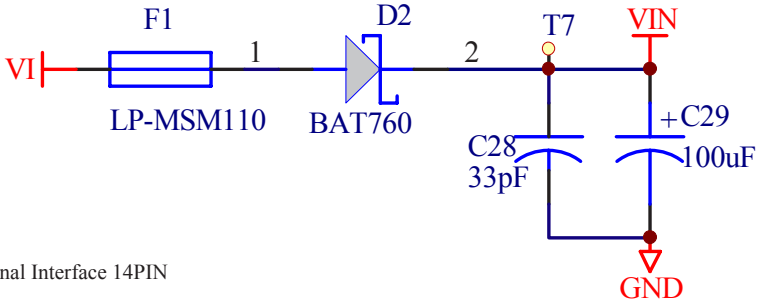


Electrical Interface

Introduction

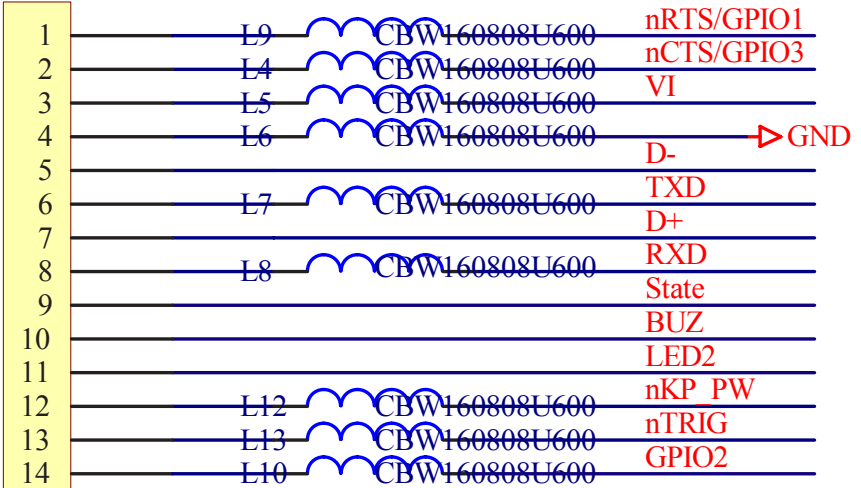
This section describes the electrical specifications of the interface signals.





External Interface 14PIN

J2

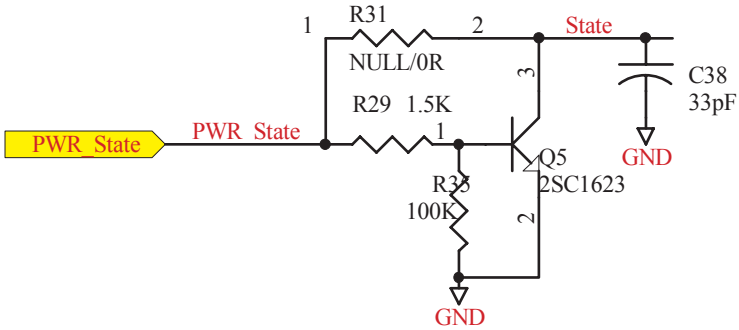


14PIN



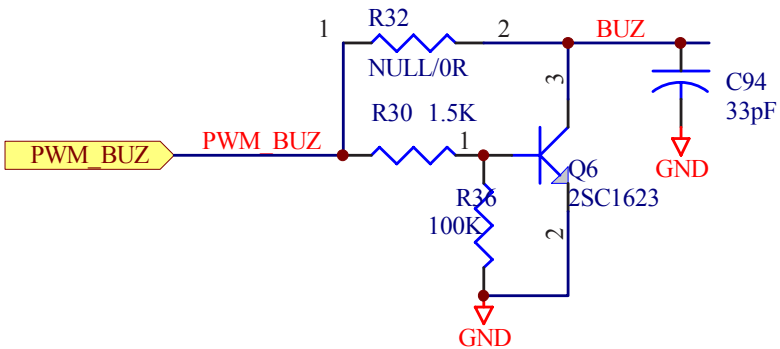
Power Indicator Driving Circuit

Here is a power indicator driving circuit which uses Open Collector Gate output. Users could expand the circuit for power indicator.



Beeper Driving Circuit

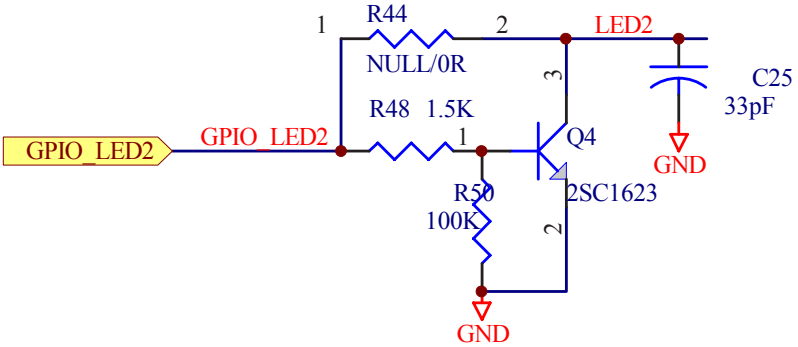
Here is a BUZ driving circuit which uses Open Collector Gate output. Users could expand the circuit by adding a beeper and a current-limiting resistance, and then connecting to the power.





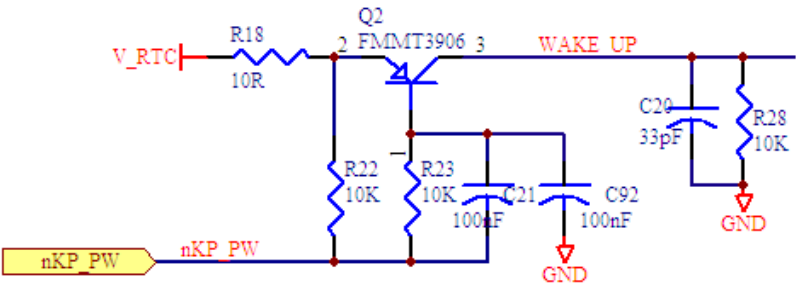
LED Driving Circuit

Here is a LED driving circuit which uses Open Collector Gate output. Users could expand the circuit by add a LED and a current-limiting resistance, and then connecting to the power.



nKP_PW Sleep/Wake Circuit

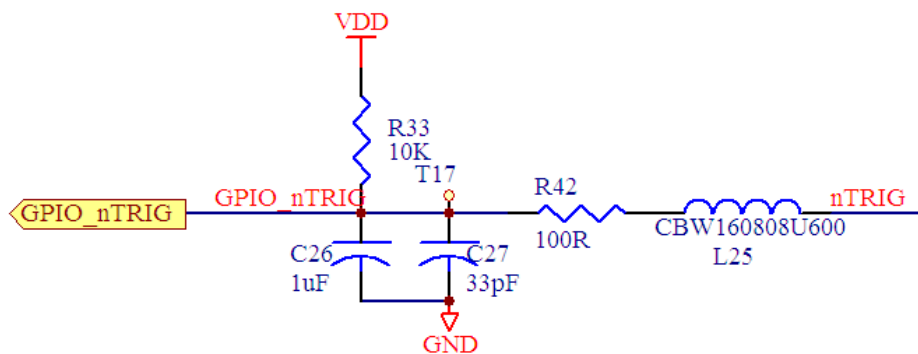
Here is a nKP_PW Sleep/Wake circuit which is triggered on low-level.

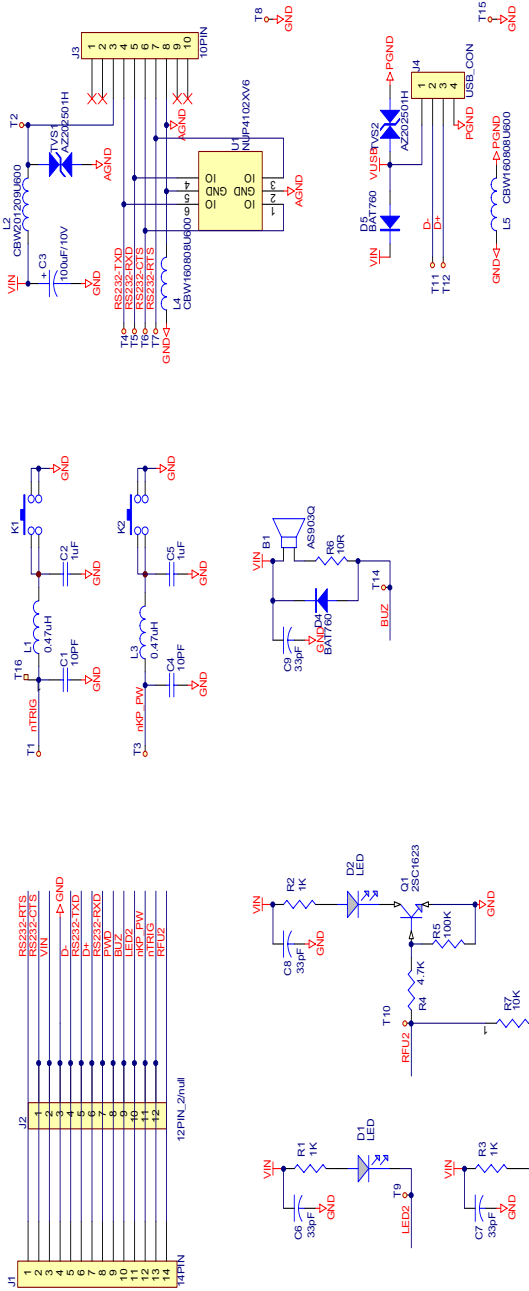




nTrig Trigger Circuit

Here is a nTrig trigger circuit which is triggered on low-level.







Working Condition

Specification	Name	Min	Typical	Max
Power Voltage (VDC)	VI	4.5	5	5.5
Working Current (when reading barcode, mA)	Icc	380		400
Environment Temperature(°C)	TA	0		70

Current Characteristic

Specification	Name	Min	Typical	Max
High-Level Output Voltage(VDC)	Voh	Vdd - 0.3		Vdd
Low-Level Output Voltage(VDC)	Vol	VSS		VSS + 0.3
High-Level Input Voltage(VDC)	Vih	0.8 * Vdd		Vdd + 0.1
Low-Level Input Voltage(VDC)	Vil	VSS - 0.1		0.2 * Vdd

Note: Vdd=3.3V





Development Tools

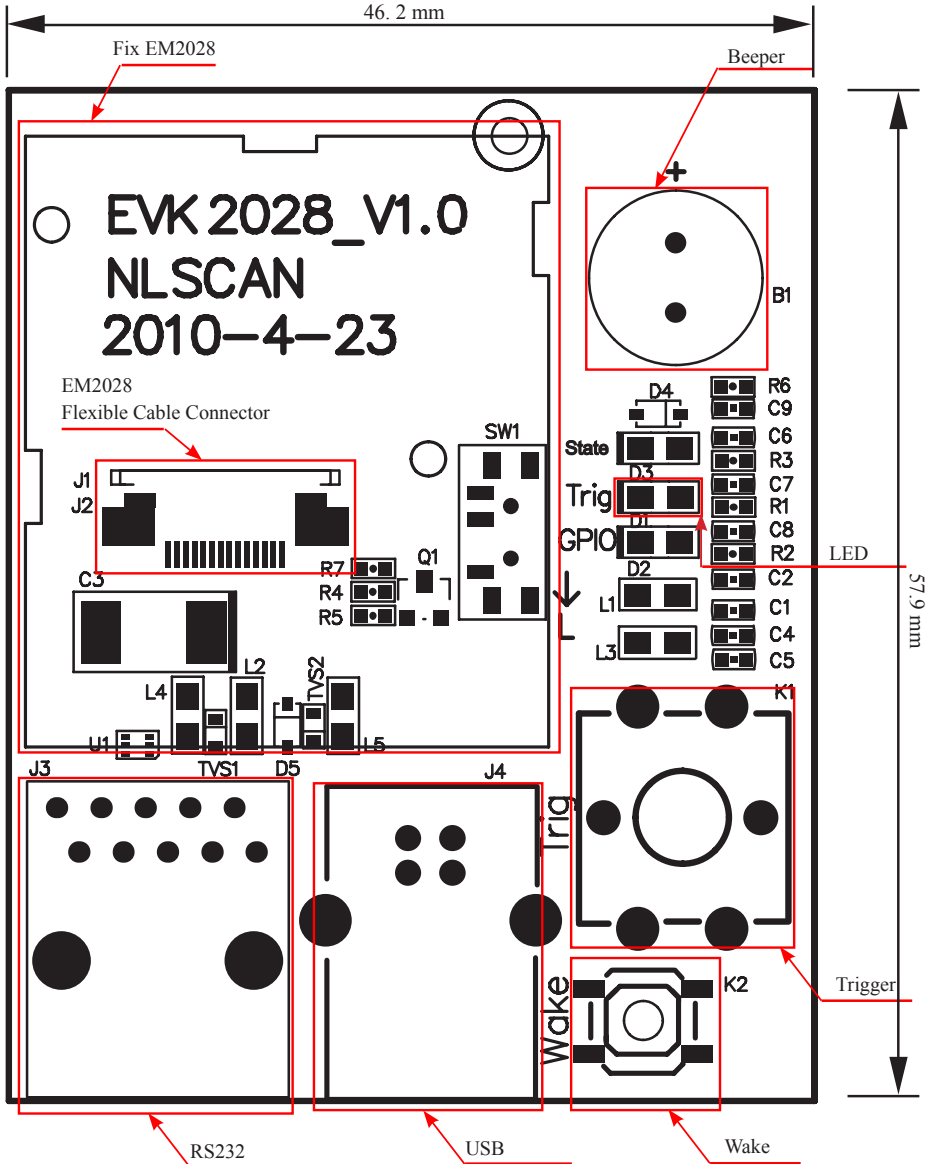
Introduction

This section lists some EM2028 development tools. A brief introduction to each tool is included.



