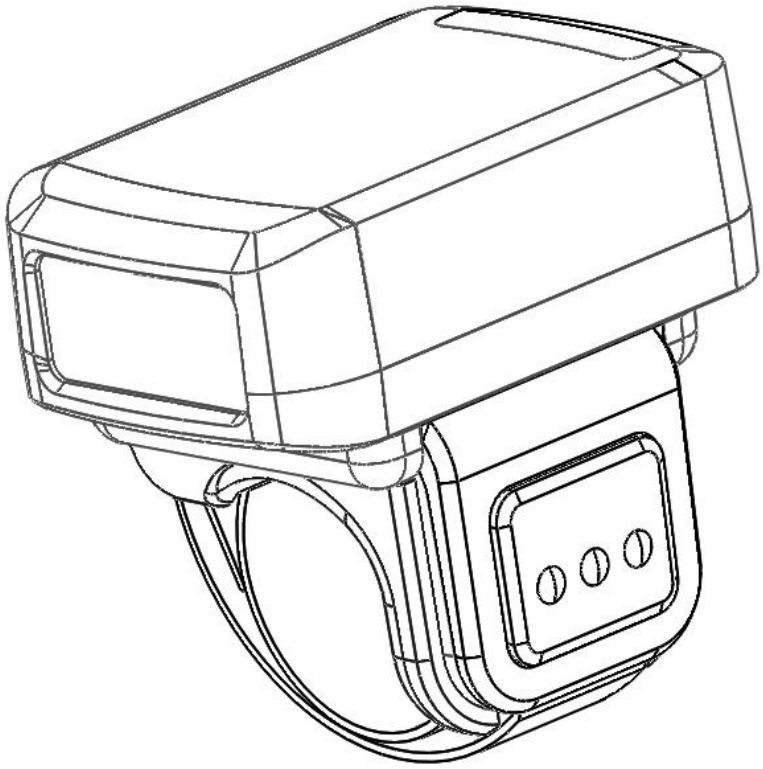
LR50 Series

Bluetooth Ring Scanner



LIBA Reader

Product Reference Guide

Getting Started

This chapter describes the features of the LR50 Ring Scanner and explains how to install and operate the scanner.

