Hopeland RFID reader

Demo user manual Python

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V1.1

CONTENTS

1.Summary

1.1 Introduction

In order to ease the user to understand the operation of our readers and the basic use of the Reader Demo software, we have prepared this document, and the Reader Demo software runs on Python 3.*.
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1.2 Open demo software

The running of Python demo depends on certain environments. You need to install the corresponding dependency packages to run properly.
Here are the most basic dependency libraries needed to run demo.
Cd(change directory) to the directory where the whl file is located, run the following command to install the library file.
pip install RFIDReaderAPI-1.0-py3-none-any.whl.
The following dependent libraries also need to be installed.
pip install gmssl.
pip install hidapi.
pip install pyserial.
pip install pyusb
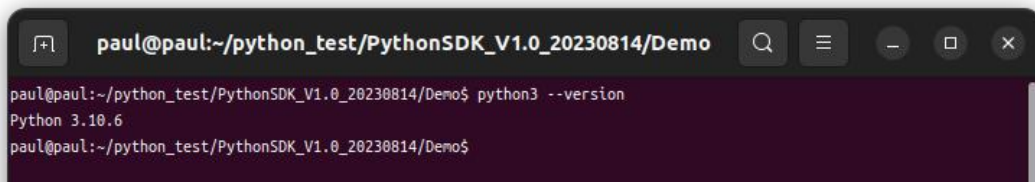
Run the main.py file in the demo folder via the python3 main.py command inside the terminal. As shown in Figure 1-1 and Figure 1-2.


```
paul@paul:~/python_test/PythonSDK_V1.0_20230814/Demo

paul@paul:~/python_test/PythonSDK_V1.0_20230814/Demo$ python3 --version
Python 3.10.6
paul@paul:~/python_test/PythonSDK_V1.0_20230814/Demo$
```
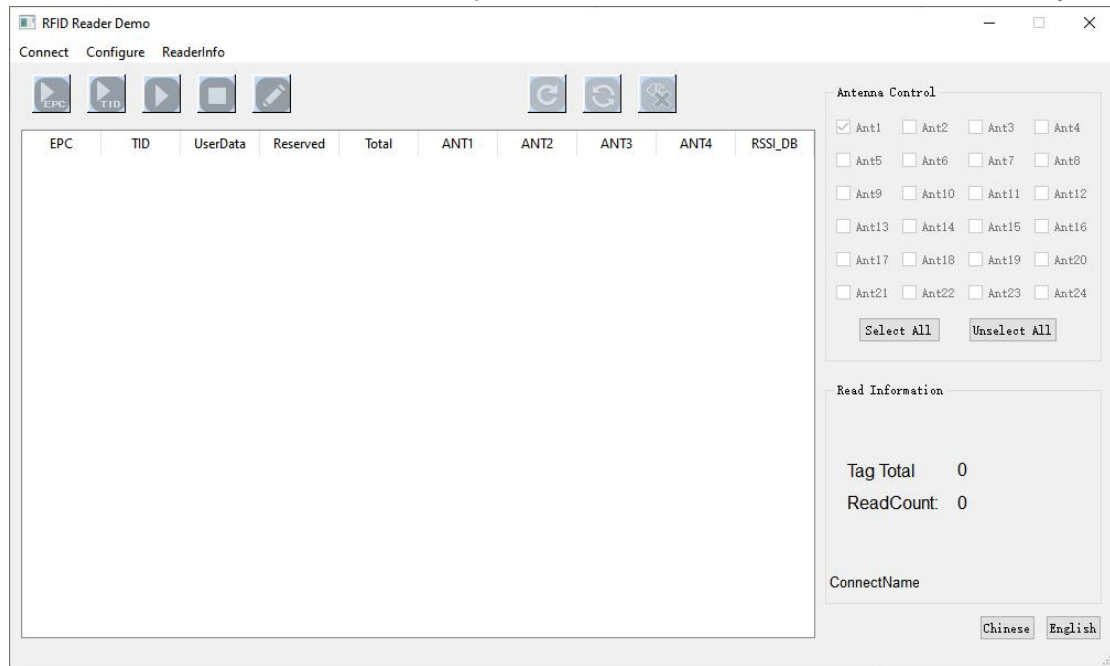
Figure 1-1

Figure 1-2

If the prompt for ModuleNotFoundError appears, such as
ModuleNotFoundError: No module named 'pyqt5_plugins', follow the prompt to
install the corresponding module. As shown in Figure 1-3.