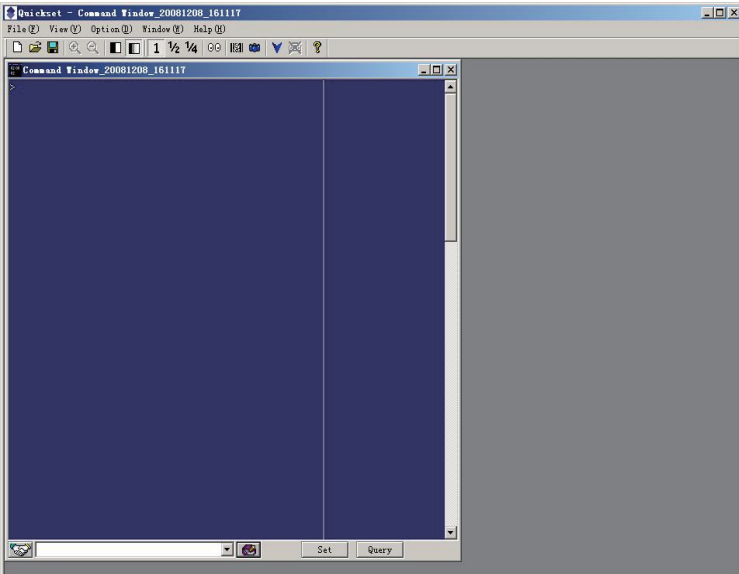


Here is a brief introduction to the EM2028 Evaluation Kit, EKV2028 (Size: 46.2mm X 57.9mm). The layout of the EVK2028 circuit board is shown in figure below. The board contains beeper, LED, trigger button, and wake button. USB and RS232 connector could be for communication. J1 or J2 is a connector where the EM2028 flexible cable connects to. J1 is 14 PIN and J2 is 12PIN.





QuickSet is a Windows based GUI program for Newland Auto-ID barcode readers. It can be used in development and for programming EM2028 and troubleshooting. The Host may implement some functions of QuickSet for the equipments or systems.





A software development kit is available for all EM series embedded engines. It allows Customers to develop their applications in EM series engines.





Programming the Engine

Introduction

There are 3 ways to program (configure) the Engine, Code Programming, Command Programming, and QuickSet Programming.

Code Programming

The Engine reads a set of specially encoded barcodes to program features. In the following sections, we will explain the options and features available and provide the barcodes to program them.

This method of programming the Engine is most straight forward. However, it requires manually readings of each barcode. As all manual operations, errors are more likely to occur.

Command Programming

The Host can send the Pro CMD strings (see the chapter of Software Interface) to program the Engine. In the following sections, the Pro CMD strings will be included with the barcodes for Code Programming.

A fixture, such as EVK3000 or other simpler circuit board, could be used to program the Engines before they are installed into your equipments or systems. Another alternative is to design the configuration capability in your equipments or systems.

This method of programming the Engine could be automated. A software program can be developed to download all the configuration data to the Engine.

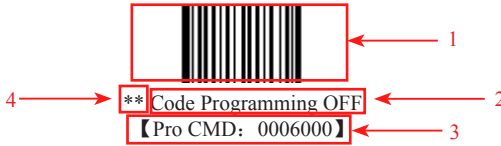
QuickSet Programming

QuickSet is a Windows based GUI program for Newland Auto-ID bar code readers. It displays decoded data and captured images. The engine with its circuit board can be easily configured through the interface of QuickSet.

This method of programming the Engine is similar as the Command Programming. QuickSet is a software program developed for Newland Auto-ID products .

Note: The programming results are restored in non-volatile memory. They will not be lost when the Engine is powered off.





This is the notation to disable the Code Programming.

There are 4 parts of a notation:

- 1、The first part of the notation is the barcode for Code Programming
- 2、The second part of the notation is the name of the options or features, such as Disable Code Programming.
- 3、The third part of the notation is the corresponding Pro CMD string of the Code Programming.
- 4、If there is “**” in front of the name, it means the notation is factory default.



Read the “Code Programming ON” barcode to activate “Code Programming” function. One or more Code Programming barcodes can be read to configure the Engine.

If an option or feature needs additional parameters, such as digits, they can be found at the end of this chapter.

To exit Code Programming, read “Code Programming OFF” or any normal barcode.

Code Programming ON



Code Programming OFF



** Code Programming OFF
【Pro CMD: 0006000】



Code Programming ON
【Pro CMD: 0006010】

The value of code programming can be sent to the Host. For factory default, “No Send Pro Code Value”, the value of programming codes will not be sent to the Host; by reading “Send Pro Code Value”, the reader will send the value of Programming Code to the Host.



**No Send Pro Code Value
【Pro CMD: 0002000】



Send Pro Code Value
【Pro CMD: 0002010】





Illumination LED lighting up barcodes are used to capture better images.
There are 4 modes:

- » “Illumination Wink” : LED keeps flashing when reading
- » “Illumination Keep ON” : LED keeps on when Power ON
- » “Illumination Read ON” : LED keeps on when reading
- » “Illumination OFF” : LED is off all the time



** Illumination Wink
【Pro CMD: 0200000】



Illumination Read ON
【Pro CMD: 0200030】



Illumination Keep ON
【Pro CMD: 0200010】



Illumination OFF
【Pro CMD: 0200020】





There are 3 modes:

- » “Aim Wink” : LED keeps flashing when reading
- » “Aim Keep ON” : LED keeps on when Power ON
- » “Aim OFF” : LED is off all the time

Code Programming ON



Code Programming OFF



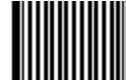
** Aim Wink

【Pro CMD: 0201000】



Aim Keep ON

【Pro CMD: 0201010】



Aim OFF

【Pro CMD: 0201020】





Decoding Beep

Read “Beep ON” to enable all decoding beep denotation and read “Beep OFF” to disable.

Code Programming ON



**Beep ON
【Pro CMD: 0203010】

Code Programming OFF



Beep OFF
【Pro CMD: 0203000】

Decoding Beep Type



**Type 1
【Pro CMD: 0203020】



Type 3
【Pro CMD: 0203022】



Type 2
【Pro CMD: 0203021】





Decoding Beep Volume



** Loud

【Pro CMD: 0203030】



Medium

【Pro CMD: 0203031】



Low

【Pro CMD: 0203032】

Code Programming ON



Code Programming OFF



Power On Beep



** Beep On

【Pro CMD: 0204001】



Beep OFF

【Pro CMD: 0204000】

Beep Denotation (Beeper Definitions)

Beep	Denotation
low-higher-higher-higher	Power ON completed
1 beep	successful reading of an ordinary barcode
2 beeps	successful reading of an programming barcode
3 short low-2 high	reading failure
1 long low	Unknown Character, Virtual Keypad (USB connection)





- » Hand-held Mode: Pull and keep holding the trigger line to read. Complete one reading or release the trigger to terminate reading status.
- » Auto Mode: The ambient luminance change in front of the engine automatically initiates reading. After completion of reading, the engine goes to idle. Both luminance change and the Trigger can initiate reading when idle.
- » Continuous Mode: Pull the Trigger line low to start reading. The engine will keep reading. To stop, pull trigger line low again.

Code Programming ON



Code Programming OFF



Hand-held Mode
【Pro CMD: 0302000】



Continuous Mode
【Pro CMD: 0302020】



**Auto Mode
【Pro CMD: 0302010】





One Reading Timeout: If the engine doesn't read any barcode during the timeout period, it will stop reading automatically. One Reading Timeout is valid in Auto mode. The default timeout is 3000ms.



Same Barcode Reading Delay: It is used to avoid misreading on the same barcode (the same format and message) in a Same Barcode Reading Delay Time. It is valid only in Auto mode. The default delay is 1500ms.



One Reading Timeout
【Pro CMD: 0313000】



Same Barcode Reading Delay
【Pro CMD: 0313010】

There are two options available in Same Barcode Reading Delay:

- » (Multi-reading) Prohibit: The same symbol can be read after delay.
- » (Multi-reading) Semi-prohibit: The same symbol can be read more than once in the delay period if ambient illumination is changed, for example the bar code is removed out of reading area and moved back.



** Multi-reading Semi-prohibit
【Pro CMD: 0313020】



Multi-reading Prohibit
【Pro CMD: 0313030】

E xample

To set One Reading Timeout to 1500ms, read these programming codes:

- 1、 “Code Programming ON”
- 2、 “One Reading Timeout”
- 3、 Digit Code “1” , “5” , “0” , “0” , see Digit Code
- 4、 “Save Programming”





- » Sensitivity is how sensitive the engine is to ambient illumination change.
- » Sensitivity value is [1 .. 20]
- » The lower the sensitivity value is the higher sensitivity will be. The lower the sensitivity value is the smaller illumination change will initiate reading.

Code Programming ON



Code Programming OFF



High Sensitivity (= 8)
【Pro CMD: 0312020】



Enhanced Sensitivity (= 5)
【Pro CMD: 0312030】



** Normal Sensitivity (= 11)
【Pro CMD: 0312010】



Program Sensitivity
(Min:1, Max:20)
【Pro CMD: 0312040】



Low Sensitivity (= 14)
【Pro CMD: 0312000】





Code Programming ON



Code Programming OFF



** Normal Exposure Mode
【Pro CMD: 0321000】



Reflections Eliminating Mode
【Pro CMD: 0321010】





Factory Default

Read “Load All Factory Default” to reset all parameters to factory default.

Applicable conditions:

- » User options programming wrong configuration leads to reading malfunction
- » Forget details of previous programming and start over.

Code Programming ON



Code Programming OFF



**Load All Factory Default
【Pro CMD: 0001000】

User Default

All user options can be saved as User Default. It will be restored in non-volatile memory.

Read “Save as User Default” to save all the current user options to be User Default, and erase the previous User Default. Read “Load User Default” to restore the engine to User Default.



Save as User Default
【Pro CMD: 0001150】



Load User Default
【Pro CMD: 0001160】



If read “Load All Factory Default”, User Default will still be restored in non-volatile memory.



Product information could be obtained by reading "Query Product Information" barcode. The engine will send it to the Host immediately.

"Power ON, Send Product Info", the engine sends product information through serial port(only) to the Host after Power ON.



Query Product Information
【Pro CMD: 0003000】



**Power ON, Do not Send Product Info
【Pro CMD: 0007000】



Power ON, Send Product Info
【Pro CMD: 0007010】

The product information is provided as follows:

Title	Remarks
Firmware Ver	Device Firmware Version
Build Time	Device Firmware Version Establishing Time
Device ID	Device Type
App Ver	Device Application Version
uIMG Ver	Device uIMG Version
Date	Device Manufacture Date
S/N	Device serial number
ESN	User-defined device serial number
Manufacture ID	Device Name
Interface	1 types of communication interfaces: TTL232(EM3000) or RS232(EM2027), baud rate, parity check, data bits, stop bit
1D	Indicate that reading 1D is allowed. Symbols are divided by comma. Additional features format: 1. "+" connect features 2. Min Message Length -> Max Message Length 3. "No Check Digit" or "Check Digit" 4. "Fixed Length: 2~64 even value". It is in this format: Fixed Length: 2 4 6 8 10 12...
2D	Indicate that reading 2D is allowed. Symbols are divided by comma. Additional feature format: Min Message Length -> Max Message Length
Scan Mode	Scan Mode: 1. Manual Scan 2. Auto Scan 3. Continuous Scan





RS232 Interface

Introduction

When the engine is connected to the Host with RS232 cable, system will select RS232 connection by default.

Under RS232 connection, the engine and the Host use the same communication parameters: baud rate, parity check, data bits select and stop bits select.



Select RS232 Connection
【Pro CMD: 1100000】





The engine and the Host should use the same serial port parameters: baud rate, parity check, data bits and stop bits. The sequence is as follows: 9600 (baud rate), null (parity check), 8 (data bits), 1 (stop bits).

Code Programming ON



Baud Rate

Baud rate is the number of bits of data transmitted per second. Set your scan engine baud rate to match the baud rate setting of the Host device. Otherwise, they can not communicate.

Code Programming OFF



The engine supports the following baud rates (The default baud rate is 9600):



**9600

【Pro CMD: 0100030】



19200

【Pro CMD: 0100050】



1200

【Pro CMD: 0100000】



38400

【Pro CMD: 0100060】



2400

【Pro CMD: 0100010】



57600

【Pro CMD: 0100070】



4800

【Pro CMD: 0100020】



115200

【Pro CMD: 0100080】



14400

【Pro CMD: 0100040】





Parity Check

Parity check options should be the same on the engine and the Host.

- » Select Odd parity: If data has an odd number of 1 bits, the parity bit value is set to 0.
- » Select Even parity: If data has an even number of 1 bits, the parity bit value is set to 0.
- » Select No Parity Check and parity bit will not be sent.

Code Programming ON



Code Programming OFF



**No Parity Check
【Pro CMD: 0101000】



Odd Check
【Pro CMD: 0101020】



Even Check
【Pro CMD: 0101010】





Data Bits Transmitted

Code Programming ON



Select data bits transmitted to be 5, 6, 7 and 8. Ensure the selections on the engine and the Host are the same.

Code Programming OFF



** 8 Data Bits

【Pro CMD: 0103030】



6 Data Bits

【Pro CMD: 0103010】



7 Data Bits

【Pro CMD: 0103020】



5 Data Bits

【Pro CMD: 0103000】

Stop Bits

Stop bit follows every byte to indicate the end of transmission and the start of the next transmission.

Default 1 stop bit.



**1 Stop Bits

【Pro CMD: 0102000】



2 Stop Bits

【Pro CMD: 0102010】





Hardware Auto Flow Control

When enabled, the engine will decide if the data should be sent in accordance with CTS signal level. When it is low level CTS signal, it means the serial port's cache memory of receiving end (such as PC) is full and the engine will not send data through RS232 until CTS signal is set to high level by receiving end. When the engine is not ready for receiving, it will set RTS signal to low level. When sending end (such as PC) detects it, it could not send data to the engine any more, otherwise the data will be lost.

When disabled, data's sending and receiving through serial port will not be effected by RTS/CTS signal.

Code Programming ON



Code Programming OFF



**Disable Hardware Auto Flow Control
【Pro CMD: 0104000】



Enable Hardware Auto Flow Control
【Pro CMD: 0104010】



Before enabling this function, please be sure that RTS/CTS signal line is contained in RS232 cable. If not, a RS232 communication error will occur.



USB Interface

Introduction

There are four options for USB connection, and any of them could be set as the default protocol on demand.

» USB HID-KBW: it emulates the unit's transmission to a USB keyboard input with no need of command settings or loading any driver. The barcode data could be entered by the virtual keyboard directly and it is also convenient for the Host to receive data.

» USB DataPipe: USB DataPipe is a transport protocol developed by Newland Auto-ID Tech Co., Ltd, which requires installation of a specific driver on the Host. It supports data transmission and user preference programming. The DataPipe driver for Windows is available in <http://www.nlscan.com/home.php>.