1. Configuration Features

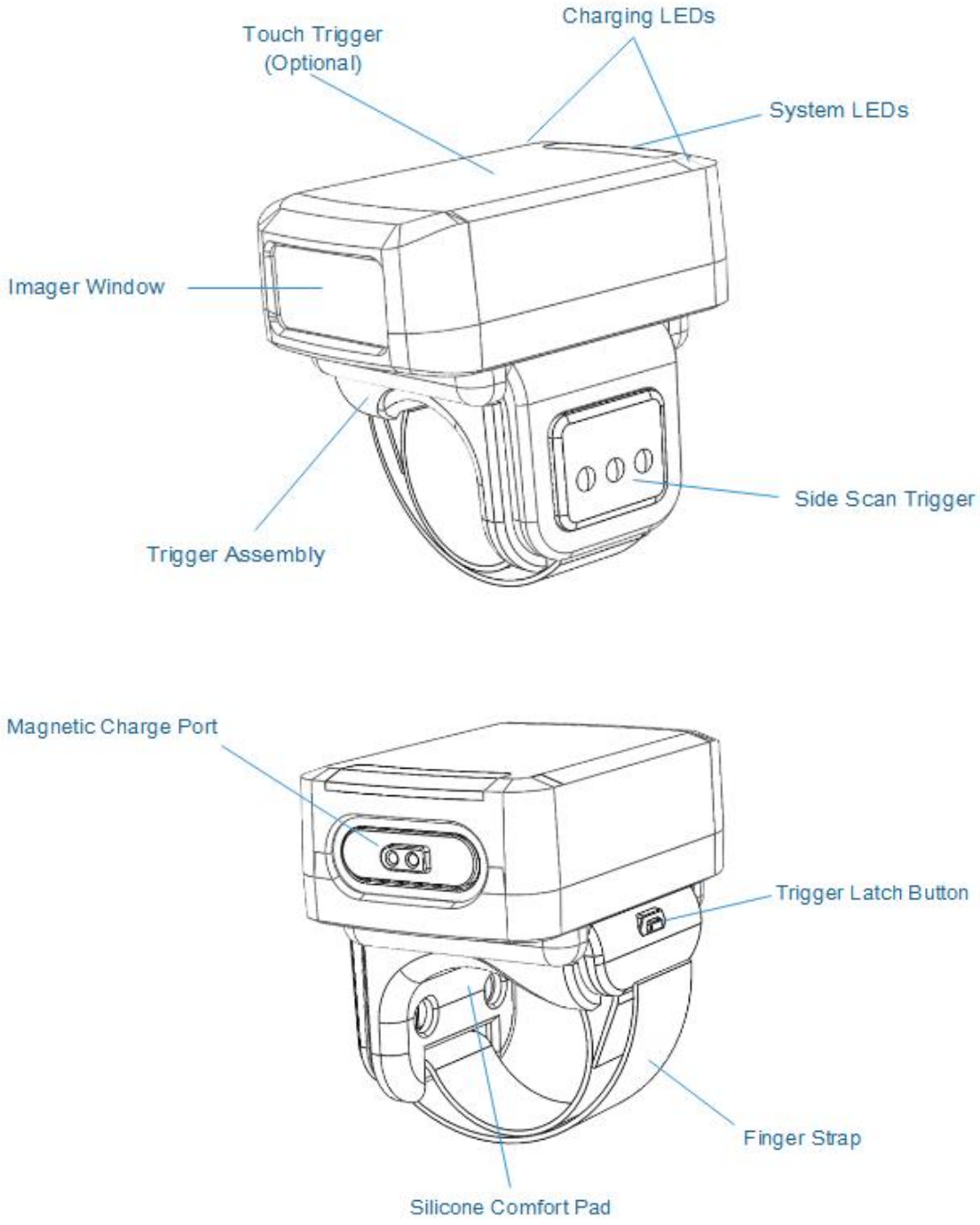


Figure 1 LR50 Series Configuration Features

2. Status Indications

The LR50 has System notification LEDs on the top of the device to display system, decode, Bluetooth and battery status. The LR50 is also equipped with a beeper that issues different beep sequences and patterns to indicate status. The System LEDs provide identical indications for ambidextrous usage.

Table 1 defines the System LED and beep sequence indications that occur to indicate status.

Table 1 System LED Indications

Indication Type	LED Indication	Beeper Indication	Description
System	Yellow Green flash in turn	Long Medium	Device is powered on.
Decode	Green	Short Medium	A barcode has been decoded.
	Green	Long High	A configuration barcode has been decoded.
Bluetooth	Blue Fast blinking	None	Device in HID advertising state.
	Blue Slow blinking	None	Device in SPPLE advertising state.
DFU	Blue Slow blinking in turn	None	Device in DFU advertising state.
	Green Slow blinking	None	Firmware installation.
Battery	Red	Long Low	Low battery indicator.

3. Configurations

The LR50 can be worn with a Single Trigger Assembly on the index finger, and triggered with the thumb. The Trigger Assembly of the LR50 is removable to provide left-hand or right-hand use.

To change the position of the trigger:

Determine whether the LR50 is used on the right or left hand and rotate the trigger assembly accordingly, so that the Scan Trigger is positioned next to the thumb when the LR50 is placed on the index finger.

Push the Trigger Assembly latch in, while lifting the Trigger Assembly away from the LR50.

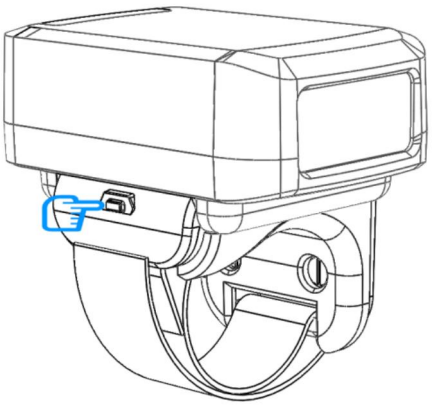


Figure 2 Push Trigger Assembly Latch In

1) Lift the Trigger Assembly off of the LR50.

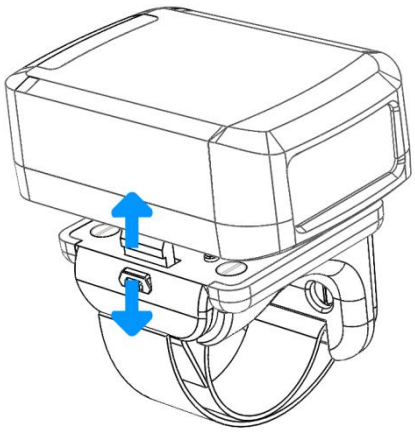


Figure 3 Lift Trigger Assembly Off LR50

2) Rotate the Trigger Assembly 180° to the other direction.

