



RF-M6004 Reader User's Manual

Shenzhen Nation RFID Technology Co, Ltd

**Welcome you to be the user of
Nation RFID products!**



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Safety Instructions

Your safety is extremely important. Read and follow all warnings and cautions in this document before handling and operating Invengo equipment. You can be seriously injured, and equipment and data can be damaged if you do not follow the cautions.

Warning

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

1 Product Overview

1.1 Product characteristics

RF-M6004 RF module is a high-performance RFID module designed and developed by Nation RFID. It is equipped with four SMA antenna interfaces. It has the leading reception sensitivity in the industry. The single tag recognition rate is fast, and the multi-tag processing ability is strong. At the same time, the reading and writing module adopts independent die opening, all-aluminium die casting, exquisite appearance, excellent heat dissipation performance.

1.2 Main uses and scope of application

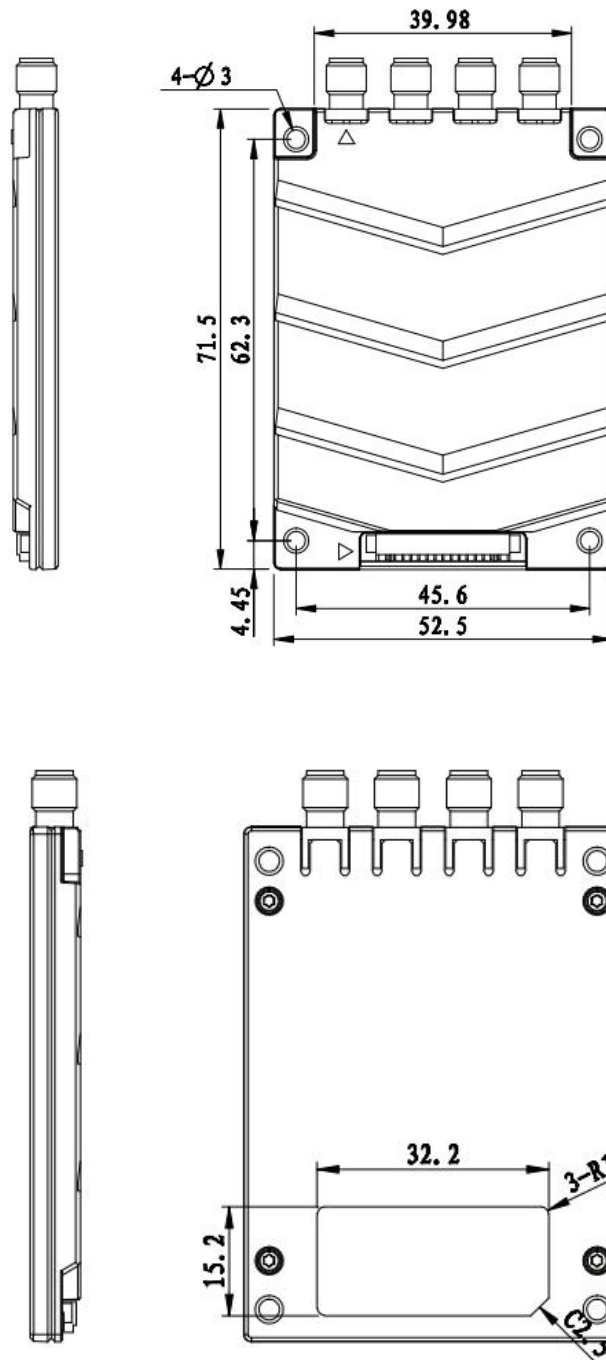
RF-M6004 RF module has the characteristics of fast single tag identification, long tag reading distance and strong multi-tag processing ability. It is widely used in challenging application fields such as warehousing, logistics, clothing, production line management, etc. It can effectively improve the overall work efficiency and reduce the error rate.。

1.3 environment condition

- working temperature: $-20^{\circ}\text{C} \sim +55^{\circ}\text{C}$
- Storage temperature: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Humidity range: 5% $\sim$ 95%RH
- Power supply: DC +3.5V $\sim$ +17V

1.4 Shape size

The volume parameters of RF-M6004 RF module are as follows: : 71.5mm x 52.5mm x 7.2mm



2 Demo Operational instructions

2.1 About Demo Software

The Demo software is used to set system parameters and perform write/read operation on Nation RFID RF-M6004 series reader and ISO compliant transponders

2.2 Demo System Requirements

● Supported Operating Systems

Windows Server 2003; Windows XP Service Pack 2; Windows Vista; Windows 7 ; Windows 10

These systems are 64-bit operating system. The USB driver does not support 64- bit OS for the time being..

● Required Software

Windows Installer 3.0 is required. Windows Installer 3.1 or later is recommended. IE 5.01 or later is required: for installing the .NET Framework.

● Recommended hardware requirements

CPU: Pentium 4 at 1.7 GHz or above

Memory: min. 512MB

2.3 technical terms

TID: Tag identifier

EPC: Electronic product code

RSSI: Received signal strength indicator

LBT: Listen before Talk

DRM: Dense reader mode

Q: Slot count parameters

2.4 Demonstration software operation

2.4.1 Connect Reader

All functions can be operated only after successful connection.

2.4.1.1 Serial Communication Connection

Double-click on the icon  to start Demo software. Each icon in the main interface toolbar is gray to indicate that the reader is not connected yet. In the “Device Connection” option list, select the communication mode “RS232 Connection”, “Param” select “COM?” (Selected PC serial slogans) and select the communication rate “115200” (default value), and click “Confirm”. as shown in Figure 1.

