Newland

RVM
RING SCANNER

OEM Scan Engines

Programming Manual

Disclaimer

Revision History

Version	Description	Date
B1.0	Beta version.	19 July 2024

Version Correspondence

Programming Manual Version	Firmware Version	Hardware Version
V1.0	NLS-RVM1.UJ101.ST.H01.1.BA4	V0.1.1
V1.0	RING.MC.ST.H01.1	V1.0.0

Table of Contents

Setting Methods

This device enables users to modify its functions or query device information through commands. However, please note that configuring functions via scanning QR codes is not supported at this time.

Users have the option to connect to the host computer either through the RJ45 port or via USB using the Type-C port on the device. Please refer to the diagram below for interface details:

The device's serial port signals adopt the RS232 protocol, located at pin 4 and pin 5 of the RJ45 interface. Pin 4 serves as the device's serial port transmission signal, while Pin 5 serves as the device's serial port reception signal.

For further interface details, please refer to the " Installation Manual ."

Once the device is powered on and connected to the host computer, users can configure the device through the communication port. Users can utilize common serial port debugging tools or our Easyset software for instruction settings. Alternatively, users can develop their serial communication software for device communication and configuration.

Note that when the device operates in HID POS or KBW mode, instructions and responses are packaged into POS packets. When sending and receiving, it is necessary to unpack and segment according to our company's definition of POS data packets.

Command Classification

This device consists of a main controller and multiple barcode-scanning engines. Therefore, commands can be broadly categorized into two types:

- Setting Commands for the main controller are referred to as MASTER Commands.

- Setting Commands for the engines are referred to as SLAVE Commands.

Further details will be provided in subsequent sections.

Master Command Explanation

Introduction

Utilizing MASTER instructions for configuring the main controller primarily involves communication settings, such as communication interfaces with the host computer; decoding control settings, such as decoding modes and delay mode; as well as basic control of LEDs and sound.

Command Syntax

The syntax of a Command/command consists of the following elements:

Prefix   Storage   Tag   SubTag   Data   Suffix

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

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

> **Category Tag:** 3 characters.

> **Function SubTag**: 3 characters.

> **Data**: The format of the data. Determined by Tag and SubTag together, can be null under some Commands.

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

Example

Setting the Reread Delay Time as 1s.

The Command will be **RRDDUR1000**.

Tag: RRD, SubTag: DUR, Storage：@，Tag：RRD，SubTag：DUR，Data: 1000.

Converting it into Serial Command format,

ASCII：~<SOH> 0000@RRDDUR1000;<ETX>

HEX：7E 01 30 30 30 30 40 52 52 44 44 55 52 31 30 30 30 3B 03

Response

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

<ACK> (HEX: 06)	Indicates a good command which has been processed.
<NAK> (HEX: 15)	Indicates a good configuration command with its **Data** field entry out of the allowable range for this Tag and SubTag combination (e.g. an entry for an inter-keystroke delay of 100 when the field will only allow 2 digits), or an invalid query command.
<ENQ> (HEX: 05)	Indicates an invalid Tag or SubTag command.

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

Therefore, its structure is as follows:

Prefix Storage Tag SubTag Data Answer State Suffix

Where "state" represents the status character.

"Answer" refers to the device's response data to the command, which can be null.

"Tag" and "SubTag" correspond to the parts of the sent command.

"Data" also corresponds to the parts of the sent command. When "Data" is a query symbol, the device's response "Data" is null.

Examples

Enable Reread Delay (RRDENA). Send this command in ASCII format. Users can write it in hexadecimal as well.

Request: ~<SOH> 0000@RRDENA1;<ETX>

Response: <STX><SOH> 0000@RRDENA1<ACK>;<ETX>

The status character is <ACK> (HEX: 06). It means that the command has been processed. If the"Anser" is null. is null, it indicates that this particular setting instruction does not carry any additional information in the response.

Request: ~<SOH> 0000@RRDENA2;<ETX>

Resposne: <STX><SOH> 0000@RRDENA2<NAK>;<ETX>

The status character is <NAK> (HEX: 15). It means that the data is not within the range of data values. Available data of RRDEN are 0 and 1.

Request: ~<SOH> 0000@ RRDENB0;<ETX>

Response: ~<SOH> 0000@ RRDENB0<ENQ>;<ETX>

The status character is <ENQ> (HEX: 05). It indicates an invalid Tag or SubTag command

Query Command

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

Data	Function
* (HEX: 2A)	What is the scanner's current value for the setting(s)?
& (HEX: 26)	What is the factory default value for the setting(s)?
^ (HEX: 5E)	What is the range of possible values for the setting(s)?

Taking the example of querying the configuration for the Reread Delay, you can send ~<SOH> 0000@RRDDUR*;<ETX> to inquire about the current Reread Delay time. Similarly, you can also send ~<SOH>0000@ RRDDUR &;<ETX> or ~<SOH>0000@ RRDDUR ^;<ETX> to inquire about the default configuration and the range of settings for the Reread Delay.

To represent value ranges, use '-' for continuous ranges and '|' to separate each value. For example, "1|3-5|7|9-20" excludes 2, 6, and 8 from the range of 1 to 20, resulting in 17 numbers.

For settings that allow both customized values and preset options like "High," "Medium," and "Low," use '_' to separate preset options from the original range. Use '|' to separate each preset option, and ':' to separate the preset name from its corresponding value. For instance:

For the frequency of the Good read sound:

The value range is: GRBFRQ20-20000_Lowest:800|Low:1600|Medium:2730|High:4200;

This means the frequency range for good read sound is from 20 to 20000. Preset values are lowest: 800, low: 1600, medium: 2730, and high: 4200.

Master Command Settings

Introduction

The MASTER command primarily focuses on querying and configuring the main controller. These commands include querying product information, communication settings, basic functionality settings, data processing, image capture settings, and more.

Query Product Information

Query Product Name

Command: QRYPDN

After sending the QRYPDN command, the product name will be sent to the host device.

	Tag	SubTag	Data
Request	QRY	PDN	NULL
Response			Product Name:xxxx

xxxx: Refers to the name of the product.

Query Product Serial Number

Command: QRYPSN

After sending the QRYPSN command, the product serial number will be sent to the host device.

	Tag	SubTag	Data
Request	QRY	PDN	NULL
Response			Serial Number:xxxxx

Query Product Firmware Version Number

Command: QRYFWV

After sending the QRYFWV command, the product firmware version number will be sent to the host device.

	Tag	SubTag	Data
Request	QRY	PWV	NULL
Response			Firmware Version:xxxxx

Query Product Hardware Version Number

Command: QRYHWV

After sending the QRYHWV command, the product hardware version number will be sent to the host device.

	Tag	SubTag	Data
Request	QRY	HWV	NULL
Response			Hardware Version:xxxxx

Query Product Manufacture Date

Command: QRYDAT

After sending the QRYDAT command, the product manufacture data will be sent to the host device.

	Tag	SubTag	Data
Request	QRY	DAT	NULL
Response			Manufacturing Date:xxxxx

"xxxxx" represents the specific manufacture date of the device, formatted as "2024-04-15".

Query OEM Serial Number

Command: QRYESN

After sending the QRYESN command, the product serial number will be sent to the host device. The serial number is defined by the customer.

	Tag	SubTag	Data
Request	QRY	ESN	NULL
Response			OEM Serial Number:xxxxx

Restore to Default Settings

Restore to Factory Default Settings

Command: FACDEF

All main controllers have a factory default setting. After sending the FACDEF command, the main controllers will be restored to their factory default configuration.

	Tag	SubTag	Data
Request	FAC	DEF	NULL
Response			Status Character

User Default Settings

In addition to the factory default settings, you can save your frequently used settings as user default settings.

User default settings also include all property settings of the main controller and will be saved permanently unless overwritten by saving the current settings as user default settings again. Sending "Save User Default Settings" will save the current settings as user default settings, overwriting any previously saved user default settings. Sending "Load User Default Settings" will switch the main controller to the state of user default settings.

Save User Default Settings

Command: CUSSAV

	Tag	SubTag	Data
Request	CUS	SAV	NULL
Response			Status Character

Load User Default Settings

Command: CUSDEF

	Tag	SubTag	Data
Request	CUS	DEF	NULL
Response			Status Character

Communication Interface

Communication Cable Auto-Adaptation

Command: AUTOUR

Disable or Enable auto-adaptation by sending the AUTOUR command.

	Tag	SubTag	Data
Request	AUT	OUR	Available value: 0-1
Response			Status Character

Data: 0-1

- 0: Disables auto-adaptation. The main controller communicates with the host according to the configuration of the communication interface.

- 1: Enables auto-adaptation. The main controller can automatically match the connected cable (only supports USB and serial cables) and switch communication modes: if a USB cable is connected, it switches to USB communication mode; if a serial cable is connected, it switches to serial communication mode.

  Note: Enabling or disabling communication cable auto-adaptation requires device restart to take effect.

  Note: When simultaneously using USB and serial connections between the scanner and the host, USB connection has higher priority. If cable auto-adaptation is enabled, the scanner will default to using the USB connection. If the communication interface is set to serial, connecting a USB cable will use USB CDC communication mode.

Switch Communication Interface

Command: INTERF

Choosing a communication interface by sending the INTERF command.

