ZX-R8204 Reader User's Manual

Ningbo K&D IOT 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

ZX-R8204 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 module adopts independent die opening, all-aluminium die casting, exquisite appearance, excellent heat dissipation performance。

1.2 Main uses and scope of application

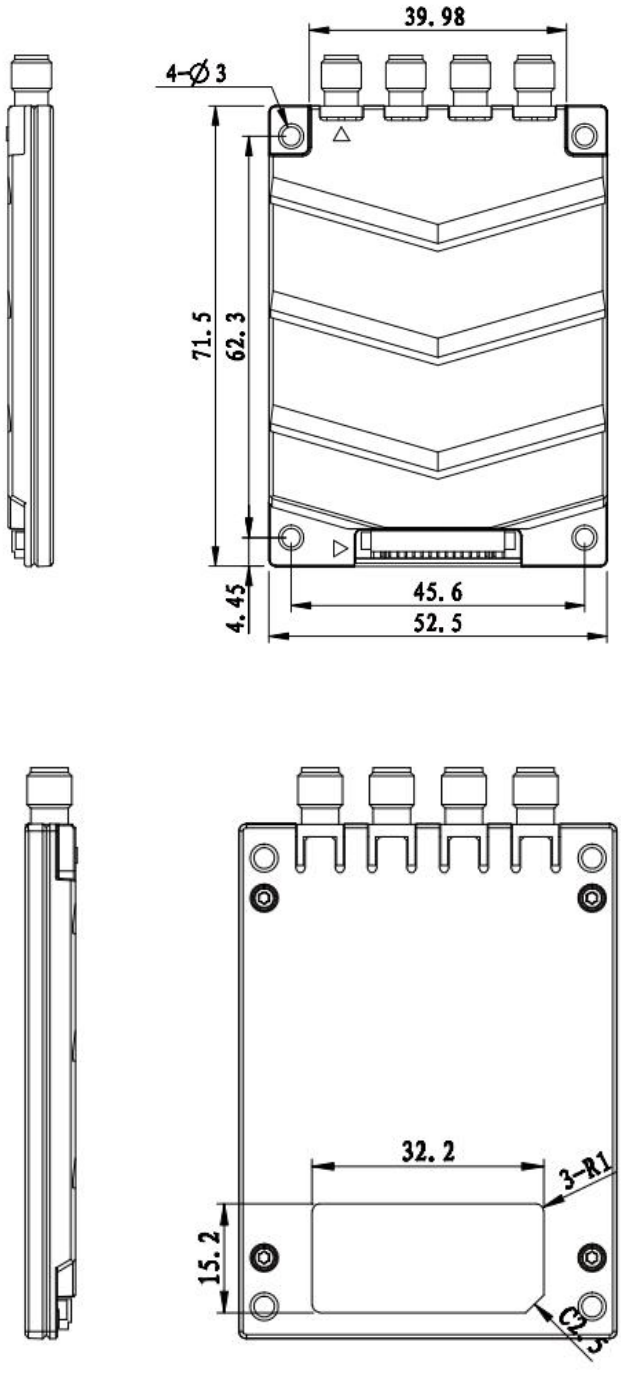
ZX-R8204 RF module has the characteristics of fast single tag identification, long tag reading distance and strong multi-tag processing ability. It is widely used in challenging application fields such as warehousing, logistics, clothing, production line management, etc. It can effectively improve the overall work efficiency and reduce the error rate.。

1.3 environment condition

- working temperature: －20℃～＋55℃
- Storage temperature: －40℃～＋85℃
- Humidity range: 5% ～ 95%RH
- Power supply: DC +3.5V～+17V

1.4 Shape size

The volume parameters of ZX-R8204 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 read operation on Nation RFID ZX-R8204 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.