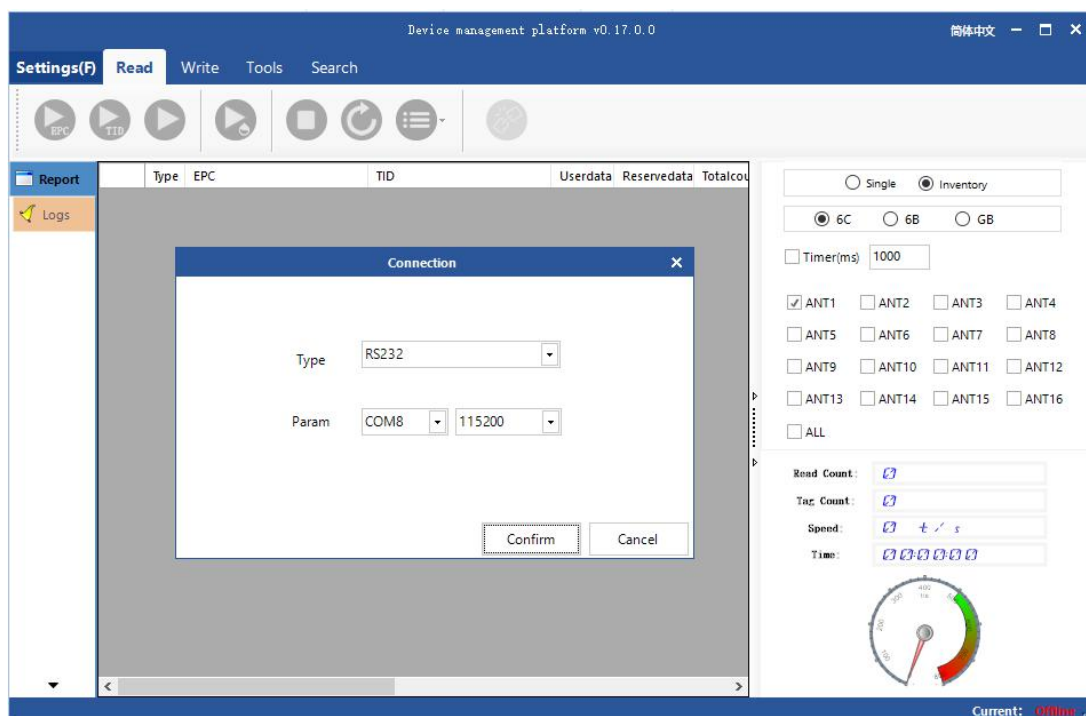


Figure 1: RS232 Selected

If the connection is successfully established, the icons in the toolbar are lit up, as shown in Figure 2, indicating that the serial connection is successful.

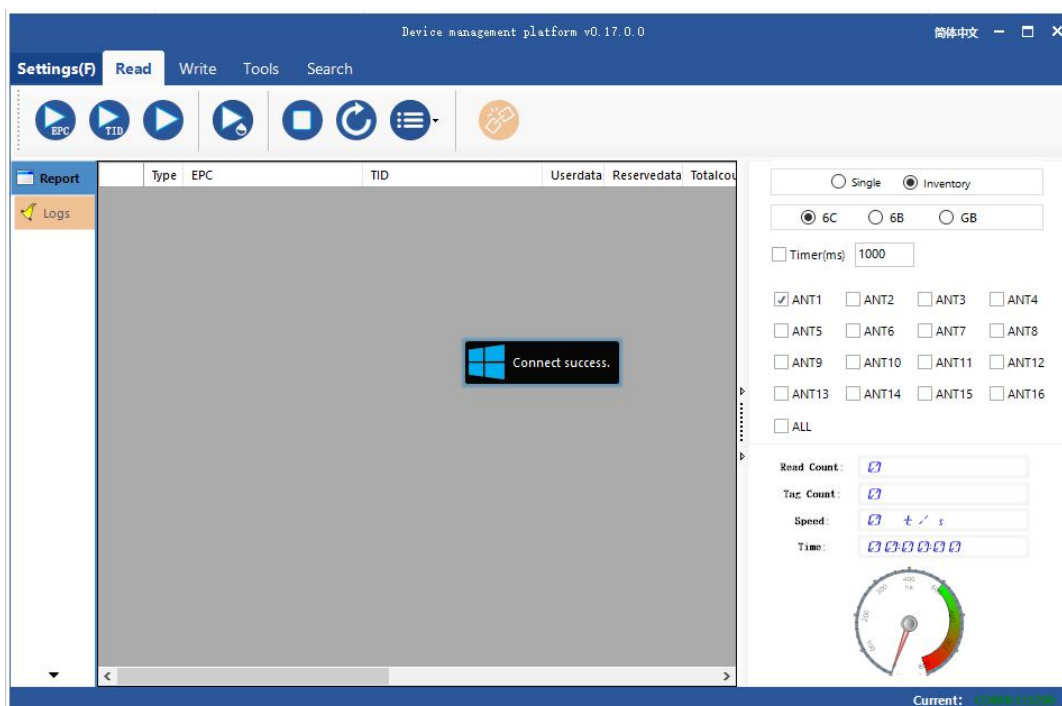


Figure 2: RS232 Successful connection

2.4.2 Data display area

Click  on the button, The data display area will be displayed, as shown in Figure 3.