	Tag	SubTag	Data
Request	INT	ERF	Available value: 0|3|5|8
Response			Status Character

Data: 0|3|5|8

➢ 0：RS232

➢ 3：HID Keyboard

➢ 5：HID POS

➢ 8：USB CDC Mode

Serial Port Settings

RS232 Baud Rate

Command: 232BAD

Baud rate is the number of bits of data transmitted per second. The baud rate used by the scanner and the host must be the same to ensure accurate data transmission.

	Tag	SubTag	Data
Request	232	BAD	Available value: 0-8
Reply			Status character

Data: 0-8.

➢ 0: 1200 bits/s

➢ 1: 2400 bits/s

➢ 2: 4800 bits/s

➢ 3: 9600 bits/s

➢ 4: 14400 bits/s

➢ 5: 19200 bits/s

➢ 6: 38400 bits/s

➢ 7: 57600 bits/s

➢ 8: 115200 bits/s

RS232 Data Bits

Command: 232DAT

Ensure that the data bits of the scanner and the data bits of the host are the same.

	Tag	SubTag	Data
Request	232	DAT	Available value: 0-1
Response			Status character

Data: 0-1.

➢ 0: 8 bits

➢ 1: 7 bits

RS232 Parity Check

Command: 232PAR

Set the parity type to match the host requirements.

	Tag	SubTag	Data
Request	232	PAR	Available value: 0-2
Response			Status character

Data: 0-2.

➢ 0: Select this option when no parity bit is required.

➢ 1: Even parity

➢ 2: Odd parity

RS232 Stop Bit

Command: 232STP

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

	Tag	SubTag	Data
Request	232	STP	Available value: 0-1
Response			Status Character

Data: 0-1.

➢ 0: 1 Stop Bit

➢ 1: 2 Stop Bit

RS232 Hardware Automatic Flow Control

Command: 232AFL

	Tag	SubTag	Data
Request	232	AFL	Available value: 0-1
Response			Status Character

Data: 0-1.

➢ 1 indicates activation: The main controller determines whether to send data based on the level of the CTS signal. When the CTS signal is low, indicating that the receiver (e.g., PC) serial port buffer is full, the main controller will stop sending serial port data until the CTS signal is set to high by the receiver (e.g., PC). When the main controller's serial port receiver is not ready, it sets RTS to low. When the sending end (e.g., PC) detects this signal as low, it must not send data to the scanner, otherwise data will be lost.

➢ 0 indicates deactivation: Serial data transmission and reception are not affected by the RTS/CTS signal.

USB Keyboard Settings

When connected via a USB data cable, the scanner can be set to HID Keyboard input mode. In this mode, the scanner acts as a virtual keyboard, and the host receiving the data accepts input from this virtual keyboard just like it would from a real keyboard. Once the scanner decodes the data, it sends it by simulating keystrokes corresponding to each data entry on the virtual keyboard.

National Keyboard Layout

Command: KBWCTY

Due to variations in keyboard layouts, symbols, and other factors across different languages and countries, the scanner can be configured to emulate keyboards from different nations as needed.

	Tag	SubTag	Data
Request	KBW	CTY	Available value: 0-19|21-28
Response			Status Character

Data: 0-19|21-28.

- 0: American English Keyboard

- 1: Belgian Keyboard

- 2: Brazilian Keyboard

- 3: Canadian (French) French Keyboard

- 4: Czechoslovakian Keyboard

- 5: Danish Keyboard

- 6: Finnish (Swedish) Keyboard

- 7: French Keyboard

- 8: German/Austrian Keyboard

- 9: Greek Keyboard

- 10: Hungarian Keyboard

- 11: Israeli (Hebrew) Keyboard

- 12: Italian Keyboard

- 13: Latin American Keyboard

- 14: Dutch (Dutch) Keyboard

- 15: Norwegian Keyboard

- 16: Polish Keyboard

- 17: Portuguese Keyboard

- 18: Romanian Keyboard

- 19: Russian Keyboard

- 21: Slovak Keyboard

- 22: Spanish Keyboard

- 23: Swedish Keyboard

- 24: Swiss (German) Keyboard

- 25: Turkish F Keyboard

- 26: Turkish Q Keyboard

- 27: British Keyboard

- 28: Japanese Keyboard

Unknown Character Beep

Command: KBWBUC

Due to differences in keyboard layouts, certain characters contained in barcode data may not be available on the selected keyboard. As a result, the main controller may not be able to transmit unknown characters. Scan the corresponding barcode below to enable or disable the beep sound when unknown characters are detected.

	Tag	SubTag	Data
Request	KBW	BUC	Available value: 0-1
Response			Status Character

Data: 0-1.

- 0 indicates: Off

- 1 indicates: On

Note: Assuming the current main controller virtual keyboard layout corresponds to French (No.7), and the barcode content scanned by this main controller is "AĐF". Since one character "Đ" (0xD0) in the barcode data is not available on the French keyboard, the main controller will skip this unknown character and continue processing the next character. In practical usage, if the unknown character beep setting is "Off," there will be no audible indication when the scanner transmits data, and the data received by the host will be "AF". If the unknown character beep setting is "On," the main controller will emit an error beep when processing this character, but the data transmitted to the host will still be "AF".

If the "Keyboard Emulation Input Character" function is enabled, this function is invalid.

Keyboard Emulation

Command: KBWALT

When the Keyboard Emulation is enabled, characters will be sent via the numeric keypad, disregarding the national keyboard layout settings. This mode also requires setting Code Page selection and Unicode output. The Code Page determines the target language, while the Unicode output setting controls whether the encoding sent to the host is Unicode or Code Page.

	Tag	SubTag	Data
Request	KBW	ALT	Available value: 0-1
Response			Status Character

Data: 0-1.

- 0 indicates: Disable Keyboard Emulation

- 1 indicates: Enable Keyboard Emulation

Note: ASCII characters between 0x00 and 0x1F are output according to the "Control Character Output" function setting.

Note: This sending method ensures smooth transmission of any character, but due to the large number of simulated keystrokes required for each character, the speed is relatively slow.

Note: Assuming the current scanner Code Page selection is Code Page 1252 (Latin, Western), and the barcode content scanned by the scanner is "AĐF" (decimal values in Code Page 1252 are 65/208/70). If the Keyboard Emulation Input Character setting is set to "Enable" and the Unicode output setting is set to "Disable," the scanner's simulated keyboard operation is as follows:

Input "A" -- ALT key pressed, simultaneously pressing the keys 0, 6, 5 in sequence on the numeric keypad, then releasing the ALT key.

Input "Đ" -- ALT key pressed, simultaneously pressing the keys 2, 0, 8 in sequence on the numeric keypad, then releasing the ALT key.

Input "F" -- ALT key pressed, simultaneously pressing the keys 0, 7, 0 in sequence on the numeric keypad, then releasing the ALT key.

Code Page

Command: KBWCPG

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the barcode being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, select the code page with which the barcodes were created by scanning the appropriate setup barcode. This feature is only effective when Emulate ALT+Keypad is turned on.

	Tag	SubTag	Data
Request	KBW	CPG	Available value: 0-12
Response			Status Character

Data: 0-12.

- 0 indicates: Code Page 1252 (Latin, Western)

- 1 indicates: Code Page 1251 (Cyrillic)

- 2 indicates: Code Page 1250 (Central European)

- 3 indicates: Code Page 1253 (Greek)

- 4 indicates: Code Page 1254 (Turkish)

- 5 indicates: Code Page 1255 (Hebrew)

- 6 indicates: Code Page 1256 (Arabic)

- 7 indicates: Code Page 1257 (Baltic)

- 8 indicates: Code Page 1258 (Vietnamese)

- 9 indicates: Code Page 936 (Simplified Chinese, GB2312, GBK)

- 10 indicates: Code Page 950 (Traditional Chinese, Big5)

- 11 indicates: Code Page 874 (Thai)

- 12 indicates: Code Page 932 (Japanese, Shift-JIS)

Unicode Output

Command: KBWCPU

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

	Tag	SubTag	Data
Request	KBW	CPU	Available value: 0-1
Response			Status Character

Data: 0-1

- 0 indicates Disable Unicode output, the main controller outputs the keyboard according to code page encoding.

- 1 indicates: Enable Unicode output, the main controller outputs the keyboard according to Unicode encoding.

Emulate Keypad with Leading Zero

Command: KBWALZ

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

	Tag	SubTag	Data
Request	KBW	ALZ	Available value: 0-1
Response			Status Character

Data: 0-1

- 0 indicates: Disable Leading "0" Output

- 1 indicates: Enable Leading "0" Output

Function Key Mapping

Command: KBWFKM

ASCII characters between 0x00 and 0x1F can be escaped as certain control function keys. The operation of inputting control function keys on the virtual keyboard is as follows, with specific ASCII values corresponding to control function keys detailed in the appendix.

	Tag	SubTag	Data
Request	KBW	FKM	Available value: 0-2
Response			Status Character

Data: 0-2

- 0: Disable

- 1: Control + ASCII mode

- 2: Alt + Keypad mode

Note: When the other HID Keyboard-related settings on the main controller are set to their default values, and this setting is configured as "Control + ASCII mode," the read data for the character "A <HT>F" (where HT represents an invisible character that is not displayed in terminal software) with hexadecimal values 0x41, 0x09, and 0x46, the main controller's virtual keyboard operation is as follows:

Input "A" - Press the key.

