

## High-Speed Laser Scan Module Series



# User's manual





## Revision History

Changes to the original manual are listed below:

<b>Version</b>	<b>Date</b>	<b>Description of Version</b>
1.0	September 21, 2010	Initial release.
1.1	February 21, 2011	Added Power save mode and examples for trigger command.
1.2	April 27, 2011	Corrected blurry barcode images in the Test Mode Setting section.
1.3	May 11, 2011	Updated Trigger Command Format section.
1.4	June 23, 2011	Added description in Edge Trigger Command.
1.5	May 17, 2013	Corrected ASCII code in appendix
1.6	May 13, 2014	Added Multi-Barcode Editor

## **Important Notice**

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## **Radio Notice**

This equipment generates uses and can radiate radio frequency energy. If not installed and used in accordance with the instructions in this manual, it may cause interference to radio communications. The equipment has been tested and found to comply with the limits for a Class A computing device pursuant to EN55022 and 47 CFR, Part 2 and Part 15 of the FCC rules. These specifications are designed to provide reasonable protection against interference when operated in a commercial environment.

### **Radio and Television Interference**

Operation of this equipment in a residential area can cause interference to radio or television reception. This can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

- ♦ Reorient the receiving antenna.
- ♦ Relocate the device with respect to the receiver.
- ♦ Move the device away from the receiver.
- ♦ Plug the device into a different outlet so that the device and the receiver are on different branch circuits.

If necessary the user may consult the manufacturer, and authorized dealer, or experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington, DC 20402 U.S.A., Stock No. 004000003454.

## **Guidance for Printing**

- ♦ This manual is in A5 size. Please double check your printer setting before printing it out.
- ♦ When the barcodes are to be printed for programming, the use of a high-resolution laser printer is strongly suggested for the best scan result.

## Laser Safety

The laser scanner complies with safety standard IEC 60825 -1 for a Class I laser produce. It also complies with CDRH as applicable to a Class IIa laser product. Avoid long term staring into direct laser light.

**Radiant Energy:** The laser scanner uses one low-power visible laser diodes operating at 650nm in an optical mechanical scanner resulting in less than 3.9 $\mu$ W radiated power as observed through a 7mm aperture and averaged over 10 seconds.

Do not attempt to remove the protective housing of the scanner, as unscanned laser light with a peak output up to 0.8mW would be accessible inside.

**Laser Light Viewing:** The scan window is the only aperture through which laser light may be observed from this product. A failure of the scanner motor, while the laser diode continues to emit a laser beam, may cause emission levels to exceed those for safe operation. The scanner has safeguards to prevent this occurrence. If, however, a stationary laser beam is emitted, the failing scanner should be disconnected from its power source immediately.

**Adjustments:** Do not attempt any adjustments or alteration of this product. Do not remove the protective housing of the scanner. There are no user-serviceable parts inside.

**Caution:** Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

**Optical:** The use of optical instruments with this product will increase the eye hazard. Optical instruments include binoculars, magnifying glasses, and microscopes but do not include normal eye glasses worn by the user.

## General Handling Precautions

- Do not dispose of the scanner in fire.
- Do not put the scanner directly in the sun or by any heat source.
- Do not use or store the scanner in a very humid place.
- Do not drop the scanner or allow it to collide violently with other objects.
- Do not take the scanner apart without authorization.

### ***For CE-countries:***

The Scanner is in conformity with the CE standards. Please note that an approved, CE-Marked power supply unit should be used to conform to these standards.

# Table of Contents

Introduction .....	1
Safety Label .....	2
Scanner Components .....	2
Maintaining the Scanner .....	3
Connection .....	4
Power .....	4
Connecting to the Host.....	4
Interface Cable .....	4
Installation .....	5
Mounting.....	5
Diagrams for Mounting .....	5
Window Instructions .....	6
Set Up.....	7
Configuring the Scanner .....	7
Power-Up Self Test .....	7
Scan Test.....	7
Controlling the Scanner from the Host .....	8
Operation .....	10
Visible Indicators .....	10
Sound Indicators.....	10
Sleep Mode.....	11
Position Object Detector .....	11
Position Scanner and Barcode Label .....	12
Read Rate Test (Standard and High Definition).....	14
Test Button (High Definition Version only) .....	15
Performance Test Mode .....	15
Test Mode Settings.....	17
Troubleshooting .....	18
Specification.....	19
Pin Assignment.....	20
Dimension .....	22
Scan Zone .....	23
Programming Guide .....	25
Default Parameters.....	26
Scanner Operation .....	26
Interface Communication .....	26
Symbolologies .....	27
Data Formatting .....	28
Program Procedure Using Barcode Manual .....	29
Parameter Setting .....	30
Scanner Operation .....	30
Interface Setting .....	43
Symbolologies .....	51
Data Editing.....	74
Appendix 1: USB Virtual COM Driver Installation .....	79
Appendix 2: Barcode Length Setting.....	80
Appendix 3: Multi-Barcode Editor.....	81
Appendix 4: Full ASCII Code 39 Table .....	83

# Introduction

This manual applies to the high-speed laser scan module series, including single-line laser scan module and high-density laser scan module. Different models share similar setting while differ in hardware and operations.

This series is small-in-size, light-in-weight, durable-in-structure and fast-in-reading, an overwhelming scan module in the industrial market.

With high-speed laser scan engine embedded, it offers a reading rate of 500 scans per second. Its hardware decode technology provides real-time decoding that effectively shortens customers' transaction time, the optimized choice to meet fast-reading requirement.

It is featured with "sleep mode" in which the laser and the motor would be switched off sequentially in order to minimize electricity consumption and prolong product life. Additionally, it automatically reads barcodes approaching the scan window, which means it is not necessary to push any button to proceed scanning.

This fixed position scanner works perfectly inside retailing price-checking machines, kiosks, medical devices and etc., aiming to provide easy-to-use and reliable user experience.

- Superior optical performance
- Good read LED indicator and tone programmable beeper
- Built-in decoder allowing automatic recognition of most barcode symbologies
- Programmable operation settings to cater to user's preference
- Simplified command programmable via RS-232C interface
- IR sensing for quick scanner wake up when scanner enters sleep mode

## Unpacking the Scanner

---

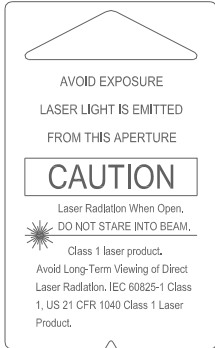
The laser scan module package should contain:

- 1ea. Laser scan module with attached interface cable
- 1ea. 5V power adapter (model depending on electrical requirements)
- 1ea. User's Manual (in hardcopy or CD)

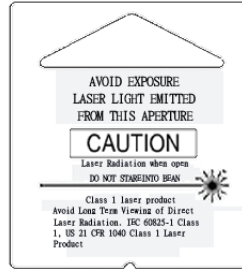
Please contact your dealer if there is any damaged or missing item.

# Safety Label

The Scanner complies with safety standard IEC60825-1 for a class I laser product. It also complies with U.S21CFR1040 as applicable to a class IIa laser product. Avoid direct long-term viewing at the laser light.



Caution label for standard version

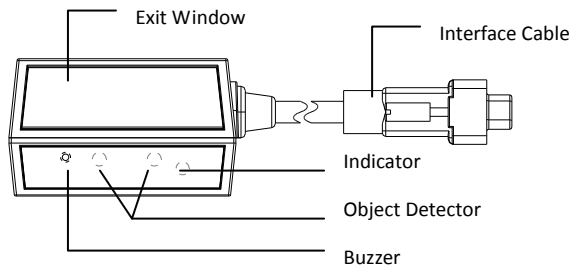


Caution label for high density version

This equipment generates uses and can radiate radio frequency energy. If not installed and used in accordance with the instructions in this manual, it may cause interference to radio communications. The equipment has been tested and found to comply with the limits for a Class A computing device pursuant to EN55022 and 47 CFR, part2 and Part 15 of FCC Rules. These specifications are designed to provide reasonable protection against interference when operated in a commercial environment.

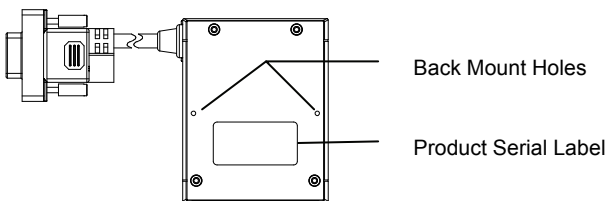
# Scanner Components

## Front view





**Bottom view**



Description	Function
Exit Window	Reads barcodes
LED Indicator	When power is on, LED turns Red; for a good read, green light blinks.
Interface Cable	For interface communication and power supply.
Product Serial Label	Contents the model name and serial NO. Please do not remove.
Beeper	A single tone beeps indication.
Object Detector	Trigger and wake up scanner when presenting barcode in its range
Back Mount Hole	To fix the scanner to your host instrument.

## Maintaining the Scanner

The scanner is designed for long-term trouble-free operation and rarely requires any maintenance. Only an occasional cleaning of the scanner window is necessary in order to remove dirt and fingerprints. It can be cleaned while the scanner is running.

When cleaning the scan window, wipe the scan window with a soft lint-free cloth and a non-abrasive cleaner to avoid scratching and damaging the scan window. Do not spray water or cleaning liquid directly into the window.

If the scanner's housing needs cleaning, use a mild cleaning agent that does not contain strong oxidizing chemicals; otherwise the exterior may be damaged.

# Connection

## Power

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The scanner requires a minimum of 210mA at 5 V DC power. The interface cable that comes with the scanner supports both direct power (where the scanner takes power from the host machine) and external power (that's what the supplied power adapter is for). A sufficiently robust host system can support a scanner successfully without external power; a host system with a barely adequate power supply may produce erratic performance (either of the host system itself, or of the scanner, or both) when a scanner is attached. Unless you are sure your host system can handle the load, it is recommended that you use the supplied power adapter. In most cases, external power is not required for keyboard and USB interface. When an external adapter is connected, the scanner does not take power from the host.

The scanner turns on when power is supplied, and turns off when power is removed. There is no on/off switch on the scanner itself.

Use only an AC/DC power adapter approved for the scanner. Use of other power supplies may cause damage to the product, and void the factory warranty.

## Connecting to the Host

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The power link interface cable comes with different host-end connectors, depending on the host. Follow the steps below to connect the interface cable to the host.

1. Make sure that the power of the host system is off.
2. Plug the host end of the interface cable to the appropriate connector on the host system.
3. For those cases where external power is used, plug the external AC power adapter into the jack on the interface cable.
4. Turn on the host system.



*The scanner will light up for 3 seconds after turned on in case it is accidentally set to be in the trigger mode and needs re-set.*

## Interface Cable

The interface cable comes with different host-end connectors, depending on the host. There are 3 standard types of interface connection that this device supports:

- (a) Keyboard wedge
- (b) RS-232 interface
- (c) USB interface (supporting HID USB and virtual COM USB)

The interface cable is not field-replaceable and unauthorized change to hardware may void warranty. For cable replacements please contact your distributor.