3) Align one end of the Trigger Assembly on the LR50 and push the other end down until it snaps into place.

4. Powering On

To power on the device:

- Press side scan trigger on the Trigger Assembly for 1 second.

To power off the device:

- Press side scan trigger on the Trigger Assembly for 5 seconds.

Upon successful decode, the green led flash once and an audible beep sounds.

5. Bluetooth Connection

The LR50 sends decoded barcode data to mobile computers and other devices via Bluetooth. Before using, connect the LR50 to a device using Bluetooth. See Bluetooth Communications for configuration.

6. Scanning

The LR50 uses digital camera technology to take an image of a barcode and software decoding algorithms are executed to extract the barcode data from the image.

To scan a barcode:

1) Launch a scanning application.

2) Press the Scan Trigger and aim the device at a barcode.

3) Adjust the position of the device so that the aiming dot appears at the center of the barcode.

Upon successful decode, the green led flash once and an audible beep sounds, then the finger will feel vibrations.

Mechanical Diagram

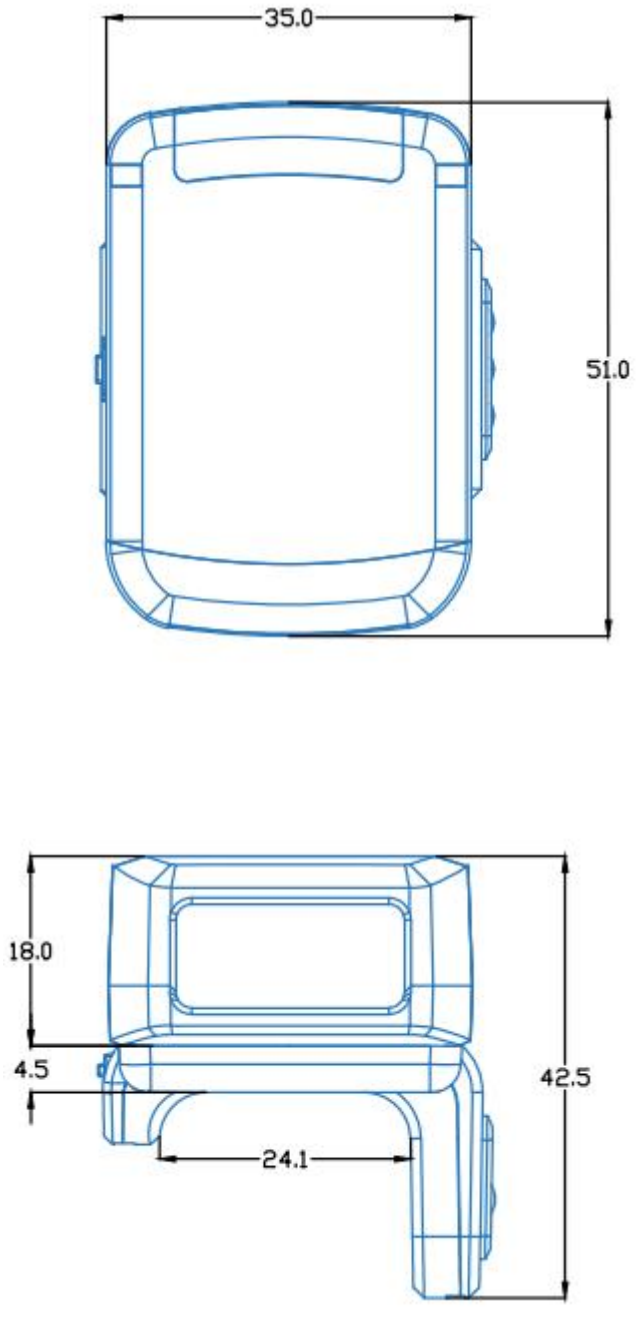


Figure 4 Mechanical Diagram

Notes

- This is a reference drawing and is not intended to specify all possible integration requirements.
- All dimensions are in mm. All untoleranced dimensions follow a general tolerance of +/- 0.2 mm.

Bluetooth Communications

1. Introduction

This chapter provides information about the modes of operation and features available for wireless communication between the LR50 and hosts. The chapter also includes the parameters necessary to configure the LR50.