Figure 1-3

2.Connect reader

2.1 Serial Connection

Click "Connect" - "RS232" to open the serial port connection interface, as
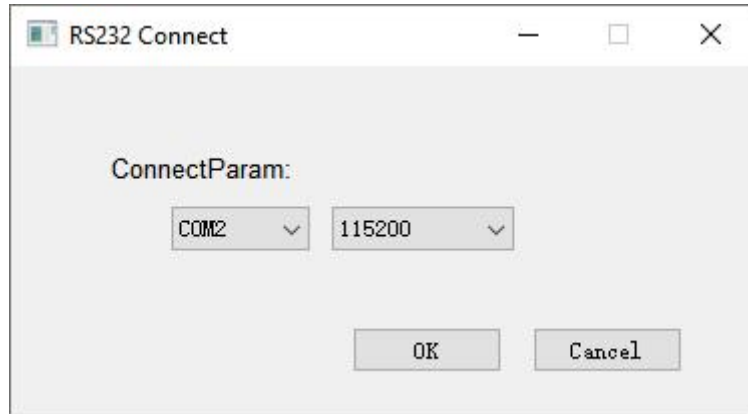
shown in Figure 2-1.

Figure 2-1

After selecting the correct serial port and baud rate, click "OK" to connect the reader. The software will list all available serial port numbers in the drop-down box, and the default baud rate of the reader is 115200 bps. If the connection fails, check the physical connection of the serial cable.

2.2 Network Connection

Click "Connect" - "TCP" to open the TCP connection interface, as shown in Figure 2-2.
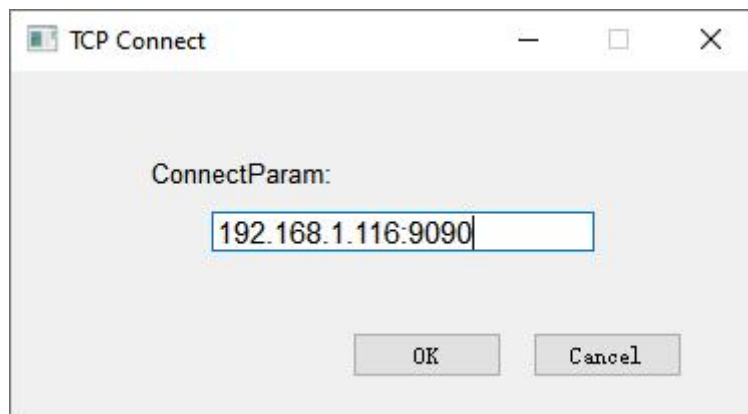
Figure 2-2

The reader's default connection parameter format is "IP address: port number", such as "192.168.1.116:9090", if the IP address and port of the reader have changed, you need to manually fill in the connection parameters, click OK to connect the reader, if the connection fails, please check the physical connection of the network cable, or check the network connectivity between the computer and the reader through the ping command, be sure that the port number is also correct, otherwise the connection will fail.

2.3 RS485 Connection

Click "Connect" - "RS485" to open the RS485 connection interface, as shown in Figure 2-3.
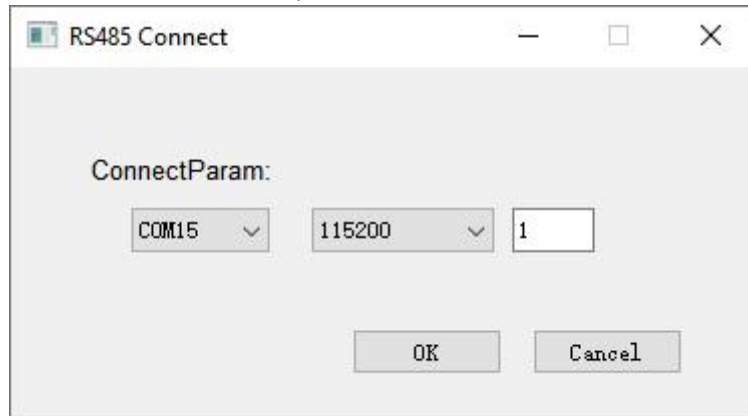
Figure 2-3

After selecting the correct serial port and baud rate,input 485 address, the default 485 address is 1, click "OK" to connect the reader. The software will list all available serial port numbers in the drop-down box, and the default baud rate of the reader is 115200 bps. If the connection fails, check the physical connection of the serial cable.