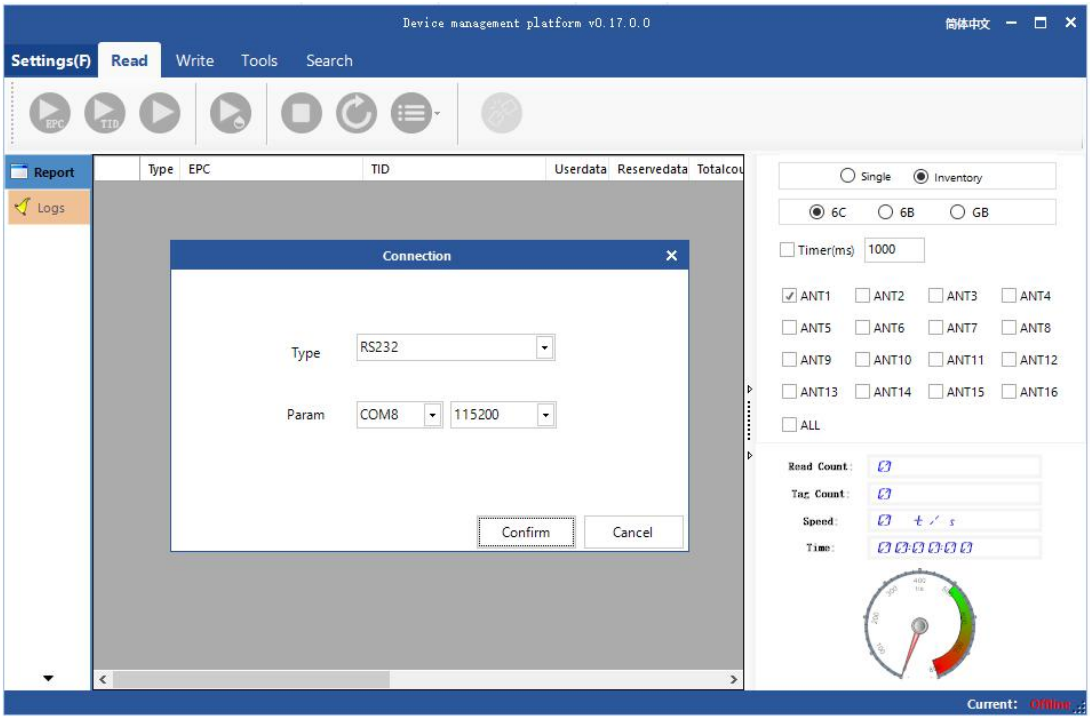


Figure 1: RS232 Selected

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.

