Newland AIDC
Scanning Made Simple

NLS-NVH220

Industrial Handheld Barcode Scanner

User Guide

Disclaimer

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

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

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Revision History

Version	Description	Date
V1.0.0	Initial release.	June 25th, 2023
V1.0.1	Correct Barcode Programming	September 19th, 2023

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Preface

Introduction

This manual provides detailed instructions for setting up and using the NLS-NVH220B Industrial Handheld Barcode Scanner (hereinafter referred to as **"the NVH220B"** or **"the scanner"**).

Chapter Description

Chapter 1 Getting Started	: Gives a general description of NVH220B scanner a*nd list the parameters .*
Chapter 2 NSet	: Introduces a useful tool you can use to set up NVH220B scanner and develop new applications.
Chapter 3 System Settings	: Introduces three configuration methods and describes how to configure general parameters of NVH220B scanner.
Chapter 4 Wireless Settings	: Describes how to configure wireless settings.
Chapter 5 RS-232 Interface	: Describes how to configure RS-232 communication parameters.
Chapter 6 USB Interface	: Describes how to configure USB communication parameters.
Chapter 8 Symbologies	: List all compatible symbologies and describes how to configure the relevant parameters.
Chapter 10 Prefix & Suffix	: Describe how to use prefix and suffix to customize scanned data.
Chapter 11 Batch Programming	: Explain how to integrate a complex programming task into a single barcode.
Appendix	: Provide factory defaults table and a bunch of frequently used programming barcodes.

Explanation of Icons

This icon indicates something relevant to this manual.

This icon indicates this information requires extra attention from the reader.

This icon indicates handy tips that can help you use or configure the scanner with ease.

This icon indicates practical examples that can help you to acquaint yourself with operations.

Chapter 1 Getting Started

Introduction

The NVH220B reads a 1D or 2D barcode by capturing its image. Adopting the advanced UIMG® technology independently developed by Newland Auto-ID Tech, it provides several scan modes, including Manual mode, Pulse mode, Aim mode, Continuous mode and Batch mode, tailored to different scanning needs.

An illustrated introduction to the NVH220B is included in this chapter. If you have a scanner at hand, make good use of it to develop a better understanding of this manual. This chapter is written for normal users, maintenance staff and software developers.

Features of the NVH220B

- Based on bluetooth 5.0 Technology
- Excellent DPM Decoding Capability
- Advanced Illumination system
- Fast Intelligent Learning and Rich Scene Configuration
- High Protection Industrial Structure Design

Accessories

Name	Specification	Number
NLS- NVH220B Scanner	NLS- NVH220B	1
USB or RS232 or PS/2 Cable	RJ45 to USB or RS232 or PS/2	1
Power Adapter	Output: DC 5V,3A	1
Quick Guide	Paper	1
Qualification Certificate /Warranty Card	Paper	1

Unpacking

Open the package and take out the scanner and its accessories. Check to make sure everything on the packing list is present and intact. If any contents are damaged or missing, please keep the original package and contact your dealer immediately for after-sales service.

CD220 Data Port

CD220 Data Port Pinouts:

PIN	Signal	Type	Function
1	NC	-	Not connected
2	NC	-	Not connected
3	VCC	P	Power, +5V
4	TXD	O	RS-232 Output
5	RXD	I	Flow control signal
6	CTS	I	
7	RTS	O	Request To Send
8	GND	P	Ground
9	D-	I/O	USB Signal
10	D+	I/O	

CD300E Data Port Pinouts:

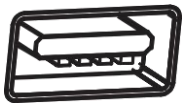
PIN	Signal	Type	Function
1	RXP	I	Ethernet RX signal

2	RXN	I	
3	VCC	P	Power, +5V
4	TXD	O	RS-232 Output
5	RXD	I	RS-232 input
6	TXP	O	Ethernet TX Signal
7	TXN	O	
8	GND	P	Ground
9	D-	I/O	USB Signal
10	D+	I/O	

Connecting the NVH220B to a Host

The scanner must be connected to a host device in actual application, such as PC, POS or any intelligent terminal with USB 、RS-232、 using a communication cable (USB or RS-232 cable).

USB

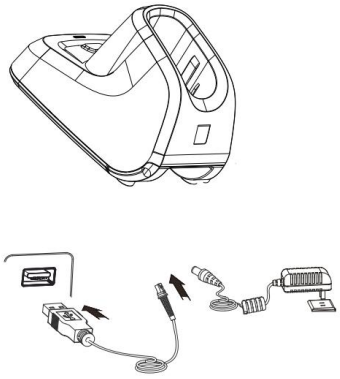
USB port on the host device 

RS-232

RS-232 port on the host device

Note: Please check which ports are available on your host to order the appropriate data cable.

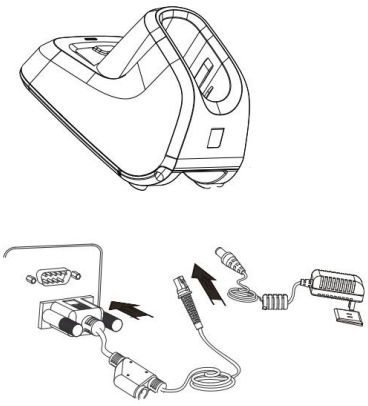
Using USB Cable



Connect the scanner to a host device through a USB cable with RJ45 and USB connectors:

1. Plug the RJ45 connector into the data port on the scanner.
2. Plug the USB connector into the USB port on the host device.
3. Plug the supplied power adapter into the power jack on the cradle.

Using RS-232 Cable



Connect the scanner to a host device through a RS-232 cable with RJ45 and RS-232 connectors and a power jack:

1. Plug the RJ45 connector into the data port on the scanner.

2. Plug the RS-232 connector into the RS-232 port on the host device.
3. Plug the supplied power adapter into the CD300 cradle.

Power On, Power Off, Reboot

Power on the scanner

A long press the trigger button, then the scanner will be turned on.

Power off the scanner

Method 1: When in the Level scan mode, the scanner will automatically power off after being in sleep mode for 15 minutes.