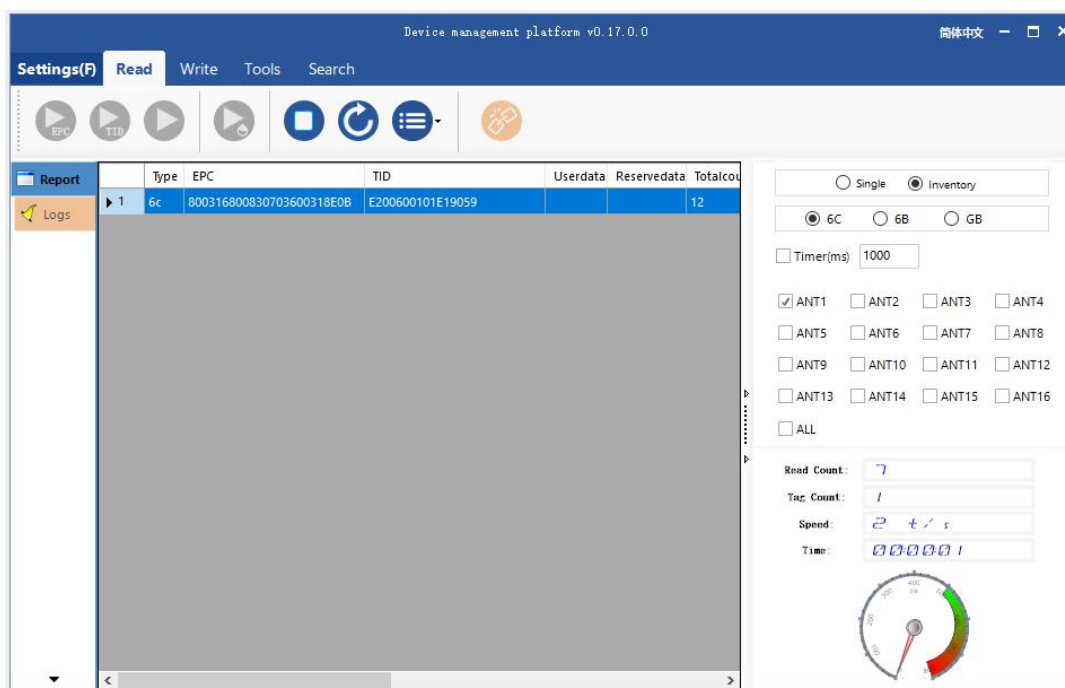


Figure 3: Data Display Area Parameter Meaning

Type: Label type: 6C、6B、GB Three kinds;

EPC: EPC Data of Labels;

TID: TID Data of Labels;

UserData: User data area;

ReserveData: Reserved area data, label password data, etc;

TotalCount: Total number of tag reads;

ANT1: Number of Reads of Antenna No.1;

ANT2: Number of Reads of Antenna No.2;

ANT3: Number of Reads of Antenna No.3;

ANT4: Number of Reads of Antenna No.4;

ANT5: Number of Reads of Antenna No.5;

ANT6: Number of Reads of Antenna No.6;

ANT7: Number of Reads of Antenna No.7;

ANT8: Number of Reads of Antenna No.8;

RSSI: signal intensity;

Frequency: Current Read Label Frequency Point ;

Phase: Current read tag phase value;

ReadTime: Read time.

2.4.2.1 Read EPC

Clickon  the button, The data display area displays the EPC data currently read.

If you want to read EPC data of custom length, see Custom Reading.

2.4.2.2 Read TID

Clickon  the button, The data display area displays EPC and TID data currently read to the tag.

If you want to read TID data of custom length, see Custom Reading.

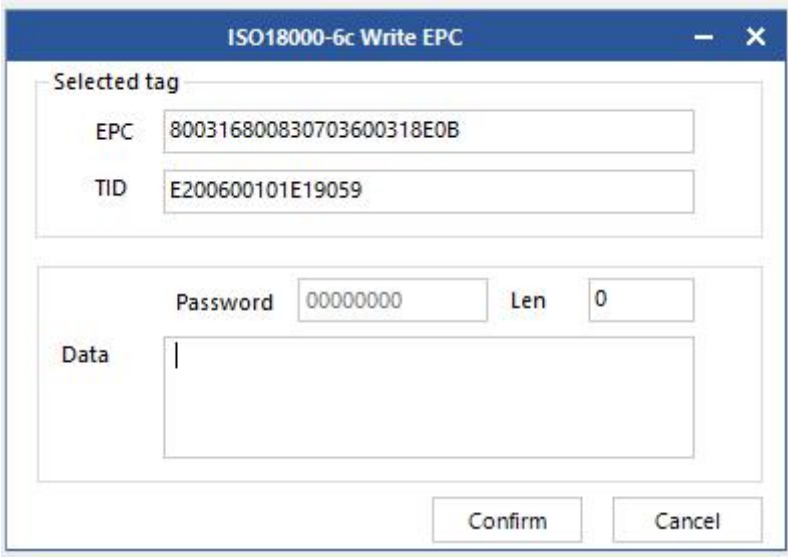
2.4.2.3 STOP

Click  on the button, Stop the current card reading operation.