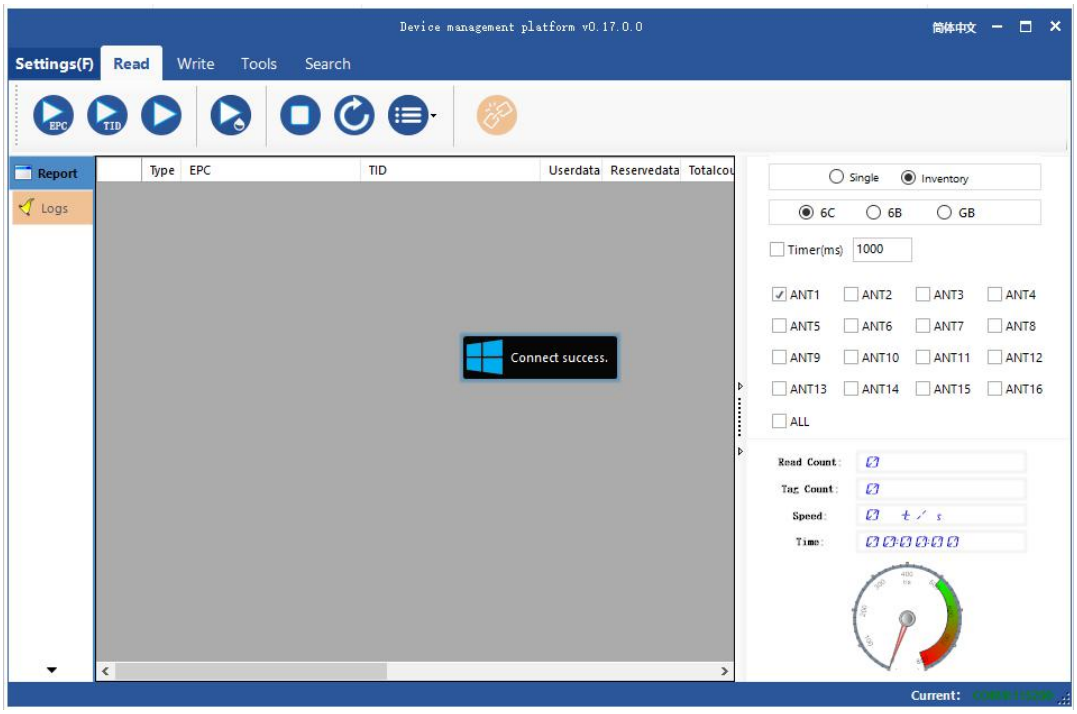


Figure 2： RS232 Successful connection

2.4.2 Data display area

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

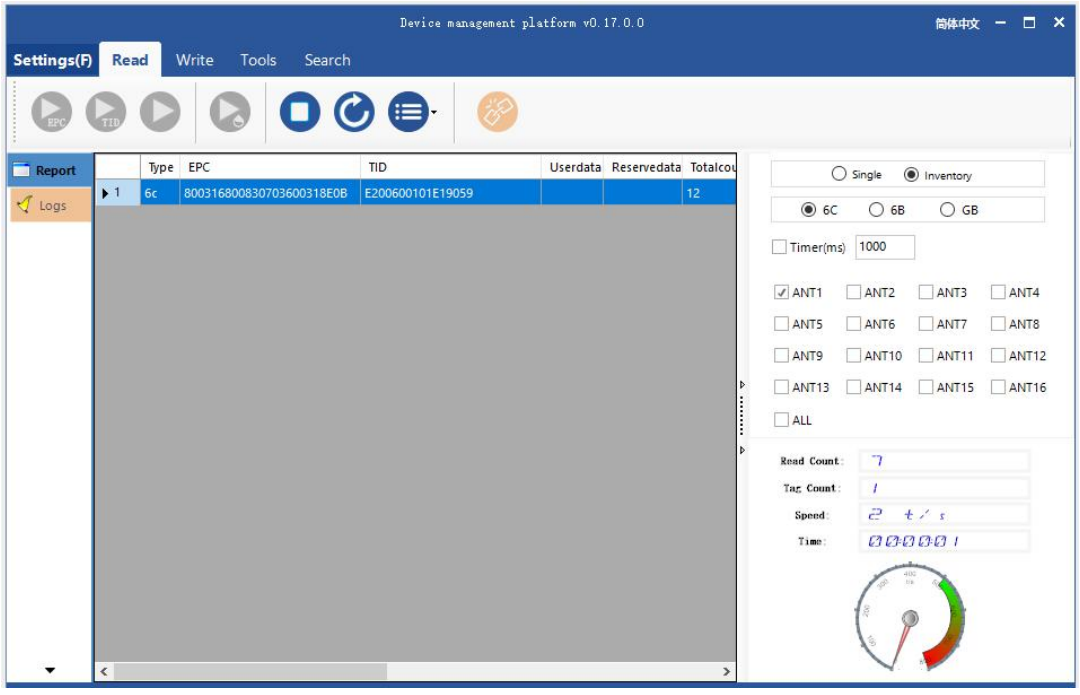


Figure 3： Data Display Area Parameter Meaning

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.

2.4.3 Equipment configuration

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

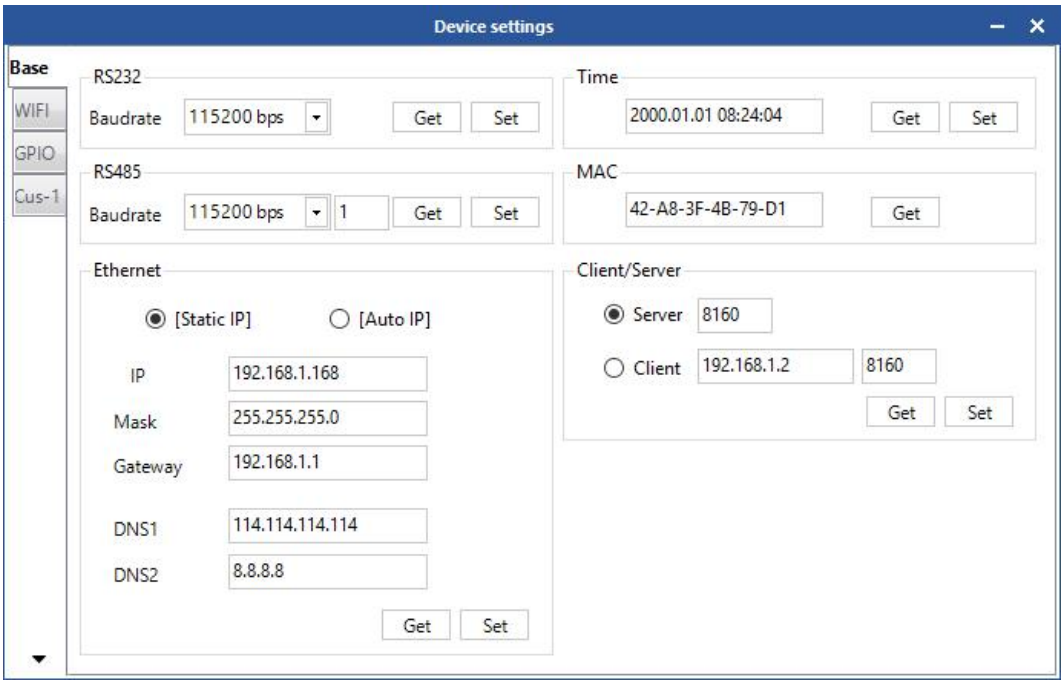


Figure 6: Equipment configuration

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.