» USB COM Port Emulation: it emulates the USB port on the Host to an RS 232 port with the same data transport and settings as the real RS 232 port. This connection mode is based on USB DataPipe protocol and requires the USB DataPipe driver, too.

» HID-POS: it is based on the HID port, with no need for customized driver installation. Its transmission is much faster than that of virtual keyboard and traditional RS 232 interface.

When a USB connection and an RS 232 connection are used at the same time, the unit will select the USB connection by default for its priority.





USB connection (no driver needed) supports simulating the Imager transmission to be a USB keyboard input. The Host receives keystrokes of the virtual keyboard. It works in “Plug and Play” base. There is no driver required.

Code Programming ON



Code Programming OFF



Select USB HID-KBW
【Pro CMD: 1100020】



If the input field of the Host allows keyboard input, no software needed to assist HID-KBW input.



USB Country Keyboard Types

The keyboard arrangements and country codes vary in different countries. Refer country codes to the table “USB Country Keyboard Types” . Follow the steps mentioned below to program.

- 1、 “Code Programming ON”
- 2、 “Select Country Code”
- 3、 Read digit codes (according to country code)
- 4、 “Save programming”
- 5、 “Code Programming OFF”

Code Programming ON



Code Programming OFF



Select Country Code
【Pro CMD: 1103000】

E
xample

Emulate Norway keyboard:

1. "Code Programming ON"
 2. "Select Country Code"
 3. Digit code: "1", "5"
 4. "Save Programming"
 5. "Code Programming OFF"
-





Country/Language	Number	Country/Language	Number
U.S.	0	Netherlands(Dutch)	14
Belgium	1	Norway	15
Brazil	2	Poland	16
Canada(French)	3	Portugal	17
Czechoslovakia	4	Romania	18
Denmark	5	Russia	19
Finland(Swedish)	6	Slovakia	21
France	7	Spain	22
Germany/Austria	8	Sweden	23
Greece	9	Switzerland(German)	24
Hungary	10	Turkey F	25
Israel(Hebrew)	11	Turkey Q	26
Italy	12	U.K	27
Latin-American	13	Japan	28





Unknown Characters, Beep

HID-KBW deems an unknown character to be a character is not included in a country keyboard type. It may not be able to allocate and send a keystroke, thus lead to an error beep.

Code Programming ON



Code Programming OFF



** No Beep, Unknown Character
【Pro CMD: 1103030】



Beep, Unknown Character
【Pro CMD: 1103031】

Example

Suppose select country keyboard types France (number 7), read a barcode "ADF". Since the "Đ" (0xD0) is not included in France country code, the Imager skip "Đ" and transmit "AF". For factory default, no beep produced. Read "Beep, Unknown Character" to indicate unknown character.





Emulate ALT + keypad

When enabled, full ASCII characters (0x00~0xff) can be sent over the numeric keypad regardless of country keyboard selections.

1. “ALT” Make
2. According to the ASCII value, input the numbers over the numeric keypad
3. “ALT ” Break

Code Programming ON



Code Programming OFF



** No Emulate ALT + keypad
【Pro CMD: 1103060】



Emulate ALT + keypad
【Pro CMD: 1103061】



Too much keystroke emulation slows the sending speed.

Example

Suppose country code “7”, France is selected, and “Emulate ALT + keypad” is enabled. Barcode message "ADF" (65/208/70) will be sent as:

1. “ALT make” + “0, 6, 5” + “ALT Break”
2. “ALT make” + “2, 0, 8” + “ALT Break”
3. “ALT make” + “0, 7, 0” + “ALT Break”





Function Key Mapping

When enabled, function characters (0x00~0x1F) are sent as ASCII sequences over the numeric keypad.

Code Programming ON



- 1、 “Ctrl make”
- 2、 Hit function key
- 3、 “Ctrl Break”

Code Programming OFF



** No Function Key Mapping
【Pro CMD: 1103130】



Function Key Mapping
【Pro CMD: 1103140】

Example

USB HID-KBW set to be factory default. Enable “Emulate CTRL + keypad”. Read barcode “A(tab)F” (0x65/0x09/0x70). The sequence is:

1. Keystroke “A”
2. Input “Ctrl I” by “Ctrl make”, Keystroke “I”, “Ctrl break”
3. Keystroke “F”

For some text editors “Ctrl I” is italic convert. So the output may be “AF”



Enable “Emulate ATL + keypad” will automatically disable “Emulate CTRL + keypad”



ASCII Function Key Mapping Table

ASCII Function	ASCII Value(HEX)	No Function Key Mapping	Function Key Mapping
NUL	00	Null	Ctrl+2
SOH	01	Keypad Enter	Ctrl+A
STX	02	Caps lock	Ctrl+B
ETX	03	Null	Ctrl+C
EOT	04	Null	Ctrl+D
ENQ	05	Null	Ctrl+E
ACK	06	Null	Ctrl+F
BEL	07	Enter	Ctrl+G
BS	08	LeftArrow	Ctrl+H
HT	09	Tab	Ctrl+I
LF	0A	DownArrow	Ctrl+J
VT	0B	Tab	Ctrl+K
FF	0C	Delete Forward	Ctrl+L
CR	0D	Enter	Ctrl+M
SO	0E	Insert	Ctrl+N
SI	0F	Escape	Ctrl+O
DLE	10	F11	Ctrl+P
DC1	11	Home	Ctrl+Q
DC2	12	PrintScreen	Ctrl+R
DC3	13	Delete	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+ -





ASCII Function Key Mapping Table (Continued)

The last five characters in the Full ASCII “CTRL” + column ([] 6 -), apply to US only. The following chart indicates the equivalents of these five characters for different countries.

Country	Codes					
United States	[	\	\]	6	-	
Belgium	[	<	]	6	-	
Scandinavia	8	<	9	6	-	
France	^	8	\$	6	=	
Germany		Ã	+	6	-	
Italy		\	+	6	-	
Switzerland		<	..	6	-	
United Kingdom	[	ø	]	6	-	
Denmark	8	\	9	6	-	
Norway	8	\	9	6	-	
Spain	[	\	\]	6	-	





Keystroke Delay

This parameter sets the delay, in milliseconds, between emulated keystrokes. Scan programming code below to increase the delay when the Host require a slower transmission of data.



** No Delay

【Pro CMD: 1103050】

Code Programming ON



Code Programming OFF



Long Delay(40ms)

【Pro CMD: 1103052】



Short Delay(20ms)

【Pro CMD: 1103051】

Caps Lock

The case of the data is inverted regardless of the state of the Caps Lock key on the Host. Lower case and upper case are converted correspondingly.



** Disable Caps Lock

【Pro CMD: 1103010】



Enable Caps Lock

【Pro CMD: 1103020】



“Convert Case” , “Emulate ALT + keypad” and “Function Key Mapping”
option prevails “Enable Caps Lock”

E
sample

“Enable Caps Lock” , barcode message “AbC” is transmitted as “aBc”



Convert Case

The Imager converts all barcode messages to the selected case.

Code Programming ON



** No Case Conversion
【Pro CMD: 1103040】

Code Programming OFF



Convert All to Upper Case
【Pro CMD: 1103041】



Convert All to Lower Case
【Pro CMD: 1103042】

E
xample

Read "Convert All to Lower Case" , Barcode message "AbC" is sent as "abc"





Emulate Numeric Keypad



Code Programming ON



Code Programming OFF



When disable, the whole barcode message will be emulated as keystrokes on main keyboard.

Read “Emulate Numeric Keypad” to enable the function, when “0~9” is of the barcode message, it will be emulated as keystrokes on numeric keypad. But sign such as “+” “_” “*” “/” “.” is emulated as keystrokes on main keyboard.

Numeric keypad is normally at the right of a standard keyboard. This function is effected by the current state of “Num Lock” of Host's numeric keypad. The emulate numeric keypad couldn't control the state of “Num Lock” . So, if “Num Lock” light off, the output is function key instead of numbers.



** Disable Emulate Numeric Keypad
【Pro CMD: 1103110】



Emulate Numeric Keypad
【Pro CMD: 1103120】



Check Num Lock light before use this function.
Enable “Emulate ALT + keypad” will automatically disable this function

Example

Enable “Emulate Number Keyboard” and read the “A4.5” barcode. If “Num Lock” on the Host is ON, the data received will be “A4.5” . If “Num Lock” is OFF, Host will receive the data from keyboard as follow:
Host receives data “A” . This character is not included in keyboard, thus the data will be sent as normal.
Next, Host receives data “4” corresponding to the instruction of “Cursor move to left” .
Then, Host receives data “.” corresponding to the instruction of “delete the character just back of cursor” .
There is no input generated by data “4” as the data “5” corresponds to NO instructions.





This protocol is defined by Newland Auto-ID. A driver has to be installed before using this protocol to communicate with reader,
The advantage of using this protocol is the fast data transmission. Meanwhile, the SDK can be easily integrated into the application system.

Code Programming ON



Code Programming OFF



Select USB DataPipe
【Pro CMD: 1100010】





When the USB port is connected to Host serial port in order to receive data from scanner, the model of imitating USB-to-RS232 has to be chosen. Hence, the engine and the Host must communicate at the same parameters and the parameters of real serial port and visual serial port must be the same.

Code Programming ON



Code Programming OFF



Select USB COM Port Emulation
【Pro CMD: 1100060】





Introduction

The HID POS interface is recommended for new applications. It can send up to 56 characters in a single USB report and is much faster than keyboard emulation.

- » Features:
- » HID based, no custom driver required
- » Much faster than keyboard emulation and traditional RS-232

Note: HID POS does not require a custom driver installation. However, a HID interface on Windows 98 does.

Code Programming ON



Code Programming OFF



Select HID-POS

【Pro CMD: 1100080】





Access the Device in Your Program

CreateFile opens the device as a HID, then ReadFile delivers the scanned data to the application. Use WriteFile to send data to the device.

For complete information on USB and HID interfaces, please see www.USB.org or refer to one of the following manuals:

Code Programming ON



Code Programming OFF



Getting Scanned Data

After scanning and decoding a bar code, the device sends the following input report:

	Bit							
Byte	7	6	5	4	3	2	1	0
0	Report ID = 0x02							
1	Length of the bar code (field "Decoded Data")							
2-57	Decoded Data (1-56)							
58-61	Reserved (1-4)							
62	Newland Symbology Identifier or N/C: 0x00							
63	-	-	-	-	-	-	-	Decode Data Continued

VID and PID Table

USB uses two numbers to identify a device and find the correct drivers. The first is the VID (Vendor ID), assigned by the USB Implementers Forum. The Newland vendor ID (VID) is 1EAB (hex). The second is the PID (Product ID). A range of PIDs is used for each Newland product sub family, so each PID contains a base number and an interface type (keyboard, COM port, etc.).

Device	Interface Type	PID(Hex)	PID(Dec)
EM2027*	Base	0200	512
	HID POS	0210	528
HR200	Base	0100	256
	HID POS	0110	272

*EM2027: A 2D barcode scan engine which is also designed and manufactured by Newland. please see www.nlscan.com to get more EM2027 product info.





Symbols

Introduction

This chapter lists all the available symbols and provides the programming barcodes to enable/disable them.

Disabling reading of the symbols which do not apply, will improve reading performance. The fewer symbols that are enabled, the faster the engine will work.





Disable Reading All

Disable Reading All = Allow reading Programming Codes only.



Disable Reading All
【Pro CMD: 0001010】

Code Programming ON



Code Programming OFF



Enable Reading All

Enable Reading All = Enable to read all symbols and Programming Codes.



Enable Reading All
【Pro CMD: 0001020】

Enable Reading All 1D



Enable Reading All 1D
【Pro CMD: 0001040】

Disable Reading All 1D



Disable Reading All 1D
【Pro CMD: 0001030】





Enable Reading All 2D



Enable Reading All 2D
【Pro CMD: 0001060】

Code Programming ON



Code Programming OFF



Disable Reading All 2D



Disable Reading All 2D
【Pro CMD: 0001050】





Load Factory Default



** Load Code 128 Factory Default
【Pro CMD: 0400000】

Code Programming ON



Code Programming OFF



Enable/Disable Code 128



Disable Code 128
【Pro CMD: 0400010】



** Enable Code 128
【Pro CMD: 0400020】



When the engine can not read Code 128, please read “Enable Code 128” and try again.





Select Message Length

It is used to program the valid reading length of Code 128. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Code 128 Message Length is defined by “Min. Message Length” and “Max. Message Length” .

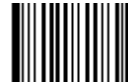
Code Programming ON



Code Programming OFF



Min Message Length (default: 1)
【Pro CMD: 0400030】



Max Message Length (default: 48)
【Pro CMD: 0400040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.

Example

To set Min Message Length of Code 128 to 8 bytes and Max Message Length to 12 bytes, read these programming codes

- 1、“Code Programming ON”
- 2、“Select Min Message Length”
- 3、Digit Code “8” , see Digit Code
- 4、“Save Programming” ,see Digit Code
- 5、“Select Max Message Length”
- 6、Digit Code “1”
- 7、Digit Code “2”
- 8、“Save Programming”
- 9、“Code Programming OFF”





Load Factory Default



**** Load UCC/EAN-8 Factory Default**
【Pro CMD: 0401000】

Code Programming ON



Code Programming OFF



Enable/Disable UCC/EAN-8



**** Enable UCC/EAN-8**
【Pro CMD: 0401020】



Disable UCC/EAN-8
【Pro CMD: 0401010】

Check Digit

UCC/EAN-8 is fixed 8 digits barcode and the last digit is check digit.



**** Transmit Check**
【Pro CMD: 0401040】



Do Not Transmit Check
【Pro CMD: 0401030】





2 Digits Addenda Code

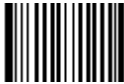
Addenda Code is the one to the right of an ordinary code. Picture below shows an ordinary code with a 2 digits Addenda Code. The left one in blue lines is an ordinary code. The right one in red lines is the 2 digits Addenda Code.



Code Programming ON



Code Programming OFF



** Disable 2 Digits Addenda Code
【Pro CMD: 0401050】



Enable 2 Digits Addenda Code
【Pro CMD: 0401060】

5 Digits Addenda Code

5 Digits Addenda Code is the one to the right of an ordinary code. Picture below shows an ordinary code with a 5 digits Addenda Code. The left one in blue lines is an ordinary code. The right one in red lines is the 5 digits Addenda Code.