# Installation

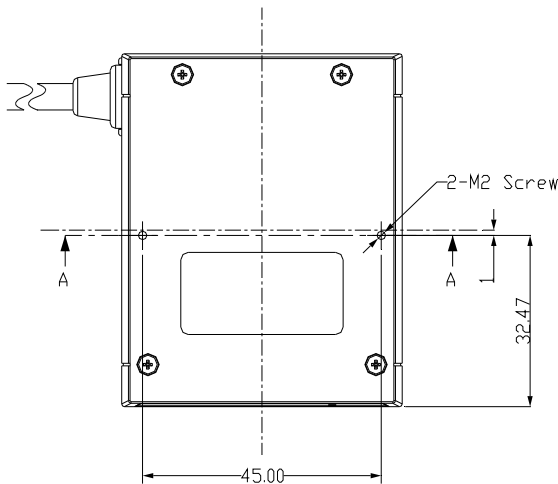
## Mounting

The scanner has reserved mounting holes for permanent fixture to a surface or integration into your specifically-designed equipment. Use mounting holes on the bottom of the scanner to mount the scanner onto the desired position. Scan performance will not be affected by the mounting direction of the scanner.

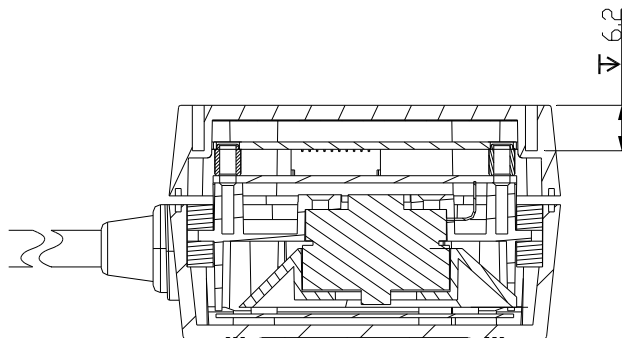
The scanner should be installed in a location away from direct sunlight; high levels of ambient light reduce scanner effectiveness. The air temperature around the scanner must not exceed 40°C (104°F).

## Diagrams for Mounting

There are two back mount holes at the bottom of the scanner, which allows easily mounting the scanner onto the host instrument with only two screws.



Screw Size: M2 x 0.4 x 6 mm



To correctly mount the scanner onto the host device, follow the steps below:

1. Locate the device in a dry position to avoid direct sunlight, bright or laser light from other source.
2. Before mounting, ensure sufficient clearance at the rear of the scanner to allow for the connector and cable
3. Use the measurements provided in the figure to locate centers of mounting holes and drill two 2.2mm holes.
4. Secure scanner with two M2x0.4-6mm screws.



- *Do not allow the mounting screws to penetrate the scanner case more than 0.235in (6mm) or damage to the scanner may result.*
- *To prevent twisting or distorting the scanner housing, ensure that the mounting surface or bracket is flat.*

## Window Instructions

It is **not** recommended to place an additional exit window in front of this scanner. The addition of the exit window can reduce the working range of the scanner due to signal loss. However, when such a window is required for application, please contact your local agency or manufacturers.

# Set Up

## Configuring the Scanner

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This manual includes a programming section which may be used to set a number of parameters on the scanner: communication interface type, sleep mode timing, same-code delay time, barcode symbologies, and more advanced settings like setting headers and trailers.

The settings are to be stored in non-volatile memory and are preserved even when the scanner is powered down. Individual parameters may be set at any time without affecting the other parameters.

In addition, the scanner can be configured by serial programming. This allows end-users to send a series of commands using the serial port of the host system. There are some basic commands in the “Controlling the Scanner from the Host” section. For more information, please contact your distributor.

## Power-Up Self Test

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The scanner would automatically run the self-test when the power is supplied. It is to verify that the scanner and interface are functioning properly and takes only seconds. The unit would give four beeps in series to indicate that the scanner passed self-test; red LED would light on afterwards. If the scanner fails the self-test, both the green and red LED would light on; a continuous beeping may also be heard.

## Scan Test

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Follow the steps below to ensure that your scanner can work well with your host system.

1. With the scanner running (red LED lights) and the host system on, try to scan several known-good barcodes.
2. Check the results on the host screen. If the scanner is reading okay, it is likely that no further setup is necessary.
3. If the host screen does not show the expected scans, go to the Parameter Setting section below.

# Controlling the Scanner from the Host

The scanner can be controlled from the host system via RS-232C interface. Controlling can be accomplished by transmitting the following single byte commands to the scanner.

## Default Settings

The default settings of the commands are as follows:

ASCII Code	Function	Byte is Also Called:
0E Hex	enable (resumes disable)	Shift Out or <Ctrl-N>
0F Hex	disable	Shift In or <Ctrl-O>
05 Hex	power-up re-initialization	ENQ or <Ctrl-E>
12 Hex	sleep	DC2 <Ctrl-R>
14 Hex	wake up (resumes sleep)	DC4 <Ctrl-T>



When the scanner is disabled, the motor of the scanner will stay on until the scanner goes into sleep mode.

## Trigger Command Format

(Only for RS-232C and USB-Virtual COM Port)

Level Trigger Command	
Command	Description
<ESC>A0<CR>	<ul style="list-style-type: none"> <li>When the scanner receives this command, the CCD/laser would light up and start scanning barcodes entering its scan field.</li> <li>The light would be switched off when the scanner receives a trigger off command.</li> </ul>
Edge Trigger Command	
Command	Description
<ESC>A0.mm<CR>	<ul style="list-style-type: none"> <li>When the scanner receives this command, the CCD/laser would light up and start scanning barcodes entering its scan field.</li> <li>The light would remain on until the scanner reads a barcode or until "mm" period is over (mm=01~60, unit: second).</li> <li>The edge trigger command is not controlled by the trigger off command.</li> </ul>

<ESC>A2<CR>	<ul style="list-style-type: none"> <li>◆ When the scanner receives this command, the CCD/laser light would light up and remain on but the device can only scan once.</li> <li>◆ The light would be switched off when the scanner receives a trigger off command.</li> </ul>
<ESC>A2.mm<CR>	<ul style="list-style-type: none"> <li>◆ When the scanner receives this command, the CCD/laser light would light up and remain on until “mm” period is over.</li> <li>◆ If the scanner read a barcode before “mm” period is over, the light-off countdown would re-start.</li> <li>◆ The scanner is not controlled by the trigger off command.</li> </ul>
<b>Trigger Off Command</b>	
Command	Description
<ESC>A1<CR>	<ul style="list-style-type: none"> <li>◆ The CCD/laser light would be switched off when the scanner receives a trigger off command.</li> </ul>

**Example:**

- Sending <ESC> “A0” <CR> (0x1b 0x41 0x30 0x0d) to scan module will activate the module for scanning.
- Sending <ESC> “A1” <CR> (0x1b 0x41 0x31 0x0d) to scan module will turn off the scan.

# Operation

## Visible Indicators

LED Status	LED Indication
Red and Green LED are off	<ol style="list-style-type: none"> <li>1. Power off.</li> <li>2. Scanner set up as Trigger mode or IR Trigger mode.</li> </ol>
Steady Red	The red LED is on when the laser is active. The red LED will be lit up until the laser is deactivated.
Single Green	A barcode has been successfully decoded.
Steady Green	<ol style="list-style-type: none"> <li>1. A barcode has been successfully decoded, but the object is not removed from the scan window.</li> <li>2. The scanner is in programming mode.</li> </ol>
Steady Yellow	The scanner has a motor or laser failure. A beep sound is to be heard along with a motor failure occurs. Return the unit for repair.
Alternate Red and Green Flashes	The scanner detects a power failure. Please check whether the power is properly connected.

## Sound Indicators

The scanner provides audible feedback when it is in operation. The beeps indicate the status of the scanner.

Beep	Indication
One Beep	A barcode has been successfully decoded.
Three Consequent Beeps	The scanner has passed the self-test and is operating properly.
Two Consequent Beeps	The scanner is in programming mode.
Continuous Beep Tone	This is a failure indication. Return the unit for repair.



## Sleep Mode

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After the scanner has been inactive for a specific length of time, the laser and the motor would automatically turn off and the scanner would enter the sleep mode. The blue LED would blink as indication.

It takes 2 steps to enter the sleep mode. The first step is the laser switching off after 10 minutes; the second step is the motor switching off after 30 minutes. The time period is programmable. Please see the Sleep Mode section on the Programming Guide for more details.

To wake up the scanner, simply place an item in front of the motion detecting area and move back and forth or left and right.



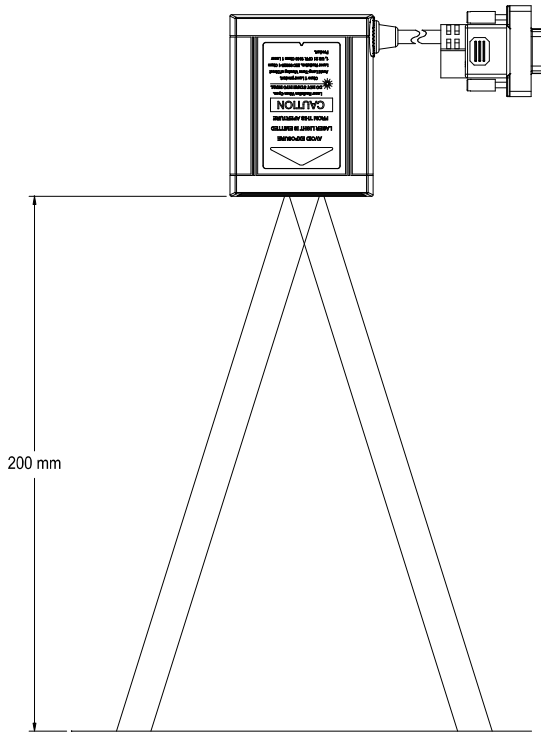
The scanner includes a motion detector that detects activity in front of the scan window. The detecting distance is about 10-20cm from the scan window while in condition with effectiveness of environment lights. The detecting distance is also programmable.

## Position Object Detector

---

Laser is off when the scanner is in the IR trigger mode. The scanner would automatically activate the laser and decodes when there is an object presented in the scanning range. But for the same barcode, the barcode can not read two times in a roll. The scanner reads only after the barcode is removed over “same code delay” duration and re-enter the range. (For the setting of same code delay duration time, please refer to the Programming Guide section.)

The laser will be switched off automatically if no barcode is present for more than 10 seconds. A red light will flash under this circumstance and laser will be turned off until the next detection.