Input "Ctrl I" - As the data for 0x09 corresponds to the control function key "I," the virtual keyboard will press and hold Ctrl, then press the I key, and finally release both the Ctrl and I keys simultaneously.

Input "F" - Press the F key.

Since "Ctrl I" corresponds to converting characters to italics in some word processing software, completing the above operations may result in seeing the normal character "A" and the italicized "F."

If this setting is configured as "Alt + Keypad mode," for the "<HT>" character, the scanner's virtual keyboard operation is as follows:

Input "Alt 0 0 9" - The virtual keyboard will press and hold Alt, then sequentially press the "0," "0," and "9" keys on the numeric keypad, and finally release Alt.

Key Delay

Command: KBWDLY

This parameter specifies the delay between simulated key presses. It can be adjusted when slower data transmission is required by the host.

	Tag	SubTag	Data
Request	KBW	DLY	Available value: 0-100
Response			Status Character

Data: 0-100(ms)

Example: To set the key delay to 20 ms, the Data value would be 20, resulting in the command Tag+SubTag+Data: KBWDLY20.

Caps Lock

Command: KBWCAP

When enabled, this setting allows for the inversion of case-sensitive characters contained within barcode data. This inversion occurs regardless of the status of the Caps Lock key on the host keyboard.

	Tag	SubTag	Data
Request	KBW	CAP	Available value: 0-3
Response			Status Character

Data: 0-3

- 0: Disabled (for non-Japanese keyboards)

- 1: Enabled (for non-Japanese keyboards)

- 2: Disabled (for Japanese keyboards)

- 3: Enabled (for Japanese keyboards)

Note: This function is ineffective if "Keyboard Emulation " or "Capitalization Conversion" functions are enabled.

Note: Upon enabling this function, if the scanner reads a barcode containing "AbC", the host will receive "aBc".

Convert Case

Command: KBWCAS

When enabled, this setting allows for the inversion of case-sensitive characters contained within barcode data. This inversion occurs regardless of the status of the Caps Lock key on the host keyboard.

	Tag	SubTag	Data
Request	KBW	CAS	Available value: 0-2
Response			Status Character

Data: 0-2

- 0: No Conversion: Alphabetic characters in barcode data are output as originally.

- 1: Convert All to Uppercase: Regardless of whether the alphabetic characters in the barcode data are uppercase or lowercase, they are all converted to uppercase.

- 2: Convert All to Lowercase: Regardless of whether the alphabetic characters in the barcode data are uppercase or lowercase, they are all converted to lowercase.

Note: This function is ineffective if the " Keyboard Emulate " function is enabled.

Emulate Numeric Keypad 1

Command: KBWNUM

	Tag	SubTag	Data
Request	KBW	NUM	Available value: 0-1
Response			Status Character

Data: 0-1

- 0 indicates: This function is not enabled, so all numeric outputs are based on the corresponding key values of

the main keyboard.

- 1 indicates: After enabling this function if the barcode data transmitted by the controller contains digits "0~9", the virtual keyboard will output according to the corresponding key values of the numeric keypad.

Note: This function is ineffective if the " Keyboard Emulate " function is enabled.

Emulate Numeric Keypad 2

Command: KBWNCH

	Tag	SubTag	Data
Request	KBW	NCH	Available value: 0-1
Response			Status Character

Data: 0-1

- 0 indicates: This function is not enabled, so these characters will be output based on the corresponding key values of the main keyboard.

- 1 indicates: After enabling this function, these characters will be output according to the corresponding key values of the numeric keypad.

Note: This function is ineffective if the " Keyboard Emulate " function is enabled.

Fast Mode

Command: KBWFAS

	Tag	SubTag	Data
Request	KBW	FAS	Available value: 0-1
Response			Status Character

Data: 0-1

- 0 indicates: Off

- 1 indicates: On

Polling Rate

Command: KBWPOR

	Tag	SubTag	Data
Request	KBW	POR	Available value: 0-10
Response			Status Character

Data: 0-10

HID POS (POS HID Bar Code Scanner)

Introduction

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

Features:

1. HID-based, no custom driver required.

2. Way more efficient in communication than keyboard emulation and traditional RS-232 interface.

Access the Cradle with Your Program

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

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

Acquire Scanned Data

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

Byte	Bit							
	7	6	5	4	3	2	1	0
0	Message ID = 0x02							
1	Barcode data length							
2-57	Barcode data（1-56）							
58-61	Reserved							
62	Newland barcode type identifier or Unused: 0x00							
63	-	-	-	-	-	-	-	Decoding data continues

Send Command to the Device

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

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

VID and PID Table

USB uses VID (Vendor ID) and PID (Product ID) to identify and locate a device. The VID is assigned by the USB Implementers Forum. Newland's vendor ID is 1EAB (Hex). A range of PIDs are used for each Newland product family. Every PID contains a base number and interface type (keyboard, COM port, etc)

Device Name	Interface Type	PID（Hexadecimal）
NLS-RVM100	USB Keyboard	4622
	USB CDC Serial	4606
	HID POS	4610

Basic Settings

Scan Mode Settings

Command: SCNMOD

Two can modes are available:

Sense Mode: The scanner activates a decode session every time it detects a barcode presented to it. The decode session continues until a barcode is decoded or the decode session timeout expires. Reread Timeout can avoid undesired rereading of the same barcode in a given period of time. Sensitivity can change the Sense Mode's sensibility to changes in images captured.

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

	Tag	SubTag	Data
Request	SCN	ENA	Available value:2-3
Response			Status character

Data: 2-3.

● 2 indicates sensor mode

● 3 indicates continuous mode.

Barcode Settings

Disable Barcode Scanning

Command: SCNENA

This command sets whether the device is allowed to perform barcode scanning. When scanning is disabled, the device will no longer recognize barcodes, and the illumination light will also turn off.

	Tag	SubTag	Data
Request	SCN	ENA	Available value: 0-1
Response			Status character

Data: 0-1.

- 0 indicates barcode scanning is disabled.

- 1 indicates barcode scanning is enabled.

Note: This command does not retain settings after power off.

Decode Session Timeout

Command: ORTSET

Maximum time that the scanner is in a single reading state. When One Reading Timeout is 0 indicates that the timeout is infinite.

	Tag	SubTag	Data
Request	ORT	SET	Available value: 0-3600000
Response			Status character

Data: 0-3600000 (ms).

Reread Settings

Reread Delay

Command: RRDENA

Reread Delay can avoid undesired rereading of the same barcode in a given period of time.

	Tag	SubTag	Data
Request	RRD	ENA	Available value: 0-1
Response			Status characters

Data: 0-1.

- ➤ **1: Enable Reread Timeout.** Do not re-read the same barcode before the reread timeout expires.

- ➤ **0: Disable Reread Timeout**. Allow the scanner to re-read the same barcode.

Reread Delay Time

Command: RRDDUR

The following Command sets the time interval between two successive reads on the same barcode.

	Tag	SubTag	Data
Request	RRD	DUR	Available value: 0-3600000
Response			Status characters

Data: 0-3600000 (ms).

Reread Delay Reset

Command: RRDREN

To restart the reread timeout when the scanner encounters the same barcode that was decoded in the last scan session before the reread timeout expires.

	Tag	SubTag	Data
Request	RRD	REN	Available value: 0-1
Response			Status characters

Data: 0-1.

➢ 0: Reread Delay Reset Off

➢ 1: Reread Delay Reset On

Good Read Delay

Command: GRDENA

Good Read Delay sets the minimum amount of time before the scanner can read another barcode after a good read.

	Tag	SubTag	Data
Request	GRD	ENA	Available value: 0-1
Response			Status characters

Data: 0-1.

➢ 0: Disable Good Read Delay

➢ 1: Enable Good Read Delay

Good Read Delay Time

Command: GRDDUR

Time that no longer outputs barcodes after a good read.

	Tag	SubTag	Data
Request	GRD	DUR	Available value: 1-3600000
Response			Status characters

Data: 1-3600000 (ms).

Serial Trigger Command

Edit Start Scanning Command

Command: SCNTCT

Using the serial port trigger command SCNTCT can directly allow the scanner to read barcodes even if no objects are sensed. Available values of Data are 0x01-0xFF. The first character cannot be "?" (0x3F).

	Tag	SubTag	Data
Request	SCN	TCT	Available value: 0x01-0xFF
Response			Status characters

Data: 0x01-0xFF. Maximum 10 bytes.

Example: Setting **start (0x73 0x74 0x61 0x72 0x74)** as the Start Scanning command. Data will be 7374617274. Tag+SubTag+Data: SCNTCT7374617274. Converting it into hexadecimal: **0x53 0x43 0x4E 0x54 0x43 0x54 0x37 0x33 0x37 0x34 0x36 0x31 0x37 0x32 0x37 0x34**.

Once set up, send 0x73 0x74 0x61 0x72 0x74 to start scanning.

Edit Stop Scanning Command

Command: SCNTCP

Using the serial port trigger command SCNTCP can directly stop the scanner from reading barcodes. Available values of Data are 0x01-0xFF. The first character cannot be "?" (0x3F).

