

RL177 Micropower Reader

User Manual

- ◆ Before you use this product, please read this manual carefully, and properly keep it for future reference.
- ◆ Due to continuous improvements, there might be changed without advanced notice.
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1. Product Overview

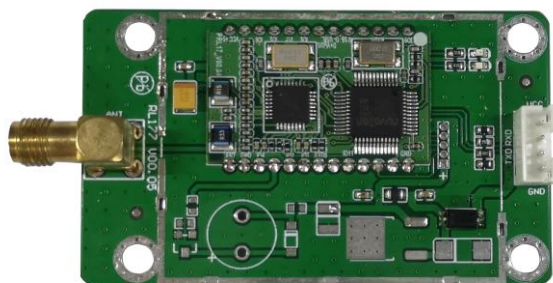
1.1. Introduction

The product complies with ISO 15693 and ISO 18000-3M1 protocol standards, has high-sensitivity read-write performance and fast anti-collision processing algorithms, and is widely used in desktop card issuance, access control, electronic bills, library and finance and other fields.

1.2. Product Features

- Operating Frequency: 13.56 MHz
- Complied with ISO 15693 and ISO 18000-3M1 Protocols
- Able to read multiple cards simultaneously
- Reading Range: 0~20cm
- Communication Interface: TTL
- Power Supply: DC5V

1.3. Pictures



RL177

1.4. Main Parameters

The detailed technical parameters of the products are as follows:

Table 1 Main Parameter Description

Parameters/Model	RL177
Operating Frequency	13.56Mhz
Support Standard	ISO 15693, ISO 18000-3M1
Antenna Interface	SMA×1
Communication Interface	RS232- TTL
Power Supply	DC 5V
Dimension	63.48×37.8×10mm

! Tips

- ① Dimensions parameters are approximate. Please refer to the actual size.
- ② Due to continuous improvement of our products, technical parameters might be changed without notice.

2. Hardware Interface Description

2.1. TTL

The communication interface of this product adopts a 2.0mm PH-4 connector, and the communication mode is TTL. Among them, the communication interface (TTL) and the power interface (DC 5V) share the same ground wire, as shown in the figure below:

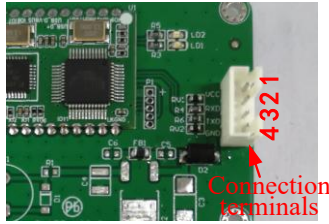


Figure 1 Communication Interface

Terminal Definition:

Table 2 Terminal Definition Description

Interface Name	Pin Terminal	Definition
Power Interface	Pin1	VCC
	Pin4	GND
Serial Port	Pin2	RXD-TTL
	Pin3	TXD-TTL
	Pin4	GND

2.2. Antenna Interface

The antenna connector of this product uses a standard UFL-R-SMT male connector, with a matching impedance of $50\ \Omega$, as shown in the figure below:

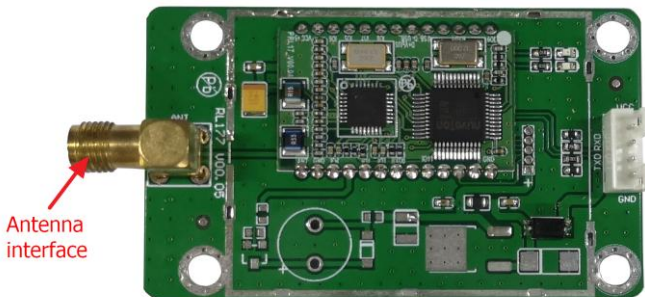


Figure 2 Antenna Interface

3. Indicator Light Description

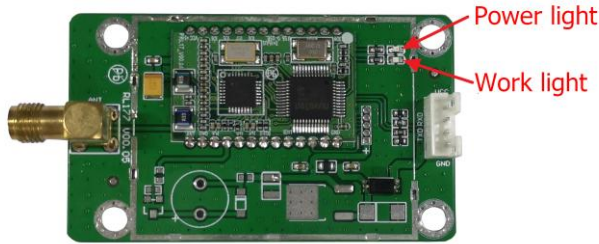


Figure 3 Indicator light

Table 3 Description of the indicator light

Type	Mark/Position	Name	Functional Description
Device Indicator Light	LD2	Power light	After the device is normally powered on, this light flashes red, and the light is off when the power is abnormal.
	LD1	Work light	When the tag is detected, the light is blue. Otherwise, the light is off.