Method 2: Scan the Power Off Scanner barcode in Chapter 3.

Reboot the scanner

If the scanner stops responding to input or runs abnormally, press and hold the Reset button on the bottom of the scanner with a straightened paperclip to reboot it.

Maintenance

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

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

Scanning Instructions

When the scanner is in the Level scan mode, you can follow the steps below to scan a barcode:

1. Press and hold the trigger. Then the scanner will project a ra green focusing dot.
2. Release the trigger when the aiming pattern goes off. If the barcode is decoded successfully, the scanner will emit a good read beep and the decoded data will be sent to the host device.

Note: For barcodes of the same batch, the scanner keeps a high success ratio in certain distance which is regarded as the optimal scanning distance.

Chapter 2 NSet

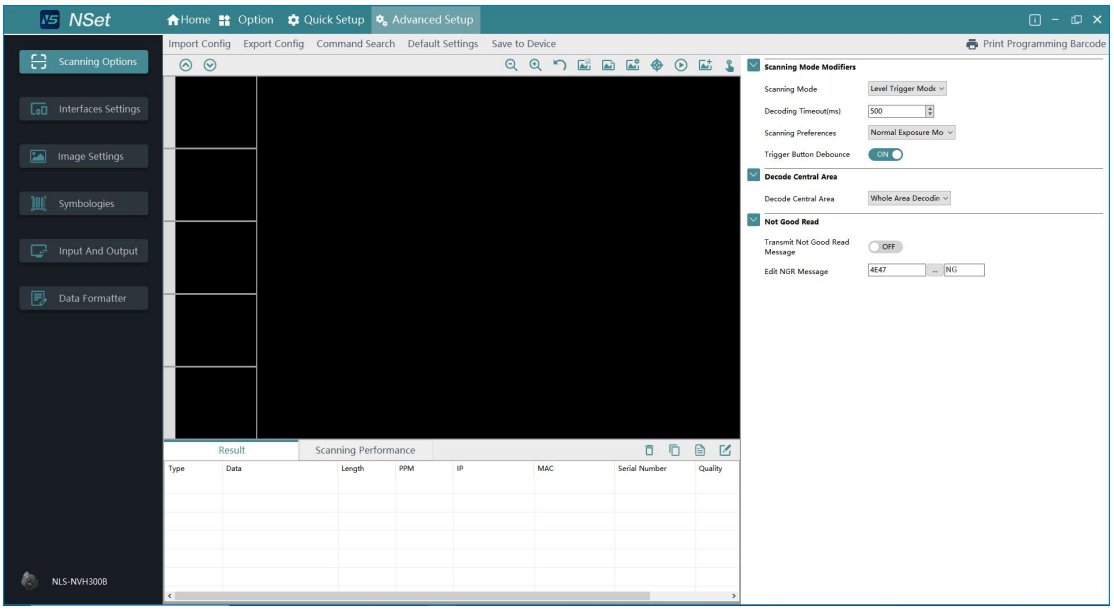
Introduction

NSet Setup Tool is a User Interface client application developed by Fujian Newland Auto-ID Tech. Co., Ltd. That simplifies initial reader setup and changing parameters of the scanners you use.

The NSet is a common platform across all models. It is installed in and runs on Windows-based PCs (usually laptops), and connection takes place through several different interface.

Main Features

- View and modify the information and setting parameters of online scanner.
- View the general configurations of the offline devices.
- Upgrade the firmware, compare the configurations, restore to the factory default ,etc in batch.
- Create/print/save setting barcodes to a PDF or Word file.
- Support to see how different options affect the reader in real time.
- Real-time refresh of device status.
- Support image playback.



Chapter 3 System Settings

Introduction

There are three ways to configure the NVH220B: Barcode programming, command programming and Nset programming.

Barcode Programming

The NVH220B can be configured by scanning programming barcodes. All user programmable features/options are described along with their programming barcodes/commands in the following sections.

Command Programming

The NVH220B can also be configured by serial commands (HEX) sent from the host device.

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

NSet Programming

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

Before programming the scanner, you need to pair it to a cradle first. When programming the scanner with serial commands or NSet, you need to insert it in the paired cradle.

Programming Barcode/ Programming Command/Function

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

1. The **Level Mode** barcode.

2. The **Level Mode** command.

3. The description of feature/option.

4. ** indicates factory default settings.

Note: "@" included in the programming command indicates permanent setting which means the setting will not be lost by removing power from the scanner or turning off or rebooting it; whereas "#" included in the programming command indicates temporary setting which means the setting will be lost by removing power from the scanner or turning off or rebooting it.

Use of Programming Command

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

Command Syntax

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

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

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

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

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

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

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

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

Query Commands

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

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

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

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

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

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

Responses

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

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

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

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

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

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

Examples

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

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

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

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

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

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

Use of Programming Barcode

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

@SETUPT0

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

@SETUPT1

Transmit Programming Barcode Data

Illumination

@ILLSCN1

**** On**

@ILLSCN0

Off

Illumination Color

@ILLCLR0

Red LED

@ILLCLR1

White LED

@ILLCLR2

** **Red LED and White LED**

@ILLCLR4

Blue LED

@ILLCLR5

Red LED, white LED and blue LED

@ILLCLR6

White LED and blue LED

@ILLCLR7

Red LED and blue LED

Illumination Rotation Interval

This parameter sets the Illumination Rotation Interval. The default value is 2000ms.

@ILLSCT

Illumination Rotation Interval

Illumination Brightness

This parameter increases the maximum value of the exposure and the gain.

@ILLBRG0

**** Normal**

@ILLBRG1

High Brightness

Aiming

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

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

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

Off: Aiming pattern is off all the time.

@AMLENA1

**** Normal**

@AMLENA0

Off

@AMLENA2

Always On

Good Read Vibration

You may choose whether or not to let the scanner vibrate when a barcode is successfully read by scanning the appropriate barcode below.

@GRVENA0

**** Off**

@GRVENA1

On

Good Read Vibration Duration

This parameter sets the length for the Good Read Vibration. It is programmable in 1ms increments from 100ms to 2,000ms. The default value is 300ms.