** Disable 5 Digits Addenda Code
【Pro CMD: 0401070】



Enable5 Digits Addenda Code
【Pro CMD: 0401080】



- “ Enable 2 Digits Addenda Code “ — read an ordinary code and 2 digits Addenda Code.
- “ Enable 5 Digits Addenda Code “ — read an ordinary code and 5 digits Addenda Code.
- “ Disable 2 Digits Addenda Code “ — read an ordinary code only, and ignore 2 digits Addenda Code.



EAN-8 expand to EAN-13

Expand EAN-8 to EAN-13, by adding 5 bytes of “0” to the left, and then transmit.

Code Programming ON



Code Programming OFF



** Do Not Expand to EAN-13
【Pro CMD: 0401090】



Expand to EAN-13
【Pro CMD: 0401100】





Load Factory Default



** Load EAN-13 Factory Default
【Pro CMD: 0402000】

Code Programming ON



Code Programming OFF



Disable/EnableEAN-13



** Enable EAN-13
【Pro CMD: 0402020】

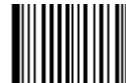


Disable EAN-13
【Pro CMD: 0402010】

Check Digit



** Transmit Check
【Pro CMD: 0402040】



Do Not Transmit Check
【Pro CMD: 0402030】





2 Digits Addenda Code

Addenda Code is the one to the right of an ordinary code. Picture below shows an ordinary code with a 2 digits Addenda Code. The left one in blue lines is an ordinary code. The right one in red lines is the 2 digits Addenda Code.

Code Programming ON



Code Programming OFF



** Disable 2 Digits Addenda Code
【Pro CMD: 0402050】



Enable 2 Digits Addenda Code
【Pro CMD: 0402060】

5 Digits Addenda Code

5 Digits Addenda Code is the one to the right of an ordinary code. Picture below shows an ordinary code with a 5 digits Addenda Code. The left one in blue lines is an ordinary code. The right one in red lines is the 5 digits Addenda Code.



** Disable 5 Digits Addenda Code
【Pro CMD: 0402070】



Enable 5 Digits Addenda Code
【Pro CMD: 0402080】



- “ Enable 2 Digits Addenda Code “ — read an ordinary code and 2 digits Addenda Code.
- “ Enable 5 Digits Addenda Code “ — read an ordinary code and 5 digits Addenda Code.
- “ Disable 2 Digits Addenda Code “ — read an ordinary code only, and ignore 2 digits Addenda Code.



Load Factory Default



** Load UPC-E Factory Default
【Pro CMD: 0403000】

Code Programming ON



Code Programming OFF



Disable/Enable UPC-E



** Enable UPC-E
【Pro CMD: 0403020】



Disable UPC-E
【Pro CMD: 0403010】



When the engine can not read UPC-E, please read “Enable UPC-E” and try again.

Check Digit

UPC-E is fixed 8 digits barcode and the last digit is check digit.



** Transmit Check
【Pro CMD: 0403040】



Do Not Transmit Check
【Pro CMD: 0403030】





2 Digits Addenda Code

Addenda Code is the one to the right of an ordinary code. Picture below shows an ordinary code with a 2 digits Addenda Code. The left one in blue lines is an ordinary code. The right one in red lines is the 2 digits Addenda Code.



Code Programming ON



Code Programming OFF



** Abort 2 Digits Addenda
【Pro CMD: 0403050】



Enable 2 Digits Addenda Code
【Pro CMD: 0403060】

5 Digits Addenda Code

5 Digits Addenda Code is the one to the right of an ordinary code. Picture below shows an ordinary code with a 5 digits Addenda Code. The left one in blue lines is an ordinary code. The right one in red lines is the 5 digits Addenda Code.



** Disable 5 Digits Addenda Code
【Pro CMD: 0403070】



Enable 5 Digits Addenda Code
【Pro CMD: 0403080】



- “ Enable 2 Digits Addenda Code “ — read an ordinary code and 2 digits Addenda Code.
- “ Enable 5 Digits Addenda Code “ — read an ordinary code and 5 digits Addenda Code.
- “ Disable 2 Digits Addenda Code “ — read an ordinary code only, and ignore 2 digits Addenda Code.



Transmit Default “0”

The first byte of UPC-E is default to “0” .

Code Programming ON



Code Programming OFF



**Do Not Transmit “0”
【Pro CMD: 0403090】



Transmit “0”
【Pro CMD: 0403100】

UPC-E Expand to UPC-A

Follow the standard algorithm to expand UPC-E to UPC-A.



**Do Not Expand to UPC-A
【Pro CMD: 0403110】



Expand to UPC-A
【Pro CMD: 0403120】





Load Factory Default



** Load UPC-A Factory Default
【Pro CMD: 0404000】

Code Programming ON



Code Programming OFF



Disable/Enable UPC-A



** Enable UPC-A
【Pro CMD: 0404020】



Disable UPC-A
【Pro CMD: 0404010】



When the engine can not read UPC-A, please read “Enable UPC-A” and try again.

Check Digit

UPC-A is fixed 13 digits barcode and the last digit is Check Digit.



**Transmit Check
【Pro CMD: 0404040】



(Do) Not Transmit Check
【Pro CMD: 0404030】





2 Digits Addenda Code

Addenda Code is the one to the right of an ordinary code. Picture below shows an ordinary code with a 2 digits Addenda Code. The left one in blue lines is an ordinary code. The right one in red lines is the 2 digits Addenda Code.



Code Programming ON



Code Programming OFF



** Disable 2 Digits Addenda Code
【Pro CMD: 0404050】



Enable 2 Digits Addenda Code
【Pro CMD: 0404060】

5 Digits Addenda Code

5 Digits Addenda Code is the one to the right of an ordinary code. Picture below shows an ordinary code with a 5 digits Addenda Code. The left one in blue lines is an ordinary code. The right one in red lines is the 5 digits Addenda Code.



** Disable 5 Digits Addenda Code
【Pro CMD: 0404070】



Enable 5 Digits Addenda Code
【Pro CMD: 0404080】



- “ Enable 2 Digits Addenda Code “ — read an ordinary code and 2 digits Addenda Code.
- “ Enable 5 Digits Addenda Code “ — read an ordinary code and 5 digits Addenda Code.
- “ Disable 2 Digits Addenda Code “ — read an ordinary code only, and ignore 2 digits Addenda Code.



Transmit Default “0”

The first byte of UPC-A is default to “0” .

Code Programming ON



Code Programming OFF



**Do Not Transmit “0”
【Pro CMD: 0404090】



Transmit “0”
【Pro CMD: 0404100】



UPC-A has the default “0” but it is not printed out, unlike UPC-E. Read “Transmit 0” will add a “0” to transmit.



Load Factory Default



** Load Interleaved 2 of 5 Factory Default
【Pro CMD: 0405000】

Code Programming ON



Code Programming OFF



Disable/Enable Interleaved 2 of 5



** Enable Interleaved 2 of 5
【Pro CMD: 0405020】



Disable Interleaved 2 of 5
【Pro CMD: 0405010】



When the engine can not read Interleaved 2 of 5, please read “Enable Interleaved 2 of 5”
and try again





Select Message Length

It is used to program the valid reading length of Interleaved 2 of 5. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Interleaved 2 of 5 Message Length is defined by “Min. Message Length” and “Max. Message Length”

Code Programming ON



Code Programming OFF



Min Message Length (default: 6)
【Pro CMD: 0405030】



Max Message Length (default: 80)
【Pro CMD: 0405040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.

Example

To set Min Message Length of Interleaved 2 of 5 as 8 bytes, and Max Message length as 12 bytes, read these programming codes:

1. “Code Programming ON”
2. “Select Min Message Length”
3. Digit Code “8” , see Digit Code Appendix (Pxxx)
4. “Save Programming” , see Digit Code Appendix (Pxxx)
5. “Select Max Message Length”
6. Digit Code “1”
7. Digit Code “2”
8. “Save Programming”
9. “Code Programming OFF”





Check Digit

Interleaved 2 of 5 may include Check Digit (not compulsory) following its barcode messages. It verifies the barcode message.

» “NO Check, Transmit All” means to read without check and transmit all bytes including barcode message and Check digit.

» “Check, Do Not Transmit Check Digit” means to read and check. If verification is successful, transmits barcode message; if not, engine will not send barcode message to the Host.

» “Check, Transmit All” means to read and check. If verification is successful, transmits all messages; if not, engine will not send barcode message to the Host.

Code Programming ON



Code Programming OFF



The number of Interleaved 2 of 5 barcode bits(check digit contained) must be even. If it is odd, a 0 will be added as the first digit. The check digit generates automatically when a barcode is produced.



**** NO Check, Transmit All
【Pro CMD: 0405050】**



**Check, Do Not Transmit Check Digit
【Pro CMD: 0405060】**



**Check, Transmit All
【Pro CMD: 0405070】**



When “Check, Do Not Transmit Check digit” is enabled and barcode message length minus one is less than Min Message Length, it will lead to an error.

E.g.: Reading a 4-byte (include check Digit) Interleaved 2 of 5 with the Min Message Length being 4 bytes and “Check, Do Not Transmit Check digit” enabled leads to an error.



Specified Lengths

Program the engine to read specified lengths or ranges of specified lengths for Interleaved 2 of 5. The length value must be 3 decimal digits. And the length value **MUST** be an even number between 2 to 64.

Read “Enable Specified Length” to enable this feature or “Disable Specified Length” to disable.

Code Programming ON



Code Programming OFF



** Disable Specified Length
【Pro CMD: 0405140】



Add Code Length
【Pro CMD: 0405160】



Enable Specified Length
【Pro CMD: 0405150】



Remove Code Length
【Pro CMD: 0405170】

Example

The engine only read Interleaved 2 of 5 which are 12 and 24 bytes.

1. “Code Programming ON”
2. “Enable Specified Length”
3. “Add Code Length”
4. Digit Code “0”, “1”, “2”
5. “Save Programming”
6. “Add code length”
7. Digit Code “0”, “2”, “4”
8. “Save Programming”
9. “Code Programming OFF”

The engine only read Interleaved 2 of 5 between 12 bytes and 24 bytes.

1. “Code Programming ON”
2. “Enable Specified Length”
3. “Add Code Length”
4. Digit Code “0”, “1”, “2”
5. Digit Code “0”, “2”, “4”
6. “Save Programming”
7. “Code Programming OFF”





ITF-14 is a fixed length, 14 bytes Interleaved 2 of 5 barcode with Check digit. By factory default, it is disabled.

When enabled, ITF-14 precedes 14-byte Interleaved 2 of 5 barcode.

Code Programming ON



Code Programming OFF



**Disable ITF-14
【Pro CMD: 0405080】



Enable ITF-14, Do Not Transmit Check Digit
【Pro CMD: 0405090】



Enable ITF-14, Transmit Check Digit
【Pro CMD: 0405100】



For instance, when ITF-14 is enabled and Interleaved 2 of 5 is disabled, the ITF-14 and 14 bytes Interleaved 2 of 5 with check digit can be read, but other Interleaved 2 of 5 can not.



ITF-6 is a fixed length 6 bytes Interleaved 2 of 5 barcode with check digit.
When enabled, ITF-6 precedes 6-byte Interleaved 2 of 5 barcode.

Code Programming ON



Code Programming OFF



****Disable ITF-6 User Selection
【Pro CMD: 0405110】**



**ITF-6, Read, Do Not Transmit Check Digit
【Pro CMD: 0405120】**



**ITF-6, Read, Transmit Check Digit
【Pro CMD: 0405130】**



For instance, when ITF-6 is enabled and Interleaved 2 of 5 is disabled, the ITF-6 and 6 bytes Interleaved 2 of 5 with check digit can be read, but other Interleaved 2 of 5 can not





Load Factory Default



** Load Matrix 2 of 5 Factory Default
【Pro CMD: 0406000】

Code Programming ON



Code Programming OFF



Disable/Enable Matrix 2 of 5



Enable Matrix 2 of 5
【Pro CMD: 0406020】



** Disable Matrix 2 of 5
【Pro CMD: 0406010】



When the engine can not read Interleaved 2 of 5, please read “Enable Interleaved 2 of 5”
and try again





Select Message Length

It is used to program the valid reading length of Matrix 2 of 5. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Matrix 2 of 5 Message Length is defined by “Min. Message Length” and “Max. Message Length”

Code Programming ON



Code Programming OFF



Min Message Length (default: 4)
【Pro CMD: 0406030】



MaxMessage Length (default: 80)
【Pro CMD: 0406040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.

Example

To set Min Message Length of Matrix 2 of 5 as 8 bytes, and Max Message length as 12 bytes, read these programming codes:

1. “Code Programming ON”
2. “Select Min Message Length”
3. Digit Code “8”, see Digit Code Appendix (Pxxx)
4. “Save Programming”, see Digit Code Appendix (Pxxx)
5. “Select Max Message Length”
6. Digit Code “1”
7. Digit Code “2”
8. “Save Programming”
9. “Code Programming OFF”





Check Digit

Matrix 2 of 5 may include Check Digit (not compulsory) following its barcode messages. It verifies the barcode message.

» “NO Check, Transmit All” means to read without check and transmit all bytes including barcode message and Check digit.

» “Check, Do Not Transmit Check Digit” means to read and check. If verification is successful, transmits barcode message; if not, engine will not send barcode message to the Host.

» “Check, Transmit All” means to read and check. If verification is successful, transmits all messages; if not, engine will not send barcode message to the Host.

Code Programming ON



Code Programming OFF



The number of Matrix 2 of 5 barcode bits(check digit contained) must be even. If it is odd, a 0 will be added as the first digit. The check digit generates automatically when a barcode is produced.



** NO Check, Transmit All

【Pro CMD: 0406050】



Check, Do Not Transmit Check Digit

【Pro CMD: 0406060】



Check, Transmit All

【Pro CMD: 0406070】



When “Check, Do Not Transmit Check digit” is enabled and barcode message length minus one is less than Min Message Length, it will lead to an error.

E.g.: Reading a 4-byte (include check Digit) Matrix 2 of 5 with the Min Message Length being 4 bytes and “Check, Do Not Transmit Check digit” enabled leads to an error.



Load Factory Default



** Load Code 39 Factory Default
【Pro CMD: 0408000】

Code Programming ON



Code Programming OFF



Enable/Disable Code 39



** Enable Code 39
【Pro CMD: 0408020】



Disable Code 39
【Pro CMD: 0408010】



When the engine can not read Code 39, please read “Enable Code 39” and try again

Transmit Start & Stop Character

Transmission of “*” can be selected.