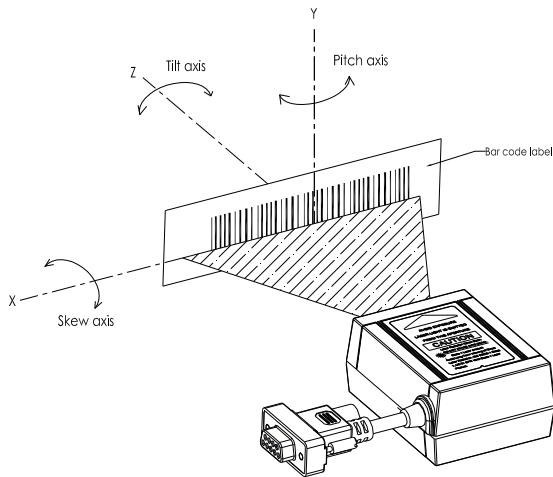


*Avoid putting objects in front of a reflective background for it might affect the correctness of this function.*

## **Position Scanner and Barcode Label**

Before testing the read rate and get its best performance, you will need to position the scanner and label in a manner that matches as nearly as possible the actual conditions of your application. The following points need to be noticed when mounting the scanner:

- (1) Avoid straight sunlight or any other bright light source illuminating.
- (2) When placing the barcode label, one must be careful not to over tilt, skew and/or pitch the barcode. (Refer to the drawing below)



- (3) Avoid putting the scanner in a specular reflection position. If the angle between the scanner and the barcode is between a specular reflection, the laser light will reflect straight back on the scanner and the internal sensor will be unable to read any barcodes.
- (4) The barcode must be placed within the effective depth of field (D.O.F.) area. The so-called "Depth of Field" is the effective barcode reading distance for the scanner. It works like a camera. If the object is placed within the focal range, the image would appear clearly; if the object is outside the focal range, the image would be blurred. The D.O.F. of a scanner is determined by the quality and density of barcodes. Usually for barcodes of shorter length or higher density, the depth of field is shorter. Moreover, it is better to avoid using depth of field extremes range. This will prevent moving the barcode often and it easily could be move away from the reading range.



*For the best placing position, please refer to the Decode Depth of Field drawing on the next page.*

## Read Rate Test (Standard and High Definition)

---

The read rate test can help in determining the optimum position of the scanner. In this test the scanner continuous to scan and decode a barcode for 500 times and then calculates the number of those scans that resulted in a good decode. This number, expressed as a percentage, will be transmitted to the host.

As the factory default, over 93% good decode will get a short beeper sound; under 93% will get 3 series beeper sound.



Start the read rate test



Perform the read rate test  
Read rate = 93%

### Host data display example:

(Barcode type: code 39. Barcode value: 12345)

12345 93% OK  
Code 39

or

12345 80% BAD  
Code 39



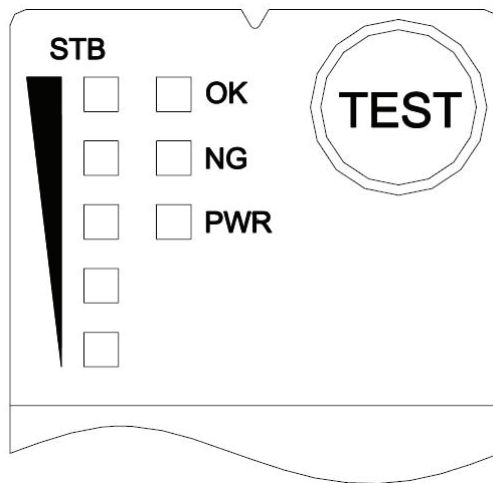
*If the scanner is powered off or reset, the read rate test will not retain and will need to be set up again.*

## Test Button (High Definition Version only)

---

Press the "Test Button" on top of the scan module to enter the scan performance test mode.

### Performance Test Mode



- The STB (Scan Test Button) LED indicates 5 levels of scan rates from 20% to 100%
- OK LED indicates a good read when scanning a barcode
- NG LED indicates a reading error when scanning a barcode
- PWR LED indicates the power status and is always on when the module is turned on

To enter into scan performance test mode:

1. Press and hold the “Test” button for more than 1 second. The STB LED indicators will flash one time and you will hear one short beep sound. This indicates that the module has successfully entered the test mode.
2. Place the barcode label within its scan range to get the best scan performance result.

The result is indicated with LED lights with different read rate as below:

<b>Read Rate %</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>	<b>Level 5</b>
<b>20%</b>	Off	Off	Off	Off	On
<b>40%</b>	Off	Off	Off	On	On
<b>60%</b>	Off	Off	On	On	On
<b>80%</b>	Off	On	On	On	On
<b>100%</b>	On	On	On	On	On

Press the “Test” button once to exit the scan performance test mode and return to its original setting.



Laser remains on for 3 seconds every time you turn on the module. You may only use the laser beam to scan the “Start Of Configuration” barcode to configure your module.

# Test Mode Settings

The "Test" button and the performance test settings can be configured using the following set-up barcodes:

\*Default values are highlighted in gray background.



Start Of Configuration

## Performance Test Mode Beeper Selection

Barcode Value	Barcode Label	Description
LB13		Beeper disable -Beeper disabled in performance test.
LB14		Beeper enable -Beeper enabled in performance test.

## Performance Test Mode Data Transmission

Barcode Value	Barcode Label	Description
LB15		Data transmission disable in performance test -Data not transmitted in performance test.
LB16		Data transmission enable in performance test -Data is transmitted in performance test.



End Of Configuration

# Troubleshooting

<b>Problem</b>	<b>Possible Cause</b>	<b>Solution</b>
The scanner has no reaction; no LED, beeps, or laser	The power is not ON.	Check your power and connection.
The scanner is functioning but it is not decoding.	The label of the barcode might be disabled. The number of characters of the barcode label does not match the initial setting.	Enable the barcode type from the programming guide. Adjust the label length setting of the barcode type.
When using the KBW interface, the data transmission is slower than usual.	The system is not compatible with the international ALT method.	Under properties, select the language property that is suitable for your keyboard.
A barcode is read but not accepted by the host device.	Either a wrong interface is selected or the interface is incorrectly set.	Check the interface, cable used and its settings.
Alternating red and green flashes	There is a power failure in this scanner.	Check and see if the power is properly connected.
Steady Yellow (red/green) LED	There is a laser failure in the scanner.	Immediately power off the scanner and return the unit for repair.
Characters are being dropped.	The delay time in the inter-character needs to be increased.	Adjust the character delay time. Please refer to programming guide on p.27.



# Specification

## Electrical Characteristics

Specification	Value
Power Consumption	1050m watts
Input Voltage	5VDC±10%
Operating Current	210mA typical

## Environmental Conditions

Specification	Value
Operating Temperature	0 °C ~ 40°C (32°F ~ 104°F)
Storing Temperature	-20 °C ~ 60 °C(-4°F ~ 140°F)
Operating Humidity	5% ~ 90% (no dewing allowed)
Resistance to Static Electricity	Air: 10 kV Contact: 8 kV (Test conditions : Subject to IEC1000-4-2. 150 pF. 330 Ω)
Ambient Light Rejection	4,500 Lux (fluorescence)

## Optical Devise

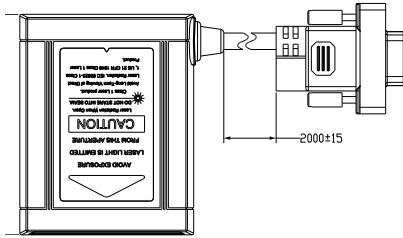
Specification	Value
Light Source	650nm visible laser diode.
Scan Pattern	Single Line Scan
Pitch Angle	±75°
Skew Angle	±65°
Roll Angle	±40°
Depth of Field (UPC/EAN 100%, PCS=90%)	45mm~210mm (Standard Version) 50mm~150mm (High Density Version)
Scan Rate	500 scans/sec
PCS Value	30%@ UPC/EAN,100%
Minimum Bar Width (Code 39, PCS=90%)	5 mil (Standard Version) 3 mil (High Density Version)

## Safety

Specification	Value
Laser Safety	CDRH class IIa, IEC 60825 class1
EMC Compliance	CE EN55022,B, FCC part 15 Class A, VCCI, BSMI

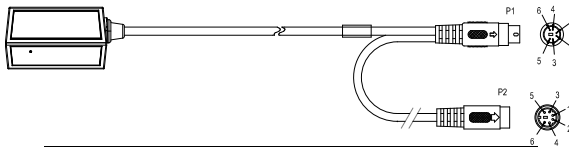
# Pin Assignment

## Scanner



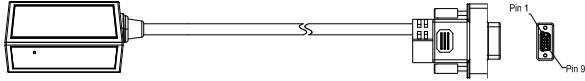
PIN-OUT CONFIGURATION			
1	+5V	2	RTS
3	CTS	4	TX
5	RX	6	KB_DATA
7	PC_CLK		READ_OUT
8	PC_DATA	9	KB_CLK
10	GND		TRIGGER

## Keyboard Wedge Interface



PIN-OUT CONFIGURATION			
MINI DIN (M)		MINI DIN(F)	
1	PC Data	1	KB Data
2	N.C.	2	N.C.
3	GND	3	GND
4	+5V	4	+5V
5	PC Clock	5	KB Clock
6	N.C.	6	N.C.

**RS-232 Interface – DTE Pin-out**



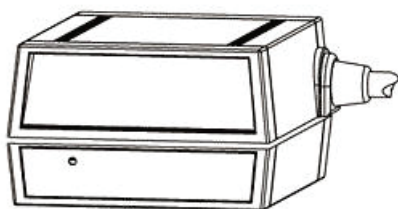
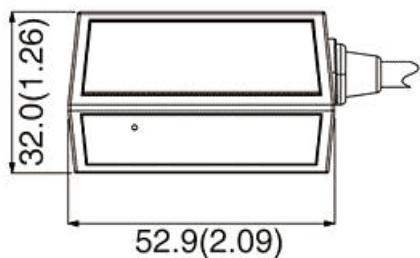
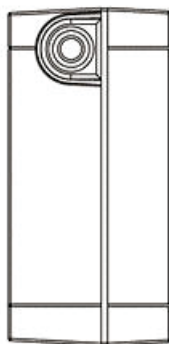
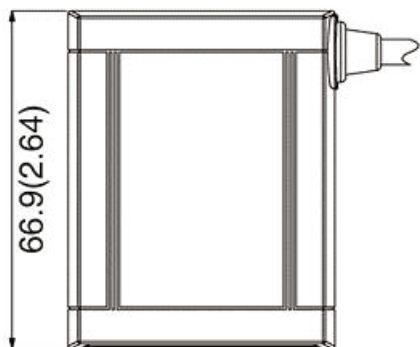
PIN-OUT CONFIGURATION	
DB9(F)	FUNCTION
2	TX
3	RX
7	CTS
8	RTS
5	GND
9	+5V Input

**USB Interface**



PIN-OUT CONFIGURATION	
USB TYPE A Connector	Function
1	VCC
2	D-
3	D+
4	VSS

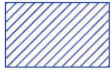
# Dimension



Unit: mm(inch)

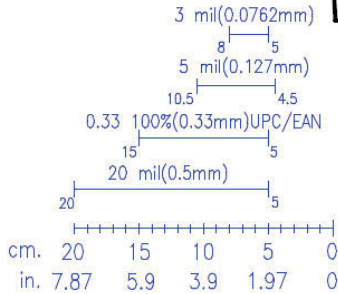
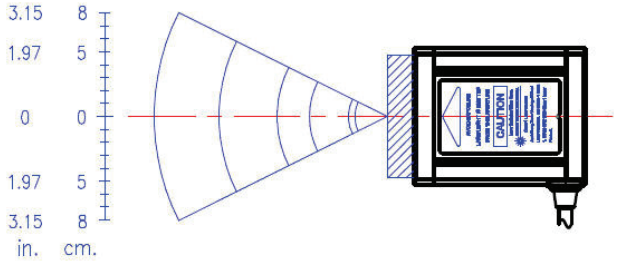
# Scan Zone