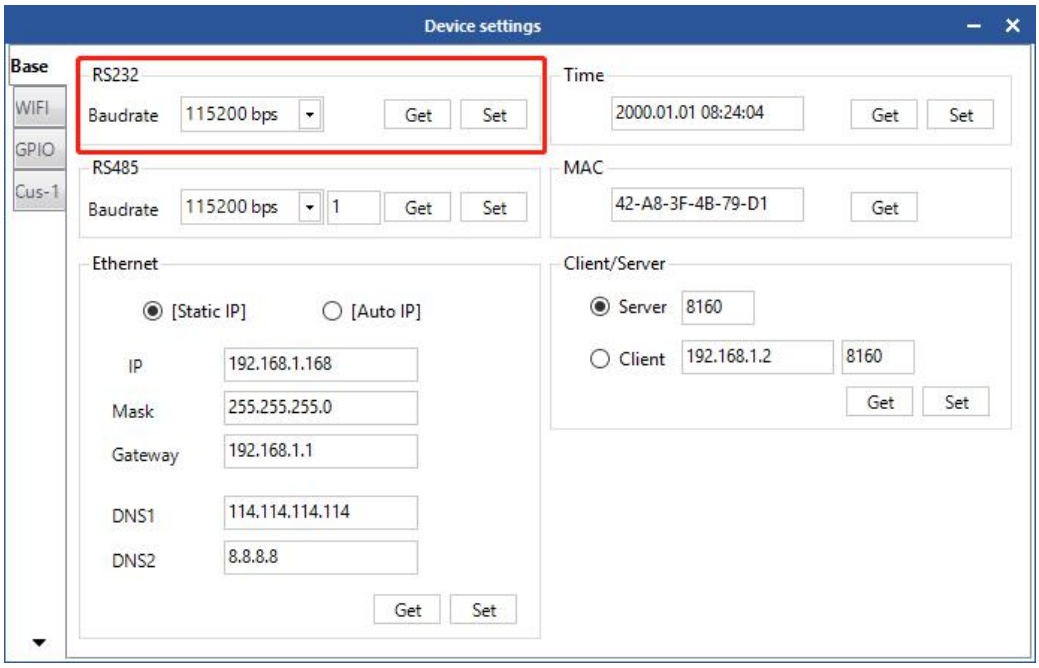


Figure 7: Serial port parameters

2.4.4 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 . Click "Set" to set reader EPC baseband parameters.