**Transmit Both “*”
【Pro CMD: 0408090】



Transmit Neither “*”
【Pro CMD: 0408080】





Select Message Length

It is used to program the valid reading length of Code 39. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Code 39 Message Length is defined by “Min. Message Length” and “Max. Message Length”.

Code Programming ON



Code Programming OFF



Min Message Length (default: 4)
【Pro CMD: 0408030】



Max Message Length (default: 48)
【Pro CMD: 0408040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.

Example

To set Min Message Length of Code 39 to 8 bytes, and Max Message Length to 12 bytes, read these programming codes:

1. “Code Programming ON”
2. “Select Min Message Length”
3. Digit Code “8”, see Digit Code
4. “Save Programming”, see Digit Code
5. “Select Max Message Length”
6. Digit Code “1”
7. Digit Code “2”
8. “Save Programming”
9. “Code Programming OFF”





Check Digit

Code 39 may include Check Digit (not compulsory) following its barcode message. It verifies the barcode message.

» "NO Check, Transmit All" means to read without check and transmit all bytes including barcode message and Check Digit.

» "Check, Do Not Transmit Check Digit" means to read and check. If verification is successful, transmits barcode message; if not, engine will not send barcode message to the Host.

» "Check, Transmit All" means to read and check. If verification is successful, transmits all messages; if not, engine will not send barcode message to the Host.

Code Programming ON



Code Programming OFF



** NO Check, Transmit All

【Pro CMD: 0408050】



Check, Transmit All
【Pro CMD: 0408070】



Check, Do not transmit Check Digit

【Pro CMD: 0408060】



When "Check, Do not Transmit Check digit" is enabled and barcode message length minus one is less than Min Message Length, it will lead to an error.

E.g.: Reading a 4-byte (include check byte) Code 39 with the Min Message Length being 4 bytes and "Check, Do not transmit Check Digit" enabled leads to an error.

Decode ASCII

Code 39 can include full ASCII characters. For factory default, the engine only decodes part of them. Read "Full ASCII decode" to decode full ASCII characters.



**Partial ASCII Decode

【Pro CMD: 0408100】



Full ASCII Decode
【Pro CMD: 0408110】



Load Factory Default



** Load Codabar Factory Default
【Pro CMD: 0409000】

Code Programming ON



Code Programming OFF



Enable/Disable Codabar



** Enable Codabar
【Pro CMD: 0409020】



Disable Codabar
【Pro CMD: 0409010】



When the engine can not read Codabar, please read “Enable Codabar” and try again.



Select Message Length

It is used to program the valid reading length of Codabar. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Codabar Message Length is defined by “Min. Message Length” and “Max. Message Length”.

Code Programming ON



Code Programming OFF



Min Message Length (default: 2)
【Pro CMD: 0409030】



Max Message Length (default: 60)
【Pro CMD: 0409040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.





Check Digit

Codabar may include Check Digit (not compulsory) following its barcode message. It verifies the barcode message.

» "NO Check, Transmit All" means to read without check and transmit all bytes including barcode message and Check Digit.

» "Check, Do Not Transmit Check Digit" means to read and check. If verification is successful, transmits barcode message; if not, engine will not send barcode message to the Host.

» "Check, Transmit All" means to read and check. If verification is successful, transmits all messages; if not, engine will not send barcode message to the Host.

Code Programming ON



Code Programming OFF



** NO Check, Transmit All
【Pro CMD: 0409050】



Check, Transmit All
【Pro CMD: 0409070】



Check, Do not transmit Check Digit
【Pro CMD: 0409060】



When "Check, Do not Transmit Check digit" is enabled and barcode message length minus one is less than Min Message Length, it will lead to an error.

E.g.: Reading a 4-byte (include check byte) Codabar with the Min Message Length being 4 bytes and "Check, Do not transmit Check Digit" enabled leads to an error.



Transmit Start & Stop Character

Codabar uses either one of “A”, “B”, “C” and “D” as the start character and the stop character. Transmission of them can be selected.

Code Programming ON



Code Programming OFF



**Transmit Both Start & Stop Character
【Pro CMD: 0409090】



Transmit Neither Start & Stop Character
【Pro CMD: 0409080】



**Use ABCD/ABCD As Start & Stop Character
【Pro CMD: 0409100】



**Use Upper Letter
【Pro CMD: 0409120】



Use ABCD/TN*E As Start & Stop Character
【Pro CMD: 0409110】



Use Lower Letter
【Pro CMD: 0409130】





Load Factory Default



** Load Code 93 Factory Default
【Pro CMD: 0410000】

Code Programming ON



Code Programming OFF



Enable /Disable Code 93



** Disable Code 93
【Pro CMD: 0410010】



Enable Code 93
【Pro CMD: 0410020】



When the engine can not read Code 93, please read “Enable Code 93” and try again.



Select Message Length

It is used to program the valid reading length of Code 93. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Code 93 Message Length is defined by “Min. Message Length” and “Max. Message Length.”

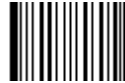
Code Programming ON



Code Programming OFF



Min Message Length (default: 1)
【Pro CMD: 0410030】



Max Message Length (default: 48)
【Pro CMD: 0410040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.

Example

To set Min Message Length of Code 93 to 8 bytes and Max Message Length to 12 bytes, read these programming codes:

1. “Code Programming ON”
2. “Select Min Message Length”
3. Digit Code “8” , see Digit Code
4. “Save Programming” , see Digit Code
5. “Select Max Message Length”
6. Digit Code “1”
7. Digit Code “2”
8. “Save Programming”
9. “Code Programming OFF”





Check Digit

Code 93 may include Check Digits (not compulsory) following its barcode message. The two digits verify the barcode message.

» "NO Check, Transmit All" means to read without check and transmit all bytes including barcode message and Check Digits.

» "Check, Do Not Transmit Check Digit" means to read and check. If verification is successful, transmits barcode message; if not, engine will not send barcode message to the Host.

» "Check, Transmit All" means to read and check. If verification is successful, transmits all messages; if not, engine will not send barcode message to the Host.

Code Programming ON



Code Programming OFF



NO Check, Transmit All
【Pro CMD: 0410050】



Check, Transmit All
【Pro CMD: 0410070】



** Check, Do not transmit Check Digit
【Pro CMD: 0410060】



When "Check, Do not Transmit Check digit" is enabled and barcode message length minus one is less than Min Message Length, it will lead to an error.
E.g.: Reading a 4-byte (include check byte) Code 93 with the Min Message Length being 4 bytes and "Check, Do not transmit Check Digit" enabled leads to an error.



Load Factory Default



** Load UCC/EAN-128 Factory Default
【Pro CMD: 0412000】

Code Programming ON



Code Programming OFF



Enable/Disable UCC/EAN-128



** Enable UCC/EAN-128
【Pro CMD: 0412020】



Disable UCC/EAN-128
【Pro CMD: 0412010】



When the engine can not read UCC/EAN-128, please read “Enable UCC/EAN-128” and try again.



Load Factory Default



** Load GS1 Databar Factory Default
【Pro CMD: 0413000】

Code Programming ON



Code Programming OFF



Enable/Disable GS1 Databar



** Enable GS1 Databar
【Pro CMD: 0413020】



Disable GS1 Databar
【Pro CMD: 0413010】



When the engine can not read GS1 Databar, please read “Enable GS1 Databar” and try again.

Transmit AI(01) Character



** Transmit AI(01) Character
【Pro CMD: 0413060】



Do not Transmit AI(01) Character
【Pro CMD: 0413050】





Load Factory Default



** Load EAN·UCC Composite Factory Default
【Pro CMD: 0414000】

Code Programming ON



Code Programming OFF



Enable/Disable EAN·UCC Composite



Enable EAN·UCC Composite
【Pro CMD: 0414020】



** Disable EAN·UCC Composite
【Pro CMD: 0414010】



Enable UPC/EAN Composite
【Pro CMD: 0414040】



** Disable UPC/EAN Composite
【Pro CMD: 0414030】



When the engine can not read EAN·UCC Composite, please read “Enable EAN·UCC Composite” and try again.



Load Factory Default



** Load Code 11 Factory Default
【Pro CMD: 0415000】

Code Programming ON



Code Programming OFF



Enable/Disable Code 11



Enable Code 11
【Pro CMD: 0415020】



** Disable Code 11
【Pro CMD: 0415010】



When the engine can not read Code 11, please read “Enable Code 11” and try again.



Select Message Length

It is used to program the valid reading length of Code 11. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Code 11 Message Length is defined by “Min. Message Length” and “Max. Message Length .”

Code Programming ON



Code Programming OFF



Min Message Length (default: 4)
【Pro CMD: 0415030】



Max Message Length (default: 48)
【Pro CMD: 0415040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.

Example

To set Min Message Length of Code11 to 8 bytes and Max Message Length to 12 bytes, read these programming codes:

1. “Code Programming ON”
2. “Select Min Message Length”
3. Digit Code “8” , see Digit Code
4. “Save Programming” , see Digit Code
5. “Select Max Message Length”
6. Digit Code “1”
7. Digit Code “2”
8. “Save Programming”
9. “Code Programming OFF”



Check Digit

Code 11 may include Check Digit (not compulsory) following its barcode message. It verifies the barcode message.

- » "NO Check, Transmit All" means to read without check and transmit all bytes including barcode message and Check Digit.
- » "Check, Do Not Transmit Check Digit" means to read and check. If verification is successful, transmits barcode message; if not, engine will not send barcode message to the Host.
- » "Check, Transmit All" means to read and check. If verification is successful, transmits all messages; if not, engine will not send barcode message to the Host.

Code Programming ON



Code Programming OFF



NO Check, Transmit All
【Pro CMD: 0415050】



Single Check Digit MOD11 (Len <= 10)
Double Check Digits MOD11/MOD11 (Len > 10)
【Pro CMD: 0415090】



** Single Check Digit, MOD11
【Pro CMD: 0415060】



Single Check Digit MOD11 (Len <= 10)
Double Check Digits MOD11/MOD9 (Len > 10)
【Pro CMD: 0415100】



Double Check Digits, MOD11/MOD11
【Pro CMD: 0415070】



Do not transmit Check Digit
【Pro CMD: 0415110】



Double Check Digits, MOD11/MOD9
【Pro CMD: 0415080】



** Transmit Check Digit
【Pro CMD: 0415120】



When "Check, Do not Transmit Check digit" is enabled and barcode message length minus one is less than Min Message Length, it will lead to an error.
E.g.: Reading a 4-byte (include check byte) Code 11 with the Min Message Length being 4 bytes and "Check, Do not transmit Check Digit" enabled leads to an error.



Load Factory Default



** Load ISBN Factory Default
【Pro CMD: 0416000】

Code Programming ON



Code Programming OFF



Enable/Disable ISBN



Enable ISBN
【Pro CMD: 0416020】



** Disable ISBN
【Pro CMD: 0416010】



When the engine can not read ISBN, please read “Enable ISBN” and try again.

Transmit



** Transmit 13 digits
【Pro CMD: 0416030】



Transmit 10 digits
【Pro CMD: 0416040】





Load Factory Default

Code Programming ON



** Load Industrial 25 Factory Default
【Pro CMD: 0417000】

Code Programming OFF



Enable/Disable Industrial 25



Enable Industrial 25
【Pro CMD: 0417020】



** Disable Industrial 25
【Pro CMD: 0417010】



When the engine can not read Industrial 25, please read “Enable Industrial 25” and try again.



Select Message Length

It is used to program the valid reading length of Industrial 25. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Industrial 25 Message Length is defined by “Min. Message Length” and “Max. Message Length .”

Code Programming ON



Code Programming OFF



Min Message Length (default: 6)
【Pro CMD: 0417030】



Max Message Length (default:48)
【Pro CMD: 0417040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.

Example

To set Min Message Length of Industrial 25 to 8 bytes and Max Message Length to 12 bytes, read these programming codes:

1. “Code Programming ON”
2. “Select Min Message Length”
3. Digit Code “8” , see Digit Code
4. “Save Programming” , see Digit Code
5. “Select Max Message Length”
6. Digit Code “1”
7. Digit Code “2”
8. “Save Programming”
9. “Code Programming OFF”





Check Digit

Industrial 25 may include Check Digit (not compulsory) following its barcode message. It verifies the barcode message.

- » "NO Check, Transmit All" means to read without check and transmit all bytes including barcode message and Check Digit.
- » "Check, Do Not Transmit Check Digit" means to read and check. If verification is successful, transmits barcode message; if not, engine will not send barcode message to the Host.
- » "Check, Transmit All" means to read and check. If verification is successful, transmits all messages; if not, engine will not send barcode message to the Host.

Code Programming ON



Code Programming OFF



** NO Check, Transmit All
【Pro CMD: 0417050】



Check, Transmit All
【Pro CMD: 0417070】



Check, Do Not Transmit Check Digit
【Pro CMD: 0417060】



When "Check, Do not Transmit Check digit" is enabled and barcode message length minus one is less than Min Message Length, it will lead to an error.
E.g.: Reading a 4-byte (include check byte) Industrial 25 with the Min Message Length being 4 bytes and "Check, Do not transmit Check Digit" enabled leads to an error.



Load Factory Default



** Load Standard 25 Factory Default
【Pro CMD: 0418000】

Code Programming ON



Code Programming OFF



Enable/Disable Standard 25



Enable Standard 25
【Pro CMD: 0418020】



** Disable Standard 25
【Pro CMD: 0418010】



When the engine can not read Standard 25, please read “Enable Standard 25” and try again.



Select Message Length

It is used to program the valid reading length of Standard 25. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Standard 25 Message Length is defined by “Min. Message Length” and “Max. Message Length .”

Code Programming ON



Code Programming OFF



Min Message Length (default: 6)
【Pro CMD: 0418030】



Max Message Length (default:48)
【Pro CMD: 0418040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.

Example

To set Min Message Length of Standard 25 to 8 bytes and Max Message Length to 12 bytes, read these programming codes:

1. “Code Programming ON”
2. “Select Min Message Length”
3. Digit Code “8” , see Digit Code
4. “Save Programming” , see Digit Code
5. “Select Max Message Length”
6. Digit Code “1”
7. Digit Code “2”
8. “Save Programming”
9. “Code Programming OFF”





Check Digit

Standard 25 may include Check Digit (not compulsory) following its barcode message. It verifies the barcode message.