	Tag	SubTag	Data
Request	SCN	TCP	Available value: 0x01-0xFF
Response			Status characters

Data: 0x01-0xFF. Maximum 10 bytes.

Example: Setting stop (0x73 0x74 0x6f 0x70) as the Stop Scanning command. Data will be 73746f70. Tag+SubTag+Data: SCNTCT73746f70. Converting it into hexadecimal: 0x53 0x43 0x4e 0x54 0x43 0x54 0x37 0x33 0x37 0x34 0x36 0x66 0x37 0x30.

Once set up, send 0x73 0x74 0x6f 0x70 to stop scanning.

Sensor Control

Infrared Sensitivity (Sense Mode)

Command: SENIRL

	Tag	SubTag	Data
Request	SEN	IRL	Available value: 1-10
Response			Status character

Data：1-10 (lower data, higher sensitivity).

After A Good Read (Sense Mode)

Command: SENARG

Enable to choose whether to go into Scan Status or Sensing Status after a good read.

	Tag	SubTag	Data
Request	SEN	ARG	Available value: 0-1
Response			Status character

Data: 0-1.

➢ **0**: Go into Sensing Status. After a good read within the One Reading Timeout, the scanner will first wait for a period of time to stabilise the IR (The time is set by the Image Stabilization Timeout). Then the scanner reads barcodes when it detects an IR value change (e.g. Objects enter close to/into the IR sensing range).

➢ **1:** Go into Scan Status. After a good read within the One Reading Timeout, the scanner will continue to read barcodes, and One Reading Timeout is retimed from 0.

Image Stabilization Timeout (Sense Mode)

Command: SENIST

After the scanner stops reading barcodes, the scanner will enter into the infrared stabilisation process, and then enter the sensing status to sense objects.

	Tag	SubTag	Data
Request	SEN	IST	Available value: 0-3000
Response			Status character

Data: 0-3000 (ms)

Proximity Sensor Output

Command: IECIDE

When setting the command to 1, the scanner will not immediately enter the decoding state when it senses objects. It will first send proximity sensor information to the host, and wait for the host to send serial trigger commands to it, then start reading barcodes.

	Tag	SubTag	Data
Request	IEC	IDE	Available value: 0-1
Response			Status characters

Data: 0-1.

➢ 0: Proximity Sensor Output Off.

➢ 1: Proximity Sensor Output On.

Note: After receiving the Strat Reading (serial trigger format) command, the scanner will read barcodes directly when it detects objects. When receiving the Stop Reading (serial trigger format) command, the scanner will output the proximity sensor information to the host when it detects objects.

Proximity Sensor Output Editing

Command: IECIDS

This command allows users to edit the information of the proximity sensor output.

	Tag	SubTag	Data
Request	IEC	IDS	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff. Maximum 7 characters.

Example: Set "IT" (hex: 0x49 0x54) as the proximity sensor output.

➢ Request: IECIDS4954

Proximity Sensor Output When Start Reading

Command: IECICE

The command is for the scenario that users need the scanner to send the proximity sensor information to the host when the IECIDE1 and Start Reading (serial trigger) commands have been sent.

	Tag	SubTag	Data
Request	IEC	ICE	Available value: 0-1
Response			Status characters

Data: 0-1

➢ 0: After detecting an object, the scanner will read the barcode straight.

➢ 1: After detecting an object, the scanner will not read barcodes straight, and the serial trigger command is required to start reading barcodes.

Infrared Detection

Command: NREAIR

The scanner supports Infrared detection which is used to detect whether any objects have entered the reading area. This function is divided into 2 phases, the calibration phase and the detection phase. The calibration phase is used to calibrate the infrared value when there is no object inside the scanner, which can be considered as the infrared zero point. The detection phase is used to detect the difference between the current IR value and the calibrated value, if the difference is large then it is assumed that there is an object inside the scanner.

	Tag	SubTag	Data
Request	NRE	AIR	Available value: 0-1
Response			见下文

Data: 0-1

➢ 1: Calibration phase. Scanner response calibration value of infrared. The response is [xxx,yyy,zzz]. xxx, yyy, and zzz indicates calibration values for different infrared separately. At the same time, the scanner will emit a sound to indicate the infrared status.

➢ 0: Detection phase. The scanner compares the current value with the calibration value if there is a change of a certain magnitude, it considers that there is an object, and the Data content of the answer is **"object"** If there is no change, it considers that there is no object, and the Data content of the answer is **"none"**.

Good Read LED Settings

Good Read LED GRLENA

Command: GRLENA

The Good Read LED can be programmed to be On and Off.

	Tag	SubTag	Data
Request	GRL	ENA	Available value: 0-1
Response			Status characters

Data: 0-1.

➢ **1**: Good Read LED On.

> ➤ **0**: Good Read LED Off.

Good Read LED Duration

Command: GRLDUR

This Command sets the amount of time that the Good Read LED remains on following a good read.

	Tag	SubTag	Data
Request	GRL	DUR	Available value: 1-10000
Response			Status characters

Available values of Data: 1-10000 (ms).

LED Indicator Control

Lighting LED Indicator

Command: LEDONS

This command is used to light the LED indicator, allowing it to be lit permanently or for a while.

	Tag	SubTag	Data
Request	MAS	LGT	XCTD
Response			Status characters

Data: XCTD

> ➤ XC: Color. 0C – Red. 2C – Green. 3C – Blue.

> ➤ TD: Lighting duration. 0-3600000 (ms). When T=1, it means lighting permanently. When T=0, it means turning off.

Example 1: Lighting the LED indicator in red for 5s.

> ➤ Tag+SubTag+Data: **LEDONS0C5000D**.

Example 2: Lighting the LED indicator in blue permanently.

> ➤ Tag+SubTag+Data: **LEDONS3C1D**.

Example 3: Turning off the blue LED indicator.

Tag+SubTag+Data：**LEDONS3C0D**.

LED Brightness

Command: LEDBTL

This command is used to light the LED indicator, allowing it to be lit permanently or for a while.

This command is used to set the brightness of the indicator lights, allowing users to adjust them for optimal effect. It only affects the decoding success indicator lights and the LEDONS operation lights, not the lights indicating device abnormalities. After sending this command, the next light operation will take effect.

	Tag	SubTag	Data
Request	LED	BTL	Available value: 0-4
Response			Status characters

Data Range: 0-4, where a higher value indicates a brighter LED indicator.

Beep Settings

Power On Beep

Command: PWBENA

The scanner can be programmed to beep when it is powered on.

	Tag	SubTag	Data
Request	PWN	ENA	Available value: 0-1
Response			Status characters

Data: 0-1.

➢ 0: Power On Beep Off.

➢ 1: Power On Beep On.

Good Read Beep

Command: GRBENA

	Tag	SubTag	Data
Request	GRB	ENA	Available value: 0-1
Response			Status characters

Available values of Data: 0-1.

➢ 0: Good Read Beep Off.

➢ 1: Good Read Beep On.

Good Read Beep Volume

Command: GRBVLL

Pre-requisite: Good Read Beep On.

	Tag	SubTag	Data
Request	GRB	VLL	Available value: 1-20
Response			Status characters

Available values of Data: 1-20 (higher Data, louder beep).

Good Read Beep Duration

Command: GRBDUR

This Command sets the length of the beep the scanner emits on a good read.

	Tag	SubTag	Data
Request	GRB	DUR	Available value: 20-300
Response			Status characters

Data: 20-300 (ms).

Good Read Beep Frequency

Command: GRBFRQ

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

	Tag	SubTag	Data
Request	GRB	FRQ	Available value: 20-20000
Response			Status characters

Data: 20-20000 (Hz).

Data Processing

Security Level

Command: SAFLVL

This Command sets decoding times that are required to correctly read a barcode. The higher the security level, the lower the decoding error rate, but the slower the speed.

	Tag	SubTag	Data
Request	SAF	LVL	Available value: 0-3
Response			Status characters

Data: 0-3 (higher data, higher security level).

Report Last Scan Engine to Read

Command: IECADE

This Command can enable or disable a prefix to the output and indicate which slave engine has scanned a code. The format of output is "[xx]data". XX is the slave engine ID. Available values are 01-0A.

	Tag	SubTag	Data
Request	IEC	ADE	Available value: 0-1
Response			Status characters

Data: 0-1.

➢ 0: Disable Report Last Scan Engine to Read.

➢ 1: Enable Report Last Scan Engine to Read.

Prefixes/Suffixes

Introduction

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

Prefixes and suffixes are how to fulfil the needs mentioned above. They can be added, removed and modified while the original barcode data remains intact.

Enable/Disable All Prefixes/Suffixes

Command: APSENA

	Tag	SubTag	Data
Request	APS	ENA	Available value: 0-1
Response			Status characters

Data: 0-1

➢ **0**: Disable All Prefixes&Suffixes

➢ 1: Enable All Prefixes&Suffixes

Prefix Sequence

Command: PRESEQ

	Tag	SubTag	Data
Request	PRE	SEQ	Available value: 0-1
Response			Status characters

Data: 0-1

➢ 0: Code ID+ Custom +AIM ID

> ➤ 1: Custom + Code ID + AIM ID 自定义前缀 CPRENA

Custom Prefix

Enable/Disable Custom Prefix

Command: CPRENA

If the custom prefix is enabled, you are allowed to append to the data a user-defined prefix that cannot exceed 10 characters. For example, if the custom prefix is "AB" and the barcode data is "123", the Host will receive "AB123".