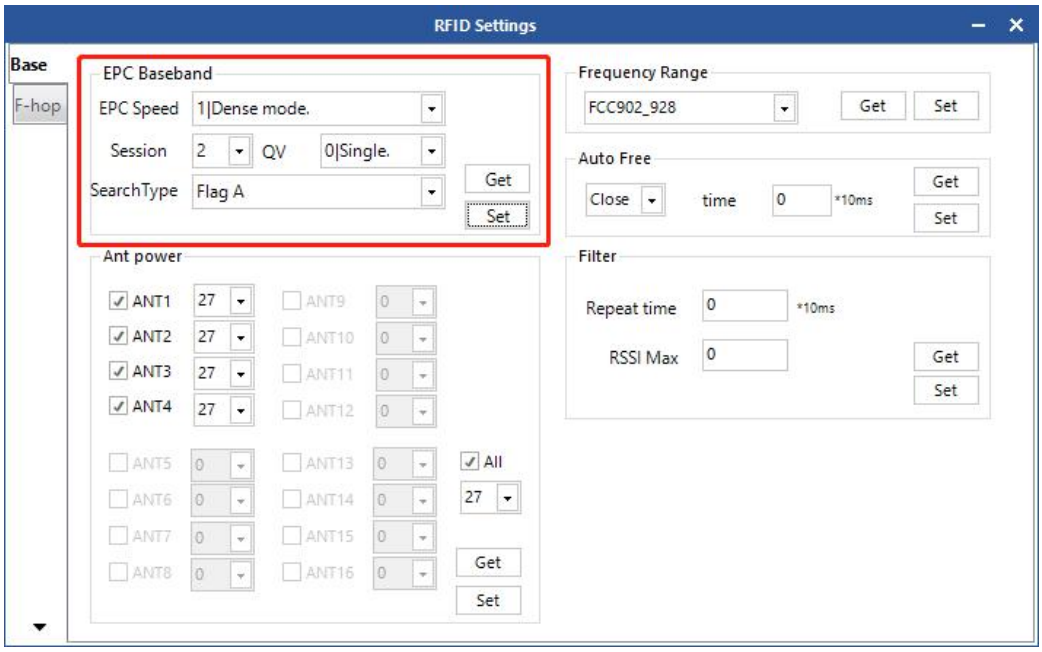


Figure 8: Baseband parameter configuration

Changing the configuration of baseband parameters can change the actual effect of reading (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 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.