- » "NO Check, Transmit All" means to read without check and transmit all bytes including barcode message and Check Digit.
- » "Check, Do Not Transmit Check Digit" means to read and check. If verification is successful, transmits barcode message; if not, engine will not send barcode message to the Host.
- » "Check, Transmit All" means to read and check. If verification is successful, transmits all messages; if not, engine will not send barcode message to the Host.

Code Programming ON



Code Programming OFF



** NO Check, Transmit All
【Pro CMD: 0418050】



Check, Transmit All
【Pro CMD: 0418070】



Check, Do Not Transmit Check Digit
【Pro CMD: 0418060】



When "Check, Do not Transmit Check digit" is enabled and barcode message length minus one is less than Min Message Length, it will lead to an error.
E.g.: Reading a 4-byte (include check byte) Industrial 25 with the Min Message Length being 4 bytes and "Check, Do not transmit Check Digit" enabled leads to an error.



Load Factory Default



** Load Plessey Factory Default
【Pro CMD: 0419000】

Code Programming ON



Code Programming OFF



Enable/Disable Plessey



Enable Plessey
【Pro CMD: 0419020】



** Disable Plessey
【Pro CMD: 0419010】



When the engine can not read Plessey, please read “Enable Plessey” and try again.



Select Message Length

It is used to program the valid reading length of Plessey. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Plessey Message Length is defined by “Min. Message Length” and “Max. Message Length .”

Code Programming ON



Code Programming OFF



Min Message Length (default: 4)
【Pro CMD: 0419030】



Max Message Length (default:48)
【Pro CMD: 0419040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.

Example

To set Min Message Length of Plessey to 8 bytes and Max Message Length to 12 bytes, read these programming codes:

1. “Code Programming ON”
2. “Select Min Message Length”
3. Digit Code “8” , see Digit Code
4. “Save Programming” , see Digit Code
5. “Select Max Message Length”
6. Digit Code “1”
7. Digit Code “2”
8. “Save Programming”
9. “Code Programming OFF”





Check Digit

Plessey may include Check Digits (not compulsory) following its barcode message. The two digits verify the barcode message.

- » "NO Check, Transmit All" means to read without check and transmit all bytes including barcode message and Check Digits.
- » "Check, Do Not Transmit Check Digit" means to read and check. If verification is successful, transmits barcode message; if not, engine will not send barcode message to the Host.
- » "Check, Transmit All" means to read and check. If verification is successful, transmits all messages; if not, engine will not send barcode message to the Host.

Code Programming ON



Code Programming OFF



NO Check, Transmit All
【Pro CMD: 0419050】



** Check, Transmit All
【Pro CMD: 0419070】



Check, Do Not Transmit Check Digit
【Pro CMD: 0419060】



When "Check, Do not Transmit Check digit" is enabled and barcode message length minus one is less than Min Message Length, it will lead to an error.
E.g.: Reading a 4-byte (include check byte) Plessey with the Min Message Length being 4 bytes and "Check, Do not transmit Check Digit" enabled leads to an error.



Load Factory Default



** Load MSI-Plessey Factory Default
【Pro CMD: 0420000】

Code Programming ON



Code Programming OFF



Enable/Disable MSI-Plessey



Enable MSI-Plessey
【Pro CMD: 0420020】



** Disable MSI-Plessey
【Pro CMD: 0420010】



When the engine can not read MSI-Plessey, please read “Enable MSI-Plessey” and try again.



Select Message Length

It is used to program the valid reading length of MSI-Plessey. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

MSI-Plessey Message Length is defined by “Min. Message Length” and “Max. Message Length.”

Code Programming ON



Code Programming OFF



Min Message Length (default: 4)
【Pro CMD: 0420030】



Max Message Length (default:48)
【Pro CMD: 0420040】



1D bar code Message Length should not exceed 127 bytes. If Max Message Length is less than Min Message Length, it means the engine will only support barcodes of the two lengths. If Max Message Length is equal to Min Message Length, the engine will only support barcodes of the length.

Example

To set Min Message Length of MSI-Plessey to 8 bytes and Max Message Length to 12 bytes, read these programming codes:

1. “Code Programming ON”
2. “Select Min Message Length”
3. Digit Code “8”, see Digit Code
4. “Save Programming”, see Digit Code
5. “Select Max Message Length”
6. Digit Code “1”
7. Digit Code “2”
8. “Save Programming”
9. “Code Programming OFF”





Check Digit

Plessey may include Check Digits(s) (not compulsory) following its barcode message. It may have one or two digits, which verify the barcode message.

» "NO Check, Transmit All" means to read without check and transmit all bytes including barcode message and Check Digits.

Code Programming ON



Code Programming OFF



NO Check, Transmit All
【Pro CMD: 0420050】



Double Check Digits, MOD10/MOD11
【Pro CMD: 0420080】



** Single Check Digit, MOD10
【Pro CMD: 0420060】



NO Transmit Check Digits
【Pro CMD: 0420090】



Double Check Digits, MOD10/MOD10
【Pro CMD: 0420070】



** Transmit Check Digits
【Pro CMD: 0420100】



When "Check, Do not Transmit Check digit" is enabled and barcode message length minus one is less than Min Message Length, it will lead to an error.
E.g.: Reading a 4-byte (include check byte) MSI-Plessey with the Min Message Length being 4 bytes and "Check, Do not transmit Check Digit" enabled leads to an error.



Load Factory Default



** Load PDF417 Factory
【Pro CMD: 0501000】

Code Programming ON



Code Programming OFF



Enable/Disable PDF417



** Enable PDF417
【Pro CMD: 0501020】



Disable PDF417
【Pro CMD: 0501010】



When the engine can not read PDF417, please read “Enable PDF417” and try again.



Select Message Length

It is used to program the valid reading length of PDF417. The engine will not send barcode message to the Host, if the decoded data length does not match the valid reading length.

PDF417 Message Length is defined by "Min. Message Length" and "Max. Message Length".

Code Programming ON



Code Programming OFF



Min Message Length (default: 1)
【Pro CMD: 0501030】



Max Message Length (default: 2710)
【Pro CMD: 0501040】



2D bar code Message Length should not exceed 65535 bytes.

Max Message Length should not be less than Min Message Length.

To read a fixed length PDF417, Please program Max & Min Message Length to the same value.

Example

To set Min Message Length of PDF417 to 8 bytes and Max Message Length to 12 bytes, read these programming codes:

1. "Code Programming ON"
2. "Select Min Message Length"
3. Digit Code "8", see Digit Code
4. "Save Programming", see Digit Code
5. "SelectMax Message Length"
6. Digit Code "1"
7. Digit Code "2"
8. "Save Programming"
9. "Code Programming OFF"



PDF417 Twin Code

PDF417 twin code is 2 PDF417 barcodes paralleled vertically or horizontally. They must have the same direction. Their specifications must be similar and the distance between them must be short.

Code Programming ON



Code Programming OFF



There are 3 options for reading PDF417 twin code:

- » Single PDF417 Only: Read either PDF417 code.
- » Twin PDF417 Only: Read both PDF417 codes. The transmission sequence is: left (upper) PDF417 code followed by right (lower) PDF417 code.
- » Both Single & Twin: Read both PDF417 codes. If successful, transmit as twin PDF417 only. Otherwise, try single PDF417 only.



** Single PDF417 Only
【Pro CMD: 0501070】



Both Single & Twin
【Pro CMD: 0501090】



Twin PDF417 Only
【Pro CMD: 0501080】

Forward/Backward Direction PDF 417

PDF 417 has forward or backward direction.

Forward Direction Barcode: Light colour ground, Deep colour bars.

Backward Direction Barcode: Deep colour ground, Light colour bars.



** Forward Direction Barcode Only
【Pro CMD: 0501320】



Both
【Pro CMD: 0501322】



Backward Direction Barcode Only
【Pro CMD: 0501321】





Load Factory Default



** Load QR Code Factory Default
【Pro CMD: 0502000】

Code Programming ON



Code Programming OFF



Enable/Disable QR Code



** Enable QR Code
【Pro CMD: 0502020】



Disable QR Code
【Pro CMD: 0502010】



When the engine can not read QR Code, please read “Enable QR Code” and try again.



Select Message Length

It is used to program the valid reading length of QR Code. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

QR Code Message Length is defined by "Min. Message Length" and "Max. Message Length".

Code Programming ON



Code Programming OFF



Min Message Length (default: 1)
【Pro CMD: 0502030】



Max Message Length (default: 7089)
【Pro CMD: 0502040】



2D bar code Message Length should not exceed 65535 bytes.

Max Message Length should not be less than Min Message Length.

To read a fixed length QR Code, Please program Max & Min Message Length to the same value



To set Min Message Length of QR Code to 8 bytes and Max Message Length to 12 bytes, read these programming codes:

1. "Code Programming ON"
2. "Select Min Message Length"
3. Digit Code "8", see Digit Code
4. Save Programming", see Digit Code
5. Select Max Message Length"
6. Digit Code "1"
7. Digit Code "2"
8. "Save Programming"
9. "Code Programming OFF"



QR Twin Code

QR twin code is 2 QR barcodes paralleled vertically or horizontally. They must have the same direction. Their specifications must be similar and the distance between them must be short.

There are 3 options for reading QR twin code:

- » Single QR Only: Read either QR code.
- » Twin QR Only: Read both QR codes. The transmission sequence is: 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.

Code Programming ON



Code Programming OFF



**Single QR Only
【Pro CMD: 0502070】



Twin QR Only
【Pro CMD: 0502080】



Both Single & Twin
【Pro CMD: 0502090】



Load Factory Default



** Load Aztec Factory Default
【Pro CMD: 0503000】

Code Programming ON



Code Programming OFF



Enable/Disable Aztec



Enable Aztec
【Pro CMD: 0503020】



** Disable Aztec
【Pro CMD: 0503010】



When the engine can not read Aztec, please read “Enable Aztec” and try again.



Select Message Length

It is used to program the valid reading length of Aztec. The engine will not send barcode message to the Host, if the decoded data length does not match the valid length.

Aztec Message Length is defined by “Min. Message Length” and “Max. Message Length”.

Code Programming ON



Code Programming OFF



Min Message Length (default: 1)
【Pro CMD: 0503030】



Max Message Length (default: 3832)
【Pro CMD: 0503040】



2D bar code Message Length should not exceed 65535 bytes.

Max Message Length should not be less than Min Message Length.

To read a fixed length Aztec, Please program Max & Min Message Length to the same value.



To set Min Message Length of Aztec to 8 bytes and Max Message Length to 12 bytes, read these programming codes.

1. “Code Programming ON”
2. “Select Min Message Length”
3. Digit Code “8”, see Digit Code
4. Save Programming”, see Digit Code
5. Select Max Message Length”
6. Digit Code “1”
7. Digit Code “2”
8. “Save Programming”
9. “Code Programming OFF”



Reading Multi-barcodes of an Image

There are three modes:

- » Mode 1: Read one barcode only.
- » Mode 2: Read fixed number of barcodes only.
- » Mode 3: Composite Reading. Read fixed number of barcodes first, if failed, read one barcode only.

Code Programming ON



Code Programming OFF



** Mode 1

【Pro CMD: 0503070】



Mode 3

【Pro CMD: 0503090】



Mode 2

【Pro CMD: 0503080】



The number of Multi-barcodes

Code Programming ON



Code Programming OFF



** 1

【Pro CMD: 0503060】



5

【Pro CMD: 0503064】



2

【Pro CMD: 0503061】



6

【Pro CMD: 0503065】



3

【Pro CMD: 0503062】



7

【Pro CMD: 0503066】



4

【Pro CMD: 0503063】



8

【Pro CMD: 0503067】





Load Factory Default



** Load Data Matrix Factory Default
【Pro CMD: 0504000】

Code Programming ON



Code Programming OFF



Enable/Disable Data Matrix



** Enable Data Matrix
【Pro CMD: 0504020】



Disable Data Matrix
【Pro CMD: 0504010】



When the engine can not read Data Matrix, please read “Enable Data Matrix” and try again.



Select Message Length

It is used to program the valid reading length of Data Matrix. The engine will not send barcode message to the Host, if the decoded data length does not match the valid reading length.

Data Matrix Message Length is defined by "Min. Message Length" and "Max. Message Length".

Code Programming ON



Code Programming OFF



Min Message Length (default: 1)

【Pro CMD: 0504030】



Max Message Length (default: 3116)

【Pro CMD: 0504040】



2D bar code Message Length should not exceed 65535 bytes.

Max Message Length should not be less than Min Message Length.

To read a fixed length Data Matrix, Please program Max & Min Message Length to the same value.

Example

To set Min Message Length of Data Matrix to 8 bytes and Max Message Length to 12 bytes, read these programming codes.

1. "Code Programming ON"
2. "Select Min Message Length"
3. Digit Code "8", see Digit Code
4. Save Programming", see Digit Code
5. Select Max Message Length"
6. Digit Code "1"
7. Digit Code "2"
8. "Save Programming"
9. "Code Programming OFF"



Data Matrix Twin Code

Data Matrix twin code is 2 Data Matrix barcodes paralleled vertically or horizontally. They must have the same direction. Their specifications must be similar and the distance between them must be short.



There are 3 options for reading Data Matrix:

- » Single Data Matrix Only: Read either Data Matrix.
- » Twin Data Matrix Only: Read both Data Matrix. The transmission sequence is: left (upper) Data Matrix followed by right (lower) Data Matrix.
- » Both Single & Twin: Read both Data Matrix. If successful, transmit as twin Data Matrix. Otherwise, try single Data Matrix only.



**Single Data Matrix Only
【Pro CMD: 0504070】



Twin Data Matrix Only
【Pro CMD: 0504080】



Both Single & Twin
【Pro CMD: 0504090】



Rectangular Symbols

Code Programming ON



Data Matrix has two formats:

» Square symbols, which has the same amount of models in length and width: 10*10, 12*12.... 144*144.

» Rectangular symbols, which has different amounts of models in length and width: 6*16;6*14...14*22.

Code Programming OFF



** Enable Rectangular Symbols
【Pro CMD: 0504110】



Disable Rectangular Symbols
【Pro CMD: 0504100】

Forward/Backwrdr Direction Data Matrix

Data Matrix has forward or backwrdr direction.

Forward Direction Barcode: Light colour ground, Deep colour bars.

Backwrdr Direction Barcode: Deep colour ground, Light colour bars.