2.4.3 Write data

2.4.3.1 Write EPC data

Select “Write Card” -> Click  the button to pop up the dialog box in the main interface, As shown in Figure 4:



The dialog box titled "ISO18000-6c Write EPC" contains the following fields and controls:

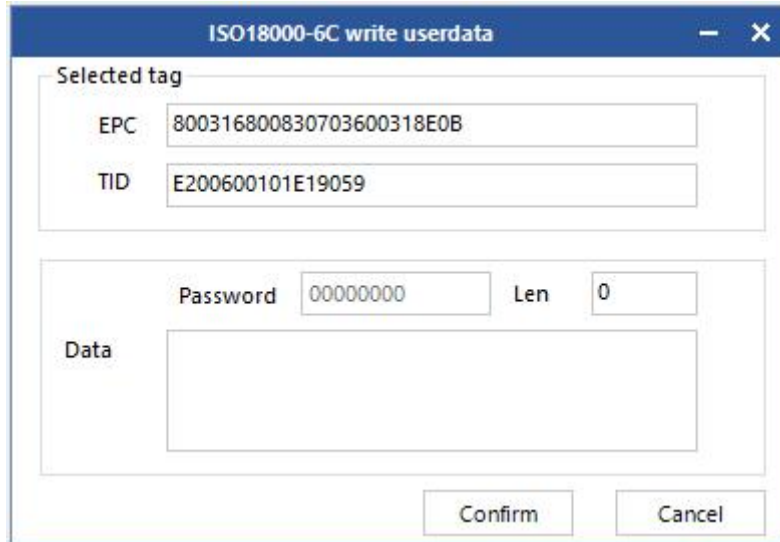
- Selected tag** section:
 - EPC**: Text box containing "800316800830703600318E0B"
 - TID**: Text box containing "E200600101E19059"
- Data** section:
 - Password**: Text box containing "00000000"
 - Len**: Text box containing "0"
 - Data**: Large text area for entering data, currently empty.
- Buttons**: "Confirm" and "Cancel" buttons at the bottom right.

Figure 4: Write EPC data

Select a label data that has been read (Data contains TID information), Fill in EPC data (hexadecimal string), Click “Confirm”.

2.4.3.2 Write user data

The main interface chooses “write card” -> click  the button to pop up the dialog box, as shown in Figure 5 below.



The image shows a software dialog box titled "ISO18000-6C write userdata". It has a blue header bar with the title and standard window controls (minimize, maximize, close). The main area is divided into sections. The "Selected tag" section contains two input fields: "EPC" with the value "800316800830703600318E0B" and "TID" with the value "E200600101E19059". Below this is a "Data" section containing a "Password" field with "00000000", a "Len" field with "0", and a large empty text area. At the bottom right are "Confirm" and "Cancel" buttons.

Selected tag	
EPC	800316800830703600318E0B
TID	E200600101E19059

Data	
Password	00000000
Len	0

Confirm Cancel

Figure 5: Write user data

Select a label data that has been read (data contains TID information), fill in user data (16-digit string), and click “Confirm”.

2.4.4 Equipment configuration

The Demo main interface chooses “Device Control”→“Device Configuration” and pops up the “Device Configuration” dialog box, as shown in Figure 6.

The screenshot shows a 'Device settings' window with a sidebar on the left containing 'Base', 'WIFI', 'GPIO', and 'Cus-1'. The 'Base' tab is selected. The main area is divided into several sections: 'RS232' with a 'Baudrate' dropdown set to '115200 bps' and 'Get'/'Set' buttons; 'RS485' with a 'Baudrate' dropdown set to '115200 bps' and a '1' input field, also with 'Get'/'Set' buttons; 'Ethernet' with radio buttons for '[Static IP]' (selected) and '[Auto IP]', and input fields for 'IP' (192.168.1.168), 'Mask' (255.255.255.0), 'Gateway' (192.168.1.1), 'DNS1' (114.114.114.114), and 'DNS2' (8.8.8.8), with 'Get'/'Set' buttons at the bottom; 'Time' with a date/time input field showing '2000.01.01 08:24:04' and 'Get'/'Set' buttons; 'MAC' with an input field showing '42-A8-3F-4B-79-D1' and a 'Get' button; and 'Client/Server' with radio buttons for 'Server' (selected) and 'Client', input fields for '8160' and '192.168.1.2', and 'Get'/'Set' buttons.

Figure 6: Equipment configuration

The upper left of the window is the serial port parameters. As shown in Figure 7, click “Get” to get the serial port communication baud rate parameters of the reader, and click “Set” to set the serial port communication baud rate of the reader. The baud rate is 9600 bps, 19200 bps, 115200 bps, 230400 BPS and 460800 bps. Others do not support it. The default reader is 115200 bps.