@GRVDUR

Set Good Read Vibration Duration

Example

Set the Good Read Vibration duration to 800ms:

1. Scan the Set Good Read Vibration Duration barcode.
2. Scan the numeric barcodes “8”, “0” and “0” from the “Digit Barcodes” section in Appendix.
3. Scan the Save barcode from the “Save/Cancel Barcodes” section in Appendix.

Good Read LED

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

@GRLENA1

**** On**

@GRLENA0

Off

Good Read LED Duration

This parameter sets the amount of time the Good Read LED remains on following a good read. It is programmable in 10ms increments from 20ms to 10,000ms.

@GRLDUR20

**** Short (20ms)**

@GRLDUR120

Medium (120ms)

@GRLDUR220

Long (220ms)

@GRLDUR320

Prolonged (320ms)

@GRLDUR

Custom (20 - 10,000ms)

Example

Set the Good Read LED duration to 800ms:

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

Power On Beep

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

@PWBENA1

**** On**

@PWBENA0

Off

Good Read Beep

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

@GRBENA1

**** On**

@GRBENA0

Off

Good Read Beep Volume

Scanning the appropriate arcodes can set the Good Read Beep Volume to low ,medium and high. This parameter is programmable from 1 to 10.

Good Read Beep Duration

This parameter sets the length of the beep the scanner emits on a good read. It is programmable in 10ms increments from 20ms to 300ms.

@GRBDUR40

Short (40ms)

@GRBDUR80

**** Medium (80ms)**

@GRBDUR120

Long (120ms)

@GRBDUR

Custom (20 - 300ms)

Example

Set the Good Read Beep duration to 200ms:

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

Good Read Beep Frequency

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

@GRBFRQ800

Extra Low (800Hz)

@GRBFRQ1600

Low (1600Hz)

@GRBFRQ2730

**** Medium (2730Hz)**

@GRBFRQ4200

High (4200Hz)

@GRBFRQ

Custom (20 - 20,000Hz)

Example

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

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

Number of Good Read Beeps

The number of beeps of a good read can be programmed from 1 to 9. To change the number of beeps, scan the barcode below and then scan a numeric barcode (1-9) and the **Save** barcode. The default value is 1.

@GRBNUM

Number of Good Read Beeps

Good Read Beep Interval Time

Good Read Beep Interval Time modifies the interval time between beeps, and it becomes effective when the Number of Good Read Beeps is greater than one.

@GRBITV0

**** Short**

@GRBITV1

Medium

Scan Mode

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

Sense Mode: The scanner activates a decode session every time when it detects a change in ambient illumination. The decode session continues until the barcode is decoded or the decode session timeout expires. Pressing the trigger can also activate a decode session.

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 same barcode in a given period of time.

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

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

Pre-Aiming Mode: When the user holds the scanner , the scanner lights up the aiming light to indicate the current position of the scanner before the user presses the button. After pressing the button, the scanner starts to read the bar code(the aimer is turned on or off according to the configuration of aimer mode. When the button is released or the barcode is decoeded successfully, the code is stopped. When the user drops down the scanner for 3 seconds, the aiming lamp will turn off.

@SCNMOD0

Level Mode

@SCNMOD2

Sense Mode

@SCNMOD3

Continuous Mode

@SCNMOD4

Pulse Mode

@SCNMOD7

Batch Mode

One Reading Timeout

This parameter sets the maximum time decode session continues during a scan attempt. It is programmable in 1ms increments from 1ms to 3,600,000ms. When it is set to 0, the timeout is infinite. The default setting is 3,000ms.

@ORTSET

One Reading Timeout

Example

Set the decode session timeout to 1,500ms:

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

Reading Interval

Timeout between Decodes sets the time period between the end of one decode session and the start of next session. It is programmable in 1ms increments from 1ms to 10,000ms. The default timeout is 500ms. This feature is only applicable to the Continuous modes.

@SCNINV

Timeout between Decodes

Example

Set the timeout between decodes to 800ms:

1. Scan the **Timeout between Decodes** barcode.
2. Scan the numeric barcodes “8”, “0” and “0” from the “Digit Barcodes” section in Appendix.
3. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.

Image Stabilization Timeout (Sense Mode)

In the course of the sense mode, when the scanner stop reading, it will enter a new process of read-adaptation to the reading environment (image).After the Image Stabilization Timeout will the scanner enter the sense mode and wait for the barcode to present.Set the parameters of Image Stabilization Timeout could change the time to adapt the reading environment. It is programmable in 1ms increments from 1ms to 3,000ms. The default setting is 200ms.

@SENIST

Image Stabilization Timeout (Sense Mode)

Delay

Reread Delay

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

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

Disable Reread Delay: Allow the scanner to re-read same barcode

@RRDENA1

****On**

@RRDENA0

Off

Reread Delay Time

The following parameter sets the timeout between decodes for same barcode. It is programmable in 1ms increments from 1ms to 3,600,000ms. The default setting is 15,000ms.

@RRDDUR

Reread Delay Time

Example

Set the Reread Delay Time to 1,000ms:

1. Scan the **Reread Delay Time** barcode.
2. Scan the numeric barcodes “1”, “0”, “0” and “0” from the “Digit Barcodes” section in Appendix.
3. Scan the Save barcode from the “Save/Cancel Barcodes” section in Appendix.

Good Read Delay

Good Read Delay sets the minimum amount of time before the scanner can read another barcode. This parameter is programmable in 1ms increments from 1ms to 3,600,000ms. The default setting is 500ms. Scan the appropriate barcode below to enable or disable the delay.

@GRDENA1

Enable Good Read Delay

@GRDENA0

**** Disable Good Read Delay**

Good Read Delay Time

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

@GRDDUR

Good Read Delay Time

Example

Set the Good Read Delay Time to 1,000ms:

1. Scan the Good Read Delay Time barcode.
2. Scan the numeric barcodes “1”, “0”, “0” and “0” from the “Digit Barcodes” section in Appendix.
3. Scan the Save barcode from the “Save/Cancel Barcodes” section in Appendix.