** Forward Direction Barcode Only
【Pro CMD: 0504320】



Both
【Pro CMD: 0504322】



Backwrdr Direction Barcode
【Pro CMD: 0504321】



Load Factory Default



** Load Maxicode Factory Default
【Pro CMD: 0505000】

Code Programming ON



Code Programming OFF



Enable/Disable Maxicode



Enable Maxicode
【Pro CMD: 0505020】



** Disable Maxicode
【Pro CMD: 0505010】



When the engine can not read Maxicode, please read “Enable Maxicode” and try again.



Select Message Length

It is used to program the valid reading length of Maxicode. The engine will not send barcode message to the Host, if the decoded data length does not match the valid reading length.

Maxicode Message Length is defined by "Min. Message Length" and "Max. Message Length".

Code Programming ON



Code Programming OFF



Min Message Length (default: 1)
【Pro CMD: 0505030】



Max Message Length (default: 150)
【Pro CMD: 0505040】



2D bar code Message Length should not exceed 65535 bytes.

Max Message Length should not be less than Min Message Length.

To read a fixed length Maxicode, Please program Max & Min Message Length to the same value.

Example

To set Min Message Length of Maxicode to 8 bytes and Max Message Length to 12 bytes, read these programming codes.

1. "Code Programming ON"
2. "Select Min Message Length"
3. Digit Code "8", see Digit Code
4. Save Programming", see Digit Code
5. Select Max Message Length"
6. Digit Code "1"
7. Digit Code "2"
8. "Save Programming"
9. "Code Programming OFF"



Load Factory Default



** Load Chinese Sensible Code Factory Default
【Pro CMD: 0508000】

Code Programming ON



Code Programming OFF



Enable/Disable Chinese Sensible Code



Enable Chinese Sensible Code
【Pro CMD: 0508020】



** Disable Chinese Sensible Code
【Pro CMD: 0508010】



When the engine can not read Maxicode, please read “Enable Chinese Sensible Code” and try again.



Select Message Length

It is used to program the valid reading length of Chinese Sensible Code. The engine will not send barcode message to the Host, if the decoded data length does not match the valid reading length.

Maxicode Message Length is defined by "Min. Message Length" and "Max. Message Length".

Code Programming ON



Code Programming OFF



Min Message Length (default: 1)
【Pro CMD: 0508030】



Max Message Length (default:7827)
【Pro CMD: 0508040】



2D bar code Message Length should not exceed 65535 bytes.

Max Message Length should not be less than Min Message Length.

To read a fixed length Maxicode, Please program Max & Min Message Length to the same value.



To set Min Message Length of Chinese Sensible Code to 8 bytes and Max Message Length to 12 bytes, read these programming codes.

1. "Code Programming ON"
2. "Select Min Message Length"
3. Digit Code "8", see Digit Code
4. Save Programming", see Digit Code
5. Select Max Message Length"
6. Digit Code "1"
7. Digit Code "2"
8. "Save Programming"
9. "Code Programming OFF"



OCR

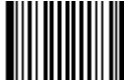
Introduction

OCR (Optical Character Recognition) is the technology that captures image of printed information, and recognizes the image to editable characters.

The engine supports OCR B standard and specific typefaces, such as:

■ 0 1 2 3 4 5 6 7 8 ■

1. Nine numbers of OCR-B typeface must be included.
2. There must be a space between No.7 and No.8 number.
3. It must start and end with “■”. There must be a space between “■” and a number.



** Load SPEC_OCR_B Factory Default
【Pro CMD: 0600000】



** Disable OCR
【Pro CMD: 0600010】



Enable OCR
【Pro CMD: 0600020】



Prefix/Suffix

Introduction

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

Prefix and Suffix are how to fulfill the needs mentioned above. They can be added, removed, and modified while the original barcode message is still in tact.



Barcode processing sequences:

1. Intercept barcode message
 2. Add Prefix/Suffix
 3. Pack
 4. Terminate with Terminal and transmit
-



Disable or Enable Prefix/Suffix

Disable All Prefix/Suffix: Transmit barcode message with no Prefix/Suffix.

Enable All Prefix/Suffix: Allow appending Code ID prefix, AIM prefix, User prefix, User suffix and Terminal to the barcode message.

Code Programming ON



Code Programming OFF



** Disable All Prefix/Suffix
【Pro CMD: 0311000】



Enable All Prefix/Suffix
【Pro CMD: 0311010】





Prefix Sequences

6 options of Prefix Sequences:

Code Programming ON



Code Programming OFF



** CodeID + AIM + User Prefix
【Pro CMD: 0317000】



AIM + User Prefix + CodeID
【Pro CMD: 0317030】



CodeID + User Prefix + AIM
【Pro CMD: 0317010】



User Prefix + CodeID + AIM
【Pro CMD: 0317040】



AIM + CodeID + User Prefix
【Pro CMD: 0317020】



User Prefix + AIM + CodeID
【Pro CMD: 0317050】





Disable or Enable User Prefix

User Prefix is added before barcode message. For example, if the user prefix is “AB” and the barcode message is “123” , the Host receives “AB123” .



** Disable User Prefix
【Pro CMD: 0305000】

Code Programming ON



Code Programming OFF



Enable User Prefix
【Pro CMD: 0305010】

Program User Prefix

Enable “Program User Prefix” . Then program user prefix byte(s). To end the prefix, read “Save programming” The user prefix byte is programmed in its hex values. See example below.

Note: The maximum length for user prefix is 10 bytes.



Program User Prefix
【Pro CMD: 0300000】

Example

Program “CODE” as user prefix (The hex of “CODE” are 0x43/0x4F/0x44/0x45):

1. Read “Code Programming ON”
2. Read “Program User Prefix”
3. Read “4,3,4,F,4,4,4,5” in order
4. Read “Save Programming”
5. Read “Code Programming OFF” .
6. Read “Allow User Prefix” to enable above programming. “CODE” will appear to the left of a barcode.





Prefix/Suffix

AIM Prefix



Tools

AIM (Automatic Identification Manufactures) defines AIM prefix for many standard barcode formats.

AIM Prefix Format: “]” + AIM prefix + “0”

Code Programming ON



Code Programming OFF



** Disable AIM Prefix for All Barcodes
【Pro CMD: 0308000】



Enable AIM Prefix for All Barcodes
【Pro CMD: 0308030】



AIM ID is not customizable.



Besides AIM prefix, Code ID prefix can be used to denote barcode format and can be customized.

The Code ID prefix **MUST** be one (1) or two (2) visible English letters.

Code Programming ON



Code Programming OFF



**** No Code ID Prefix**
【Pro CMD: 0307000】



Allow Code ID Prefix
【Pro CMD: 0307010】

Code ID Default



All Bar codes, Load Code ID Factory Default
【Pro CMD: 0307020】





Modify Code ID

See the examples below for how to modify a code ID and restore factory default code ID.

Code Programming ON



Example

Modify PDF417 Code ID to be “p” (hex value is 0x70)

1. Read “Code Programming ON”
2. Read “Modify PDF417”
3. Read Digit Code “7”, “0”
4. Read “Save Programming”
5. Read “Code Programming OFF” .

Code Programming OFF



Load Code ID factory default (including PDF417)

1. Read “Code Programming ON”
2. Read “2D, Load Code ID Factory Default”
3. Read “Code Programming OFF” .



Modify PDF417

【Pro CMD: 0005000】



Modify Data Matrix

【Pro CMD: 0005030】



Modify QR Code

【Pro CMD: 0005010】



Modify Maxicode

【Pro CMD: 0005040】



Modify Aztec

【Pro CMD: 0005020】



User Define Code

【Pro CMD: 0005090】



Modify EAN-8
【Pro CMD: 0004040】



Modify EAN-13
【Pro CMD: 0004050】



Modify UPC-E
【Pro CMD: 0004060】



Modify UPC-A
【Pro CMD: 0004070】



Modify Interleaved 2 of 5
【Pro CMD: 0004080】



Modify ITF-14
【Pro CMD: 0004090】

Code Programming ON



Code Programming OFF



Modify ITF-6
【Pro CMD: 0004100】



Modify Code 39
【Pro CMD: 0004130】



Modify Codabar
【Pro CMD: 0004150】



Modify Code 93
【Pro CMD: 0004170】





Modify Code 128
【Pro CMD: 0004020】



Modify UCC/EAN-128
【Pro CMD: 0004030】



Modify Code 11
【Pro CMD: 0004280】



Modify EAN•UCC Composite
【Pro CMD: 0004300】



Modify GS1 Databar
【Pro CMD: 0004310】



Modify ISBN
【Pro CMD: 0004240】



Modify Industrial 25
【Pro CMD: 0004250】



Modify Standard 25
【Pro CMD: 0004260】



Modify Plessey
【Pro CMD: 0004270】



Modify MSI-Plessey
【Pro CMD: 0004290】

Code Programming ON



Code Programming OFF





Prefix/Suffix

User Suffix



Disable or Enable User Suffix

User suffix is appended to the right of barcode message. For example, if user suffix is “AB” , and the barcode message is “123” , The Host receives “123AB” .

Code Programming ON



Code Programming OFF



**Disable User Suffix
【Pro CMD: 0306000】



Enable User Suffix
【Pro CMD: 0306010】

Program User Suffix

Read “Program User Suffix” . Then program user suffix byte(s). To end the suffix, read “Save programming” . The user suffix byte is programmed in its hex values. See example below.

Note: The maximum length for user suffix is 10 bytes.



Program User Suffix
【Pro CMD: 0301000】

Example

Program “CODE” as user suffix (The hex of “CODE” are 0x43, 0x4F, 0x44, and 0x45):

1. Read “Code Programming ON”
2. Read “Program User Suffix”
3. Read “4,3,4,F,4,4,4,5” in order
4. Read “Save Programming”
5. Read “Code Programming OFF”
6. Read “Allow User Suffix” to enable above programming. “CODE” will appear to the right of a barcode.





Disable or Enable Terminal

“Terminal” is the termination for a string of barcode messages. It can not be formatted like other suffix and prefix. It is fixed to the right and the very end of a barcode transmission.

Code Programming ON



Code Programming OFF



**Disable Terminal
【Pro CMD: 0309000】



Enable Terminal
【Pro CMD: 0309010】

Program Terminal

Read “Program Terminal” . Then program terminal byte(s). To end the suffix, read “Save programming” . The terminal byte is programmed in its hex values. See example below.

Note: The maximum length for terminal is 2 bytes.



Program Terminal
【Pro CMD: 0310000】



Program Ox0D as Terminal
【Pro CMD: 0310010】



Program Ox0D 0x0A as Terminal
【Pro CMD: 0310020】





Message Interception & Pack

Introduction

Barcode message could divide information into different sections, such as product ID, manufacture ID, and so on. They are important overall. However, at certain situations, some of them are not of interest. This is where message interception comes in. Message interception feature allows transmission of selected section(s). Message intercept only applies to “raw” barcode messages.

The sequence of a read to transmit without message intercept is: Read a “raw” barcode → Add prefix → Append suffix → Append terminal → Transmit to Host.

The sequence of a read to transmit with message intercept is: Read a “raw” barcode → Intercept Message → Add prefix → Append suffix → Append terminal → transmit to Host.

A special programming, pack, can insert barcode messages into a certain message format.

Then the processing sequence is: Read to obtain barcode message → Intercept → Add prefix → Append suffix → Pack → Append terminal → Transmit.



Interception Rule No.1: It only intercepts selected symbols' raw barcode messages and it effects all barcodes of the barcode format.

Code Programming ON



Interception Rule No.2: There are maximum 3 interception options restored in the non-volatile memory. If more than 3 are programmed, the last 3 are stored. For example, if there are 4 options are programmed in the order of Code 128 , Code 39, QR Code, and UPC-A and "Save" . The 3 options are restored in the order of: Code 39, QR Code, UPC-A.

Code Programming OFF



Interception Rule No.3: If there are more than one options programmed for a barcode format, the later one is used. For example, there are 3 options restored, Code 128 option A, QR Code option, Code 128 option B. The Code 128 option B is used when a Code 128 barcode is read.

"Enable Interception" barcode should be read before intercepting message.

Steps should be followed to erase certain barcode(EAN-13 e.g.) interception options:

- 1、 Read "Erase Certain Barcode Interception Options" barcode;
- 2、 Get Symbol ID, for example, EAN-13:005
- 3、 Read digit codes accordingly.
- 4、 Read "Save" barcode.



**Disable Interception
【Pro CMD: 0315000】



Erase Certain Barcode Interception Options
【Pro CMD: 0316010】



Enable Interception
【Pro CMD: 0315010】



Erase Latest Interception Options
【Pro CMD: 0316020】



Program Intercept Option
【Pro CMD: 0316000】



Erase All Interception Options
【Pro CMD: 0316030】





Programming 1D Intercept Option

Code Programming ON



Code Programming OFF



When programming 1D intercept option, read digit codes as interception command. The rules is as below:

- » The interception command format of 1D interception command regards a 3-digit decimal number as a unit.
- » The interception command has two parts, which are barcode type part(Symbol ID) and data interception part. A command could have several data interception parts.
- » A barcode type part(Symbol ID) uses a unit, such as “005” ; a datainterception part uses three units, including intercepting direction unit:000(Ascending) or 001(Descending), start unit and stop unit.
- » There is only one type of barcode to be setted to intercept in a time.

Example

Intercept EAN-13 from 1st digit to 3rd ascending and from reciprocal 4th to reciprocal 1st:

- 1、 Read “Code Programming ON”
- 2、 Read “Allow Interception”
- 3、 Read “Program Intercept Option”
- 4、 Check Symbols ID Number table for EAN-13
- 5、 Read below digit barcodes

digit	005	000	001	003	001	004	001
Denotes	symbol ID	ascending	the 1st digit	the 3rd digit	descending	the 4th digit	the 1st digit

Barcode Type

Data Interception 1

Data Interception 2

Note:

- 1、 Maximum sections of barcode message interception are 5.
- 2、 Maximum value is 127 for both start digital and end digital
- 3、 Overlaps of barcode message sections are allowed and work independently.
- 4、 Start unit and end unit determine its message section. In the above example, descending “004” and “001” means the section of “last 4th”, “last 3rd”, “last 2nd”, and “last one” digits.
- 5、 To intercept only one digit, program start unit and end unit to be the same value.