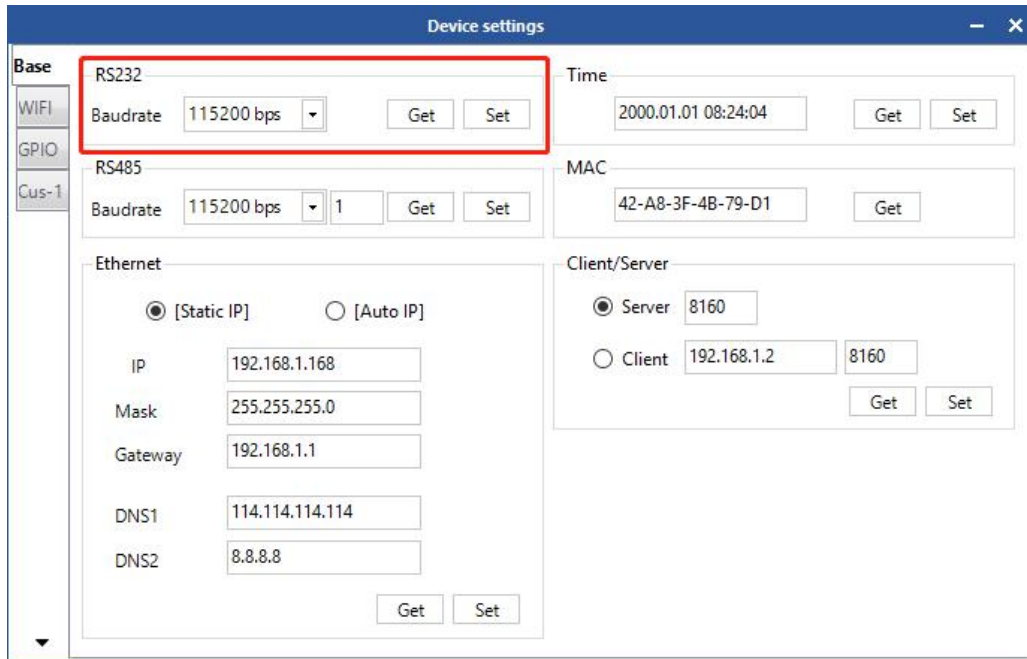


Figure 7: Serial port parameters

2.4.5 EPC baseband parameters

The upper left of the window is the EPC baseband parameters. As shown in Figure 8, click “Get” to get the EPC baseband parameters of the reader and writer. Click “Set” to set reader EPC baseband parameters.

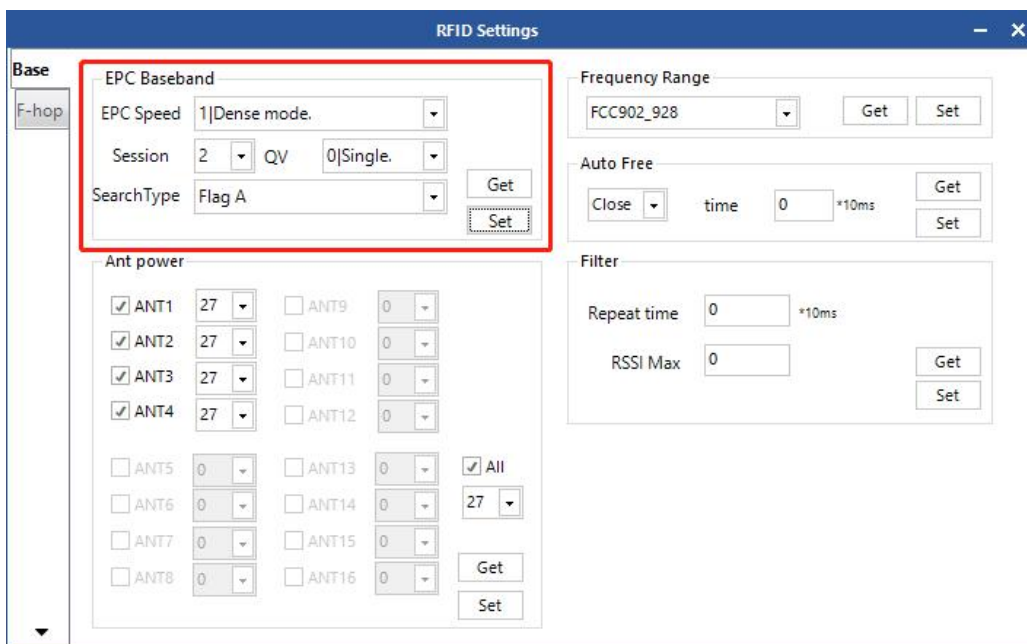


Figure 8: Baseband parameter configuration

Changing the configuration of baseband parameters can change the actual effect of reading and writing (it can be reasonably configured according to the application scenario, but it needs to be operated under the guidance of our engineers).

EPC baseband rate provides six choices:

Tair = 25us, FM0, LHF = 40KHz; intensive reading mode;

Tair = 25us, Miller 4, LHF = 300KHz; Fast read mode;

Tari = 25us, Miller 4, LHF = 320KHz; 255/AUTO.

Session offers four options:

0; 1; 2; 3.

Q value provides sixteen choices:

0/Single label ; 1; 2; 3; 4/Multi-label; 5; 6; 7; 8; 9; 10; 11;
12; 13; 14; 15.

Label search provides three options:

A-side inventory;

B-B-side inventory;

C-A|B-side inventory.

2.4.6 Antenna Port Power Configuration

The antenna power is at the bottom left of the window. As shown in Figure 9, the reader antenna power can be obtained by clicking “Get”. Click “Set” to set the reader antenna power.