## High Density Version



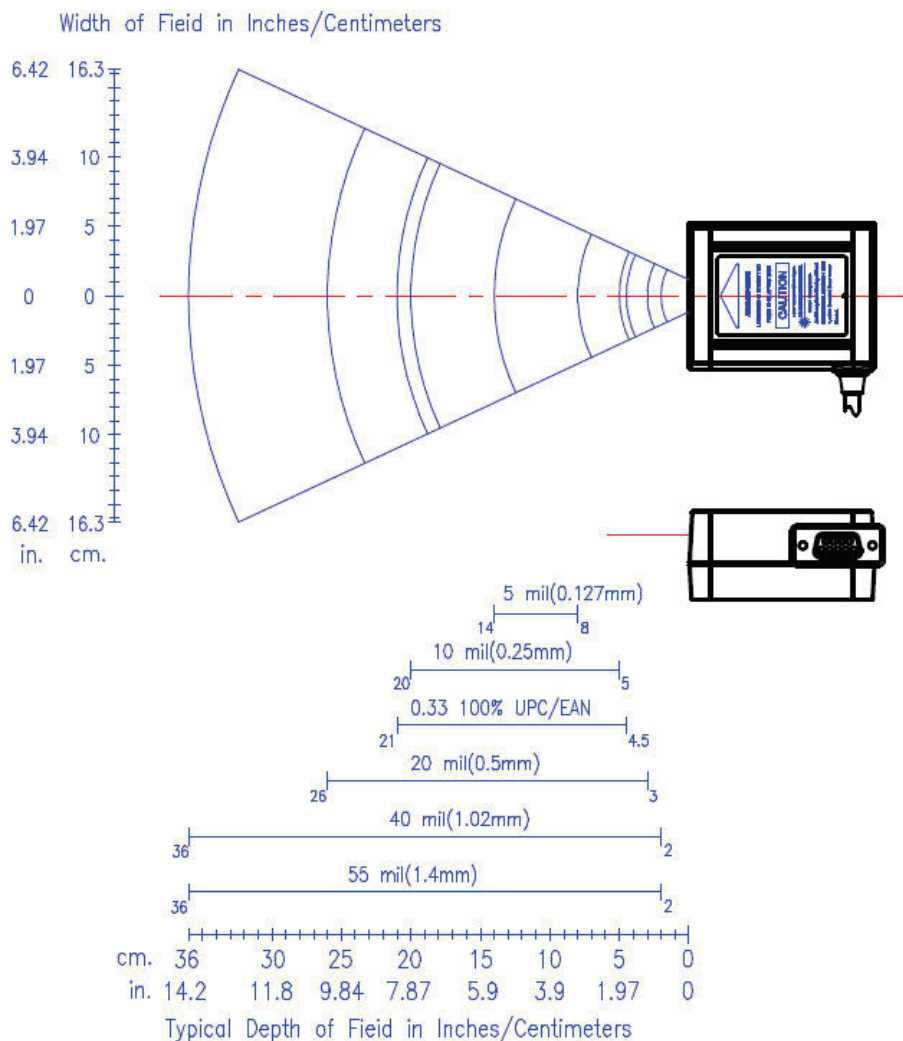
Inhibit Area

Width of Field in Inches/Centimeters



Typical Depth of Field in Inches/Centimeters

## Standard Version



Near ranges on lower density barcodes (not specified) are dependent upon the width of the barcode and scan angle.

# Programming Guide

Scanning a series of programming barcode labels can configure the series scanners. This allows decoding options and interface protocols to be tailored to a specific application. The configuration is stored in non-volatile memory and will not be lost after switched off.

The scanner must be properly powered before programming. For RS-232C type scanners, an external power adapter must be used to supply DC power to the scanner. If a keyboard emulation type scanner is used with an IBM PC/XT/ AT, PS/2 or any fully compatible computers, power will be drawn from the key- board port. No external power adapter is required. If keyboard emulation type scanner is used with any other non IBM PC compatible computers, an external power adapter may be needed.

During the programming mode, the laser scanner will acknowledge a good and valid reading with a short beep. It will give long beeps for an invalid or bad reading.

## **Programming Options**

Programmable options are divided into four groups. The first group includes the options of the general behavior of the laser scanner and various scan function settings. The second group governs interface operation of RS-232C, keyboard emulation, USB and wand emulation. The third group sets the decoding parameters for each barcode symbology. The last group determines the formats of the barcodes you scan.

## **Default Parameters**

This table shows the default settings of all the programmable parameters. By scanning the "Reset" programming label, the default settings will be restored and the laser scanner will enter programming mode.

## **Quality Barcode Labels**

The quality of the barcode label can affect the scanning performance. Poor-quality labels are difficult to decode and may result in non-reads or misreads. The barcode label should be printed to specifications. This means that the bars are printed within spec, with the correct widths, no ink spread, crisps edges and no voids. There should be a sufficient quiet zone on both ends of the barcode label. For best results, the label paper or label stock should have a matte finish to diffuse light. The print contrast signal should also be as high as practical.

## Default Parameters

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This table gives the default settings of all the programmable parameters. The default settings would be restored whenever the laser scanner reads the “Reset” programming label in programming mode. If you wish to change any setting, scan the appropriate barcodes below.

### Scanner Operation

Parameter	Default
Same code delay	Infinite
Beeping frequency	Medium
Beeping duration	50msec
LED/Beep before data transmission	On
Auto Scan Mode	Enable
Power save	Off
Header and trailer	None
Inter message delay	None
Inter character delay	None

### Interface Communication

Parameter	Default
<b>RS-232 Interface</b>	
Baud rate	9600
Parity	none
Data Bits	8
Stop Bit	1
RTS/CTS	off
Terminator	<CR><LF>
<b>Keyboard Wedge Interface</b>	
Terminal Type	PC/AT
Keyboard	US keyboard
Terminator	Enter
<b>USB Interface</b>	
Terminator type	Enter
Code mode	Scan code
Keyboard	US keyboard
<b>Wand Emulation</b>	
Wand emulation speed	Normal
Data output	Black=high



## Symbologies

Parameter	Default
<b>Decoder Selection</b>	
EAN/UPC	Enable
Code 39	Enable
Code 32	Disable
Codabar	Disable
ITF 2 of 5	Enable
MSI	Disable
Chinese Post Code	Disable
Code 93	Enable
Code 128	Enable
EAN-128	Disable
Telepen	Disable
Code 11	Disable
Standard 2 of 5	Disable
Industrial 2 of 5	Disable
Matrix 2 of 5	Disable
GS1 DataBar	Disable
<b>Code Identifiers</b>	
Identifier code as factory standard	Disable
Identifier code as AIM standard	Disable
Code 39 identifier code	M
ITF 2 of 5 identifier code	I
Chinese post code identifier code	H
UPC-A identifier code	A
UPC-E identifier code	E
EAN-13 identifier code	F
EAN-8 identifier code	FF
Codabar identifier code	N
Code 128 identifier code	K
Code 93 identifier code	L
MSI identifier code	P
Code 11 identifier code	O
Standard 2 of 5 identifier code	S
Industrial 2 of 5 identifier code	D
Matrix 2 of 5 identifier code	G
GS1 DataBar identifier code	RS
GS1 DataBar Limited identifier code	RL
GS1 DataBar Expanded identifier code	RX

<b>Barcode Length</b>		
Codabar Code 11 Standard 2 of 5 Industrial 2 of 5 Matrix 2 of 5	maximum	32
	minimum	6
Code 39 Code 93 Code 128	maximum	62
	minimum	3
Chinese Post Code	maximum	16
	minimum	10
MSI ITF 2 of 5	maximum	32
	minimum	4
GS1 DataBar GS1 DataBar Limited	maximum	14
	minimum	14
GS1 DataBar Expanded	maximum	48
	minimum	6

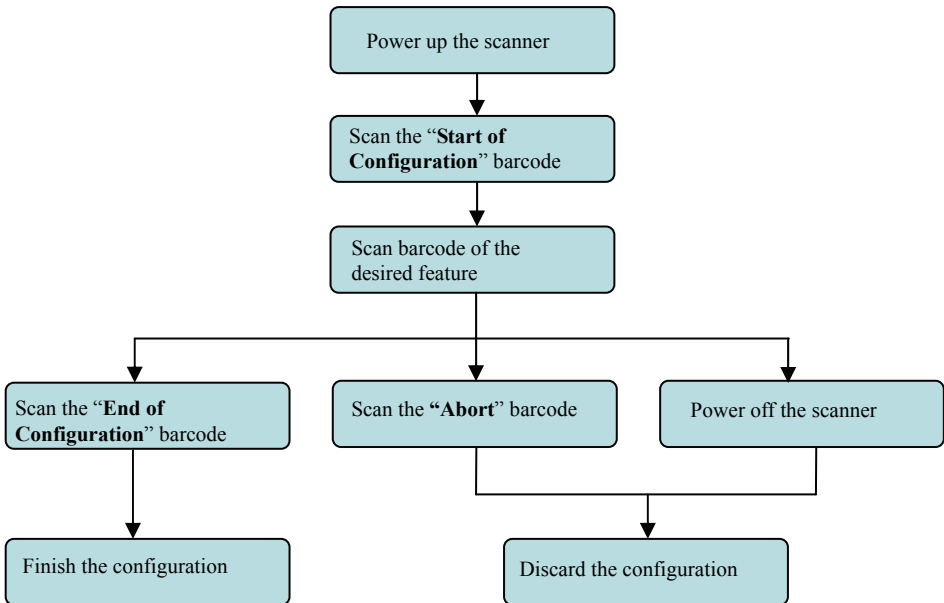
## Data Formatting

<b>Code</b>	<b>Message Format</b>
EAN-13	D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13
EAN-8	D1 D2 D3 D4 D5 D6 D7 D8
UPC-A	D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12
UPC-E	D1 D2 D3 D4 D5 D6 D7 D8
Code 128	D1-Dx (default 3~62)
EAN-128	C1 D1-Dx (default 3~62)
Code 39	D1-Dx (default 3~62)
Codabar	D1-Dx (default 6~32)
ITF 2 of 5	D1-Dx (default 6~32)
Chinese Post Code	D1-Dx (default 8~32)
Code 93	D1-Dx (default 3~32)
MSI	D1-Dx (default 6~32)

# Program Procedure Using Barcode Manual

Below is the programming procedure by using barcodes in this guide.

1. Power up the scanner.
2. Scan the **Start of Configuration** barcode.
3. Scan the barcode for the desired feature. Multiple features can be enabled/disabled before scanning the **End of Configuration** barcode.
4. Scan the **End of Configuration** barcode and save the new configuration.
5. To give up a configuration change, power off the scanner before scanning the **End of Configuration** barcode or scan the **Abort** barcode.
6. For some parameter setting, such as barcode length and identifier code, it is required to scan the **Set** barcode to save the configuration.



Default values are highlighted in gray background.

# Parameter Setting

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Default values are highlighted in **grey background**.