Programming 2D Intercept Option

When programming 2D intercept option, read digit codes as interception command. The rules is as below:

» The interception command has two parts, which are barcode type part(Symbol ID) and data interception part. A command could have several data interception parts.

» A barcode type part(Symbol ID) uses a unit, such as “005” ; a data interception part uses three units, including intercepting direction unit:000(Ascending) or 001(Descending), start unit and stop unit.

» Barcode type part and intercepting direction regards a 3-digit decimal number as a unit; but start and stop digit regards a 6-digit decimal number as a unit. They uses 6 digits to present 4-digit value. The first two digits are for thousandth and next two digits for hundredth. For example, 001013 means 113.

» There is only one type of barcode to be setted to intercept in a time.

Code Programming ON



Code Programming OFF

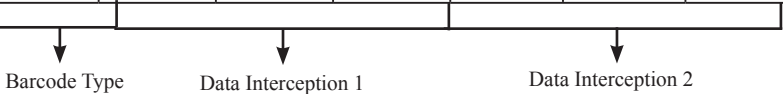


Example

For example, intercept QR Code from 1st digit to 20th ascending and from 113th digit to 140th ascending.

1. Read “Code Programming ON”
2. Read “Enable Interception”
3. Read “Program Intercept Option”
4. Check Symbols ID Number table for QR Code
5. Read below digit barcodes

digit	033	000	000001	000020	000	001013	001040
Denote	symbol ID	ascending	The 1st digit	The 20th digit	ascending	The 113th digit	The 140th digit



Rules:

- 1、Maximum intercept 3 barcode message sections
- 2、Maximum value is 9999 for start digital and end digital
- 3、Overlaps of barcode message sections are allowed and work independently.
- 4、Start unit and end unit determine its message section. In the above example, ascending “000001” and “000020” means the first 20 digits.
- 5、To intercept only one digit, program start unit and end unit to be the same value.





Introduction

Data Pack is for the special requirements of barcode message. There are 3 types of data pack. Data pack effects all data formats, in that be sure to load the default “Disable Pack” if pack is not required.

Code Programming ON



Code Programming OFF



** Disable Pack

【Pro CMD: 0314000】

Normal Pack

Normal pack format:

[STX + ATTR + LEN] + [AL_TYPE + DATA] + [LRC]

- » STX: 0x02
- » ATTR: 0x00
- » LEN: Barcode message length is expressed by 2 bytes, range “0x0000~0xFFFF” which is between 0 and 65535.
- » AL_TYPE: 0x36
- » DATA: Barcode message
- » LRC: Parity byte

The algorithm:

- 1、 computation sequence is $LRC=0xFF+STX+ATTR+LEN+AL_TYPE+DATA$
- 2、 computation method is XOR, byte by byte.



Normal Pack

【Pro CMD: 0314010】





Batch Programming



Tools

Introduction

Batch Programming can integrate a programming sequence into one barcode.

Batch Programming Rules:

- » Sub-command is in this format: Programming Command + Parameters
- » Sub-commands are terminated by semicolons. Note that there is no blank between a sub-command and its terminator semicolon.
- » “Save Programming” (0000160) to terminate
- » Use Barcode Generator software to make the 2D batch barcode.

Code Programming ON



Code Programming OFF



For example, to generate a batch barcode for “Illumination Keep ON”(0200030), “Auto Mode”(0302010), “One Reading Timeout = 2000”(0313000), and “Disable Fixed Length Selection”(0405140)for Interleaved 2 of 5.

0200030; 0302010; 0313000 = 2000; 0405140; 0000160; Generate a batch code.



Allow Read Batch Code
【Pro CMD: 0001110】



Batch command can contain many commands. Each command is divided by semicolon. Batch command must be ended with save command.

Command structure: command (+ equal mark + setting information)

The setting command list is provided below

There are 4 setting command modes

1. Setting syntax 1: Command

The most command is the one can be set at one time without the command.

e.g.:

The command setting the baud rate as 38400 bps: 0100060

The command setting auto mode: 0302010

2. Setting syntax 2: Command + equal mark + number

This command is used for setting the value of parameter, including the longest and shortest length of the barcode, one reading timeout setting, same barcode reading delay setting, sensitive value setting, etc.

e.g.:

The command setting the one reading timeout as 3000ms: 0313000 = 3000

The command setting the sensitive value as 10: 0312040 = 10

3. Setting syntax 3: command + equal mark + hex (e.g., 0x101a, 0x2C03)

This command can be used as setting the user-defined prefix, user-defined suffix, ending suffix, CodeID, increase or cancel the barcode length value, information intercepting, etc. Note: every two hexes in the command stand for a setting character

e.g.:

Append the fixed length 4 of interleaved 2of 5 to 26: 0405160 = 0x041a

Setting the suffix information of the ending as CR/LF: 0310000 = 0x0d0a

4. Setting syntax 4: command + equal mark+ double quotation marks

If the setting information is viewable character, then this mode of setting is appropriate.

e.g.:

The command setting the user-defined prefix information as AUTO-ID : 0300000 = "AUTO-ID"





Make the command list (ended with save command) to a PDF417, QR code or DataMatrix.

For example, to produce a batch command means: light Always On, Auto Scan, change delay time to 2 seconds, Disable Fixed Length of I 2 of 5. Firstly find commands as follows

0200030; (light Always On)

0302010; (Auto Mode)

0313000 = 2000; (change One Reading Timeout to 2 seconds)

0405140; (Disable Fixed Length of Interleaved 2 of 5)

0000160; (Save)

The batch setting code (PDF417) is as follow,





Read “Code Programming ON”, then read “enable batch setting code”, and then read the batch setting code produced just now, finally Read “Code Programming Off”

Code Programming ON



Code Programming OFF



Code Programming ON
【Pro CMD: 0006010】



Allow Read Batch Code
【Pro CMD: 0001110】



Batch Setting Code



Code Programming OFF
【Pro CMD: 0006000】



Appendix

Digit Code

It is must to be read save after read digit code.



0

【Pro CMD: 0000000】



4

【Pro CMD: 0000040】



1

【Pro CMD: 0000010】



5

【Pro CMD: 0000050】



2

【Pro CMD: 0000020】



6

【Pro CMD: 0000060】



3

【Pro CMD: 0000030】



7

【Pro CMD: 0000070】



8

【Pro CMD: 0000080】



C

【Pro CMD: 0000120】



9

【Pro CMD: 0000090】



D

【Pro CMD: 0000130】



A

【Pro CMD: 0000100】



E

【Pro CMD: 0000140】



B

【Pro CMD: 0000110】



F

【Pro CMD: 0000150】





In order to save the received data “Save” has to be read after data transition completed. If error occurs when reading data, the wrong data can be deleted and the setting up can be done again..

Eg, after a program code is received then ‘1 2 3’ in order is received, if then read “Abort One Data of Current Setting” the “3” will be deleted; if read “Abort One String of Current Setting” the ‘123’ will be deleted; if read “Abort Current Setting” both the program code and ‘123’ will be deleted, the device will be on status of “initiating program code”

Code Programming ON



Code Programming OFF



Save

【Pro CMD: 0000160】



Abort One Data of Current Setting

【Pro CMD: 0000170】



Abort Current Setting

【Pro CMD: 0000190】



Abort One String of Current Setting

【Pro CMD: 0000180】



Parameters	Factory Default	Remark
General Programming		
Code Programming	Off	
Send Pro Code Value	Off	
Illumination	Illumination Wink	
Aiming	Aiming Wink	
Decoding Beep	On	
Decoding Beep Type	Type 1	
Decoding Beep Volume	Loud	
Power On Beep	On	
Working Mode	Auto Mode	
One Reading Timeout	3000ms	
Same Barcode Reading Delay	Multi-reading Semi-prohibit, 1500ms	
Sensitivity	Normal Sensitivity	Sensitivity = 11
Exposure Imaging Mode	Normal Exposure Mode	
Power On, Send Product Info	Off	
OCR	Off	
Communication Programming		
Baud Rate	9600	RS232
Serial Port Check	No Check	RS232
Transmit Digits	8 Digits	RS232
Stop Digit	1 Digit	Fixed, RS232
Hardware Auto Flow Control	Off	RS232
Unkown Character, Beep	Off	USB HID-KBW
Emulate ALT + keypad	Off	USB HID-KBW
Function Key Mapping	Off	USB HID-KBW
Keystroke Delay	No Delay	USB HID-KBW
Caps Lock	Off	USB HID-KBW
Convert Case	Off	USB HID-KBW
Emulate Numeric Keypad	Off	USB HID-KBW
Data Format Programming		
Add Prefix/Suffix	Off	
Prefix Sequences	CodeID+User Prefix+AIMID	CodeID+AIMID+(Prefix+Data) +Suffix+Terminal
AIMID	Off	]Cm Mark
CodeID	Off	One Digit, Capital or Small Letter
User Prefix	Off	No more than 10 digits
User Suffix	Off	No more than 10 digits
Terminal	Off	No more than 2 digits
Interception	Off	
Pack	Off	





Parameters	Factory Default	Remark
Symbol		
Code 128		
Enable	On	
Max Message Length	48	
Min Message Length	1	
EAN-8		
Enable	On	
Send Check Digit	On	
Enable 2 Digits Addenda Code	Off	
Enable 5 Digits Addenda Code	Off	
Expand to EAN-13	Off	
EAN-13		
Enable	On	
Send Check Digit	On	
Enable 2 Digits Addenda Code	Off	
Enable 5 Digits Addenda Code	Off	
UPC-E		
Enable	On	
Send Check Digit	On	
Enable 2 Digits Addenda Code	Off	
Enable 5 Digits Addenda Code	Off	
Expand to UPC-A	Off	
Send Default "0"	Off	
UPC-A		
Enable	On	
Send Check Digit	On	
Enable 2 Digits Addenda Code	Off	
Enable 5 Digits Addenda Code	Off	
Send Default "0"	Off	
Interleaved 2 of 5		
Enable	On	
Check	Off	
Send Check Digit	Off	
Max Message Length	80	





Min Message Length	6	No less than 4
Specified Lengths	Off	
ITF-6		
Enable	Off	
ITF-14		
Enable	Off	
Matrix 2 of 5		
Enable	Off	
Check	Off	
Max Message Length	80	
Min Message Length	4	No less than 4
Code 39		
Enable	On	
Check	Off	
Send Start & Stop Character	On	
Support Full ASCII	Off	
Max Message Length	48	
Min Message Length	4	No less than 4
Codabar		
Enable	On	
Check	Off	
Send Start & Stop Character	On	ABCD/ABCD, Upper Case
Max Message Length	60	
Min Message Length	2	
Code 93		
Enable	Off	
Check	On	
Send Check Digit	Off	
Max Message Length	48	
Min Message Length	1	No less than 1
UCC/EAN-128		
Enable	On	
GSI Databar		
Enable	On	
Send AI(01) Character	On	





<i>EAN•UCC Composite</i>		
Enable	Off	
UPC/EAN Composite Enable	Off	
<i>Code 11</i>		
Enable	Off	
Send Check Digit	On	
1 Digit, MOD11 Check	On	
Max Message Length	48	
Min Message Length	4	No less than 4
<i>ISBN</i>		
Enable	Off	
Transmit 13 Digits	On	
<i>Industrial 25</i>		
Enable	Off	
Check	Off	
Max Message Length	48	
Min Message Length	6	No less than 4
<i>Standard 25</i>		
Enable	Off	
Check	Off	
Max Message Length	48	
Min Message Length	6	No less than 4
<i>Plessey</i>		
Enable	Off	
Check and Transmit Check Digits	On	
Max Message Length	48	
Min Message Length	4	No less than 4
<i>MSI-Plessey</i>		
Enable	Off	
Check and Transmit Check Digits	On	
Single MOD10 Check	On	
Max Message Length	48	
Min Message Length	4	No less than 4





PDF417		
Enable	On	
Read Single PDF417 Only	On	
Max Message Length	2710	
Min Message Length	1	
Read Forward Direction Barcode Only	On	
QR Code		
Enable	On	
Read Single QR Only	On	
Max Message Length	7089	
Min Message Length	1	
Aztec		
Enable	Off	
Max Message Length	3832	
Min Message Length	1	
Reading Multi-barcodes of an Image	Off	
Data Matrix		
Enable	On	
Max Message Length	3116	
Min Message Length	1	
Read Single DM Only	On	
Rectangular Symbols	On	
Read Forward Direction Barcode Only	On	
Maxicode		
Enable	Off	
Max Message Length	150	
Min Message Length	1	
Maxicode		
Enable	Off	
Max Message Length	7827	
Min Message Length	1	





Symbol	AIM ID	Possible AIM ID Modifiers(m)
Code 128	]C0	
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-6	]Im	1,3
ITF-14	]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	
Code 11	]Hm	0,1,3
ISBN	]X0	
Industrial 25	]S0	
Standard 25	]R0	
Plessey	]P0	
MSI-Plessey	]Mm	0,1
GSI Databar	]e0	
EAN•UCC Composite	]em	0-3
PDF417	]Lm	0-2
QR Code	]Qm	0-6
Aztec	]zm	0-9, A-C
Data Matrix	]dm	0-6
Maxicode	]Um	0-3
Chinese Sensible Code	]Xm	

Reference:

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





Symbol	Code ID
Code 128	j
UCC/EAN-128	j
EAN-8	d
EAN-13	d
UPC-E	c
UPC-A	c
Interleaved 2 of 5	e
ITF-6	e
ITF-14	e
Matrix 2 of 5	v
Code 39	b
Codabar	a
Code 93	i
Code 11	H
GSI Databar	R
EAN•UCC Composite	y
ISBN	B
Industrial 25	I
Standard 25	f
Plessey	n
MSI-Plessey	m
PDF417	r
QR Code	s
Aztec	z
Data Matrix	u
Maxicode	x
Chinese Sensible Code	h





Symbol	ID Number
Code 128	002
UCC/EAN-128	003
EAN-8	004
EAN-13	005
UPC-E	006
UPC-A	007
Interleaved 2 of 5	008
ITF-14	009
ITF-6	010
Matrix 2 of 5	011
Code 39	013
Codabar	015
Code 93	017
ISBN	024
Industrial25	025
Standard25	026
Plessey	027
Code11	028
MSI-Plessey	029
EAN•UCC Composite	030
GS1 Databar	031
PDF417	032
QR Code	033
Aztec	034
DataMatrix	035
Maxicode	036
Chinese Sensible Code	039
User-Define Code	041
SPEC_OCR_B	064



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