To set feature values, scan a single barcode or a short barcode sequence. The settings are stored in non-volatile memory and are preserved even when the LR50 is powered down.

To return all features to default values, scan a Set Factory Defaults barcode. Throughout the programming barcode menus, default values are indicated with asterisks (*).

2. Bluetooth Connection Modes

The LR50 supports Bluetooth 5.0 and can connect to a host computer using the following Bluetooth profile through Bluetooth Low Energy (BLE) radio:

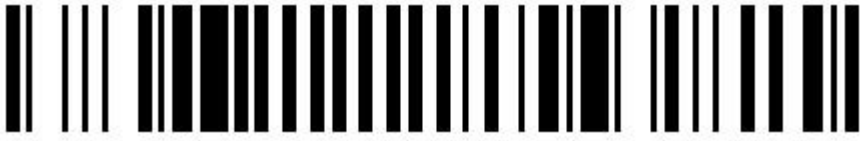
- Human Interface Device (HID Profile)
- Serial Port Profile Low Energy (SPPLE Profile, GATT Profile)

NOTE: Not all host devices support Bluetooth Low Energy. Verify that your device supports Bluetooth Low Energy mode before attempting to connect to the LR50 .

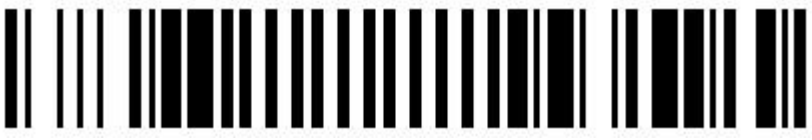
3. Keyboard Emulation

The Bluetooth Human Interface Device (HID) profile enables the LR50 to emulate a Bluetooth keyboard input device and connect to a host computer.

Bluetooth HID Barcodes



***Bluetooth HID OUTPUT**



Clear Paired Record

4. HID Options

The LR50 supports virtual keyboard emulation for the Apple iOS and Android, and keyboard emulation over the Bluetooth HID profile. In this mode the LR50 can interact with Bluetooth enabled hosts supporting the HID profile as a Bluetooth keyboard. Scanned data is transmitted to the host as keystrokes.

HID Features for Apple iOS

Parameter # 1077

This option works with Apple iOS devices to enable the opening and closing of the iOS virtual keyboard by double-clicking the scan trigger.

Disable (0)

***Enable (1)**

HID Keyboard Keystroke Delay

Parameter # 1082

This parameter sets the delay, in milliseconds, between emulated keystrokes. Scan a barcode below to increase the delay when the HID host requires a slower transmission of data.

***No Delay (0)**

Medium Delay (20)

Long Delay (50)

Country Keyboard Type Change

Parameter # 2108

While in HID mode, the RS5100 supports several keyboard layouts. To change the North American Standard Keyboards layout to a different country code layout, scan the required barcode corresponding to the country keyboard type.

***US English (0)**

French (1)

German (2)

Spanish (3)

Italian (4)

Portuguese (5)

Japanese (6)

Belgian (7)

5. Serial Port Profile Low Energy (GATT)

This enables communication with Scanner SDK for Android and iOS generated apps, and allows the host to establish a connection with the scanner over Bluetooth Low Energy radio. The scanner is discoverable (Peripheral mode).

To establish a connection (initial setup only), scan the SPPLE barcode. From the host application, select the scanner from the discovered device list.

Serial Port Profile Low Energy Barcode

Bluetooth SPPLE Output

Table 2 GATT UUID of Serial Port Profile Low Energy

UUID Type	Value	Description
Service	0x0001	The UUID of the Serial Port Profile Low Energy Service
Write	0x0002	The UUID of the RX Characteristic
Notify	0x0003	The UUID of the TX Characteristic

6. General Bluetooth Options

Bluetooth Friendly Name

Parameter # 1073

The command format is <G1073/*name*>. Place the content of the name in the *name* position of the command and generate a new name setting barcode. The default name is ”LR50”.

***LR50**

Read Device MAC Address

Parameter # 1065

Read Device MAC Address

Bluetooth Friendly Name Format

Parameter # 1322

LR50 supports a configurable name format which can be configured to operate in:

• Display the friendly name with the lase four numbers of MAC as suffix.

• Display the friendly name without any suffix.