Start Of Configuration

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## Scanner Operation

### 1 System Function Setting

Barcode Value	Barcode Label	Description
--		Reset (return to factory default)
%/		Display firmware version
++		Abort :exit programming mode with no update
KE94		Return to customer default
KE95		Save as customer default



End Of Configuration

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Start Of Configuration

**2 Interface Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
KE97		Return to USB default
KE99		Return to RS-232 default
KE87		Enable USB virtual COM (Virtual COM driver required. For installation steps refer to Appendix 1.)
KE01		Enable IBM PC/AT/PS/2 Keyboard emulation
KE05		Enable stand-alone keyboard (Required no keyboard or key simulator. Only available for special firmware version.)
KE98		Enable wand emulation (Only available for special firmware version.)
KE77		Enable OPOS/JPOS (Available for USB interface only and requires driver. For RS-232 interface, the scanner needs reset and identifier code has to be enabled.)



End Of Configuration



### 3 Scan Function Setting

#### Standard Operation

Barcode Value	Barcode Label	Description
SM02		<p><b>Auto scan mode</b></p> <p>Laser remains on when the scanner is turned on. The scanner automatically decodes objects entering its scan field. When reading the same barcode, user must remove the object from the scan field after the first scan and wait for the time set in “same code delay” to pass before scanning the object again.</p>
SM07		<p><b>IR trigger mode</b></p> <p>Laser remains off when the scanner is in IR trigger mode. The scanner automatically activates and decodes objects present in the scanning range. When reading the same barcode, user must remove the object from the scan field after the first scan and wait for the time set in “same code delay” to pass before scanning the object again. Laser shuts off automatically when no barcode is present for more than 10 seconds. If one object remains in the IR detection zone for more than 10 seconds, the laser is shut off and the scanner will reactivate detection after the object is removed.</p>
SM08		<p><b>Aim mode</b></p> <p>The laser blinks and would automatically decode objects entering its scan field.</p>

#### Aim Mode Laser Blink Rate

Barcode Value	Barcode Label	Description
FT00		<b>Medium</b>
FT01		Fast
FT02		Slow



*Laser remains on for 3 seconds every time you turn on the scanner. You may only use the laser beam to scan the “Start Of Configuration” barcode to configure your scanner.*





**Hardware Trigger Operation (Special cable required)**

Barcode Value	Barcode Label	Description
SM01		<p>Trigger mode</p> <p>Laser is off at initial power up. The scanner reads barcodes only when the external hardware trigger is pressed. Laser is turned off after a successful decode. To scan another barcode, the external hardware trigger must be pressed again.</p>
SM04		<p>Alternate mode</p> <p>Laser is off at initial power up. Press the external hardware trigger to turn on the laser. When the laser is on, the scanner automatically reads objects entering the scan field. When reading the same barcode, user must remove the object from the scan field after the first scan and wait for the time set in "same code delay" to pass before scanning the object again. The laser beam remains on until the trigger is pressed again.</p>
SM06		<p>Momentary mode</p> <p>Laser is off at initial power up. Press and hold the external hardware trigger to turn on the laser. When the laser is on, the scanner automatically reads objects entering the scan field. When reading the same barcode, user must remove the object from the scan field after the first scan and wait for the time set in "same code delay" to pass before scanning the object again. The laser beam remains on until the trigger is released.</p>



*Customized cable with trigger function required to enable Hardware Trigger Operation. Please see your distributor for more information.*





**4. Operation Function Setting**

**Good Read Beeper Tone Selection**

Barcode Value	Barcode Label	Description
GR02		Low beeper tone
GR01		Medium beeper tone
GR03		High beeper tone
GR05		Speaker disable

**Beeper Sound Selection**

Barcode Value	Barcode Label	Description
GR13		Very short (5 msec)
GR12		Short (20 msec)
GR11		Medium (50 msec)
GR10		Long (100 msec)
GR14		Very Long (200 msec)
GR15		Ultra long (500 msec)







Start Of Configuration

**Beeper Volume Selection**

Barcode Value	Barcode Label	Description
GR20		Loud
GR21		Medium
GR22		Slight

**Beeper Timing Selection**

Barcode Value	Barcode Label	Description
LB00		LED/Beep after transmission <ul style="list-style-type: none"> <li>Use this barcode to indicate a "good read" after a barcode has been successfully decoded.</li> </ul>
LB01		LED/Beep before transmission <ul style="list-style-type: none"> <li>Use this barcode to indicate a "good read" before successfully transmitting the barcode data to the host.</li> </ul>
LB03		Power-on tone enable
LB04		Power-on tone disable



End Of Configuration

Start Of Configuration

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**Inter Message Delay**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
IM01		0 ms
IM02		100 ms
IM03		500 ms
IM04		1000 ms

**Inter Character Delay**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
IC01		0ms
IC05		2ms
IC00		5ms
IC02		10ms
IC03		20ms
IC04		50ms



End Of Configuration



Start Of Configuration

**Same Code Delay**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
SD01		Same code delay time 50msec
SD02		Same code delay time 100msec
SD03		Same code delay time 200msec
SD04		Same code delay time 300msec
SD05		Same code delay time 400msec
SD06		Same code delay time 500msec
SD07		Same code delay time 600msec
SD08		Same code delay time 700msec
SD09		Same code delay time 800msec
SD10		Same code delay time 900msec
SD11		Same code delay time 1000msec
SD12		Same code delay time Infinite



End Of Configuration



**Transmit "Bad Read" and "No Read" Message  
(Only for RS-232C interface and USB virtual COM port)**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
NG00		Don't transmit error code
NG01		Transmit "BR"<CR> for bad read or no read.
NG02		Transmit <STX>">"<ETX> for bad read Transmit <STX>"?"<ETX> for no read
NG03		Transmit ">"<CR> for bad read Transmit "?"<CR> for no read
NG04		Transmit "CAN" <CR> for bad read or no read. CAN=18hex
NG05		Transmit <STX>"CAN"<ETX> for bad read or no read. CAN=18hex





## 5. Sleep Mode Setting

### Laser Sleep Mode

Use the barcodes below to set up the timing of laser switching off when the scanner is idle.

Barcode Value	Barcode Label	Description
LS00		Laser sleep mode off (Laser remains lit up.)
LS01		Laser off after the scanner is idle for 5 min
LS02		Laser off after the scanner is idle for 10 min
LS03		Laser off after the scanner is idle for 15 min
LS04		Laser off after the scanner is idle for 20 min
LS05		Laser off after the scanner is idle for 25 min
LS06		Laser off after the scanner is idle for 30 min
LS14		Laser off when the scanner enters sleep mode (IR active)
LS15		Laser blink when the scanner enters sleep mode (IR disable)





**Motor Sleep Mode**

Use the barcodes below to set up the timing of motor switching off when the scanner is idle.

Barcode Value	Barcode Label	Description
MT00		Motor Sleep mode off
MT01		Motor off after the scanner is idle for 5 min
MT02		Motor off after the scanner is idle for 10 min
MT03		Motor off after the scanner is idle for 20 min
MT04		Motor off after the scanner is idle for 30 min
MT05		Motor off after the scanner is idle for 60 min



*The scanner in motor sleep mode can be wakened up by serial command, hardware trigger or IR detection.*





Start Of Configuration

## 6. Hardware Trigger Operation Setting

Barcode Value	Barcode Label	Description
TR00		Laser remains on as long as trigger is pressed
TR01		Laser remains on for 1 second after trigger is pressed
TR02		Laser remains on for 2 seconds after trigger is pressed
TR03		Laser remains on for 3 seconds after trigger is pressed
TR04		Laser remains on for 4 seconds after trigger is pressed
TR05		Laser remains on for 5 seconds after trigger is pressed
TR06		Laser remains on for 6 seconds after trigger is pressed
TR07		Laser remains on for 7 seconds after trigger is pressed
TR08		Laser remains for 8 seconds after trigger is pressed
TR09		Laser remains on for 9 seconds after trigger is pressed
TR10		Laser remains on for 10 seconds after trigger is pressed
TR20		Trigger input high active
TR21		Trigger input low active



End Of Configuration



**6. Hardware Trigger Operation Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
MT00		Power save mode off
MT01		Power save after 5 min
MT02		Power save after 10 min
MT03		Power save after 20 min
MT04		Power save after 30 min
MT05		Power save after 60 min
MT12		Power save after every trigger scan

**\*Power Save mode:** After the scanner has been inactive for a period of time, the device powers down to reduce power consumption.







# Interface Setting

## 1 RS-232C Interface Setting

### Baud Rate

Barcode Value	Barcode Label	Baud Rate
		Description
BR09		115200
BR08		57600
BR00		38400
BR01		19200
BR02		<b>9600</b>
BR03		4800
BR04		2400
BR05		1200





Start Of Configuration

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**Parity Bit**

Barcode Value	Barcode Label	Description
PB01		Even parity
PB02		Odd parity
PB03		Mark parity
PB04		Space parity
PB05		None parity

**Stop Bit**

Barcode Value	Barcode Label	Description
SB01		1 stop bit
SB02		2 stop bit

**Data Bit**

Barcode Value	Barcode Label	Description
DB07		7 data bit
DB08		8 data bit



End Of Configuration



Start Of Configuration

**Handshaking Protocol**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
HP01		None handshaking
HP02		ACK/NAK
HP03		Xon/Xoff
HP04		RTS/CTS
LB07		Enable BEEPER ON<BEL> CHARACTER
LB08		Ignore BEEP ON <BEL> CHARACTER
LB09		Disable ACK/NAK timeout beeper
LB10		Enable ACK/NAK timeout beeper (three beeps)
RT01		ACK/NAK response time 300ms
RT03		ACK/NAK response time 500ms
RT05		ACK/NAK response time 1 sec
RT02		ACK/NAK response time 2 sec
RT04		ACK/NAK response time 3 sec
RT06		ACK/NAK response time 5 sec
RT07		ACK/NAK response time infinity



End Of Configuration

**Message Terminator**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
DT11		RS-232 message terminator—none
DT12		RS-232 message terminator—CR/LF
DT13		RS-232 message terminator—CR
DT14		RS-232 message terminator—LF
DT15		RS-232 message terminator—H-tab
DT16		RS-232 message terminator—STX/ETX
DT17		RS-232 message terminator—EOT


















Start Of Configuration

## 2 Keyboard Wedge and USB Interface Setting

### Language Support

Barcode Value	Barcode Label	Description
KL00		International Keyboard mode (ALT mode)
KL01		Keyboard language support — USA
KL02		Keyboard language support — UK
KL03		Keyboard language support — Germany
KL04		Keyboard language support — French
KL05		Keyboard language support — Spanish
KL06		Keyboard language support — Italian
KL07		Keyboard language support — Switzerland
KL08		Keyboard language support — Sweden
KL09		Keyboard language support — Belgium
KL10		Keyboard language support — Portugal
KL11		Keyboard language support — Turkish
KL15		Keyboard language support — Japanese



End Of Configuration



**Keyboard Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
CP00		Capital lock on
CP01		Capital lock off
CP05		Function key emulation enable
CP06		Function key emulation disable
CP18		Send number as normal data
CP19		Send number as keypad data
CP20		Alphabet follow as keyboard
CP21		Alphabet always upper case
CP22		Alphabet always Lower case

**Message Terminator**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
DT01		Keyboard terminator---none
DT02		Keyboard terminator---Enter
DT03		Keyboard terminator---H-TAB





Start Of Configuration

### 3 Wand Emulation Setting

Wand emulation is a standard interface but requires special firmware. If needed, please contact your distributor.