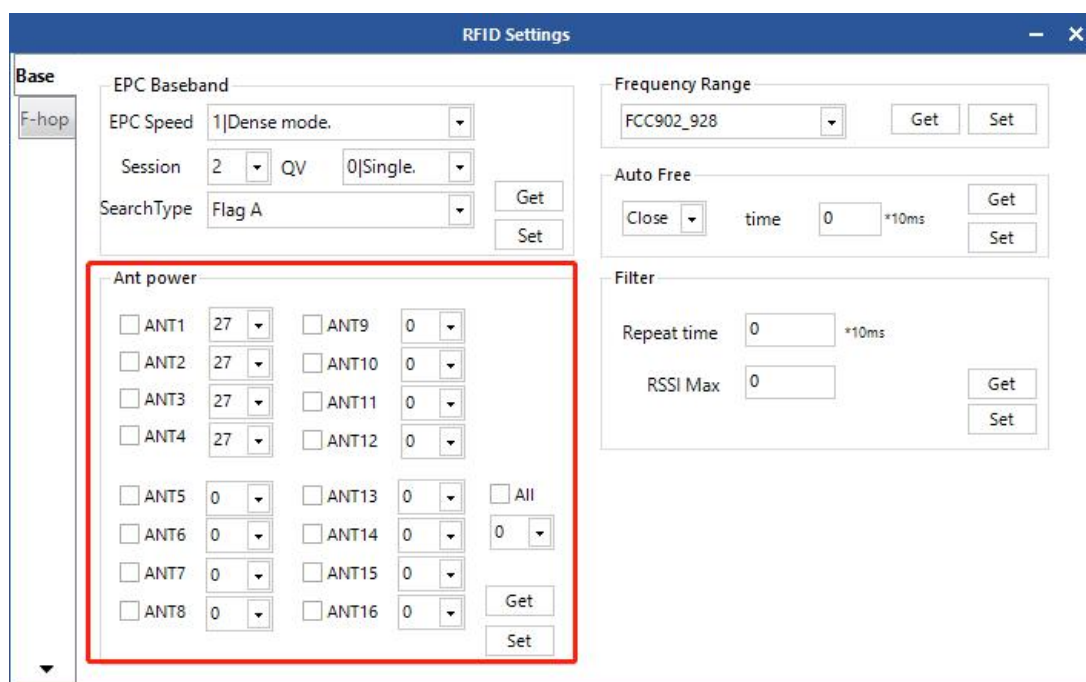


Figure 9: Antenna Port Power Configuration

Check the corresponding antenna port (the external antenna has been connected), select the corresponding power value from the list of power values, click Settings, and pop up the prompt box for successful configuration.

2.4.7 Frequency Hopping Management

Select frequency hopping in the left menu bar of the RFID configuration, as shown in Figure 10. Select “FCC902-928MHz” in the “Frequency” drop-down list as shown in Figure 11, from the left frequency list box, click “>” the button and import it into the right list box, then click “Set” to

determine. if you want to select the full frequency hopping, click “>>”, then click on the right side. The list box shows all the frequencies in this band. Click “Set” to see Figure 12. If you click “<<” on the right list box, all frequencies will be cleared.