	Tag	SubTag	Data
Request	CPR	ENA	Available value: 0-1
Response			Status characters

Available values of Data: 0-1

> ➤ 0: Disable Custom Prefix

> ➤ 1: Enable Custom Prefix

Set Custom Prefix

Command: CPRSET

	Tag	SubTag	Data
Request	CPR	SET	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff. 10 characters maximum.

Example: Set the custom prefix to "CODE" (HEX: 0x43/0x4F/0x44/0x45).

> ➤ CPRSET434F4445

AIM ID Prefix

Command: AIDENA

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

	Tag	SubTag	Data
Request	AID	ENA	Available value: 0-1
Response			Status characters

Data: 0-1

➢ 0: Disable AIM ID Prefix

➢ 1: Enable AIM ID Prefix

Enable/Disable Code ID Prefix

Command: CIDENA

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

	Tag	SubTag	Data
Request	CID	ENA	Available value: 0-1
Response			Status characters

Data: 0-1

➢ 0: Disable Code ID Prefix

➢ 1: Enable Code ID Prefix

Modify Code128 Code ID

Command: CID002

	Tag	SubTag	Data
Request	CID	002	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff.

Modify EAN8 Code ID

Command: CID004

	Tag	SubTag	Data
Request	CID	004	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff.

Modify EAN13 Code ID

Command: CID005

	Tag	SubTag	Data
Request	CID	005	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff.

Modify UPCE Code ID

Command: CID006

	Tag	SubTag	Data
Request	CID	006	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff.

Modify UPCA Code ID

Command: CID007

	Tag	SubTag	Data
Request	CID	007	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff.

Modify CODE39 Code ID

Command: CID013

	Tag	SubTag	Data
Request	CID	013	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff.

Modify QR Code ID

Command: CID033

	Tag	SubTag	Data
Request	CID	033	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff.

Modify DM Code ID

Command: CID034

	Tag	SubTag	Data
Request	CID	034	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff.

Modify Aztec Code ID

Command: CID035

	Tag	SubTag	Data
Request	CID	034	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xf.

Enable/Disable Custom Suffix

Command: CUSENA

	Tag	SubTag	Data
Request	CUS	ENA	Available value: 0-1
Response			Status characters

Data: 0-1

0: Disable Custom Suffix

1: Enable Custom Suffix

Set Custom Suffix

Command: CSUSET

	Tag	SubTag	Data
Request	CSU	SET	Available value: 0x00-0xFF
Response			Status characters

Data: 0x00-0xff. 10 characters maximum.

Enable/Disable Terminating Suffix

Command: TSUENA

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

	Tag	SubTag	Data
Request	TSU	ENA	Available value: 0-1
Response			Status characters

Data: 0-1

➢ 0: Disable Terminating Suffix.

➢ 1: Enable Terminating Suffix.

Set Terminating Suffix

➢ Command: TSUSET

	Tag	SubTag	Data
Request	TSU	SET	Available value: 0x00-0xFF
Response			Status characters

➢ Data: 0x00-0xff. 2 characters maximum.

Image Capture Setting

Introduction

Users can capture real-time images and decoded images of a specific slave engine through the host. Also, these images can be in various formats.

Imaging Engine Designate

Command: MASIMG

Since you can only capture one image at a time, you need to designate an engine before capturing images. The default engine is Engine 1. This Command cannot be saved permanently, so after the scanner is rebooted, the engine that captures images will be Engine 1.

	Tag	SubTag	Data
Request	MAS	IMG	Available value: 1-10
Response			Status characters

Data: 1-10 (Number of engines)

Example: Designate Engine 10 as the imaging engine.

Request: MASIMG10

Image Capture

Command: IMGGET

Capturing images by sending this Command.

	Tag	SubTag	Data
Request			XTYRZFUQ
Response	IMG	GET	Length + Image Data + <Status characters>

Request Data： XTYRZFUQ

➢ T, type：

 ■ 0T: Real-time image.

 ■ 1T: Decoded image.

➢ R, ratio：

 ■ 0R: 1:1

 ■ 1R: 1/4

 ■ 2R: 1/16

➢ F, format:

 ■ 0F: Raw

 ■ 1F: BMP

 ■ 2F: JPEG

 ■ 3F: TIFF

 ■ 4F - 1bit BMP

➢ Q, quality of images in JPEG format

 ■ 0Q: Low

 ■ 1Q: Middle

 ■ 2Q: High

- ■ 3Q: Highest

Response Data：Length + Image Data + <Status characters>

When the image is successfully captured, the first 8 characters of the response data are the length of the image, followed . by the image data. The device will keep sending image data until it finishes sending, at which point the status character is <ACK>. When the scanner fails to capture an image, the response data is <NAK>. If data errors occur during the image-capturing process, the status character will be <NAK>.

Example: Engine 1 captures a middle-quality real-time image in 1/16 ratio and JPEG format.

➢ IMGGET0T2R2F1Q

Then the response will be 0000625Cxxxxxxxxxxxxx…<ACK>. 0000625C is the length of the image data. Xxxxxxxxxxxxxx is in HEX format. Its byte count is 0x0000625C.

System Control

Slave Engine Upgrade

Slave Engine Firmware Upgrade

Command: IECUPK

With this Command user can upgrade all slave engines in batch, please see below for the upgrade process.

There will be LED indications during the process. **During the upgrade process**:

➢ The scanner cannot be disconnected from the power supply.

➢ The connection with the host computer can be disconnected.

	Tag	SubTag	Data
Request	IEC	UPK	Available value: 0
Response			Status characters

First. storing the firmware of slave engines to the master by Easyset

Then, send command IECUPK0to upgrade the firmware to all slave engines.

LED indication when upgrading the firmware:

➢ Blue light always on (Preparatory phase) → Blue light flickers fast (Sending firmware) → Blue light flickers slowly (Slaves erase flash) → Blue light always on (Ending phase)

■ Flicker fast: Light on for 50ms. Light off for 50ms.

■ Flicker slowly: Light on for 1s. Light off for 1s.

After the upgrade is finished, RVM will actively send the upgrade result to the host in the format of result: x,x,x,x,x,x,x,x,x,x,x.

➢ x is 1 indicating that the upgrade is successful.

➢ X is -1 indicating that the corresponding slave upgrade has failed.

Reboot the scanner, if the scanner monitors the latest upgrade with (a) slave(s) upgrade failure, the blue indicator flicker: on for 2s and then off for 2s.

Query Upgrade Result

Command: IECUPR

Query the result of the most recent slave upgrade.

	Tag	SubTag	Data
Request	IEC	UPR	NULL
Response			Result

Pesonse: x,x,x,x,x,x,x,x,x,x<Status characters>.

➢ x is 1 indicating that the upgrade is successful.

➢ X is -1 indicating that the corresponding slave upgrade has failed.

Clear Slave Firmware from Master

Command: IECUPC

Clear the latest upgrade result and clear the firmware package

	Tag	SubTag	Data
Request	IEC	UPK	NULL
Response			Result

Device Self-Check

Power-On Handshake Result Query

Command: MASSHS

When the device is powered on, it automatically performs a handshake operation with all the scanners to ensure proper functioning. Sending this command retrieves the status of each scanner during the current power-on handshake. This command can be used to locate errors when the device's red indicator light is blinking during power-on.

	Tag	SubTag	Data
Request	MAS	SHS	Null
Response			Handshake Result

The response data section is as follows:

[index:x, com:y, camera:y, empower:y, config:z]

[index:x, com:y, camera:y, empower:y, config:z]

[index:x, com:y, camera:y, empower:y, config:z]

[index:x, com:y, camera:y, empower:y, config:z]

[index:x, com:y, camera:y, empower:y, config:z]

[index:x, com:y, camera:y, empower:y, config:z]

[index:x, com:y, camera:y, empower:y, config:z]

[index:x, com:y, camera:y, empower:y, config:z]

[index:x, com:y, camera:y, empower:y, config:z]

[index:x, com:y, camera:y, empower:y, config:z]

Index: x represents the serial number of the scanner.

Com indicates whether communication between the scanner and the controller is normal. If y is not negative, it indicates normal communication.

The camera indicates whether the CMOS of the scanner is functioning properly. If y is not negative, it indicates normal CMOS operation.

Empower indicates whether the scanner is authorized. If y is not negative, it indicates authorization.

Config represents the checksum of the scanner's configuration. This data is not indicative of abnormalities.

For example, [index:1, com:0, camera:0, empower:0, config:457812897] indicates that scanner number 1 has normal communication, normal CMOS operation, authorization, and a configuration checksum of 0x457812897.

If communication with a certain scanner is abnormal, the status data for that scanner will be [index:2, com:-1]. This indicates that communication with scanner number 2 is abnormal. Devices with communication issues will not have additional information appended regarding CMOS status or authorization.