Barcode Value	Barcode Label	Description
WD01		All barcode will be decoded and transmitted in that symbology
WD02		Enable Wand output data format as Code 39
WO01		Wand emulation data output black = high <ul style="list-style-type: none"> <li>Scan this barcode to set quiet zones and spaces low and bars =high.</li> </ul>
WO02		Wand emulation data output black=low <ul style="list-style-type: none"> <li>Scan this barcode to set quiet zones and spaces high and bars=low</li> </ul>
WO03		Idle = high <ul style="list-style-type: none"> <li>Idle state refers to the TTL logic level of the Wand Emulation signal when not in use</li> </ul>
WO04		Idle = low <ul style="list-style-type: none"> <li>Idle state refers to the TTL logic level of the Wand Emulation signal when not in use</li> </ul>
WS01		Wand emulation speed---Low <ul style="list-style-type: none"> <li>This option allows the transmission of wand emulation at 1ms narrow element width</li> </ul>
WS02		Wand emulation speed---medium <ul style="list-style-type: none"> <li>This option allows the transmission of wand emulation at 600us narrow element width</li> </ul>



End Of Configuration



**Wand Emulation Speed**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
WS03		Wand emulation speed---normal
WS04		Wand emulation speed---high <ul style="list-style-type: none"> <li>This option allows the transmission of wand emulation at 300us narrow element width</li> </ul>
WS05		Wand emulation speed---higher <ul style="list-style-type: none"> <li>This option allows the transmission of wand emulation at 100 us narrow element width</li> </ul>
WS00		Wand emulation narrow/wide ratio 1:2
WS08		Wand emulation narrow/wide ratio 1:3







Start Of Configuration

## Symbologies

### 1 Codabar Parameter Setting

Barcode Value	Barcode Label	Description
RC02		Codabar enable
RD02		Codabar disable
CB05		Codabar start/stop character transmission — none
CB06		Codabar start/stop character transmission — A,B,C,D
CB07		Codabar start/stop character transmission — DC1~DC4
CB08		Codabar start/stop character transmission — a,t,b/n,c/* ,d/e
CB09		Codabar maximum length setting
CB10		Codabar minimum length setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---

CB11		Codabar concatenation disable
CB12		Codabar concatenation enable



End Of Configuration

Start Of Configuration

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<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
CB13		No check character
CB14		Validate modulo 16, but don't transmit
CB15		Validate modulo 16 and transmit
DC50		Codabar data redundant check=off
DC51		Codabar data redundant check=1
DC52		Codabar data redundant check=2
DC53		Codabar data redundant check=3



End Of Configuration



Start Of Configuration

**2 Code 39 Parameter Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
RC01		Code 39 enable
RD01		Code 39 disable
RC13		Code 32 enable
RD13		Code 32 disable
DC00		Code 39 data redundant check=off
DC01		Code 39 data redundant check=1
DC02		Code 39 data redundant check=2
DC03		Code 39 data redundant check=3
3901		Standard code 39
3902		Full ASCII code 39
3903		Code 39 start/stop character transmission
3904		Code 39 start/stop character without transmission



End Of Configuration



Start Of Configuration

Barcode Value	Barcode Label	Description
3905		Code 39 check digit calculate and transmit
3906		Code 39 check digit calculate but without transmit
3907		No check character
3908		Code 39 maximum length setting
3909		Code 39 minimum length setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---

3910		Code 39 concatenation enable
3911		Code 39 concatenation disable
3912		Code 32 (Italian pharmacy) transmit "A" character
3913		Code 32 (Italian pharmacy) without transmit "A" character



End Of Configuration



Start Of Configuration

### 3 Code 93 Parameter Setting

Barcode Value	Barcode Label	Description
RC08		Code 93 enable
RD08		Code 93 disable
DC30		Code 93 data redundant check=off
DC31		Code 93 data redundant check=1
DC32		Code 93 data redundant check=2
DC33		Code 93 data redundant check=3
9301		Code 93 maximum length setting
9302		Code 93 minimum length setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---

9303		Code 93 check digit calculate but without transmit
9304		Code 93 check digit not calculate and without transmit
9305		Code 93 check digit calculate and transmit



End Of Configuration



**4 Code 128 Parameter Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
RC06		Code 128 enable
RD06		Code 128 disable
RC10		EAN-128 enable
RD10		EAN-128 disable
DC40		Code 128 data redundant check=off
DC41		Code 128 data redundant check=1
DC42		Code 128 data redundant check=2
DC43		Code 128 data redundant check=3
1801		Code128 FNC2 concatenation enable
1802		Code128 FNC2 concatenation disable
1803		No check character
1804		Calculate but not transmitted
1805		Calculate and transmit
1806		Code 128 maximum length setting
1807		Code 128 minimum length setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---





Start Of Configuration

**5 Chinese Post Code Parameter Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
RC05		Chinese post code enable
RD05		Chinese post code disable
DC60		Chinese post code data redundant check=off
DC61		Chinese post code data redundant check=1
DC62		Chinese post code data redundant check=2
DC63		Chinese post code data redundant check=3
SZ01		Chinese post code maximum length setting
SZ02		Chinese post code minimum length setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---



End Of Configuration



**6 MSI/Plessey Parameter Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
RC14		MSI enable
RD14		MSI disable
DC70		MSI data redundant check= off
DC71		MSI data redundant check=1
DC72		MSI data redundant check=2
DC73		MSI data redundant check=3
MS01		MSI/Plessey maximum length setting
MS02		MSI/Plessey minimum length setting
SET		Confirm to save this setting (required for reading full ASCII table and length setting)
MS03		MSI/Plessey double check digit calculate but not transmit
MS04		MSI/Plessey double check digit without calculate and transmit
MS05		MSI/Plessey double check digit calculate but only first digit transmit
MS06		MSI/Plessey double check digit calculate and both transmit
MS07		MSI/Plessey single check digit calculate but without transmit
MS08		MSI/Plessey single check digit calculate and transmit







Start Of Configuration

**7 Code 11 Interface Setting**

Barcode Value	Barcode Label	Description
RC07		Code 11 enable
RD07		Code 11 disable
1101		Code 11 maximum length setting
1102		Code 11 minimum length setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---

1103		Code 11 one check digit verification
1104		Code 11 two check digit verification
1105		Two Check for Code 11 check digit if code length is longer than 10 characters
1106		Disable verification
1107		Code 11 check digit transmitted
1108		Code 11 check digit not transmitted



End Of Configuration



**8 ITF 2 of 5 Parameter Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
RC04		ITF 2 of 5 enable
RD04		ITF 2 of 5 disable
RC09		IATA code enable
RD09		IATA disable
DC80		ITF 25 data redundant check=off
DC81		ITF25 data redundant check=1
DC82		ITF25 data redundant check=2
DC83		ITF25 data redundant check=3
IT03		ITF 2 of 5 no check character
IT04		ITF 2 of 5 check digit calculate and transmit
IT05		ITF 2 of 5 check digit calculate but without transmit





## Start Of Configuration

Barcode Value	Barcode Label	Description
IT01		ITF 2 of 5 code maximum length setting
IT02		ITF 2 of 5 code minimum length setting
IT06		ITF 2 of 5 one fixed length setting
IT07		ITF 2 of 5 two fixed length setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---

IT08		ITF 2 of 5 length variable
------	--	----------------------------



## End Of Configuration



**9 Standard 2 of 5 Parameter Setting**

Barcode Value	Barcode Label	Description
RC22		Standard 2 of 5 code enable
RD22		Standard 2 of 5 code disable
D051		Standard 2 of 5 code maximum length setting
D052		Standard 2 of 5 code minimum length setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---

D053		Standard 2 of 5 code no check character
D054		Standard 2 of 5 code check digit calculate and transmit
D055		Standard 2 of 5 code check digit calculate but without transmit





Start Of Configuration

**10 Industrial 2 of 5 Parameter Setting**

Barcode Value	Barcode Label	Description
RC21		Industrial 2 of 5 code enable
RD21		Industrial 2 of 5 code disable
D251		Industrial 2 of 5 code maximum length setting
D252		Industrial 2 of 5 code minimum length setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---

D253		Industrial 2 of 5 code no check character
D254		Industrial 2 of 5 code check digit calculate and transmit
D255		Industrial 2 of 5 code check digit calculate but without transmission



End Of Configuration



**11 UPC/EAN/JAN Parameter Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
RC11		EAN convert to ISSN/ISBN enable
RD11		EAN convert to ISSN/ISBN disable
RC03		UPC/EAN/JAN enable
RD03		UPC/EAN/JAN disable
UE01		UPC/EAN/JAN all enable
UE02		EAN-8 or EAN-13 enable
UE03		UPC-A and EAN-13 enable
UE04		UPC-A and UPC-E enable
UE05		UPC-A enable
UE06		UPC-E enable
UE07		EAN-13 enable
UE08		EAN-8 enable
UE09		UPC/EAN Addendum disable





Start Of Configuration

Barcode Value	Barcode Label	Description
UE10		Add on 5 only
UE11		Add on 2 only
UE12		Add on 2 or 5
UE13		Force UPC-E to UPC-A format enable
UE14		Force UPC-E to UPC-A format disable
UE15		Force UPC-A to EAN-13 format enable
UE16		Force UPC-A to EAN-13 format disable
UE44		Force EAN-8 to EAN-13 format enable
UE45		Force EAN-8 to EAN-13 format disable
UE17		Transmit UPC-A check digit enable
UE18		Transmit UPC-A check digit disable
UE19		Transmit UPC-E leading character enable
UE20		Transmit UPC-E leading character disable
UE21		Transmit UPC-E check digit enable
UE22		Transmit UPC-E check digit disable



End Of Configuration



Start Of Configuration

Barcode Value	Barcode Label	Description
UE23		Transmit EAN-8 check digit enable
UE24		Transmit EAN-8 check digit disable
UE25		Transmit EAN-13 check digit enable
UE26		Transmit EAN-13 check digit disable
UE27		Transmit UPC-A leading character enable
UE28		Transmit UPC-A leading character disable
UE30		Add-on format with separator
UE31		Add-on format without separator
UE60		EAN-13 country code first "0" can transmitted
UE61		EAN-13 country code first:"0" can't transmitted
UE66		EAN-13 with first 0 ID code same as "UPC-A"
UE67		EAN-13 with first 0 ID code same as "EAN-13"
DC10		UPC-A data redundant check=off
DC11		UPC-A data redundant check=1



End Of Configuration





Start Of Configuration

Barcode Value	Barcode Label	Description
DC12		UPC-A data redundant check=2
DC13		UPC-A data redundant check=3
DC14		UPC-E data redundant check=off
DC15		UPC-E data redundant check=1
DC16		UPC-E data redundant check=2
DC17		UPC-E data redundant check=3
DC20		EAN-13 data redundant check=off
DC21		EAN-13 data redundant check=1
DC22		EAN-13 data redundant check=2
DC23		EAN-13 data redundant check=3
DC24		EAN-8 data redundant check=off
DC25		EAN-8 data redundant check=1
DC26		EAN-8 data redundant check=2
DC27		EAN-8 data redundant check=3
UE32		EAN/UPC +add-on (none mandatory)
UE33		EAN/UPC +add-on (mandatory)