Image Decoding Timeout

Image Decoding Timeout specifies the maximum time the scanner will spend decoding an image. This parameter is programmable in 1ms increments from 1ms to 3,000ms. The default timeout is 350ms.

@DETSET

Image Decoding Timeout

Example

Set the image decoding timeout to 800ms:

1. Scan the **Image Decoding Timeout** barcode.
2. Scan the numeric barcodes “8”, “0” and “0” from the “Digit Barcodes” section in Appendix.
3. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.

Scanning Preference

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

High Motion Tolerance Mode: Select this mode when reading barcodes on moving objects.

@EXPLVL0

**** Normal Mode**

@EXPLVL4

High Motion Tolerance Mode

Sensitivity

Sensitivity specifies the degree of acuteness of the scanner's response to changes in images captured. There are 20 levels to choose from. The smaller the value, the higher the sensitivity and the lower requirement in image change to trigger the scanner. You can select an appropriate degree of sensitivity that fits the application environment. The default setting is Level 1. This feature is only applicable to the Sense mode.

@SENLVL14

Low Sensitivity

@SENLVL11

Medium Sensitivity

@SENLVL8

High Sensitivity

@SENLVL5

Enhanced Sensitivity

@SENLVL

Custom Sensitivity

Example

Set the Sensitivity to 10:

1.Scan the **Custom Sensitivity** barcode.

2.Scan the numeric barcodes “1”, “0” from the “Digit Barcodes” section in Appendix.

3.Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.

Read Barcode On/Off

Sending the Read Barcode Off command **@NGRENA0** to the scanner can disable it from reading barcode, and the scanner is unable to scan barcode unless you send the Read Barcode On command **@NGRENA1** to it or power cycle it. By default, Read Barcode is On.

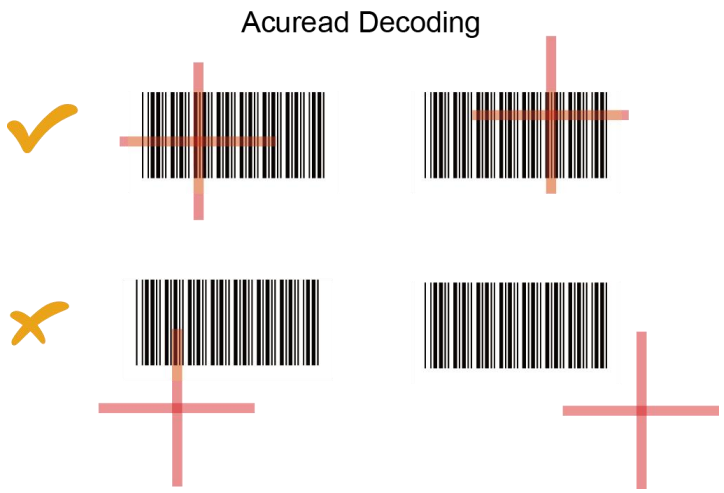
Decode Area

Whole Area Decoding: The scanner attempts to decode barcode(s) within its field of view, from the center to the periphery, and transmits the barcode that has been first decoded.

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

Acuscan: The scanner only decodes the barcode aimed squarely by the aiming pattern. For those using a crosshair aiming pattern, only the barcode aimed by the center of crosshair will be decoded.

Priori On Aimed Barcode: The scanner attempts to decode priority the aimed barcode(s). If there is no barcode in the aimed area, the scanner would decode the barcode close to the aiming area first.



@CADENA0

Whole Area Decoding

@CADENA1

Specific Area Decoding

@CADENA2

Acuscan

@CADENA4

****Priori On Aimed Barcode**

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

The default decoding area is an area of 40% top, 60% bottom, 40% left and 60% right of the scanner's field of view

You can define the decoding area using the **Top of Decoding Area**, **Bottom of Decoding Area**, **Left of Decoding Area** and **Right of Decoding Area** barcodes as well as numeric barcode(s) that represent(s) a desired percentage (0-100). The value of Bottom must be greater than that of Top; the value of Right must be greater than that of Left.

@CADTOP

Top of Decoding Area

@CADBOT

Bottom of Decoding Area

@CADLEF

Left of Decoding Area

@CADRIG

Right of Decoding Area

Example

Program the scanner to only read Barcode 1 in the figure above by setting the decoding area to 10% top, 45% bottom, 15% left and 30% right:

1. Scan the **Top of Decoding Area** barcode.
2. Scan the numeric barcode "0" from the "Digit Barcodes" section in Appendix.
3. Scan the **Save** barcode from the "Save/Cancel Barcodes" section in Appendix.
4. Scan the **Bottom of Decoding Area** barcode.
5. Scan the numeric barcodes "4" and "5" from the "Digit Barcodes" section in Appendix.
6. Scan the **Save** barcode from the "Save/Cancel Barcodes" section in Appendix.
7. Scan the **Top of Decoding Area** barcode.
8. Scan the numeric barcodes "1" and "0" from the "Digit Barcodes" section in Appendix.
9. Scan the **Save** barcode from the "Save/Cancel Barcodes" section in Appendix.
10. Scan the **Left of Decoding Area** barcode.
11. Scan the numeric barcode "0" from the "Digit Barcodes" section in Appendix.
12. Scan the **Save** barcode from the "Save/Cancel Barcodes" section in Appendix.
13. Scan the **Right of Decoding Area** barcode.
14. Scan the numeric barcodes "3" and "0" from the "Digit Barcodes" section in Appendix.
15. Scan the **Save** barcode from the "Save/Cancel Barcodes" section in Appendix.
16. Scan the **Left of Decoding Area** barcode.
17. Scan the numeric barcodes "1" and "5" from the "Digit Barcodes" section in Appendix.
18. Scan the **Save** barcode from the "Save/Cancel Barcodes" section in Appendix.

Image Flipping

@MIRROR0

**** Do Not Flip**

@MIRROR1

Flip Horizontally

Example of image not flipped

Example of image flipped horizontally

Image Resize

This option alters image resolution before compression. Multiple pixels are combined to one pixel, resulting in a

smaller image containing the original content with reduced resolution.