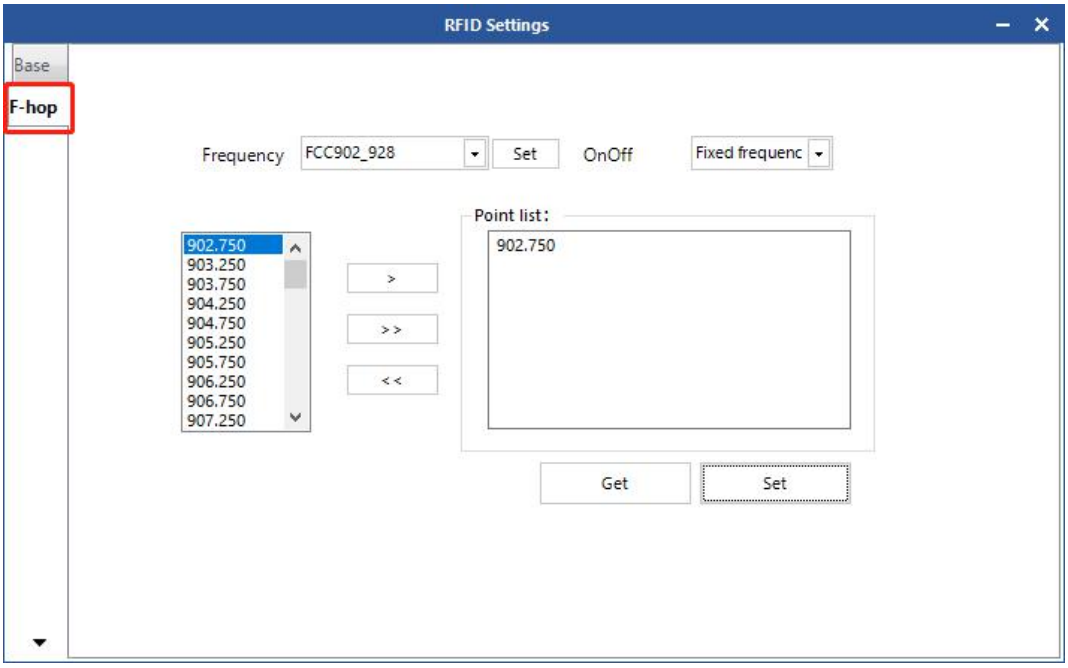


Figure 10: Frequency Hopping Management

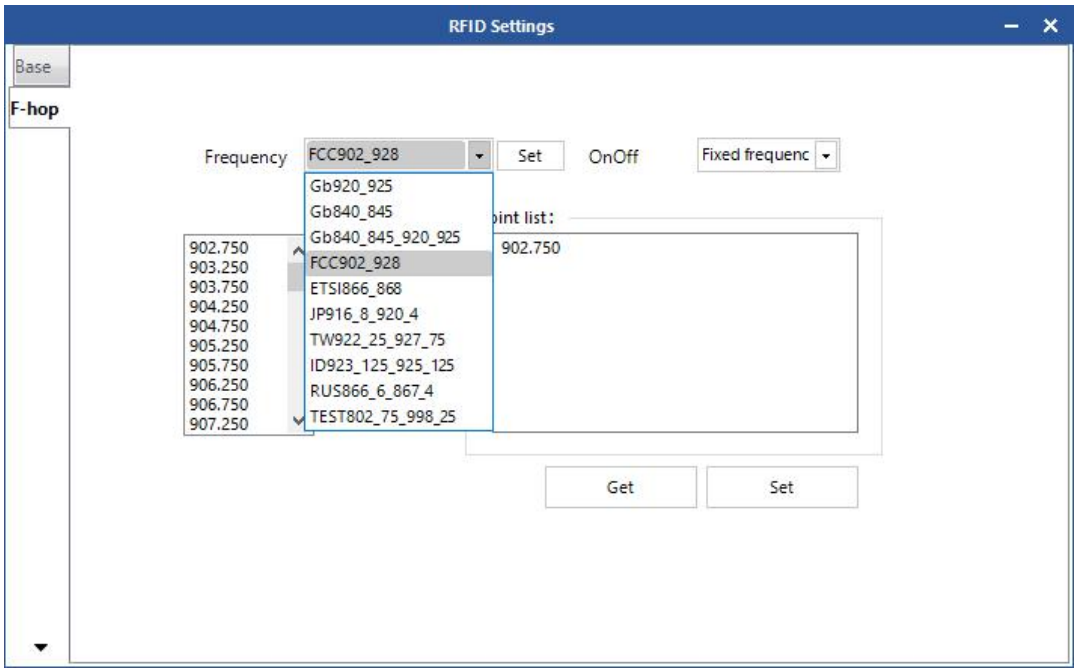


Figure 11: Selection of working frequency band

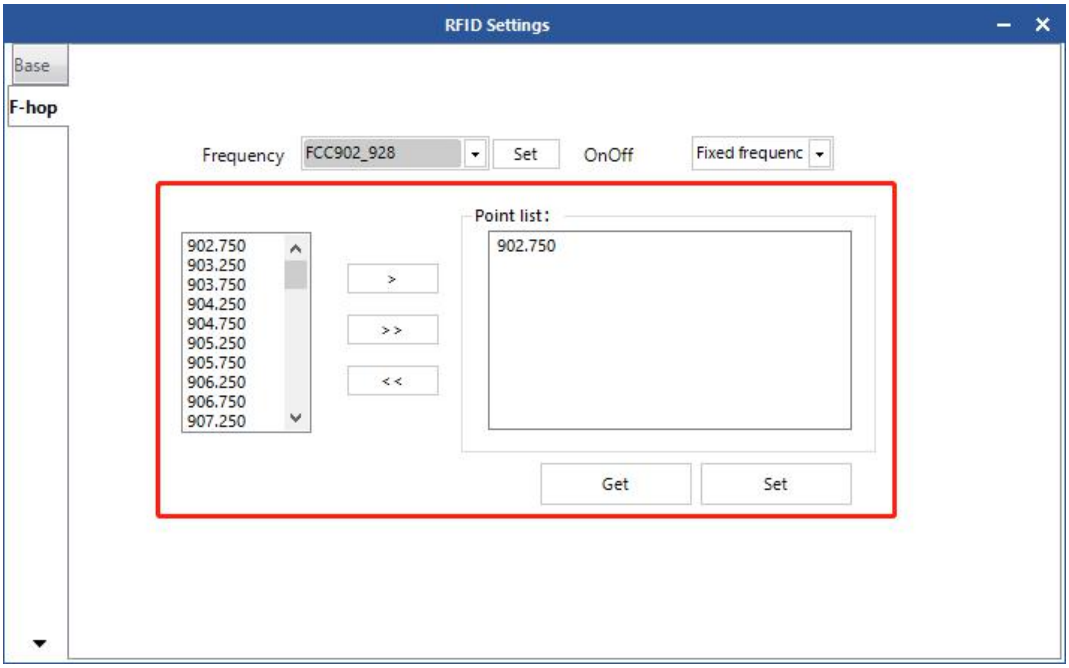


Figure 12: Frequency point selection

2.4.7 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.