End Of Configuration



Start Of Configuration

UE35		EAN/UPC +add-on mandatory for 978/977 bookland <b>(Supplement requirement, not sent for other)</b>
UE38		EAN/UPC +add-on mandatory for 978/977 bookland <b>(Supplement requirement, optionally for other)</b>
UE42		EAN/UPC +add-on mandatory for 491 Japanese bookland <b>(Supplement requirement, not sent for other)</b>
UE43		EAN/UPC +add-on mandatory 491 Japanese bookland <b>(Supplement requirement, optionally for other)</b>
UE34		EAN/UPC +add-on mandatory for 378/379 French <b>(Supplement requirement, not sent for other)</b>
UE37		EAN/UPC +add-on mandatory for 378/379 French <b>(Supplement requirement, optionally for other)</b>
UE36		EAN/UPC +add-on mandatory for 434/439 German <b>(Supplement requirement, not sent for other)</b>
UE39		EAN/UPC +add-on mandatory for 434/439 German <b>(Supplement requirement, optionally for other)</b>
UE40		EAN/UPC +add-on mandatory for 419/414 Euro amounts <b>(Supplement requirement, not sent for other)</b>
UE41		EAN/UPC +add-on mandatory for 414/419 Euro <b>(Supplement requirement, optionally for other)</b>
UE46		EAN/UPC +add-on mandatory for 414/419/378/379/978/977/434/439/529/ Euro <b>(Supplement requirement, optionally for other)</b>
UE47		EAN/UPC +add-on mandatory for 414/419/378/379/978/977/434/439/529/ Euro <b>(Supplement requirement, not sent for other)</b>



End Of Configuration



Start Of Configuration

**12 Telepen Parameter Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
RC25		Telepen enable
RD25		Telepen disable
TE03		Telepen numeric mode enable
TE04		AIM Telepen enable



End Of Configuration



**13 Matrix 2 of 5 Parameter Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
RC12		Matrix 2 of 5 enable
RD12		Matrix 2 of 5 disable
D151		Matrix 2 of 5 maximum length setting
D152		Matrix 2 of 5 minimum length setting
SET		Confirm to save this setting (required for reading full ASCII table and length setting)
D153		Matrix 2 of 5 no check character
D154		Matrix 2 of 5 check digit calculate and transmit
D155		Matrix 2 of 5 check digit calculate but without transmission





**14 GS1 DataBar Parameter Setting**

There are 7 kinds of barcodes in the GS1 DataBar family and they are categorized into three groups. Barcode types in the same group use the same barcodes for setting.

Group	Representative	Contents
Group 1	GS1 DataBar Omnidirectional <b>(Formally RSS-14)</b>	GS1 DataBar Omnidirectional GS1 DataBar Truncated GS1 DataBar Stacked GS1 DataBar Stacked Omnidirectional
Group 2	GS1 DataBar Limited <b>(Formally RSS Limited)</b>	GS1 DataBar Limited
Group 3	GS1 DataBar Expanded <b>(Formally RSS Expanded)</b>	GS1 DataBar Expanded GS1 DataBar Expanded Stacked

**GS1 DataBar Omnidirectional (Formally RSS-14)**

Barcode Value	Barcode Label	Description
RC15		GS1 DataBar Omnidirectional enable
RD15		GS1 DataBar Omnidirectional disable
SS00		Transmit GS1 DataBar Omnidirectional check digit
SS01		Do not transmit GS1 DataBar Omnidirectional check digit
SS02		Transmit GS1 DataBar Omnidirectional application ID (01)
SS03		Do not transmit GS1 DataBar Omnidirectional application ID (01)
SS05		GS1 DataBar Omnidirectional /EAN-128 emulation enable
SS04		GS1 DataBar Omnidirectional /EAN-128 emulation disable



**GS1 DataBar Limited (Formally RSS Limited)**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
RC16		GS1 DataBar Limited enable
RD16		GS1 DataBar Limited disable
SS10		Transmit GS1 DataBar Limited check digit
SS11		Don't transmit GS1 DataBar Limited check digit
SS12		Transmit GS1 DataBar limited application ID (01)
SS13		Do not transmit GS1 DataBar limited application ID





Start Of Configuration

**GS1 DataBar Expanded (Formally RSS Expanded)**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
RC17		GS1 DataBar Expanded enable
RD17		GS1 DataBar Expanded disable
SS07		GS1 DataBar Expanded/EAN-128 emulation enable
SS06		GS1 DataBar Expanded/EAN-128 emulation disable
SS08		GS1 DataBar Expanded check digital enable
SS09		GS1 DataBar Expanded check digital disable
SS16		Transmit GS1 DataBar Expanded application ID (01)
SS17		Do not transmit GS1 DataBar Expanded application ID



End Of Configuration



## Data Editing

### 1 Identifier Code

Barcode Value	Barcode Label	Description
IS00		Disable identifier code
IS01		Enable identifier code table as factory standard
IS03		Enable identifier code table as AIM standard.
CI01		Code 39 identifier code setting
CI02		ITF 2 of 5 identifier code setting
CI03		Chinese Post Code identifier code setting
CI04		UPC-E identifier code setting
CI05		UPC-A identifier code setting
CI06		EAN-13 identifier code setting
CI07		EAN-8 identifier code setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---







Start Of Configuration

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
CI08		Codabar identifier code setting
CI09		Code 128 identifier code setting
CI10		Code 93 identifier code setting
CI11		MSI identifier code setting
CI12		GS1 DataBar Omnidirectional identifier code setting
CI13		GS1 DataBar Limited identifier code setting
CI14		GS1 DataBar expanded identifier code setting
CI15		Industrial 2 of 5 identifier code setting
CI16		Code 11 Identifier code setting
CI17		Standard 2 of 5 identifier code setting
CI18		Matrix 2 of 5 identifier code setting

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---



End Of Configuration



**2 Header and Trailer**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
CP11		Add code length as header enable (2 digits)
CP12		Add code length as header disable (2 digits)
HT01		Header (Preamble)
HT02		Trailer (Postamble)
HT03		Truncate header character
HT04		Truncate trailer character

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---





Start Of Configuration

### 3 Multi-Barcode Editing

Refer to Appendix 3 for detail setup steps.

#### Function Setting

Barcode Value	Barcode Label	Description
MC00		Start to edit multi-barcode
MC01		Multi-barcode enable
MC02		Multi-barcode disable
MC03		Apply output sequence <ul style="list-style-type: none"> <li>In this mode, the scanner would retain the barcode data until it reads all the conditioned barcodes and transmit the data all together. If the scanner reads a barcode not compliant with programmed format, it would consider it a normal barcode and transmit this data.</li> </ul>
MC04		Enforce output sequence <ul style="list-style-type: none"> <li>In this mode, every barcode must follow the programmed format; otherwise no data would be transmitted.</li> </ul>
MC05		Enable terminator
MC06		Disable terminator

SET		Confirm to save this setting (required for reading full ASCII table and length setting)
-----	--	---



End Of Configuration



Start Of Configuration

**Barcode Type Setting**

<b>Barcode Value</b>	<b>Barcode Label</b>	<b>Description</b>
\$Q		Code39
\$A		Codabar
\$B		ITF2 of 5
\$C		Code128
\$F		Code 93
\$G		MSI
\$E		Chinese Post Code
4		EAN-8
D		EAN-13
/D		UPC-A
\$T		UPC-E
\$U		GS1 DataBar Standard
\$V		GS1 DataBar Expanded
\$W		GS1 DataBar Limited



End Of Configuration

## Appendix 1: USB Virtual COM Driver Installation

Contact your distributor to get the driver and follow the steps below to enable USB virtual COM port.

1. Connect the scanner and the host (e.g. a PC) with a USB interface cable.
2. Enable USB virtual COM port with programming barcodes on page 8.
3. After the programming, the host would request driver installation. Browse your files to locate the driver and start installation.
4. The USB virtual COM port is ready for use after driver installation.

## Appendix 2: Barcode Length Setting

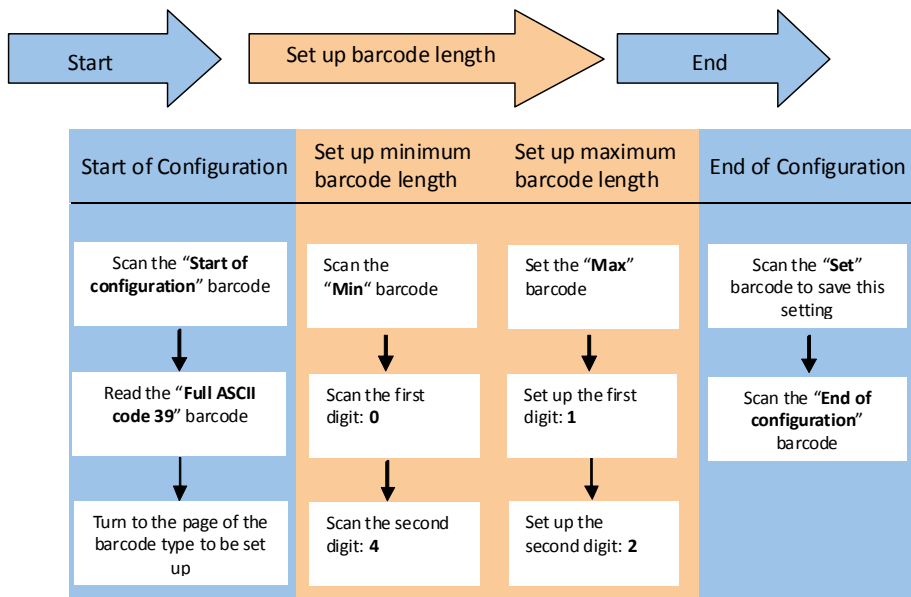
### Introduction

The length of a barcode is the number of characters it contains, including check digits. As listed in the Default Parameters section, each barcode type has different default length. You may change the setting by the following procedure.

To set up barcode length, the parameters to be determined are barcode type and the desired barcode length. Barcode length is consisted of 2 digits. For numbers smaller than 10, you need to add a "0" in the front.

### Example

If the barcode length is 4 to 12 digits, the steps would be as below:



Use the ASCII table (Appendix 4) to set up barcode length. Be sure to enable the full ASCII code 39 option before you start and read the "Set" label to set your choice into memory.