2.4 Disconnect

Click the button to disconnect the current connection, and you need to reconnect the reader after disconnection to operate the reader again, as shown in Figure 2-4.

Figure 2-4

3.Quick-start

3.1 Read and Write Control

The read-write control function is at the top right of the software main interface, as shown in Figure 3-1.
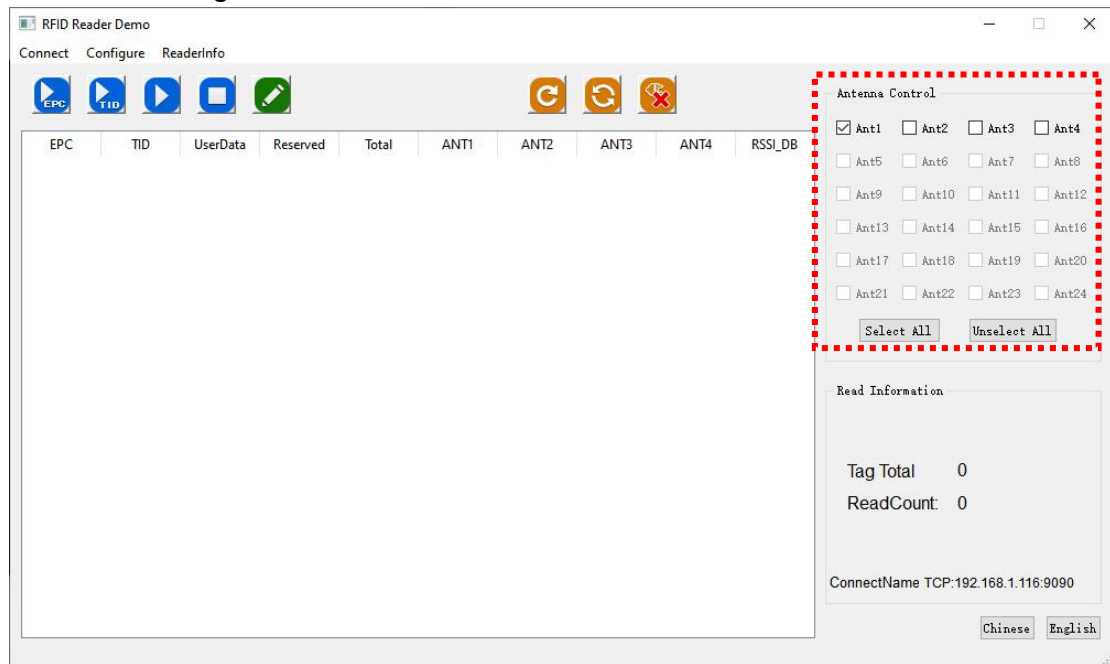
Figure 3-1