4. Installation Description

The device can be used without installation. Dimension descriptions are shown as below (unit: mm).

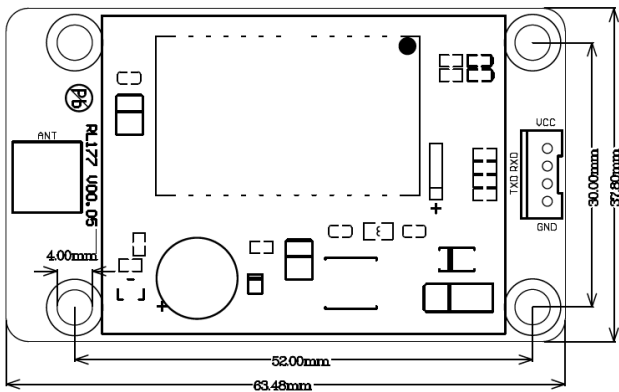


Figure 4 Dimension description

5. Device Connection

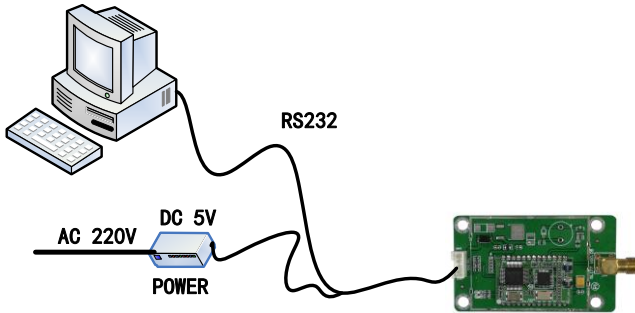


Figure 5 Connection diagram

6. Device Configuration And Test Instructions

6.1. Connection Description

Please refer to the previous section to connect the device. After the device connected and powered, open the R-Tool file folder and double click the file

 **R-Tool** to start the configuration tool as shown below:

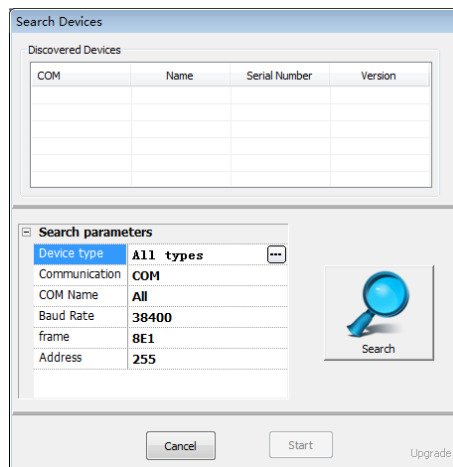


Figure 6 R-Tool interface

Select the corresponding communication method according to the actual interface

type used by the device. Select “COM” for [communication] in [Search Parameters]. Select “ALL” for [COM NAME], “38400” for [Baud Rate], “811” for [Frame] and “255” for [Address] , click the search button to search for the device. After the device is found, the device information will be automatically displayed in the "Discovered Devices" list, as shown in the figure below:

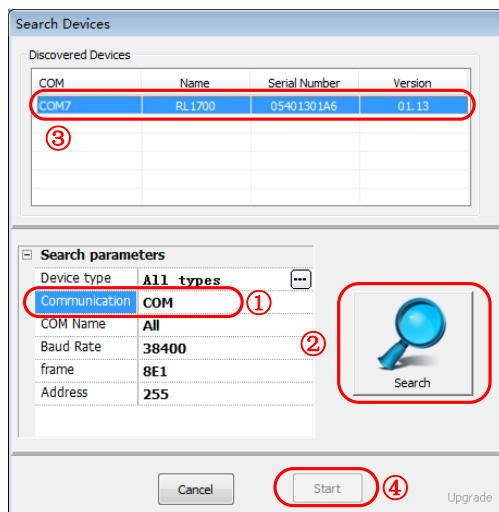


Figure 7 Connection step for RS232 interface

Click “Start” (as Step ④ in the figure above) to enter the main interface of the test software.