@IMGRSE0;

**** Original Image**

@IMGRSE1;

Resize By 50% On Both Horizontal And Vertical

Image Filter

Sets the filter to be applied to the image before being processed. This parameter can be used to successfully decode particular ink-spread printed codes (ex. direct part mark codes). Different filters can be applied to a single code. See the Nset User's Manual for examples of Image Filter application.

Exposure Settings

This function determines whether the exposure parameter used by the scanner to take a picture is limited by the maximum exposure time and the minimum exposure time

- ✧ Off：The exposure time range of the photograph is controlled by the scanner firmware,
- ✧ On：The exposure time range of the photograph is between the maximum and minimum exposure time.

@EXPEEN0

**** Off**

@EXPEEN1

On

Maximum Exposure Time

@EXPEMX

Maximum Exposure Time

Minimum Exposure Tim

@EXPEMN

Minimum Exposure Time

Gain Parameter Limit

This function determines whether the gain parameters used by the scanner to take the picture are limited by the maximum and minimum gain.

- ✧ Off：Gain parameter is controlled by the scanner firmware.
- ✧ On：Gain parameter range of the photograph is between the maximum and minimum exposure time.

@EXPGEN0

**** Off**

@EXPGEN1

On

Set Maximum Gain Parameter

@EXPGMX

Maximum Gain Parameter

Set Minimum Gain Parameter

@EXPGMN

Maximum Gain Parameter

Transmit Not Good Read Message

- ✧ Enable: When the code failed to decoded, and you release the trigger or Decode Session Timeout , Not Good Read Message will be sent to the host.
- ✧ Disable: When the code failed to decoded, Not Good Read Message will not be sent to the host.

@NGRENA0

** Disable

@NGRENA1

Enable

Edit NGR Message

Not Good Read Message supports up to 7 characters, from 0 to oxff. (Default: NG)

@NGRSET

Edit NGR Message

Default Settings

Factory Defaults

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

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

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

@FACDEF

Restore All Factory Defaults

Custom Defaults

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

Custom defaults are stored in the non-volatile memory.

@CUSSAV

Save as Custom Defaults

@CUSDEF

Restore All Custom Defaults

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

Restore the Factory Defaults of Ethernet

Scanning the Restore the Factory Defaults of Ethernet can reset all parameters on the Ethernet parameters to the defaults(The default ip address is 192.168.1.100).

@NETDEF

Restore the Factory Defaults of Ethernet

Query Scanner Information

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

@QRYSYS

Query Scanner Information

Query Product Name

@QRYPDN

Query Product Name

Query Firmware Version

@QRYFWV

Query Firmware Version

Query Decoder Version

@QRYDCV

Query Decoder Version

Query Hardware Version

@QRYHWV

Query Hardware Version

Query Serial Number

@QRYPSN

Query Serial Number

Query Manufacturing Date

@QRYDAT

Query Manufacturing Date

Query Cradle Information

@BASQSY

Query Cradle Information

Query Cradle Battery Level

@WLSQPW

Query Cradle Battery Level

Power off

The device would be powered off when the long period of time not in use or in the process of transportation,.

@PWROFF

Power off

Chapter 4 Wireless Communications

Wireless Factory Defaults

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

@BASFDF

Restore All Factory Defaults

Scanning the following barcode can clear all cradle pairing information.

@BASCLP

Undo Pairing Info on Cradle

Scanning the following barcode can clear all scanner pairing information.

@WLSCLP

Clear Pairing Info on Scanner

Operating Modes

The scanner provides the following two operating modes:

Bluetooth HID Mode allows your scanner to communicate with a remote host using Bluetooth. You must first pair your scanner to the host before these two Bluetooth devices can communicate with each other.

Cradle Mode allows your scanner to communicate with a remote host by pairing with a cradle.

Cradle Mode

@INCBCI0

Cradle Mode

Bluetooth HID mode

@INCBCI1

Bluetooth HID Mode

Scan the setup code @WLSCLP to clear the pairing information in wireless scanner, and re-scan the setup code @INCBCI0 to switch to cradle mode.

Batch Mode

Batch Mode Options

Off: The scanner attempts to transmit every barcode you scan. When you are out of service range, the scanned data will be lost.

Automatic Batch Mode: When in service range, the scanner attempts to transmit every barcode you scan. When out of range, the scanner stores the scanned data in the flash memory. Once you are back to service range, the scanner will automatically transmit the stored data and then remove it from the flash memory after transmission is done.

Manual Batch Mode: Scanned data will be stored in the flash memory no matter whether you are in service range or not. You may send the stored data to the host in either of the following ways: (i) press the P button on the cradle after inserting the scanner in cradle; or (ii) scan the Transmit Stored Data barcode before inserting the scanner in cradle. The scanner will automatically remove the stored data from the flash memory after transmission is done if the Auto Clear Stored Data after Transmission feature is turned on.

@WLSBAT0

****off**

@WLSBAT1

Automatic Batch Mode

@WLSBAT2

Manual Batch Mode

Start Batch Transmit

@WLSSBT

Start Batch Transmit

Query/Clear Stored Data in Flash

@WLSQFC

Query the Number of Stored Barcodes

@WLSCLF

Clear All Stored Data

Prevent Same Barcode Storage

This feature is available only when scanning barcodes in the Automatic or Manual Batch mode.

On: The scanner discards the data and generates an error beep when encountering a barcode that has

existed in the flash memory.

Off: The scanner stores the data when encountering a barcode that has existed in the flash memory.

@WLSSSE0

**OFF

@WLSSSE1

ON

Batch Mode Transmit Delay

Sometimes when multiple barcodes stored in the flash memory are sent to the host, the transmission of those barcodes is too fast for the application to process. To program a transmit delay between barcodes, scan one of the following delays.