Device Self-Check

Command: CHSDEV

The device is equipped with a self-check function. Customers can send the command "CHSDEV" during regular operations to initiate a self-check.

	Tag	SubTag	Data
Request	CHS	DEV	Null
Response			Check Result

The execution process is as follows:

1. The illumination light starts flashing, indicating the device is in self-check mode.

2. The RGB indicator light flashes sequentially in red, green, and blue, with each colour lighting up for 0.5 seconds.

3. The buzzer emits a continuous beep.

4. The device waits for the self-check to complete.

5. When the self-check is completed, the green indicator light stays lit for 2 seconds, accompanied by 2 short beeps from the buzzer.

6. The illumination returns to normal.

7. The device outputs the self-check result.

The command returns data as follows:

[index:x, com:y, camera:y, pic:y, empower:y, config:z]

[index:x, com:y, camera:y, pic:y, empower:y, config:z]

[index:x, com:y, camera:y, pic:y, empower:y, config:z]

[index:x, com:y, camera:y, pic:y, empower:y, config:z]

[index:x, com:y, camera:y, pic:y, empower:y, config:z]

[index:x, com:y, camera:y, pic:y, empower:y, config:z]

[index:x, com:y, camera:y, pic:y, empower:y, config:z]

[index:x, com:y, camera:y, pic:y, empower:y, config:z]

[index:x, com:y, camera:y, pic:y, empower:y, config:z]

[index:x, com:y, camera:y, pic:y, empower:y, config:z]

MCU:y

MemUsed:zzzzzz, MemMax:zzzzzz, RunTime:zzzzzz, ConfigChange:y

[index:x, com:y, camera:y, pic:y, empower:y, config:z] part is defined the same as the response of MASSHS. In this section, "pic" is added to indicate whether the scanner's image acquisition function is functioning properly.

MCU: Indicates the device's infrared function. If y is a negative number, it indicates an abnormality.

MemUsed, MemMax: Indicates the device's memory usage.

Runtime: Indicates the device's running time.

ConfigChange: Indicates whether there have been configuration changes since power-on. A value of 1 indicates changes have been made.

Device LED Status

The device is equipped with a set of status lights to indicate its current operational state. The table below illustrates their meanings:

Engine & MCU Malfunction	Scan Engine communication abnormality	Red LED	LED Light on for 1 second and off for 1 second
	Scan Engine CMOS abnormality		
	Scan Engine is not authorized		
	MCU communication abnormality	Red LED	Solid on
	Infrared abnormality		
Upgrade process	Host upgrade	Blue LED	Solid on
	MCU upgrade		
	Scan Engine upgrade	Blue LED	Blue LED solid on -> Rapid Blinking -> Slow Blinking -> Solid on
	Scan engine upgrade abnormality	Blue LED	LED Light on for 2 seconds and off for 2 seconds
USB Disconnection	USB Reconnection	Purple LED	Light On for 5 seconds within 10 seconds
Power-On Detection Process	Power-On Check	Blue LED	Solid on

Get System Logs

	Tag	SubTag	Data
Request	CHS	GET	0-1
Response			System log

Data: 0-1.

- 1: Get logs saved in memory.

- 0: Get logs saved in FLASH.

Note: If the user's device sends an abnormal signal and the customer cannot locate the problem even after completing the self-check, they can send this command to get the device's system logs and provide them to technical support

Scan Engine Decoding Check

Command: IECSDC

This command is used to check whether all 10 engines of the device can decode properly. User cooperation is required for this command. After sending this command, the device enters the engine decoding check state. The user needs to place a scannable barcode into the collection hole and rotate it one to several times. The rotation speed should not be too fast; completing one rotation cycle in 4 seconds is appropriate.

If all 10 engines successfully decode within the specified time (defined by the engine decoding check timeout), a decoding success prompt is given, and the decoding success indicator light illuminates along with a beep. Otherwise, a single abnormal prompt is given.

After successful decoding or timeout, the device exits the check state and returns to normal operation.

	Tag	SubTag	Data
Request	IEC	SDC	Null
Response			Status characters

Scan Engine Decoding Check Timeout

Command: IECSDT

Used to set the specified time for scan engine decoding check.

	Tag	SubTag	Data
Request	IEC	SDT	Available value: 5000-20000
Response			Log

Data: 5000-200000(ms).

Slave Command Settings

Introduction

SLAVE command is used to configure the scanning engine, including barcode scanning settings. SLAVE commands can be categorized based on the target:

- Commands are supported by both single and multiple engines.

- Commands are supported only for all engines collectively.

- Commands are supported only for a single engine.

Config Slave Engine

The command is specifically used for setting up engines. The host sends the SLAVE command to the controller, which acts as an intermediary to package it according to the communication protocol between the controller and the engine, and then sends it to the target engine. Therefore, from the overall structure perspective, it is no different from the MASTER structure. Its uniqueness lies in the fact that the TAG is fixed as "MAS", and the SubTag is fixed as "TSP". The Data part has a fixed structure. The Storage category has no actual significance and can be represented by "#" or "@".

It's important to note that after executing one SLAVE command, please wait for at least 20ms before sending the next SLAVE command.

The format of a SLAVE command is as follows:

Prefix Storage MAS TSP Data Suffix

The composition of the Data is as follows:

XXTCMD

XX represents the address of the engine to be configured, with optional values ranging from 00-0A. 00 represents a broadcast to configure all engines, mainly used for configuration rather than querying.

T can be "@" or "#", where "@" indicates that the engine can maintain the set state even after power off.

CMD refers to the setting command for the engine, as described above. CMD consists of an order (setting instruction) and parameters (param).

Example 1: Enabling EAN8 reading for all engine heads. The CMD is EA8ENA1, where the order is EA8ENA and the param is 1. The address is 00. Therefore, the SLAVE command is:

ASCII: ~<SOH> 0000@MASTSP00@EA8ENA1;<ETX>

HEX: 7E 01 30 30 30 30 40 4D 41 53 54 53 50 30 30 40 45 41 38 45 4E 41 31 3B 03

Example 2: Querying the serial number of engine number 1. The CMD is QRYPSN, where the order is QRYPSN and the param is null. The address is 01. Therefore, the SLAVE command is:

ASCII: ~<SOH> 0000@MASTSP01@QRYPSN;<ETX>

HEX: 7E 01 30 30 30 30 40 4D 41 53 54 53 50 30 31 40 51 52 59 50 53 4E 3B 03

Slave Engine Command Response

After the SLAVE command is executed directly, the controller responds to the host computer. Since the structure of the SLAVE command is identical to that of the MASTER command, its response also follows the structure of the MASTER command.

The format of the response is as follows:

Prefix   Storage   MAS TSP   Data Anser state Suffix

For example, when querying whether engine number 1 allows reading of EAN13, the CMD is:

- Request: ~<SOH> 0000@MASTSP01@E13ENA*;<ETX>

- Response: <STX><SOH> 0000@MASTSP01@E13ENA*@E13ENA1<ACK>;<ETX>

- The response includes: The state character is <ACK> (HEX: 06), indicating success. The data section (in red), which is identical to the Data section of the transmitted command, serves as an echo. Answer section (in blue), representing the response from engine number 1. In this case, "E13ENA1" indicates that engine number 1 allows the reading of EAN13.

For broadcast commands, i.e., commands addressed to all engines with address 00, the response part only includes the status character, and the Answer part is null. For example, if sending MASTSP00@E13ENA0 to disable EAN13 reading for all engines, the response would be MASTSP00@E13ENA0<ACK>;

Commands Supporting Single Engine and All Engines

This set of commands enables adjustments for both individual engines and all engines, primarily used for device troubleshooting. These settings are not retained when the device is powered off.

Address	Order	Param
00-0A	SCNENA	Available value: 0-1

Param: 0-1

- 0: Disable scanning

- 1: Enable scanning

For instance, to deactivate scanning for engine number 3, the address would be 03, the order SCNENA, and the param 0. This forms the CMD as 03@SCNENA0. Thus, the complete SLAVE command would be MASTSP03@SCNENA0. (Prefix, Storage, and Suffix are not shown here). Similarly, for other engines, only the address needs to be modified.

Commands Exclusive to All Engines

This subset of commands is solely dedicated to configuring all engines collectively. Hence, the address part of the command format must be filled with 00. Primarily focusing on code system settings, these commands ensure uniformity across all engines' operations by supporting broadcast settings only. For broadcast commands, the device responds only with the status symbol.

1D Barcode Inverse

Address	Order	Param
00	CCF1IV	Available value: 0-2

Param: 0-2

- 0: Recognize regular 1D barcodes only

- 1: Recognize inverse 1D barcodes only

- 2: Recognize both regular and inverse 1D barcodes

Example: Configuring all engines to recognize inverse 1D barcodes only, with the requirement to save this setting. In this case, the order is CCF1V and the param is 1. The CMD would be 00@CCF1V1. Consequently, the complete SLAVE command would be MASTSP00@CCF1V1. (Prefix, Storage, and Suffix are omitted here).

Code 128

Restoring Factory Defaults

Sending this SLAVE command resets the Code128 configuration of the engines to factory defaults.