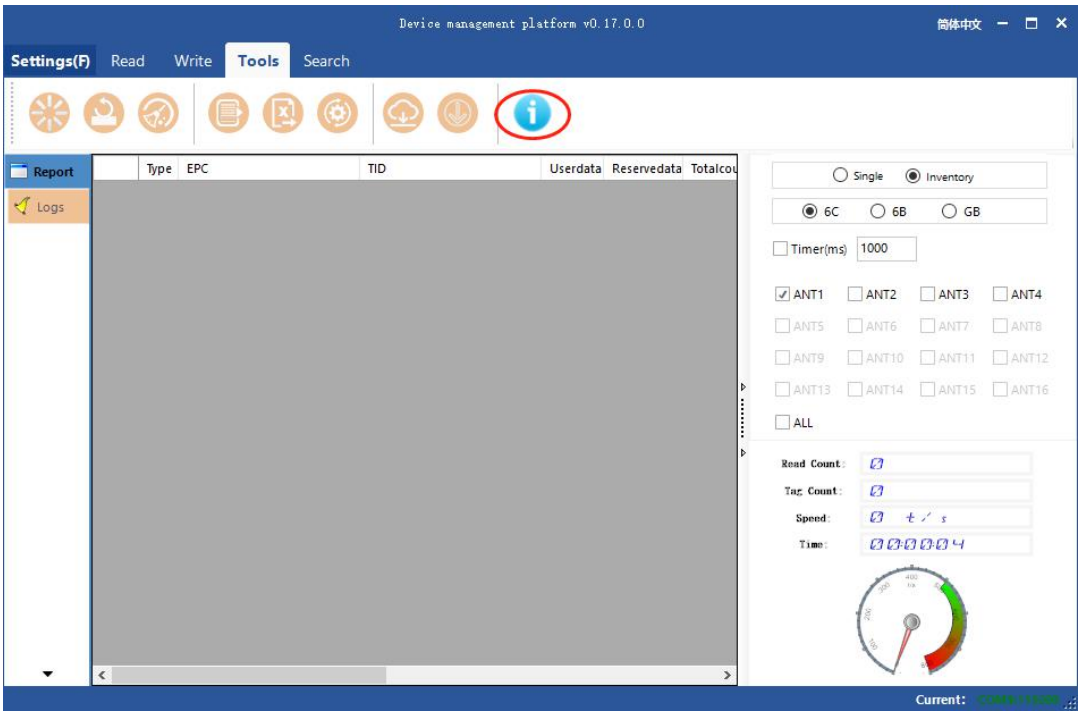


Figure 13: Equipment Information

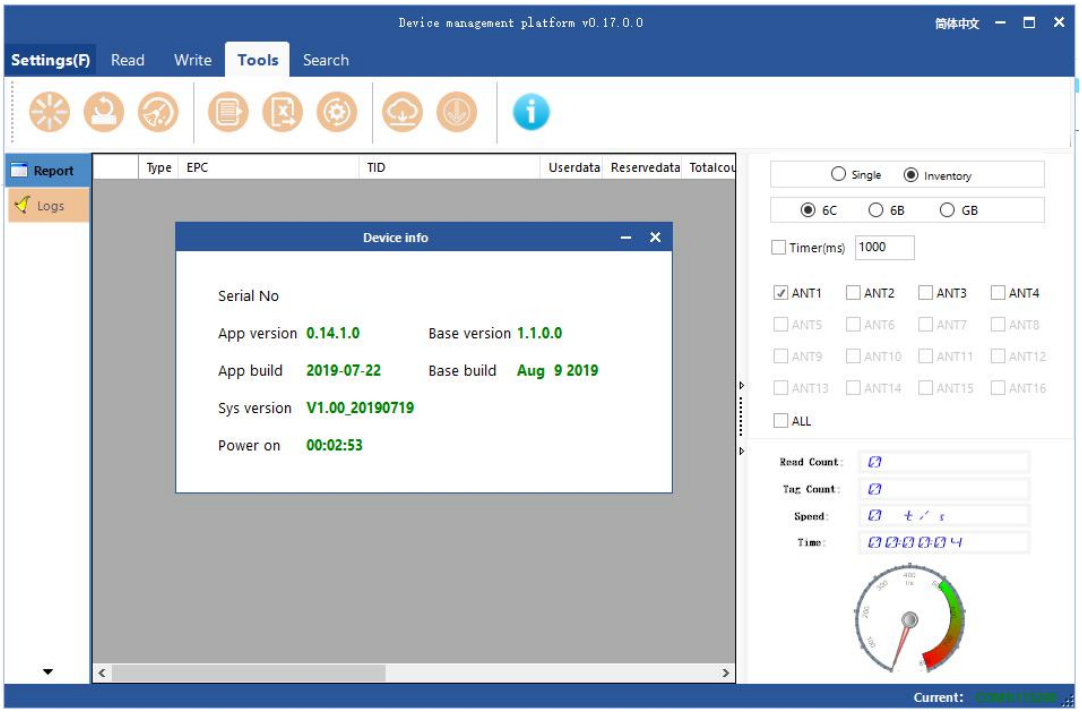


Figure 14: Equipment Information Bullet Window

3 Packaging and Storage

3.1 Packaging

In order to facilitate storage and transportation in the future, the ZX-R8204 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

ZX-R8204 RF module long-term storage should have the following conditions：

☆ ambient temperature：-40℃～+85℃

☆ relative humidity：5% RH～90%RH

4 Services and Support

Ningbo K&D IOT Technology Co., Ltd

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.