@WLSBTD0

No Transmit Delay

@WLSBTD50

Short Transmit Delay

@WLSBTD100

Medium Transmit Delay

@WLSBTD150

Long Transmit Delay

@WLSBTD

Custom Transmit Delay (0-10,000ms)

Example

Set the batch mode transmit delay to 200ms:

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

Batch Transmit Terminating Character

You may scan the appropriate barcode below to select whether or not to send an end of transmission message (user-programmable) to notify the host when transmission of all stored data is done. This feature is only available to data transmission initiated manually under the Manual Batch mode.

@WLSBTT0

**** Off**

@WLSBTT1

On

Custom Batch Transmit Terminating Character

@WLSBTC

Auto Clear **Flash Memory**

Set Batch Transmit Terminating Character

You may scan the appropriate barcode below to choose whether to clear or keep the stored data in the flash memory after transmission. This feature is only available to the Manual Batch mode.

@WLSCLE0

****OFF**

@WLSCLE1

ON

Radio Communication Modes

Point-to-Point Mode: Only one scanner can be paired to one cradle at a time.

Multiple-to-Point Mode: Up to seven scanners can be paired to one cradle.

@BASMPM0

** **Point-to-Point Mode**

@BASMPM1

Multiplepoint-to-Point Mode

Sleep Timeout

When the wireless scanner is in standby state for a period of time (i.e., the wireless scanner sleep timeout), the device will go into the sleep mode timeout value ranges from 1-65535 in seconds, with the default value of 15 seconds.

@WLSIDT

Sleep Timeout

Example

Set the Sleep Timeout to 30s

1.Read **Wireless Scanner Sleep Timeout** barcode

2.Scan the numeric barcodes “3”, “0” from the “Digit Barcodes” section in Appendix.

3.Scan the Save barcode from the “Save/Cancel Barcodes” section in Appendix.

Shutdown Timeout

When the wireless scanner is in sleeping state for a period of time (i.e., the Wireless Scanner Shutdown Timeout), the device will shut down automatically. timeout value ranges from 1-255 in minute, with the default value of 30 minutes.

@WLSDST

Wireless Scanner Shutdown Timeout

Example

Set the Shutdown Timeout to 18mins

1.Read Wireless Wireless Scanner Shutdown Timeout barcode

2.Scan the numeric barcodes “1”, “8” from the “Digit Barcodes” section in Appendix.

3.Scan the Save barcode from the “Save/Cancel Barcodes” section in Appendix.

When The Wireless Scanner Is Placed On The Cradle

@WLSRCE0

** **Disable Reading Barcode**

@WLSRCE1

Enable Reading Barcode

Chapter 5 RS-232 Interface

Introduction

When the cradle is connected to the RS-232 port of a host device, you need to set communication parameters (including baud rate, parity check, data bit and stop bit) on the cradle to match the host device so that two devices can communicate with each other.

@INTERF0

RS-232

Baud Rate

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

@232BAD8

**** 115200**

@232BAD7

57600

@232BAD6

38400

@232BAD5

19200

@232BAD4

14400

@232BAD3

9600

@232BAD2

4800

@232BAD1

2400

Parity Check

Set the parity type to match the host requirements.

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

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

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

@232PAR0

**** None**

@232PAR1

Even Parity

@232PAR2

Odd Parity

Data Bit

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

@232DAT1

7 Data Bits

@232DAT0

**** 8 Data Bits**

Stop Bit

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

@232STP0

**** 1 Stop Bit**

@232STP1

2 Stop Bits

RS232 Hardware control

If this feature is enabled, the cradle determines whether to transmit data based on CTS signal level. When CTS signal is at a low level which means the serial port's cache memory of receiving device (such as PC) is full, the cradle sends data through RS-232 port until CTS signal is set to high level by receiving device. When the cradle is not ready for receiving, it will set RTS signal to low level. When sending device (such as PC) detects it, it will not send data to the cradle any more to prevent data loss.

If this feature is disabled, reception/transmission of serial data will not be influenced by RTS/CTS signal.

@232FLW0

**** None**

@232FLW1

RTS Hardware control

@232FLW2

CTS Hardware control

@232FLW3

RTS &CTS Hardware control

Before enabling this feature, make sure that RTS/CTS signal lines are contained in RS-232 cable. Without the signal lines, RS-232 communication errors will occur.

Chapter 6 USB Interface

Introduction

There are three options for USB connection.

1. USB Keyboard: The scanner's transmission is simulated as USB keyboard input with no need for command configuration or a driver. Barcode data could be entered by the virtual keyboard directly and it is also convenient for the host device to receive data.
2. USB CDC: The USB CDC feature allows the host device to receive data in the way as a serial port does. A driver is needed when using this feature.
3. HID-POS: It is based on the HID interface, with no need for a custom driver. It excels virtual keyboard and traditional RS-232 interface in transmission speed.

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

USB HID Keyboard

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

@INTERF3

**** USB HID Keyboard**

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

USB Country Keyboard Types

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

@KBWCTY0

**** U.S. (English)**

@KBWCTY1

Belgium

@KBWCTY2

Brazil

@KBWCTY3

Canada (French)

@KBWCTY4

Czechoslovakia

@KBWCTY5

Denmark

@KBWCTY6

Finland (Swedish)

@KBWCTY7

France

@KBWCTY8

Germany/ Austria

@KBWCTY9

Greece

@KBWCTY10

Hungary

@KBWCTY11

Israel (Hebrew)

@KBWCTY12

Italy

@KBWCTY13

Latin America/ South America

@KBWCTY14

Netherlands (Dutch)

@KBWCTY15

Norway

@KBWCTY16

Poland

@KBWCTY17

Portugal

@KBWCTY18

Romania

@KBWCTY19

Russia

@KBWCTY21

Slovakia

@KBWCTY22

Spain

@KBWCTY23

Sweden

@KBWCTY24

Switzerland (German)

@KBWCTY25

Turkey_F

@KBWCTY26

Turkey_Q

@KBWCTY27

UK

@KBWCTY28

Japan

Beep on Unknown Character

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

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

@KBWBUC0

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

@KBWBUC1

Beep on Unknown Character

Example

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

Do Not Beep on Unknown Character: The scanner does not beep and the Host receives "AF".