Address	Order	Param
00	128DEF	Null

Enable/Disable Code 128

Address	Order	Param
00	128ENA	Available value: 0-1

Param: 0-1

- 0: Disable Code128

- 1: Enable inverse 1D barcode reading

Set Length Range for Code 128

Address	Order	Param
00	128MIN	Available value: 0-127

Address	Order	Param
00	128MAX	Available value: 0-127

128MIN is used to set the minimum length of Code128 barcodes that can be recognized, while 128MAX is used to set the maximum length. With these two commands, the engine can only recognize Code128 barcodes within this range.

example: Setting the minimum length of Code128 barcodes that all engines can recognize to 5. In this case, the order is 128MIN and the param is 5. The CMD would be 00@128MIN5. Thus, the complete SLAVE command would be MASTSP00@128MIN5.

EAN-8

Restoring Factory Defaults

Sending this SLAVE command resets the EAN8 configuration of the engines to factory defaults.

Address	Order	Param
00	EA8DEF	Null

Enable/Disable EAN-8

Address	Order	Param
00	EA8ENA	Available value: 0-1

Param: 0-1

- 0: Disable Code EAN-8

- 1: Enable EAN-8

Transmit Check Character

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

Address	Order	Param
00	EA8CHK	Available value: 1-2

Param: 1-2

- 1: Do not transmit the check character

- 2: Transmit the check character

2-Digit Add-On Code

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

Address	Order	Param
00	EA8AD2	Available value: 0-1

Param: 0-1

- 0: Disable 2-Digit Add-On Code

- 1: Enable 2-Digit Add-On Code

5-Digit Add-On Code

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

Address	Order	Param
00	EA8AD5	Available value: 0-1

Param: 0-1

- 0: Disable 5-Digit Add-On Code

- 1: Enable 5-Digit Add-On Code

Add-On Code Required

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

Address	Order	Param
00	EA8REQ	Available value: 0-1

Param: 0-1

- 0: EAN-8 Add-On Code Not Required

- 1: EAN-8 Add-On Code Required

EAN-13

Restoring Factory Defaults

Sending this SLAVE command resets the EAN-13 configuration of the engines to factory defaults.

Address	Order	Param
00	E13DEF	Null

Enable/Disable EAN-13

Address	Order	Param
00	E13ENA	Available value: 0-1

Param: 0-1

- 0: Disable Code EAN-13

- 1: Enable EAN-13

Transmit Check Character

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

Address	Order	Param
00	EA13CHK	Available value: 1-2

Param: 1-2

- 1: Do not transmit the check character

- 2: Transmit the check character

2-Digit Add-On Code

An EAN-13 barcode can be augmented with a two-digit add-on code to form a new one. In the example below, the part surrounded by the blue dotted line is an EAN-8 barcode while the part circled by the red dotted line is a two-digit add-on code.

Address	Order	Param
00	E13AD2	Available value: 0-1

Param: 0-1

- 0: Disable 2-Digit Add-On Code

- 1: Enable 2-Digit Add-On Code

5-Digit Add-On Code

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

Address	Order	Param
00	E13AD5	Available value: 0-1

Param: 0-1

- 0: Disable 5-Digit Add-On Code

- 1: Enable 5-Digit Add-On Code

Add-On Code Required

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

Address	Order	Param
00	E13REQ	Available value: 0-1

Param: 0-1

- 0: EAN-13 Add-On Code Not Required

- 1: EAN-13 Add-On Code Required

UPC-E

Restoring Factory Defaults

Sending this SLAVE command resets the UPC-E configuration of the engines to factory defaults.

Address	Order	Param
00	UPEDEF	Null

Enable/Disable UPC-E

Address	Order	Param
00	UPEENA	Available value: 0-1

Param: 0-1

- 0: Disable Code UPC-E

- 1: Enable UPC-E

Enable/Disable UPC-E0

Address	Order	Param
00	UPEEN0	Available value: 0-1

Param: 0-1

- 0: Disable Code UPC-E0, unable to read UPC-E barcodes starting with "0".

- 1: Enable UPC-E0, enable to read UPC-E barcodes starting with "0".

Enable/Disable UPC-E1

Address	Order	Param
00	UPEEN1	Available value: 0-1

Param: 0-1

- 0: Disable Code UPC-E1, unable to read UPC-E barcodes starting with "1".

- 1: Enable UPC-E1, enable to read UPC-E barcodes starting with "1".

Transmit Check Character

Address	Order	Param
00	UPECHK	Available value: 1-2

Param: 1-2

- 1: Do not transmit the check character

- 2: Transmit the check character

2-Digit Add-On Code

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

Address	Order	Param
00	UPEAD2	Available value: 0-1

Param: 0-1

- 0: Disable 2-Digit Add-On Code

- 1: Enable 2-Digit Add-On Code

5-Digit Add-On Code

A UPC-E barcode can be augmented with a five-digit add-on code to form a new one. In the example below, the part surrounded by the blue dotted line is a UPC-E barcode while the part circled by the red dotted line is a five-digit add-on code.
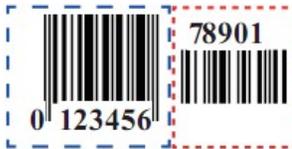
Address	Order	Param
00	UPEAD5	Available value: 0-1

Param: 0-1

- 0: Disable 5-Digit Add-On Code

- 1: Enable 5-Digit Add-On Code

Add-On Code Required

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

Address	Order	Param
00	UPEREQ	Available value: 0-1

Param: 0-1

- 0: UPC-E Add-On Code Not Required

- 1: UPC-E Add-On Code Required

Transmit Preamble Character

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

Address	Order	Param
00	UPEPRE	Available value: 0-2

Param: 0-2

- 0: Transmit no preamble

- 1: Transmit system character only

- 2: Transmit system character and country code

UPC-A

Restoring Factory Defaults

Sending this SLAVE command resets the UPC-A configuration of the engines to factory defaults.

Address	Order	Param
00	UPADEF	Null

Enable/Disable UPC-A

Address	Order	Param
00	UPAENA	Available value: 0-1

Param: 0-1

● 0: Disable Code UPC-A

● 1: Enable UPC-A

Transmit Check Character

Address	Order	Param
00	UPACHK	Available value: 1-2

Param: 1-2

● 1: Do not transmit the check character

- 2: Transmit the check character

2-Digit Add-On Code

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

Address	Order	Param
00	UPAAD2	Available value: 0-1

Param: 0-1

- 0: Disable 2-Digit Add-On Code

- 1: Enable 2-Digit Add-On Code

5-Digit Add-On Code

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

Address	Order	Param

Address	Order	Param
00	UPAAD5	Available value: 0-1

Param: 0-1

- 0: Disable 5-Digit Add-On Code

- 1: Enable 5-Digit Add-On Code

Add-On Code Required

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

Address	Order	Param
00	UPAREQ	Available value: 0-1

Param: 0-1

- 0: UPC-A Add-On Code Not Required

- 1: UPC-A Add-On Code Required

Transmit Preamble Character

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

Address	Order	Param
00	UPAPRE	Available value: 0-2

Param: 0-2

- 0: Transmit no preamble

- 1: Transmit system character only

- 2: Transmit system character and country code

Code-39

Restoring Factory Defaults

Sending this SLAVE command resets the Code-39 configuration of the engines to factory defaults.

Address	Order	Param
00	C39DEF	Null

Enable/Disable Code-39

Address	Order	Param
00	C39ENA	Available value: 0-1

Param: 0-1

- 0: Disable Code-39

- 1: Enable Code-39

Transmit Check Character

Address	Order	Param

Address	Order	Param
00	UPACHK	Available value: 1-2

Param: 1-2

- 1: Do not transmit the check character

- 2: Transmit the check character

Set Length Range for Code 39

Address	Order	Param
00	C39MIN	Available value: 0-127

Address	Order	Param
00	C39MAX	Available value: 0-127

C39MIN is used to set the minimum length of Code39 barcodes that can be recognized, while C39MAX is used to set the maximum length. With these two commands, the engine can only recognize Code39 barcodes within this range.

Check Character Verification

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

Address	Order	Param
00	C39CHK	Available value: 0-2

Param: 0-2

- 0: Disable Check Character Verification, The scanner transmits Code 39 barcodes as it is.

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

- 2: Transmit Check Character After Verification: The scanner checks the integrity of all Code 39 barcodes to verify that the data complies with the check character algorithm. Barcodes passing the check will be transmitted, whereas those failing it will not be transmitted.

Transmit Start/Stop Character

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

Address	Order	Param
00	C39TSC	Available value: 0-1

Param: 0-1

- 0: Do Not Transmit Start/Stop Character

- 1: Transmit Start/Stop Character

Enable/Disable Code 39 Full ASCII

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

Address	Order	Param
00	C39ASC	Available value: 0-1

Param: 0-1

- 0: Disable Code 39 Full ASCII

- 1: Enable Code 39 Full ASCII

Code 32 Pharmaceutical (PARAF)

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

Address	Order	Param
00	C39E32	Available value: 0-1

Param: 0-1

- 0: Disable Code 32

- 1: Enable Code 32

Code 32 Prefix

You may scan the appropriate barcode below to enable or disable adding the prefix character "A" to all Code 32 barcodes. Code 32 must be enabled for this parameter to function.