***Display Name With MAC Suffix**

Display Name Without MAC Suffix

Radio Output Power

Parameter # 1324

LR50 uses a configurable radio which can be configured to operate in:

• Low power mode as a Class 2 device

• High power mode as Class 1 device. Bluetooth Communications Increase the radio output power to increase range.

Scan a barcode to select the desired power mode.

*Class 2 (0)

Class 1 (1)

7. LR50 Firmware Update

Parameter # 1002

Enter DFU Mode

Miscellaneous Scanner Options

1. Introduction

This chapter provides information about the modes of operation and features available for wireless communication between the LR50 and hosts. The chapter also includes the parameters necessary to configure the LR50.

To set feature values, scan a single barcode or a short barcode sequence. The settings are stored in non-volatile memory and are preserved even when the LR50 is powered down.

To return all features to default values, scan a default barcode in Default Parameters on page 116XXX. Throughout the programming barcode menus, default values are indicated with asterisks (*).

2. Set Factory Defaults

Scan the Set Factory Defaults barcode below to eliminate all custom default values and set the LR50 to factory default values (For factory default values, see Standard Default Parameters).

Set Factory Defaults

3. Beep After Good Decode and Transmission

Beeper Action

Parameter # 4001

Scan a barcode below to select whether or not the LR50 beeps after a good decode or data Transmission. If selecting Disable Beep On After Decode and Transmission, the beeper still operates during parameter menu scanning and to indicate error conditions.

*Enable Beeper After Decode (1)

Enable Beeper After Transmission (2)

Disable Beeper After Decode and Transmission (0)

Beeper Volume

Parameter # 3010

To select a beeper volume, scan the Low Volume, Medium Volume, or High Volume barcode.

Low Volume (2)

Medium Volume (1)

*High Volume (0)

Beeper Tone

Parameter # 3011

To select a beeper tone, scan one of the following barcodes.

Low Tone (2)

*Medium Tone (1)

High Tone (0)

Beeper Duration

Parameter # 2106

To select the duration for the beeper, scan one of the following barcodes.

Mute (0)

*Short (50)

Medium (100)

Long (200)

4. Vibrate After Good Decode and Transmission

Vibrator Action

Parameter # 4002

Scan a barcode below to select whether or not the LR50 vibrate after a good decode or data Transmission. If selecting Disable vibrate After Decode and Transmission, the vibrator still operates during parameter menu scanning and to indicate error conditions.

*Enable vibrator After Decode (1)

Enable vibrator After Transfer (2)

Disable vibrator After Decode and Transfer (0)

Vibrator Duration

Parameter # 2107

To select the duration for the vibrator, scan one of the following barcodes.

Disable (0)

*Short (80)

Medium (150)

Long (300)

5. Scan Data Transmission Format

The scan data will be changed into following format if the Prefix Values and Suffix Values are set correctly.

<PREFIX> <DATA> <SUFFIX>

Prefix Values

Parameter # 2042

Prefix Enter (CR and LF)

Prefix CR

Prefix TAB

*Prefix Disable

Suffix Values

Parameter # 2043

*Suffix Enter (CR and LF)

Suffix CR

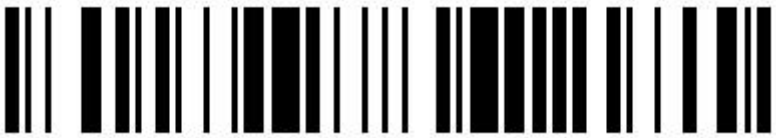
Suffix TAB

Suffix Disable

6. Miscellaneous Indicator Test

Read Hardware Infomation

Read Firmware Version



Query Battery Level

Beeper Demonstration

Parameter # 3001

Beeper On Once (1)

Beeper On Twice (2)

Beeper On 3 Times (3)

LEDs Blink Demonstration

Parameter # 101

Left Green LED Blink Once

Right Green LED Blink Once

Double Green LEDs Blink Once

Left Red LED Blink Once

Right Red LED Blink Once

Double Red LEDs Blink Once

Left Yellow LED Blink Once

Right Yellow LED Blink Once

Double Yellow LEDs Blink Once

Symbologies

Please refer to the user manual of the corresponding scan engine.

Standard Default Parameters Table

Table 3 *To be continue.....*

Maintenance and Troubleshooting

1. Introduction

This chapter provides suggested LR50 troubleshooting and maintenance.