6.2. Parameters Setting

6.2.1. Communication Interface

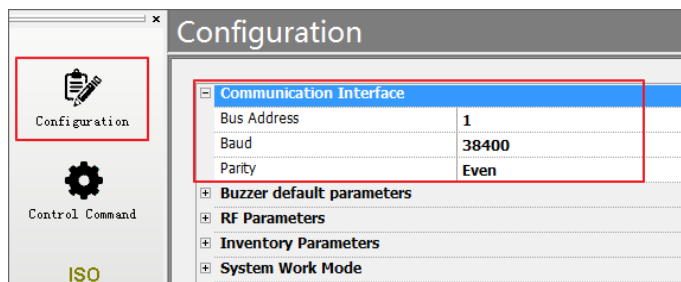


Figure 8 Configuration interface for communication interface

- **Bus address:** between 1-255
- **Baud Rate:** 9600, 19200, 38400, 57600, 115200, 230400
- **Parity check type:** None, Odd, Even

6.2.2. Buzzer Default Parameters

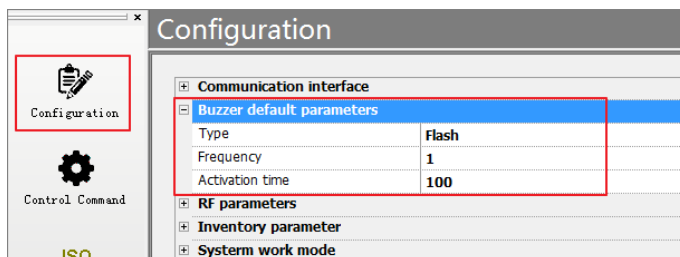


Figure 9 Configuration interface for buzzer default parameters

- **Type:** Unchanged, On, Off, Flash.
- **Frequency:** value range from 0 to 255, only applicable for the Flash type.
- **Activation time:** the frequency of buzzer, only applicable for the Flash type.

Note: The V00.01 version of the device does not support this function temporarily.

6.2.3. RF Parameters

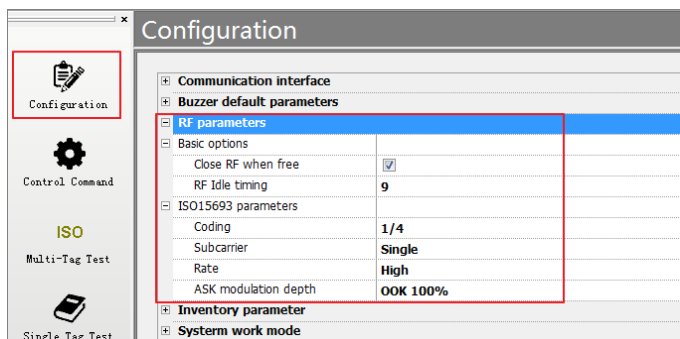


Figure 10 Configuration interface for RF parameters

- **Basic options**
 1. Close RF when free: At host control mode, the device will automatically turn

off the RF if it does not receive a command of card reading or opening the RF.

2. RF Idle timing: Value range: 0-256. Reader will be switched into idle mode if there's no operation in the time that has been set.