Address	Order	Param
00	C39S32	Available value: 0-1

Param: 0-1

- 0: Disable Code 32 Prefix

- 1: Enable Code 32 Prefix

Transmit Code32 Start/Stop Character

Address	Order	Param
00	C39T32	Available value: 0-1

Param: 0-1

- 0: Do Not Transmit Code 32 Start/Stop Character

- 1: Transmit Code 32 Start/Stop Character

Transmits Code 32 Check Character

Address	Order	Param
00	C39C32	Available value: 0-1

Param: 0-1

- 0: Do Not Transmit Code32 Check Character.

- 1: Transmit Code 32 Check Character.

QR Code

Restoring Factory Defaults

Sending this SLAVE command resets the QR configuration of the engines to factory defaults.

Address	Order	Param
00	QRCDEF	Null

Enable/Disable QR Code

Address	Order	Param
00	QRCENA	Available value: 0-1

Param: 0-1

- 0: Disable QR Code

- 1: Enable QR Code

Set Length Range for QR Code

Address	Order	Param
00	QRCMIN	Available value: 1-6144

Address	Order	Param
00	QRCMAX	Available value: 1-6144

QRCMIN is used to set the minimum length of QR Code barcodes that can be recognized, while QRCMAX is used to set the maximum length. With these two commands, the engine can only recognize QR Code barcodes within this range.

QR Inverse

Regular barcode: Dark bars on a bright background. Inverse barcode: Bright bars on a dark background.

Address	Order	Param
00	QRCINV	Available value: 0-2

Param: 0-2

- 0: Recognize regular QR barcodes only

- 1: Recognize Inverse QR barcodes only

- 2: Recognize both regular and inverse QR barcodes

QR ECI Output

Address	Order	Param
00	QRCECI	Available value: 0-1

Param: 0-1

- 0: Disable QR ECI Output

- 1: Enable QR ECI Output

Data Matrix

Restoring Factory Defaults

Sending this SLAVE command resets the Data Matrix configuration of the engines to factory defaults.

Address	Order	Param
00	DMCDEF	Null

Enable/Disable Data Matrix Code

Address	Order	Param
00	DMCENA	Available value: 0-1

Param: 0-1

- 0: Disable Data Matrix Code

- 1: Enable Data Matrix Code

Set Length Range for Data Matrix Code

Address	Order	Param
00	DMCMIN	Available value: 1-6144

Address	Order	Param
00	DMCMAX	Available value: 1-6144

DMCMIN is used to set the minimum length of Data Matrix Code barcodes that can be recognized, while DMCMAX is used to set the maximum length. With these two commands, the engine can only recognize Data Matrix Code barcodes within this range.

Rectangular Barcode

The Data Matrix has two formats:

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

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

Address	Order	Param
00	DMCREC	Available value: 0-1

Param: 0-1

- 0: Disable Rectangular Barcode

- 1: Enable Rectangular Barcode

Data Matrix Inverse

Regular barcode: Dark bars on a bright background. Inverse barcode: Bright bars on a dark background.

Address	Order	Param
00	DMCINV	Available value: 0-2

Param: 0-2

- 0: Recognize regular Data Matrix barcodes only

- 1: Recognize Inverse Data Matrix barcodes only

- 2: Recognize both regular and inverse Data Matrix barcodes

Data Matrix ECI Output

Address	Order	Param
00	DMCECI	Available value: 0-1

Param: 0-1

- 0: Disable Data Matrix ECI Output

- 1: Enable Data Matrix ECI Output

Aztec

Restoring Factory Defaults

Sending this SLAVE command resets the Aztec configuration of the engines to factory defaults.

Address	Order	Param
00	AZTDEF	Null

Enable/Disable Data Aztec

Address	Order	Param
00	AZTENA	Available value: 0-1

Param: 0-1

- 0: Disable Aztec Code

- 1: Enable Aztec Code

Set Length Range for Aztec Code

Address	Order	Param
00	AZTMIN	Available value: 1-6144

Address	Order	Param
00	AZTMAX	Available value: 1-6144

AZTMIN is used to set the minimum length of Aztec Code barcodes that can be recognized, while AZTMAX is used to set the maximum length. With these two commands, the engine can only recognize Aztec Code barcodes within this range.

Aztec Inverse

Regular barcode: Dark bars on a bright background. Inverse barcode: Bright bars on a dark background.

Address	Order	Param
00	AZTINV	Available value: 0-2

Param: 0-2

- 0: Recognize regular Aztec barcodes only

- 1: Recognize Inverse Aztec barcodes only

- 2: Recognize both regular and inverse Aztec barcodes

Aztec ECI Output

Address	Order	Param
00	AZTECI	Available value: 0-1

Param: 0-1

- 0: Disable Aztec ECI Output

- 1: Enable Aztec ECI Output

Help

To optimize scanning performance, it's advisable to limit barcode support to EAN-8, EAN-13, UPC-E, and UPC-A formats for bottle recycling applications, despite the device's capability to handle various barcode formats. This approach conserves device resources and ensures efficient operation. Moreover, it's recommended to refrain from configuring the engines while the device is decoding, as this helps maintain stable communication between the main controller and the engines.

Commands Exclusive to Individual Engines

For commands exclusively targeting individual scan engines, the address field must not be set to '00' in the command format. These commands are primarily intended for querying purposes.

Explanation	CMD
Query Serial Number	QRYPSN
Query Hardware Information	QRYHWV
Query Production Date	QRYDAT
Query Firmware Version	QRYFWV
Query Product OEM Serial Number	QRYESN

These CMD definitions are consistent with the product information query in MASTER. QRYDCV is a unique query function for engines, elaborated upon here. Other CMDs are not reiterated for brevity.

Address	Order	param
01-0A	QRYDCV	Null

To query the serial number of engine 4, the SLAVE command is MASTSP04@QRYPSN; the response generated is MASTSP04@QRYPSN@QRYPSN Serial Number: XXXXXXX.

Apart from the commands listed in the table, settings for barcode formats applicable to all engines can also be queried. Simply replace the data in the param field with * or &, for example, to query the enablement status of EAN13. To check if EAN13 is enabled for engine 8, the SLAVE command is MASTSP08@E13ENA*; the response generated is MASTSP08@E13ENA*@E13ENA1.

Appendix

AIM ID Table

Symbology	AIM ID	P ossible AIM ID Modifiers (m)
Code 128	]C0	
EAN-8	]E4	
EAN-13	]E0	
UPC-E	]E0	
UPC-A	]E0	
Code 39	]Am	0，1，3，4，5，7
QR Code	]Qm	0-6
Aztec	]zm	0-9，A-C
Data Matrix	]dm	0-6

Code ID Table

Symbology	Code ID
Code 128	j
EAN-8	d
EAN-13	d
UPC-E	c
UPC-A	c
Code 39	b
QR Code	s
Aztec	z
Data Matrix	u

ASCII Function Key Mapping Table

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

ASCII Function Key Mapping Table (Continued)

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

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

ASCII Table

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

1e	30	RS (Request to Send)
1f	31	US (Unit Separator)
20	32	SP (Space)
21	33	! (Exclamation Mark)
22	34	" (Double Quote)
23	35	# (Number Sign)
24	36	$ (Dollar Sign)
25	37	% (Percent)
26	38	& (Ampersand)
27	39	` (Single Quote)
28	40	((Right / Closing Parenthesis)
29	41	) (Right / Closing Parenthesis)
2a	42	* (Asterisk)
2b	43	+ (Plus)
2c	44	, (Comma)
2d	45	- (Minus / Dash)
2e	46	. (Dot)
2f	47	/ (Forward Slash)
30	48	0
31	49	1
32	50	2
33	51	3
34	52	4
35	53	5
36	54	6
37	55	7
38	56	8
39	57	9
3a	58	: (Colon)
3b	59	; (Semi-colon)
3c	60	< (Less Than)
3d	61	= (Equal Sign)
3e	62	> (Greater Than)
3f	63	? (Question Mark)
40	64	@ (AT Symbol)
41	65	A

42	66	B
43	67	C
44	68	D
45	69	E
46	70	F
47	71	G
48	72	H
49	73	I
4a	74	J
4b	75	K
4c	76	L
4d	77	M
4e	78	N
4f	79	O
50	80	P
51	81	Q
52	82	R
53	83	S
54	84	T
55	85	U
56	86	V
57	87	W
58	88	X
59	89	Y
5a	90	Z
5b	91	[(Left / Opening Bracket)
5c	92	\ (Back Slash)
5d	93	] (Right / Closing Bracket)
5e	94	^ (Caret / Circumflex)
5f	95	_ (Underscore)
60	96	' (Grave Accent)
61	97	a
62	98	b
63	99	c
64	100	d
65	101	e

66	102	f
67	103	g
68	104	h
69	105	i
6a	106	j
6b	107	k
6c	108	l
6d	109	m
6e	110	n
6f	111	o
70	112	p
71	113	q
72	114	r
73	115	s
74	116	t
75	117	u
76	118	v
77	119	w
78	120	x
79	121	y
7a	122	z
7b	123	{ (Left/ Opening Brace)
7c	124	| (Vertical Bar)
7d	125	} (Right/Closing Brace)
7e	126	~ (Tilde)
7f	127	DEL (Delete)

SCANNING
MADE SIMPLE