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

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

Emulate ALT+Keypad

When **Emulate ALT+Keypad** is turned on, any ASCII character (0x00 - 0xFF) is sent over the numeric keypad no matter which keyboard type is selected.

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

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

@KBWALT0

**** Emulate ALT+Keypad OFF**

@KBWALT1

Emulate ALT+Keypad ON

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

Example

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

"A" – "ALT Make" + "065" + "ALT Break"

"Đ" -- "ALT Make" + "208" + "ALT Break"

"F" -- "ALT Make" + "070" + "ALT Break"

Code Page

Code pages define the mapping of character codes to characters. If the data received does not display with the proper characters, it may be because the barcode being scanned was created using a code page that is different from the one the host program is expecting. If this is the case, select the code page with which the barcodes were created by scanning the appropriate barcode below. For PDF417, QR Code, Aztec and Data Matrix, besides setting the code page, you also need to set the character encoding in the "Character Encoding" section in Chapter 7. This feature is only effective when **Emulate ALT+Keypad** is turned on.

@KBWCPG0

**** Code Page 1252 (West European Latin)**

@KBWCPG1

Code Page 1251 (Cyrillic)

@KBWCPG2

Code Page 1250 (Central and East European Latin)

@KBWCPG3

Code Page 1253 (Greek)

@KBWCPG4

Code Page 1254 (Turkish)

@KBWCPG5

Code Page 1255 (Hebrew)

@KBWCPG6

Code Page 1256 (Arabic)

@KBWCPG7

Code Page 1257 (Baltic)

@KBWCPG8

Code Page 1258 (Vietnamese)

@KBWCPG9

Code Page 936 (Simplified Chinese, GB2312,GBK）

@KBWCPG10

Code Page 950 (Traditional Chinese, Big5)

@KBWCPG11

Code Page 874(Thai)

@KBWCPG12

Code Page 932（Japanese, Shift-JIS）

Unicode Encoding

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

@KBWCPU0

**** Off**

@KBWCPU1

On

Function Key Mapping

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

1. CTRL Make
2. Press function key
3. CTRL Break

@KBWFKM0

**** Disable**

@KBWFKM1

Ctrl+ASCII Mode

@KBWFKM2;

Alt+Keypad Mode

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

"A" - Keystroke "A".

<HT> - "Ctrl Make" + Keystroke "I" + "Ctrl Break"

"F" - Keystroke "F"

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

Emulate ALT+Keypad ON prevails over **Ctrl+ASCII Mode**.

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

Inter-Keystroke Delay

This parameter specifies the delay between emulated keystrokes.

@KBWDLY0

**** No Delay**

@KBWDLY40

Long Delay (40ms)

@KBWDLY20

Short Delay (20ms)

Caps Lock

The **Caps Lock ON** option can invert upper and lower case characters contained in barcode data. This inversion occurs regardless of the state of Caps Lock key on the host device's keyboard.

@KBWCAP0

**** Caps Lock OFF**

@KBWCAP1

Caps Lock ON

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

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

Convert Case

You may scan the appropriate barcode below to convert all barcode data to your desired case.

@KBWCAS0

**** No Case Conversion**

@KBWCAS1

Convert All to Upper Case

@KBWCAS2

Convert All to Lower Case

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

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

Emulate Numeric Keypad

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

Emulate Numeric Keypad 1: Sending a number (0-9) is emulated as keystroke(s) on numeric keypad. The state of Num Lock on the simulated numeric keypad is determined by its equivalent on the host device. If Num Lock on the host device is turned off, the output of simulated numeric keypad is function key instead of number.

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

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

@KBWNUM0

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

@KBWNUM1

Emulate Numeric Keypad 1

@KBWNCH0

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

@KBWNCH1

Emulate Numeric Keypad 2

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

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

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

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

1. “A” is sent on main keyboard;

2. “4” is sent as the function key “Cursor Move to Left”;

3. “.” is sent on main keyboard;

4. “5” is not sent as it does not correspond to any function key.

Polling Rate

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

@KBWPOR0

1ms

@KBWPOR1

2ms

@KBWPOR2

3ms

@KBWPOR3

**** 4ms**

@KBWPOR4

5ms

@KBWPOR5

6ms

@KBWPOR6

7ms

@KBWPOR7

8ms

@KBWPOR8

9ms

@KBWPOR9

10ms

USB CDC

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

@INTERF8

USB CDC

USB HID-POS

Introduction

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

Features:

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

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

@INTERF5

HID POS

Access the Scanner with Your Program

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

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

Acquire Scanned Data

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

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

Send Command to the Scanner

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

	Bit							
Byte	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/PID

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

Product	Interface	PID (Hex)	PID (Dec)
NVH220B	USB HID Keyboard	1403	5123
	USB CDC	1406	5126
	USB HID-POS	1410	5136

Chapter 7 Symbologies

Introduction

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

Global Settings

Enable/Disable All Symbologies

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

@ALLENA1

Enable All Symbologies

@ALLENA0

Disable All Symbologies

Enable/Disable 1D Symbologies

@ALL1DC1

Enable 1D Symbologies

@ALL1DC0

Disable 1D Symbologies

Enable/Disable 2D Symbologies

@ALL2DC1

Enable 2D Symbologies

@ALL2DC0

Disable 2D Symbologies

Image Brightness Adaptation

The two parameters of image brightness adaptation 1 and 2, which are linkage relations, are set to adapt to the brightness of the image.When the image is too dark, two parameters can be adjusted down at the same time; When the image is too bright, you can try to raise both parameters at the same time.

@CCFCTV

Image Brightness Adaptation 1

@CCFMTV

Image Brightness Adaptation 2

1D Decoding Complexity

The Decoding Complexity parameter selects the decoding algorithm according to the printing/marking technique used to create the symbol and on the overall printing/marking quality.

- ✧ Low: For no stain, wrinkle and other high-quality barcodes;
- ✧ Medium: Bar code with general quality such as certain dirt, fold, etc;
- ✧ High: For Bar code with poor printing quality.