2. Maintenance

Cleaning the scan window is the basic maintenance required. A dirty window can affect scanning performance.

• Do not allow abrasive material to touch the window.

• Remove any dirt particles with a damp cloth.

• Wipe the window using a tissue moistened with ammonia/water.

• Do not spray water or other cleaning liquids directly into the window.

3. Charging Safety Guidelines

• The area in which the LR50 units are charged should be clear of debris and combustible materials or chemicals. Particular care should be taken where the device is charged in a non-commercial environment.

• Do not use incompatible chargers. If you have any questions about the compatibility of a charger, contact Libareader Support.

• Improper battery use may result in a fire, explosion, or other hazard.

• To charge the mobile device battery, the battery and charger temperatures must be between +32°F and +104°F (0°C and +40°C)

• Do not leave or store the equipment in or near areas that might get very hot, such as in a parked vehicle or near a radiator or other heat source. Do not place battery into a microwave oven or dryer.

4. Cleaning Instructions

Approved Cleanser Active Ingredients

100% of the active ingredients in any cleaner must consist of one or some combination of the following: isopropyl alcohol, or mild dish soap.

Harmful Ingredients

The following chemicals are known to damage the plastics on the device and should not come in contact with the device: ammonia solutions, compounds of amines or ammonia; acetone; ketones; ethers; aromatic and chlorinated hydrocarbons; acqueous or alcoholic alkaline solutions; ethanolamine; toluene; trichloroethylene; benzene; carbolic acid, TB-lysoform, bleach products and hydrogen peroxide.

Cleaning Instructions

Do not apply liquid directly to the device. Dampen a soft cloth or use pre-moistened wipes. Do not wrap the device in the cloth or wipe, but gently wipe the unit. Be careful not to let liquid pool around the display window or other places. Allow the unit to air dry before use.

Cleaning Materials Required

- Alcohol wipes
- Lens tissue
- Cotton tipped applicators
- Isopropyl alcohol
- Can of compressed air with a tube.

Cleaning Frequency

The cleaning frequency is up to the customer's discretion due to the varied environments. However when used in dirty environments it may be advisable to periodically clean the scanner exit window to ensure optimum scanning performance.

Cleaning the RS5100

Housing

Using alcohol wipes, wipe the housing.

Exit Window

The exit window material is PMMA, so please do not use alcohol to clean the window to defend against destroying its clarity. Wipe the exit window periodically with a lens tissue or other material suitable for cleaning eyeglasses.

CAUTION: Do not pour, spray, or spill any liquid on the LR50.

5. Troubleshooting

Table 4 LR50 Troubleshooting

Problem	Cause	Solution
Aiming pattern does not display when pressing the Scan Trigger.	Battery is not charged.	charge the battery.
	Trigger Assembly does not respond.	Replace the Trigger Assembly.
LR50 does not decode a barcode.	Barcode is unreadable.	Verify that the barcode is not defective, i.e., smudged or damaged.
	Exit window is dirty.	Clean exit window with a lens tissue. Tissues for eyeglasses work well. Do not use tissues coated with lotion.
	Barcode symbology is not supported or enabled.	Check the symbology settings of the scan engine.
	Bluetooth link is disconnected.	Reestablish Bluetooth connection.

NOTE: If after performing these checks the LR50 still experiences problems, contact the distributor or call Libareader Support.