Tick the check box on the left of the antenna number to control whether the reader will use this antenna during read and write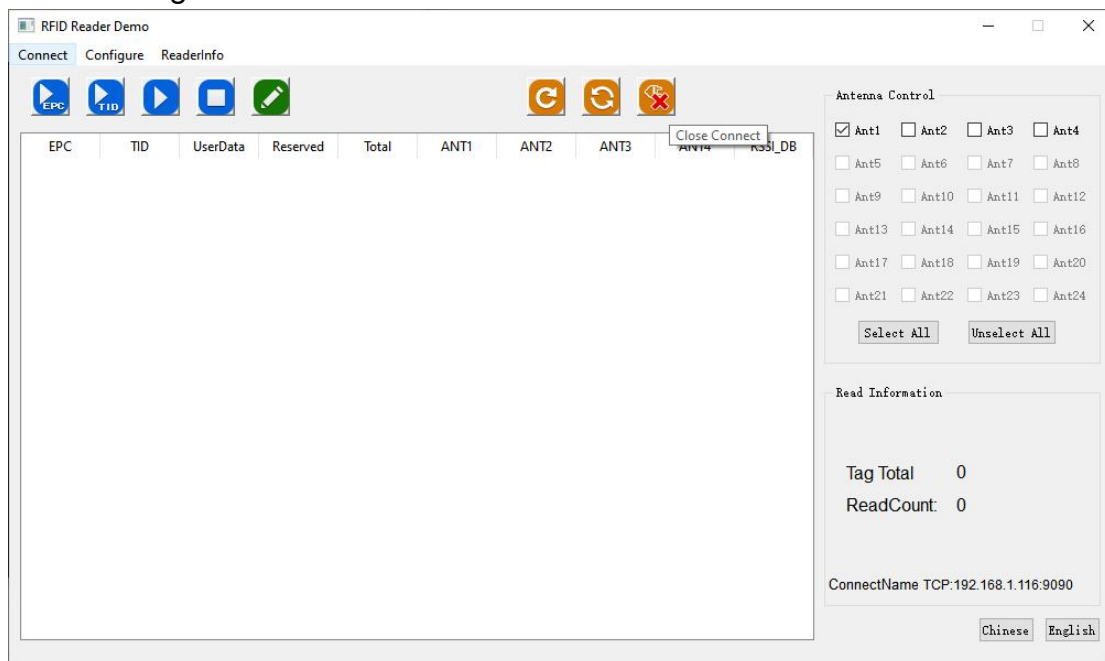 operations. You can select multiple options .At least one antenna needs to be checked. If it is not checked, an error will be prompted, as shown in Figure 3-2. Check the reader antenna according to the actual situation. Checking the antenna port that is not connected with an antenna may damage the antenna port.

Figure 3-2

Before stopping reading, the real-time information in the lower right is updated according to the tag data read by the reader, and the tag data in the list is also updated, as shown in Figure 3-3.
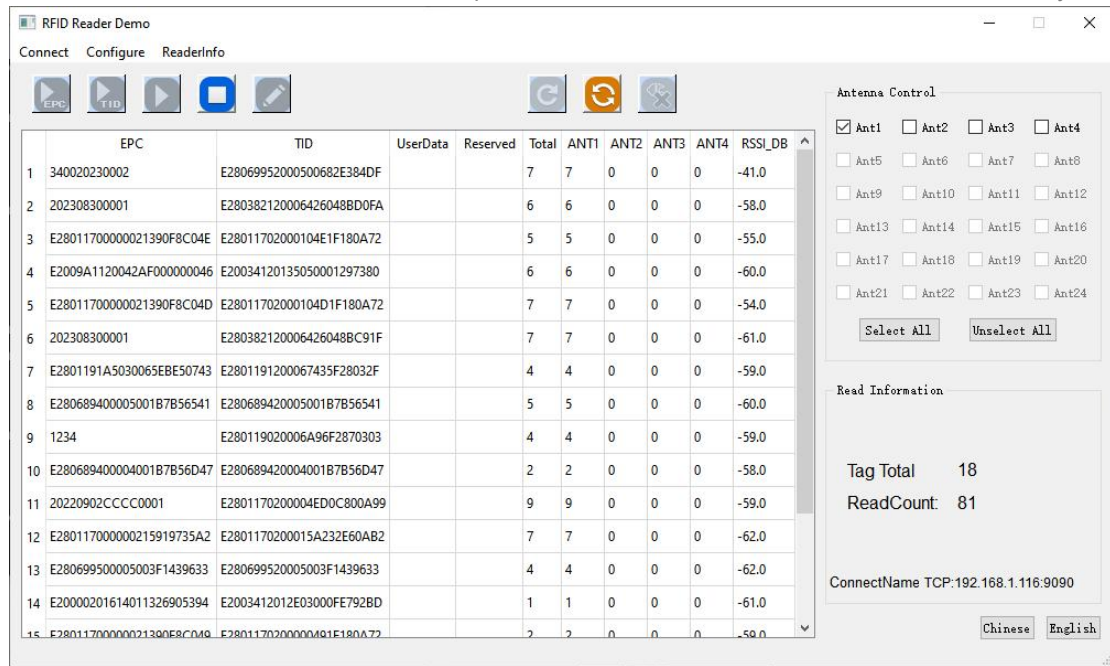
Figure 3-3

3.2 Read Tags

After the read and write control is set, the read and write operation can be carried out.