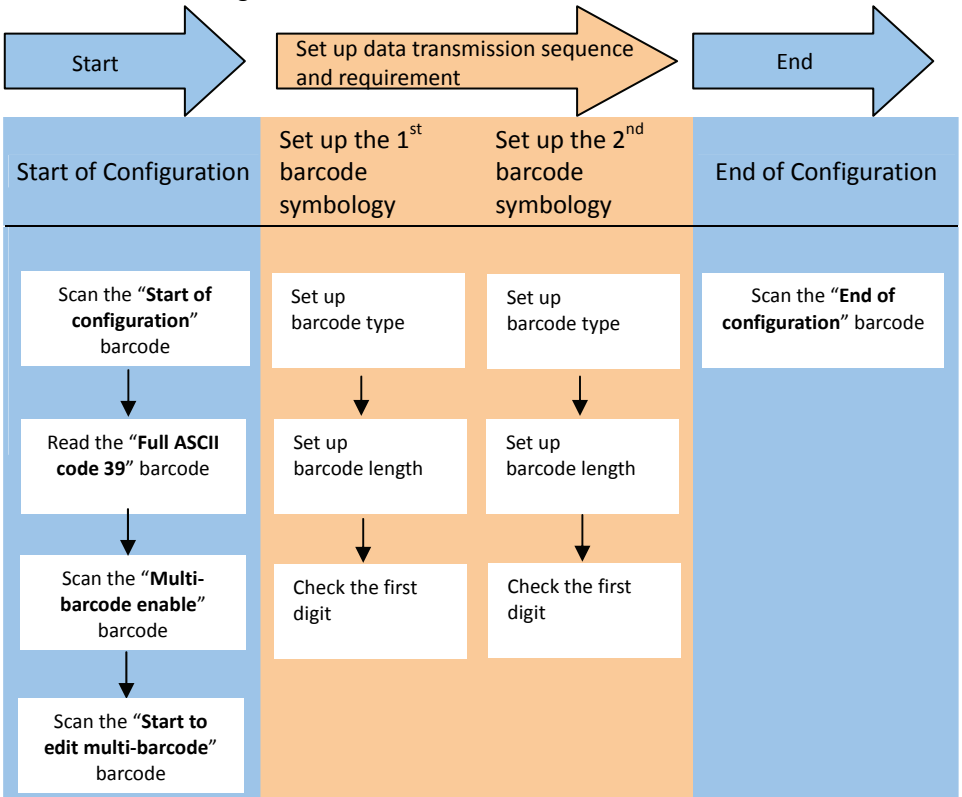
# Appendix 3: Multi-Barcode Editor

## Introduction

The multi-barcode editor function allows users to set up the sequence of barcode data transmission. After the configuration, the scanner would transmit data in the pre-programmed sequence even if the user doesn't scan barcodes in the correct order. Users can set up the sequence of up to 5 pieces of barcode data.

The three parameters to be programmed are: barcode type, barcode length and check digit.

Set up as "0" if the barcode length is not required; set up as "NUL" if there is no need to check the first digit of the barcode value.

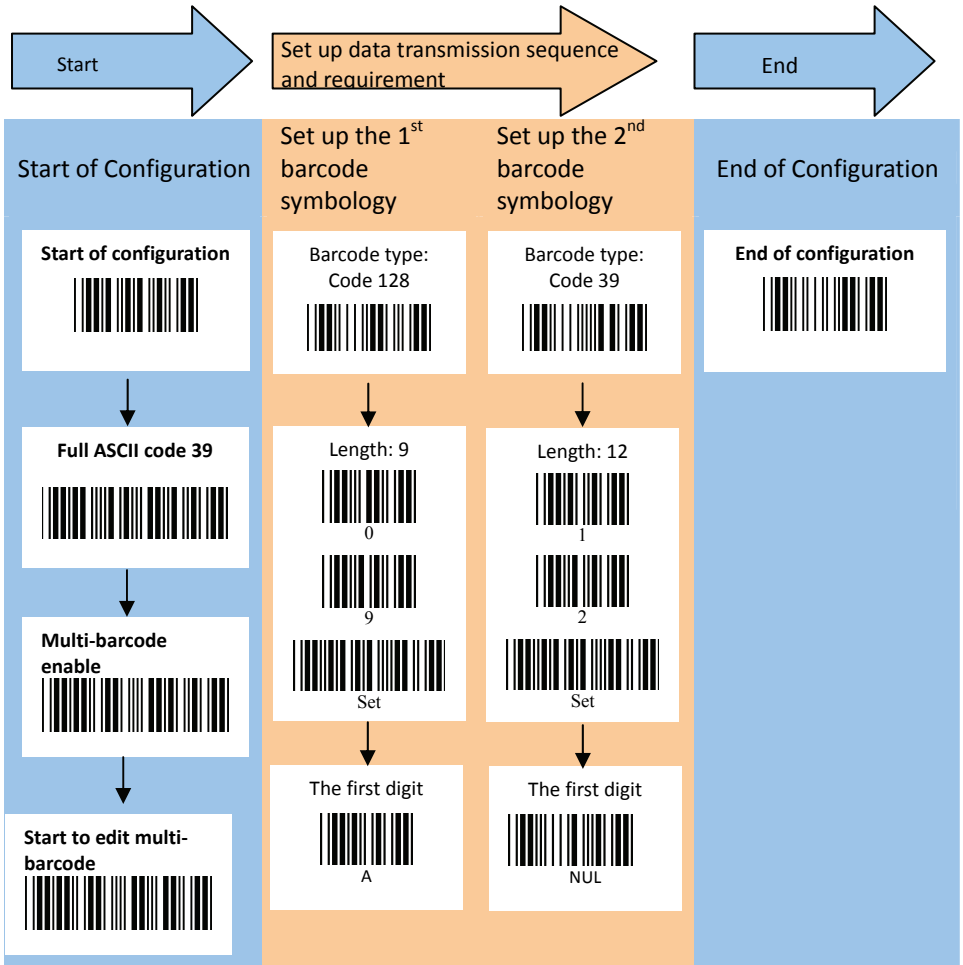


Use the ASCII table (Appendix 4) to set up barcode length and first digit checkup. Be sure to enable the full ASCII code 39 option before you start and read the "Set" label to set your choice into memory.

Example

If the barcode data transmission sequence and requirements are as below:

The 1 <sup>st</sup> barcode symbology		The 2 <sup>nd</sup> barcode symbology	
Barcode type	Code 128	Barcode type	Code 39
Barcode length	9	Barcode length	12
First digit	A	First digit	No check on the first digit is required







## Appendix 4: Full ASCII Code 39 Table

Code 39	ASCII	Hexa-code	Code 39	ASCII	Hexa-code
	Full ASCII ---NUL	00		Full ASCII ---SI Function key----"Shift"	0F
	Full ASCII ---SOH Function key----"Ins"	01		Full ASCII ---DLE Function key----"5(num)"	10
	Full ASCII ---STX Function key----"Del"	02		Full ASCII ---DC1 Function key----"F1"	11
	Full ASCII ---ETX Function key----"Home"	03		Full ASCII ---DC2 Function key----"F2"	12
	Full ASCII ---EOT Function key----"End"	04		Full ASCII ---DC3 Function key----"F3"	13
	Full ASCII ---ENQ Function key----"Up arrow"	05		Full ASCII ---DC4 Function key----"F4"	14
	Full ASCII ---ACK Function key----"Down arrow"	06		Full ASCII ---NAK Function key----"F5"	15
	Full ASCII ---BEL Function key----"Left arrow"	07		Full ASCII ---SYN Function key----"F6"	16
	Full ASCII ---BS Function key----"Backspace"	08		Full ASCII ---ETB Function key----"F7"	17
	Full ASCII ---HT Function key----"TAB"	09		Full ASCII ---CAN Function key----"F8"	18
	Full ASCII ---LF Function key----"Enter (alpha numeric)"	0A		Full ASCII ---EN Function key----"F9"	19
	Full ASCII ---VT Function key----"right arrow"	0B		Full ASCII ---SUB Function key----"F10"	1A
	Full ASCII ---FF Function key----"PgUp"	0C		Full ASCII ---ESC Function key----"F11"	1B
	Full ASCII ---CR Function key---- "Enetr(num.)"	0D		Full ASCII ---FS Function key----"F12"	1C
	Full ASCII ---SO Function key----"PgDn"	0E		Full ASCII ---GS Function key----"ESC"	1D





**Full ASCII Code 39 Table**

Code 39	ASCII	Hexa-code	Code 39	ASCII	Hexa-code
	Full ASCII ---RS Function key-----"CTL(L)"	1E		Full ASCII ----	2D
	Full ASCII ---US Function key-----"ALT(L)"	1F		Full ASCII ---.	2E
	Full ASCII ---SP	20		Full ASCII ---/	2F
	Full ASCII ---!	21		Full ASCII ---0	30
	Full ASCII ---"	22		Full ASCII ---1	31
	Full ASCII ---#	23		Full ASCII ---2	32
	Full ASCII ---\$	24		Full ASCII ---3	33
	Full ASCII ---%	25		Full ASCII ---4	34
	Full ASCII ---&	26		Full ASCII ---5	35
	Full ASCII ---'	27		Full ASCII ---6	36
	Full ASCII --- (	28		Full ASCII ---7	37
	Full ASCII ---)	29		Full ASCII ---8	38
	Full ASCII ---*	2A		Full ASCII ---9	39
	Full ASCII ---+	2B		Full ASCII ---:	3A
	Full ASCII ---,	2C		Full ASCII ---;	3B





Start Of Configuration

**Full ASCII Code 39 Table**

Code 39	ASCII	Hexa-code	Code 39	ASCII	Hexa-code
	Full ASCII ---<	3C		Full ASCII ---K	4B
	Full ASCII ---=	3D		Full ASCII ---L	4C
	Full ASCII --->	3E		Full ASCII ---M	4D
	Full ASCII ---?	3F		Full ASCII ---N	4E
	Full ASCII ---@	40		Full ASCII ---O	4F
	Full ASCII ---A	41		Full ASCII ---P	50
	Full ASCII ---B	42		Full ASCII ---Q	51
	Full ASCII ---C	43		Full ASCII ---R	52
	Full ASCII ---D	44		Full ASCII ---S	53
	Full ASCII ---E	45		Full ASCII ---T	54
	Full ASCII ---F	46		Full ASCII ---U	55
	Full ASCII ---G	47		Full ASCII ---V	56
	Full ASCII ---H	48		Full ASCII ---W	57
	Full ASCII ---I	49		Full ASCII ---X	58
	Full ASCII ---J	4A		Full ASCII ---Y	59



End Of Configuration



Start Of Configuration

**Full ASCII Code 39 Table**

<b>Code 39</b>	<b>ASCII</b>	<b>Hexa-code</b>	<b>Code 39</b>	<b>ASCII</b>	<b>Hexa-code</b>
	Full ASCII ---Z	5A		Full ASCII ---i	69
	Full ASCII ---[	5B		Full ASCII ---j	6A
	Full ASCII ---\	5C		Full ASCII ---k	6B
	Full ASCII ---]	5D		Full ASCII ---l	6C
	Full ASCII ---^	5E		Full ASCII ---m	6D
	Full ASCII ---_	5F		Full ASCII ---n	6E
	Full ASCII ---`	60		Full ASCII ---o	6F
	Full ASCII ---a	61		Full ASCII ---p	70
	Full ASCII ---b	62		Full ASCII ---q	71
	Full ASCII ---c	63		Full ASCII ---r	72
	Full ASCII ---d	64		Full ASCII ---s	73
	Full ASCII ---e	65		Full ASCII ---t	74
	Full ASCII ---f	66		Full ASCII ---u	75
	Full ASCII ---g	67		Full ASCII ---v	76
	Full ASCII ---h	68		Full ASCII ---w	77



End Of Configuration



Start Of Configuration

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**Full ASCII Code 39 Table**

<b>Code 39</b>	<b>ASCII</b>	<b>Hexa- code</b>
	Full ASCII ---x	78
	Full ASCII ---y	79
	Full ASCII ---z	7A
	Full ASCII ---{	7B
	Full ASCII ---	7C
	Full ASCII ---}	7D
	Full ASCII ---~	7E
	Full ASCII ---DEL	7F



End Of Configuration