● Parameters of ISO15693

1. Coding: 1/4,1/256
2. Subcarrier: Single, Double
3. Rate: High, Low
4. ASK Modulation Depth: Select the appropriate value based on the actual application

6.2.4. Inventory Parameters

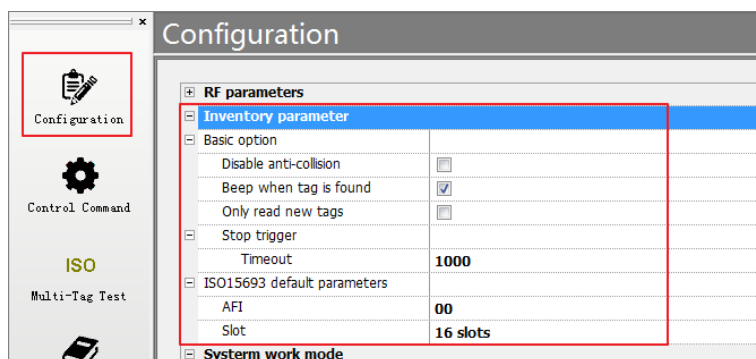


Figure 11 Configuration interface for inventory parameters

● Basic Options

1. Disable anti-collision: Whether to turn off anti-collision function or not
2. Beep when tag is found: Whether to buzz when a tag is found
3. Only read new tags: When a tag keep being in the antenna area, it can only be read once
4. Stop trigger—Timeout: Set the time when the trigger timed out to stop (unit: ms)

● ISO15963 default parameters

1. AFI: 00-FF. NOTE: 00 means not to enable
2. Slot: 1 shot, 16 shot

6.2.5. System Work Mode

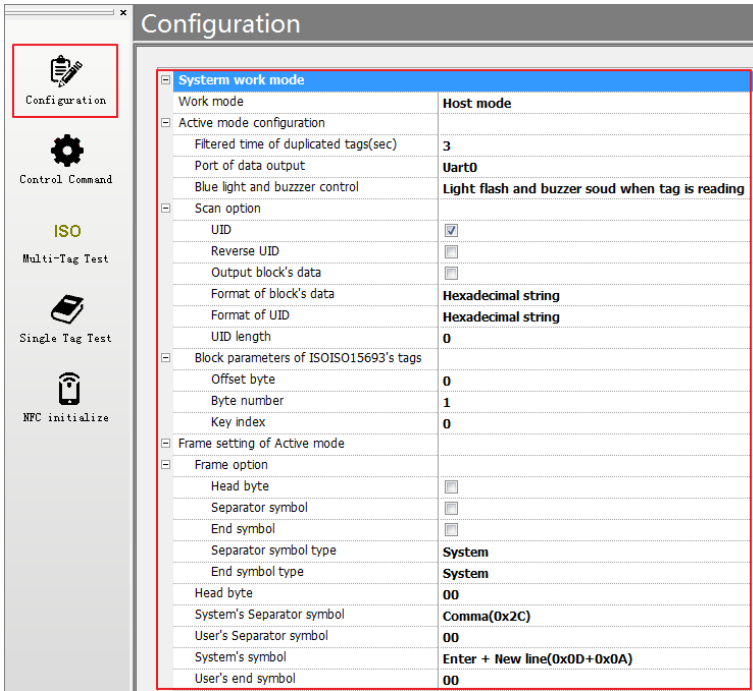


Figure 12 System work mode interface

- **Work Mode**

1. Host Mode: The host software is required to send commands
2. Active Mode: Automatic invention is available without the host software sending commands, and the active mode scan configuration should be configured in advance when set to active mode.

- **Active Mode Configuration**

1. Filtered time of duplicated tag(sec): The tag can only be counted again beyond the specified time.
2. Port of data output: Uart1 output, USBHID output, keyboard emulation output, Wiegand 26, Wiegand 34.
3. Blue light and buzzer control:

- ① Flash and buzz when a tag is found.

- ② Control by LED of micro-farming access.

4. Scan option:

- ① Output UID: Output the tag UID.
- ② Reverse UID: Output the reversed tag UID.
- ③ Output the block's data: Output the block's data content (the security status byte not included).

- ④ Format of the block's data:

Each byte is output in hexadecimal string.

Each byte is output transferred to the ASCII code.