FCC warning:

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

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.

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.

This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment.
This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations.

Warning:

The module is limited to OEM installation ONLY

The antenna installation must be professional installation, and does not permit use of any antenna with the transmitter; the permitted types of antenna must be specified.
The module cannot be sold via retail to the general public or by mail order; it must be sold to authorized dealers or installers only.
The end product intended use is not for consumers and general public; rather device is generally for industrial/commercial use.
The installation shall be performed by trained licensed professionals, it uses specialized software and adjusts the best angles and orientations, which are difficult for ordinary people to do.

The module is limited to installation in mobile or fixed application.

The OEM integrator is responsible for ensuring the end-user has no manual instruction to remove or install module;

Modular approval allows installation in different end-use products by an original equipment manufacturer (OEM) with limited or no additional testing or equipment authorization for the transmitter function provided by the ZX-R8204. Specifically:

- No additional transmitter compliance testing is required if the module is operated with the antenna listed in the document below.

- No additional transmitter-compliance testing is required if the module is operated with the same general type of antenna (i.e. near-field segmented loop, circularly polarized patches) as those listed in this User's Guide and in the FCC filing for the ZX-R8204. Acceptable antennas must be of equal or less far field gain than the antenna previously authorized under the same FCC ID, and must have similar in band and out of band characteristics.

In addition, the end product must comply with all applicable FCC equipment authorizations, regulations, requirements and equipment functions not associated with the ZX-R8204. For example, compliance must be demonstrated to regulations for other transmitter components within the host product, to requirements for unintentional radiators (Part 15B), and to additional authorization requirements for the non-transmitter functions.

The OEM applying the ZX-R8204 is required to include all FCC and/or IC statements and warnings detailed in the following sections to the end product labeling (where specified) and in the finished product manual. The OEM must also strictly adhere to antenna and installation guidelines and MPE restrictions stated in this document.

The finished product manual must contain the following statement:

The host product shall use physical label stating "contains transmitter module FCC ID: 2AYIXZX-R8204" or "contains FCC ID: 2AYIXZX-R8204"

WARNING: The Federal Communications Commission warns that changes or modifications of the radio module within this device not expressly approved by Ningbo K&D IOT Technology Co., Ltd could void the user's authority to operate the equipment.

In the case where an OEM seeks class B (residential) limits for the host product, the finished product manual must contain the following statement:

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.

In the case where an OEM seeks the lesser category of a Class A digital device for their finished product, the following statement must be included in the manual of the finished product:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense.

A statement must be included on the exterior of the final OEM product which communicates that the device identified by the aforementioned FCC and Industry Canada ID numbers are contained within the product.

The OEM must include the following statements on the exterior of the finished product unless the product is too small (e.g. less than 4 x 4 inches):

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 any interference that may cause undesired operation.

The user manual for the end product must include the following information in a prominent location:

To comply with FCC's RF radiation exposure requirements, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 20cm is maintained between the radiator (antenna) & user's/nearby people's body at all times and must not be co-located or operating in conjunction with any other antenna or transmitter

The ZX-R8204 is compatible with many varieties of antennas, but for purposes of modular certification with FCC, only one antenna was tested. ZX-R8204 users can have their own antenna and ZX-R8204 systems certified with FCC and IC.

In order to operate the ZX-R8204 under either FCC ID: 2AYIXZX-R8204, the OEM must strictly follow these antenna guidelines:

- The OEM may operate only with the following antenna or antennas of the same type with maximum gain as shown:

  circularly-polarized patch antenna with 6.29 dBi linear far field gain

- RF I/O interface to the antenna connector on the PCB shall be accomplished via a microstrip or stripline transmission line with characteristic impedance of 50 ohms +/- 10%. A custom coaxial pigtail may also be utilized to connect to the antenna in lieu of a connector.

- The connector on the OEM's PCB which interfaces to the antenna must be of a unique type to disable connection to a non-permissible antenna in compliance with FCC section 15.203. The following connectors are allowed:

- The OEM must professionally install the ZX-R8204 into its final environment to ensure that the conditions are met.

The minimum safe distance for people from the ZX-R8204 has been determined by conservative calculation to be less than 20 cm for the allowable antenna types. The end product User's Guide must include the following statement in a prominent location:
To comply with FCC's RF radiation exposure requirements, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 20 cm is maintained between the radiator (antenna) & user's/nearby people's body at all times and must not be co-located or operating in conjunction with any other antenna or transmitter.