Technical Specifications

PRODUCT	LR50-SE	LR50-N6	LR50-LA
Scan Engine	Zebra SE4107	Honeywell N4680	E4760
Optical Resolution	1280 x 960 pixels	640 x 480 pixels (Global shutter)	640 x 480 pixels (Global shutter)
FPS	--	120 max	120 max
Physical Characteristics			
Dimensions	2.01 in. L x 1.38 in. W x 0.71 in. D (1.67 in. H with trigger)		
	51 mm L x 35 mm W x 18 mm D (42.5 mm H with trigger)		
Weight	1.55 oz./44 g	1.41 oz./40 g	1.45 oz./41 g
Battery	650 mAh Li-ion battery	500 mAh Li-ion battery	650 mAh Li-ion battery
Performance Characteristics			
Charging Time	3 Hours	2.5 Hours	3 Hours
Battery Life	14 working hours (scan every 5 seconds)	13.5 working hours (scan every 5 seconds)	15 working hours (scan every 5 seconds)
Field of View	H:44.5°, V:33.5°	H:40°, V:30°	H:39°, V:30°
Scan View	Skew:±60°, Pitch:±60°, Roll: 360°	Skew:±60°, Pitch:±60°, Roll: 360°	Skew:±55°, Pitch:±55°, Roll: 360°
Aiming Element	Green LED	Red LED Dot	Red Laser Pattern
Illumination Element	1 Warm-White LED	1 White LED	1 White LED
Resolution	1D: 3mil, 2D: 5mil	1D: 3mil	1D: 3mil, 2D: 5mil
Decode Range (20 Mil QR)	30 mm to 356 mm [1.2 in to 14 in]	36 mm to 367 mm [1.4 in to 14.5 in]	30 mm to 330 mm [1.2 in to 10.8 in]
Offline Memory	1MBytes (63K records of UPC-A)		
LED	2 RGB LEDs located at the top side of the device (programmable)		
Beeper	Up to 85 dB @ 10 cm (programmable)		
Vibration	Inside the ring trigger (programmable)		
Button Trigger	Manual ambidextrous trigger with a long life of 5 million cycles		
Touch Trigger	(Optional)		
User Interface			
LED	2 RGB LEDs located at the top side of the device (programmable)		
Beeper	Up to 85 dB @ 10 cm (programmable)		
Vibration	Inside the ring trigger (programmable)		
Restore Key	User accessible for emergency shutdown		
Button Trigger	Manual ambidextrous trigger with a long life of 5 million cycles		
Touch Trigger	(Optional)		
User Environment			
Operating Temp.	32℉ to 113℉ / 0℃ to 45℃		

Storage Temp.	14℉ to 113℉ / -10℃ to 45℃
Humidity	5% - 95% non condensing
Drop Spec.	Multiple 6 ft./1.8 m drops to concrete
Tumble Spec.	1,000 1.64 ft./0.5 m tumbles
Vibration	Sine 5-2000Hz, 4g peak, 1 hour per axis; Random 20-2000Hz, 6g RMS or 0.04g2/Hz, 1 hour per axis
Electrostatic Discharge (ESD)	±15kVdc air discharge; ±8kVdc contact discharge
Peripherals and Accessories	
USB magnet charging cable; spare trigger mounts	
Bluetooth	
Class 1 and 2, Bluetooth Low Energy 5.0	
Supporting profiles: Human Interface Device Profile (HID), GATT General Profile, Battery Service (BAS)	
Warranty	
1 (one) year from the date of shipment.	
Regulatory	
CE, RoHS, FCC	
Decode Range LR50-SE	
Symbology	Near/Far
Code 39: 5 mil	2.4 in./6.1 cm to 9.5 in./24.1 cm
Code 128: 5 mil	2.8 in./7.1 cm to 9.0 in./22.9 cm
PDF417: 6.67 mil	2.4 in./6.1 cm to 8.0 in./20.3 cm
UPCA: 100%	1.8 in./4.6 cm to19.5 in./49.5 cm
DataMatrix: 10 mil	2.9 in./7.4 cm to 8.5 in./21.6 cm
QR Code: 20 mil	1.2 in./3.0 cm to 14.0 in./35.6 cm
Decode Range LR50-N6	
Symbology	Near/Far
Code 39: 5 mil	1.8 in./4.5 cm to 7.1 in./18.0 cm
Code 128: 5 mil	2.2 in./5.6 cm to 6.2 in./15.8 cm
PDF417: 7 mil	2.2 in./5.5 cm to 6.4 in./16.3 cm
UPCA 100%: 13 mil	1.8 in./4.6 cm to 15.4 in./39.0 cm
DataMatrix: 10 mil	1.8 in./4.0 cm to 7.2 in./18.2 cm
QR Code: 20 mil	1.4 in./3.6 cm to 14.5 in./36.7 cm
Decode Range LR50-LA	
Symbology	Near/Far
Code 39: 4.2 mil	2.0 in./5.0 cm to 6.3 in./16.0 cm
Code 39: 7.5 mil	2.0 in./5.0 cm to 6.9 in./17.5 cm
Code 128: 14 mil	3.7 in./9.5 cm to 16.1 in./41.0 cm
UPCA: 100%	2.0 in./5.0 cm to 11.4 in./29.0 cm
DataMatrix: 10 mil	2.4 in./6.0 cm to 7.9 in./20.0 cm
QR Code: 25 mil	1.6 in./4.0 cm to 17.1 in./43.5 cm