3.2.1 Read EPC

Click the [EPC] button to read EPC. Tag data will be displayed in the middle list. Real-time information will also be updated in the lower left corner, as shown in Figure 3-4.

Figure 3-4

3.2.2 Read TID

Click the [TID] button to read TID. The information of TID and EPC will be displayed in the list, as shown in Figure 3-5.
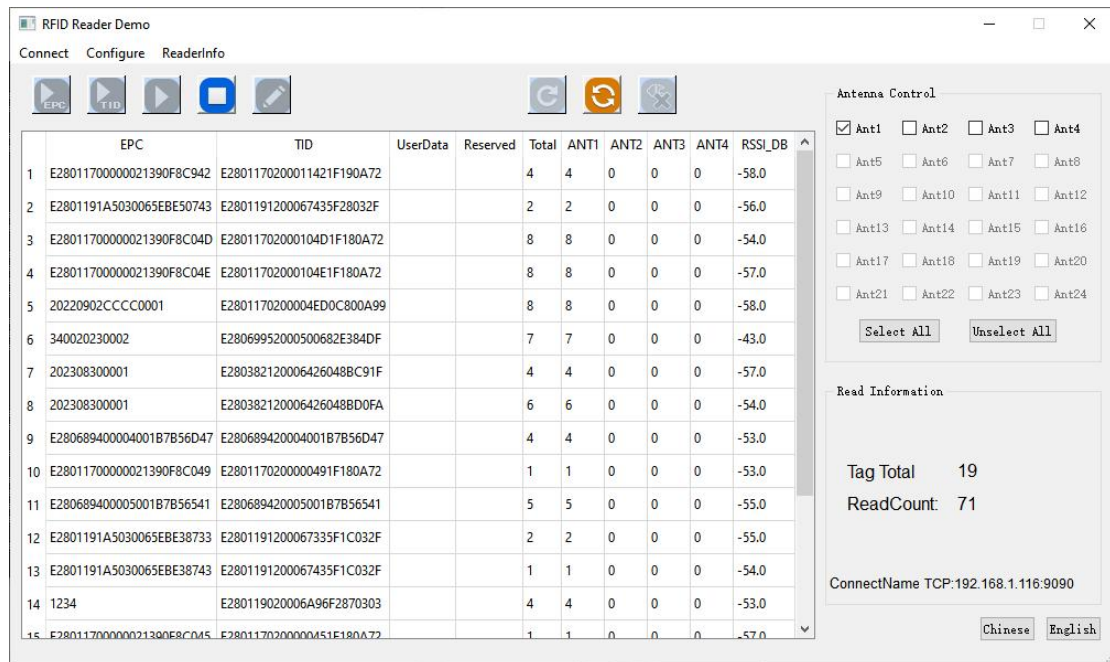
Figure 3-5