@CCF1DC0

Low

@CCF1DC1

****Medium**

@CCF1DC2

High

1D Inverse

@CCF1IV0

****Regular**

@CCF1IV2

Regular and Inverse

Read Multi-barcodes on an Image

Read Multi-barcodes on an Image enables a 2D imaging scanner to scan all the bar codes within a label, and then modify and transmit all of them to a host application. For working examples Read Multi-barcodes on an Image that can be programmed to a scanner, see the Nset User's Manual.

@ALLMEN0

****Enable**

@ALLMEN1

Disable

Code 11

Restore Factory Defaults

@C11DEF

Restore the Factory Defaults of Code 11

Enable/Disable Code 11

@C11ENA1

Enable Code 11

@C11ENA0

**** Disable Code 11**

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

Set Length Range for Code 11

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

@C11MIN

Set the Minimum Length (Default: 4)

@C11MAX

Set the Maximum Length (Default: 48)

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

Set the scanner to decode Code 11 barcodes containing between 8 and 12 characters:

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

Check Character Verification

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

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

@C11CHK0

Disable

@C11CHK1

**** One Check Character, MOD11**

@C11CHK2

Two Check Characters, MOD11/MOD11

@C11CHK3

Two Check Characters, MOD11/MOD9

@C11CHK4

One Check Character, MOD11 (Len<=10)
Two Check Characters, MOD11/MOD11(Len>10)

@C11CHK5

One Check Character, MOD11 (Len<=10)
Two Check Characters, MOD11/MOD9 (Len>10)

Transmit Check Character

@C11TCK0

Do Not Transmit Code 11 Check Character

@C11TCK1

**** Transmit Code 11 Check Character**

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

Code 128

Restore Factory Defaults

@128DEF

Restore the Factory Defaults of Code 128

Enable/Disable Code 128

@128ENA1

**** Enable Code 128**

@128ENA0

Disable Code 128

If the scanner fails to identify Code 128 barcodes, you may first try this solution by scanning the **Enable Code 128** barcode.

Set Length Range for Code 128

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

@128MIN

Set the Minimum Length (Default: 1)

@128MAX

Set the Maximum Length (Default: 48)

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

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

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

Code 39

Restore Factory Defaults

@C39DEF

Restore the Factory Defaults of Code 39

Enable/Disable Code 39

@C39ENA1

**** Enable Code 39**

@C39ENA0

Disable Code 39

If the scanner fails to identify Code 39 barcodes, you may first try this solution by scanning the **Enable Code 39** barcode.

Set Length Range for Code 39

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

@C39MIN

Set the Minimum Length (Default: 1)

@C39MAX

Set the Maximum Length (Default: 48)

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

Set the scanner to decode Code 39 barcodes containing between 8 and 12 characters:

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

Check Character Verification

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

- **Disable:** The scanner transmits Code 39 barcodes as is.
- **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.
- **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.

@C39CHK0

**** Disable**

@C39CHK1

Do Not Transmit Check Character After Verification

@C39CHK2

Transmit Check Character After Verification

If the **Do Not Transmit Check Character After Verification** option is enabled, Code 39 barcodes with a length that is less than the configured minimum length after having the check character excluded will not be decoded. (For example, when the **Do Not Transmit**

Check Character After Verification option is enabled and the minimum length is set to 4, Code 39 barcodes with a total length of 4 characters including the check character cannot be read.)

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.

@C39TSC0

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

@C39TSC1

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.

@C39ASC0

**** Disable Code 39 Full ASCII**

@C39ASC1

Enable Code 39 Full ASCII

GS1-128 (UCC/EAN-128)

Restore Factory Defaults

@GS1DEF

Restore the Factory Defaults of GS1-128

Enable/Disable GS1-128

@GS1ENA1

**** Enable GS1-128**

@GS1ENA0

Disable GS1-128

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

AIM 128

Restore Factory Defaults

@AIMDEF

Restore the Factory Defaults of AIM 128

Enable/Disable AIM 128

@AIMENA1

Enable AIM128

@AIMENA0

**** Disable AIM 128**

If the scanner fails to identify AIM 128 barcodes, you may first try this solution by scanning the

Enable AIM 128 barcode.

Set Length Range for AIM 128

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

@AIMMIN

Set the Minimum Length (Default: 1)

@AIMMAX

Set the Maximum Length (Default: 48)

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

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

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

6. Scan the **Save** barcode from the “Save/Cancel Barcodes” section in Appendix.

ISBT 128

Restore Factory Defaults

@IBTDEF

Restore the Factory Defaults of ISBT 128

Enable/Disable ISBT 128

@IBTENA1

Enable ISBT 128

@IBTENA0

**** Disable ISBT 128**

If the scanner fails to identify ISBT-128 barcodes, you may first try this solution by scanning the **Enable ISBT-128** barcode.

Codabar

Restore Factory Defaults

@CBADEF

Restore the Factory Defaults of Codabar

Enable/Disable Codabar

@CBAENA1

**** Enable Codabar**

@CBAENA0

Disable Codabar

If the scanner fails to identify Codabar barcodes, you may first try this solution by scanning the **Enable Codabar** barcode.

Set Length Range for Codabar

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

@CBAMIN

Set the Minimum Length (Default: 2)

@CBAMAX

Set the Maximum Length (Default: 60)

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

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

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

Check Character Verification

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

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

@CBACHK0

**** Disable**

@CBACHK1

Do Not Transmit Check Character After Verification

@CBACHK2

Transmit Check Character After Verification

If the **Do Not Transmit Check Character After Verification** option is enabled, Codabar barcodes with a length that is less than the configured minimum length after having the check character excluded will not be decoded. (For example, when the **Do Not Transmit**

Check Character After Verification option is enabled and the minimum length is set to 4, Codabar barcodes with a total length of 4 characters including the check character cannot be read.)

Start/Stop Character

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

@CBATSC0

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

@CBATSC1

Transmit Start/Stop Character

@CBASCF0

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

@CBASCF1

ABCD/TN*E as the Start/Stop Character

@CBASCF2

abcd/abcd as the Start/Stop Character