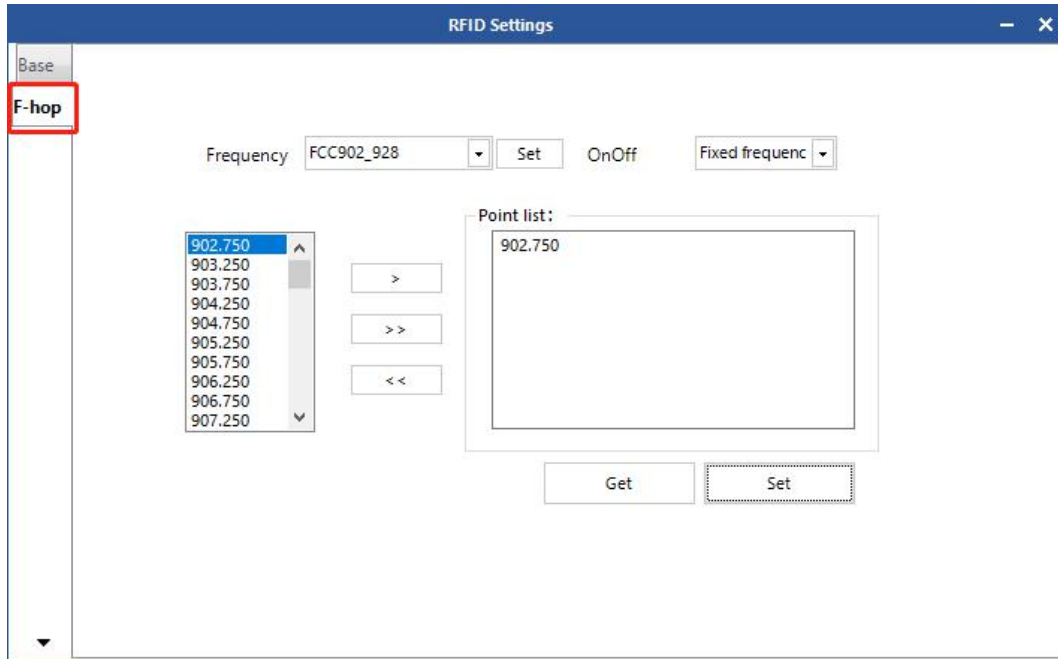


Figure 10: Frequency Hopping Management

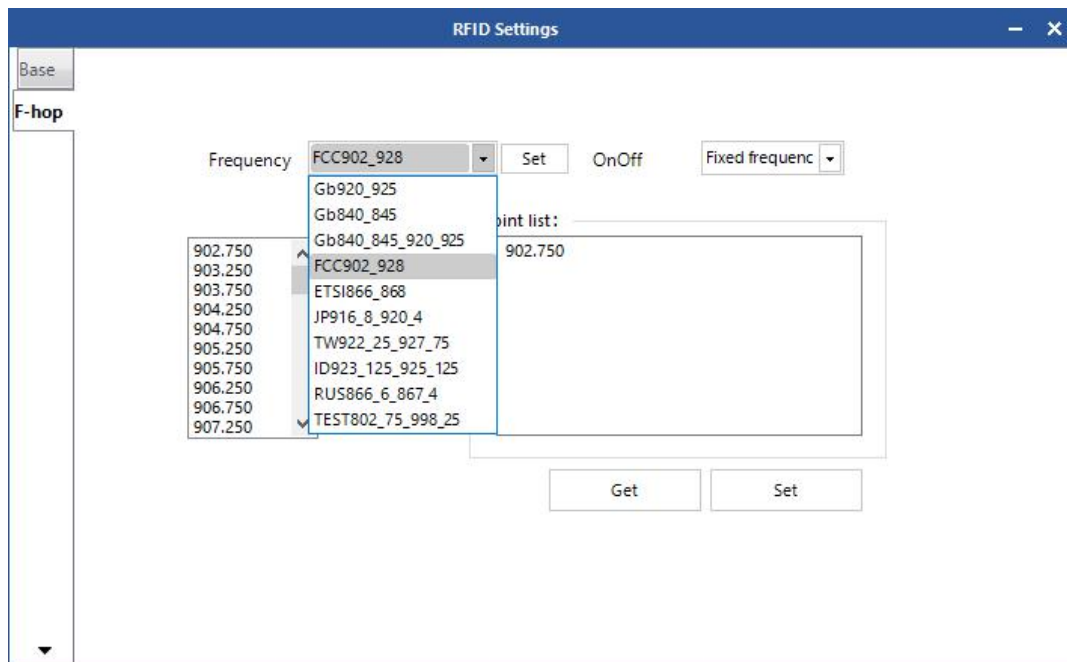


Figure 11: Selection of working frequency band

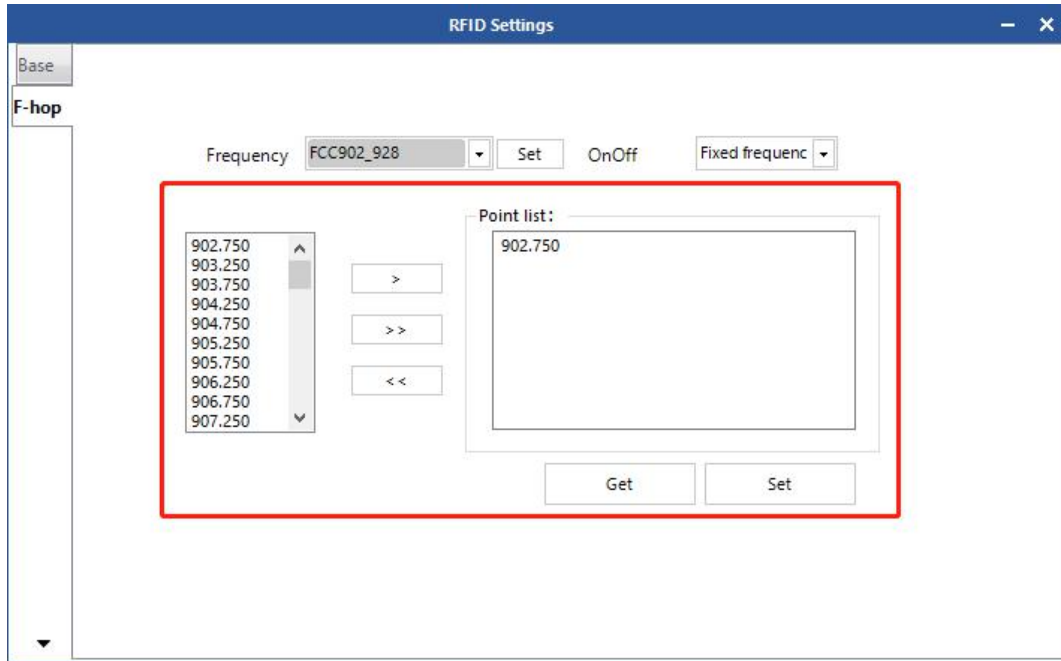


Figure 12: Frequency point selection

2.4.8 Equipment Information

The main interface chooses “Tool” -> “” Device Information, as shown in Figure 13. After clicking on the icon, a “Device Info” pop-up window appears, as shown in Figure 14.