- ⑤ Format of UID:

A. Format as hex string.

B. Format as LSB 3 bytes convert to integer string.

C. Format as LSB 4 bytes convert to integer string.

D. Format as compliant with Wiegand.

E. Format as compliant with Wiegand fix 8 bytes.

- ⑥ UID length: 0-8, 0 for unlimited length, output of a complete UID.

5. Block parameters of ISO15693's tags:

Offset byte: Offset of the first byte to be read

Byte number: Number of bytes to be read

● **Frame setting of active mode**

1. Frame option:

- ① Head byte: whether to output custom frame header byte.
- ② Separator symbol: whether to output a custom separator.
- ③ End symbol: whether to output custom terminator.
- ④ Separator Symbol type: system separator, custom separator.
- ⑤ End symbol type: system terminator, custom terminator.

2. User-defined frame header byte: Specify the frame header byte, need to enable the output frame header byte, the value range is 00-FF.

3. System's separator symbol: optional: comma 0x2C, space 0x20, TAB 0x07, semicolon 0x3B, line feed 0x0A, carriage return 0x0D, carriage return line feed

0x0D+0x0A

4. User's separator: Specify a user-defined separator, you need to enable the separator as a custom separator, and the value range is 00-FF.

5. System's symbol: optional: comma 0x2C, space 0x20, TAB 0x07, semicolon 0x3B, line feed 0x0A, carriage return 0x0D, carriage return line feed 0x0D+0x0A.

6. User's end symbol: Specify the user-defined end character, you need to enable the end character to be a custom end character, and the value range is 00-FF.

NOTE: Configurations above are common ones. If there's extra requirement of configuration, please contact our technology staff.

6.3. Testing

6.3.1. Multi-Tag Inventory Testing

Click "Multi-Tags Test" after starting R-Tool, as shown in Figure 13, Step ①, ②, ③.

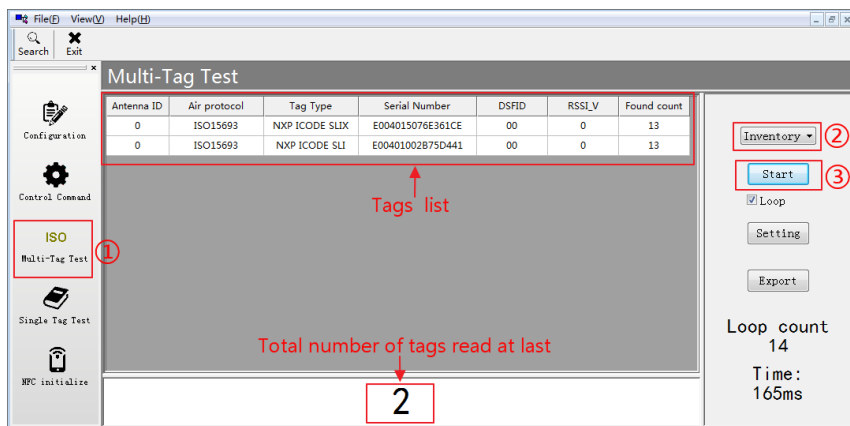


Figure 13 Multi-Tag inventory test steps

Note:

Step 1: Select the menu "ISO Multi-Tag Test" in R-Tool interface;

Step 2: Select the "Inventory" in the drop-down list above the "Start" button;

Step 3: Click the "Start" button to carry out the inventory testing.

6.3.2. Single-Tag Operation Test

Click “Single Tag Test” after starting R-Tool, as shown in Figure 14, Step ①, ②, ③, ④, ⑤.