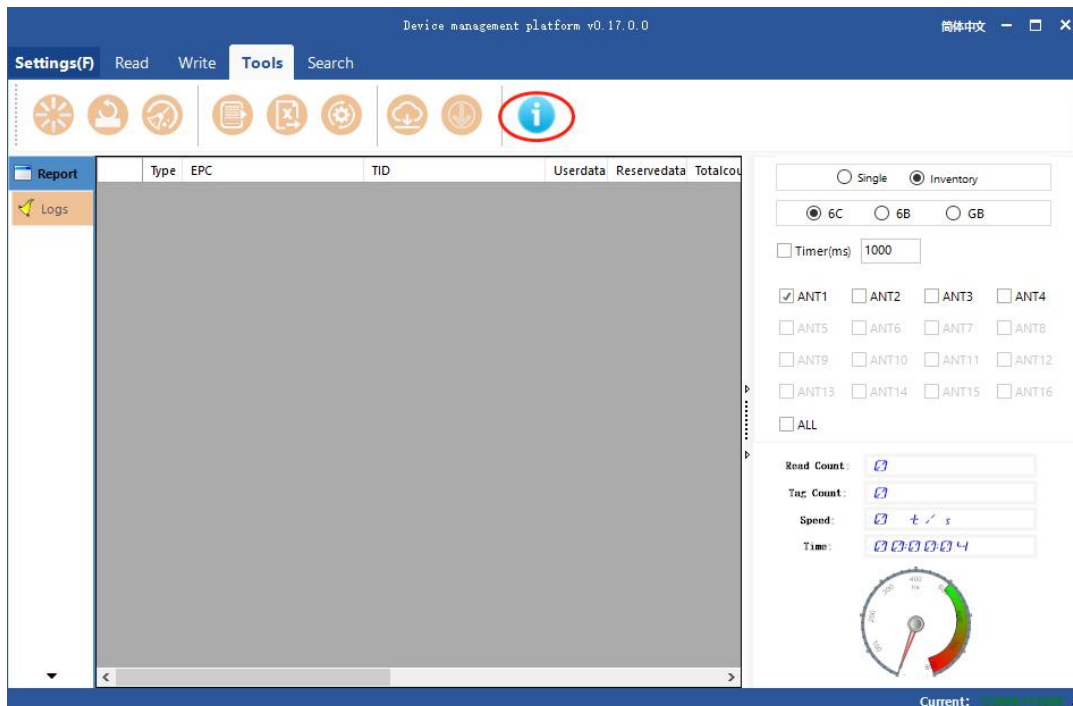


Figure 13: Equipment Information

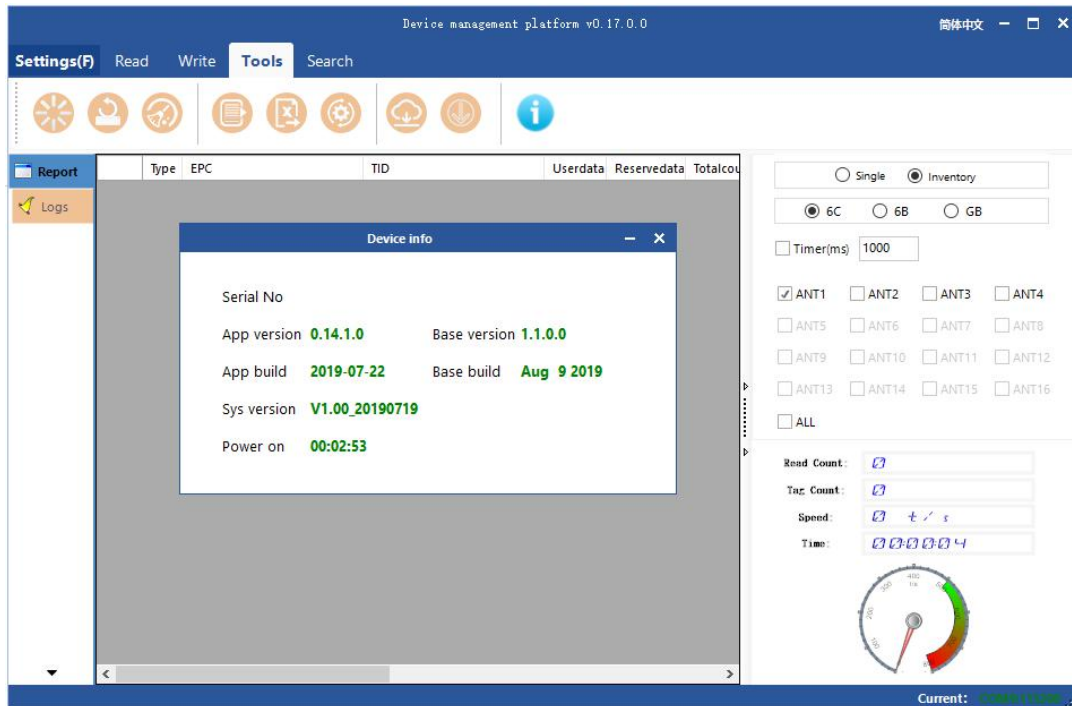


Figure 14: Equipment Information Bullet Window

3 Packaging and Storage

3.1 Packaging

In order to facilitate storage and transportation in the future, the RF-M6004 RF module is opened and the packaging box and materials are properly preserved. In addition to the module, the package also includes the accessories needed for the use of the product. Please confirm whether the products and accessories are complete according to the product packing list. If there are any discrepancies or damages, please contact the after-sales department in time.

3.2 Storage requirements

RF-M6004 RF module long-term storage should have the following conditions:

- ☆ ambient temperature: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- ☆ relative humidity: 5% RH $\sim$ 90%RH

4 Services and Support

Shenzhen Nation RFID Technologe Co

Advising customers

Our aim is to provide customers with high quality products, follow-up will continue to optimize and update our products to ensure that our product performance is in the forefront of similar products. This user manual will be different from the actual equipment in terms of product characteristics, composition and design. We will provide corrections in time. If you fail to provide timely advice, please consult after-sales.

Sales Telephone: 0755-26909366

National Core Material Federation Official Website: www.nationrfid.com

After-sales support: service@nationrfid.com



Warranty Notes:

In order to provide better service, our company randomly attaches a warranty card, please keep it well, in order to enjoy the proper service.

1、 Since the date of purchase, the product has not been dismantled and repaired in normal operation, and enjoys warranty service within one year.

2、 The following conditions are not covered by free maintenance:

- Over the warranty period
- Damage caused by abuse or human activities
- Terminal Damage Caused by Over Vibration of Users in Transportation

3、 This product software is upgraded free of charge, and users can get free training through different scenarios.

4、 If the user does not have a warranty card, he or she will charge according to the circumstances.