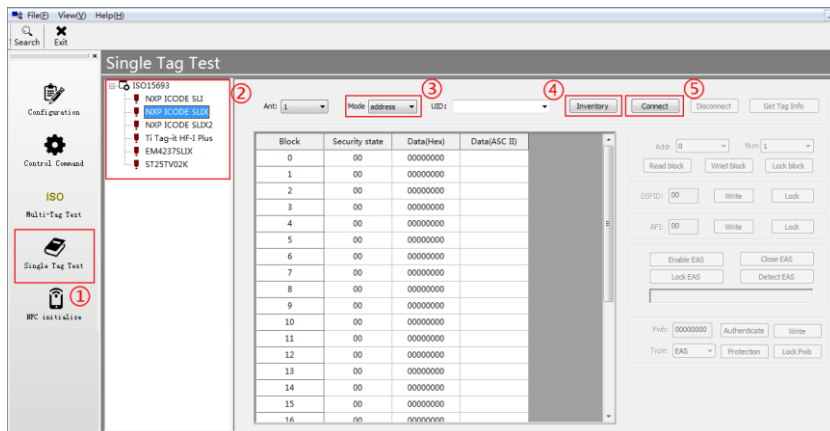


Figure 14 Single tag test steps

NOTE:

Step 1: Select the menu "Single Tag Test" in R-Tool interface;

Step 2: Select the type of tag to be operated in "Single Tag Test" interface;

Step 3: mode: none address; address.

1) For a single tag, select the "none address" mode.

2) For multiple tags, select the "address" mode.

Step 4: Click the "Inventory" button to display the UID list in UID drop-down box.

Step 5: 1) For a single tag: click the "Connect" button;

2) For multiple tags: in UID drop-down box, select the tags required to be operated, and then click the "Connect" button;

After above steps, Reading and Writing are available as shown below:

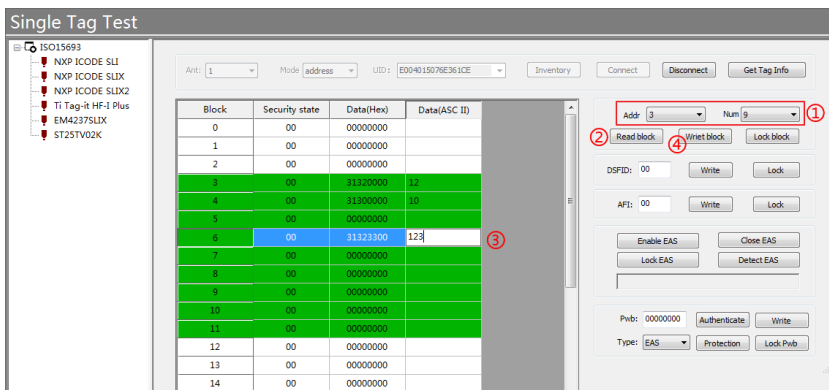


Figure 15 Single Tag Test Descriptions

Steps:

1) Set the data block of the tag to be operated in the [Addr] drop-down box and the [Num] drop-down box. After setting, the operable data block is displayed in green indicating that it can be operated;

2) Click [Read Block] to read the data value of the data block selected in step 1;

3) Write the value in the line (green area) of the data block whose value should be written, and then click [Write Block];

4) After the operation is completed, click the [Disconnect] button to disconnect the tag connection.

7. Troubleshooting of FAQs

1) The indicator of the reader is off:

Failure analysis:

- ① There is a problem or poor contact in the reader's communication interface;
- ② The reader indicator is broken.

Troubleshooting method: reconnect the reader or change a USB cable to connect the reader:

① The indicator is off and the reader cannot function: There might be a reader MCU failure;

② The reader can read normally, but the light is still off: Reader indicator might be

broken.

2) The reader works but the tag cannot be read normally:

Failure analysis:

- ① The tag is damaged;
- ② The performance of the antenna board is unstable or the device has poor contact.

Troubleshooting method:

Please check whether the tag is damaged, and carry out another test with a new tag.

If the new tag can be read normally, it means the tag is damaged; if the tag cannot be read, there might be an MCU error or the antenna of the reader is broken. Please contact the technology staff for maintenance services.

8. Technical Support

➤ **URL for downloading development data and testing operation**

<https://www.gzandea.com/download.php>

➤ **TEL for Technical support and equipment debugging**

Mobile phone: 138 0251 4535 180 2712 4253

Fixed telephone: 020-32039552

Caution: The user is cautioned that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which 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 or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



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