3.2.3 Custom Read

If you need to read the data in different data areas of tags at the same time, you need to use the custom read operation. You can freely control the read area by using the custom read. Click the button to set the custom read interface, as shown in Figure 3-6.
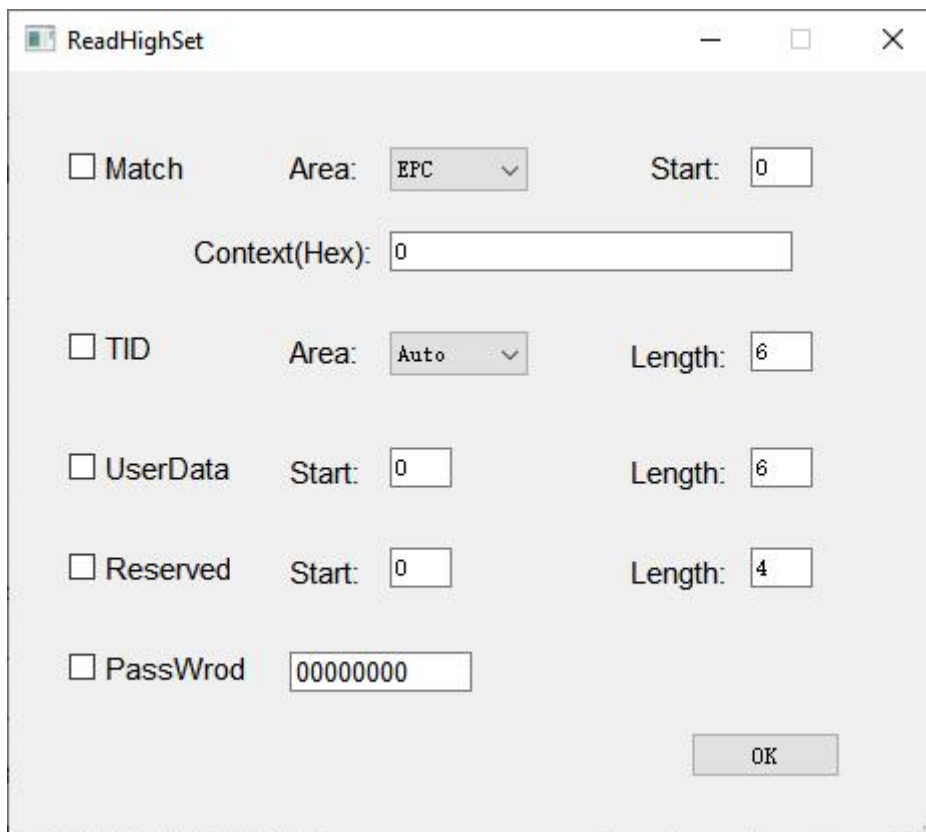
Figure 3-6
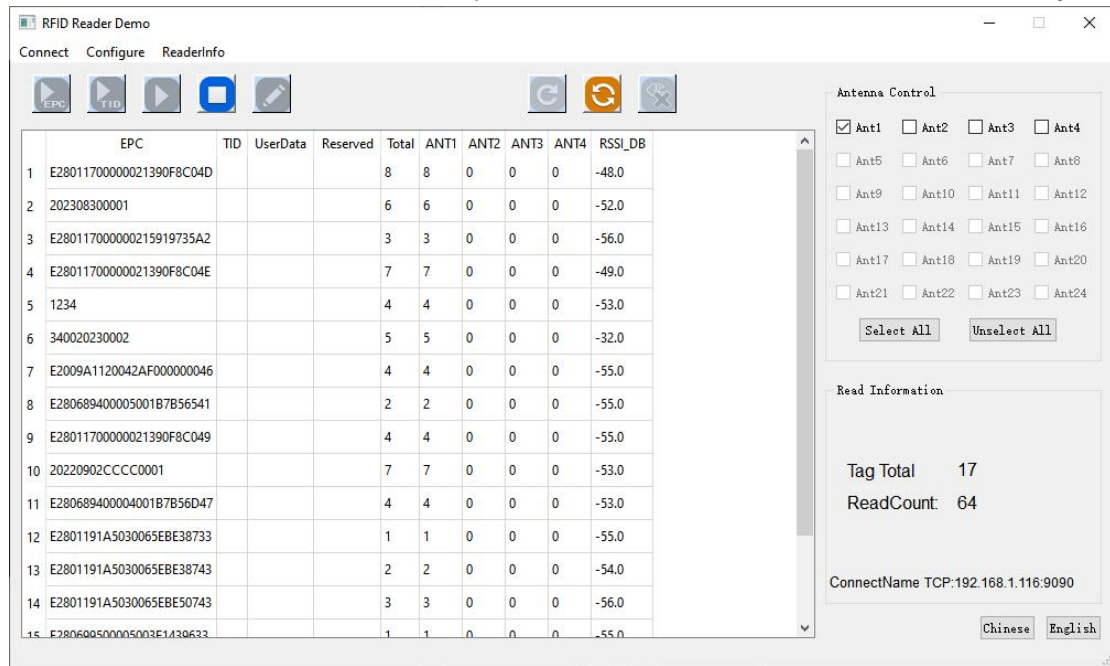
You need to check the front check box of each tag area to decide which area to read, fill in and select the read parameters, length unit is word, and content is hex data, after clicking OK, the reader will read according to the configuration, if there is any tag match the configuration, the tag data in the main interface will be updated in real time.

3.2.4 Stop Reading

When reader is reading tags, you can click stop button to stop the reader reading, and the information list and real time information will all stop updating, as shown in Figure 3-7.
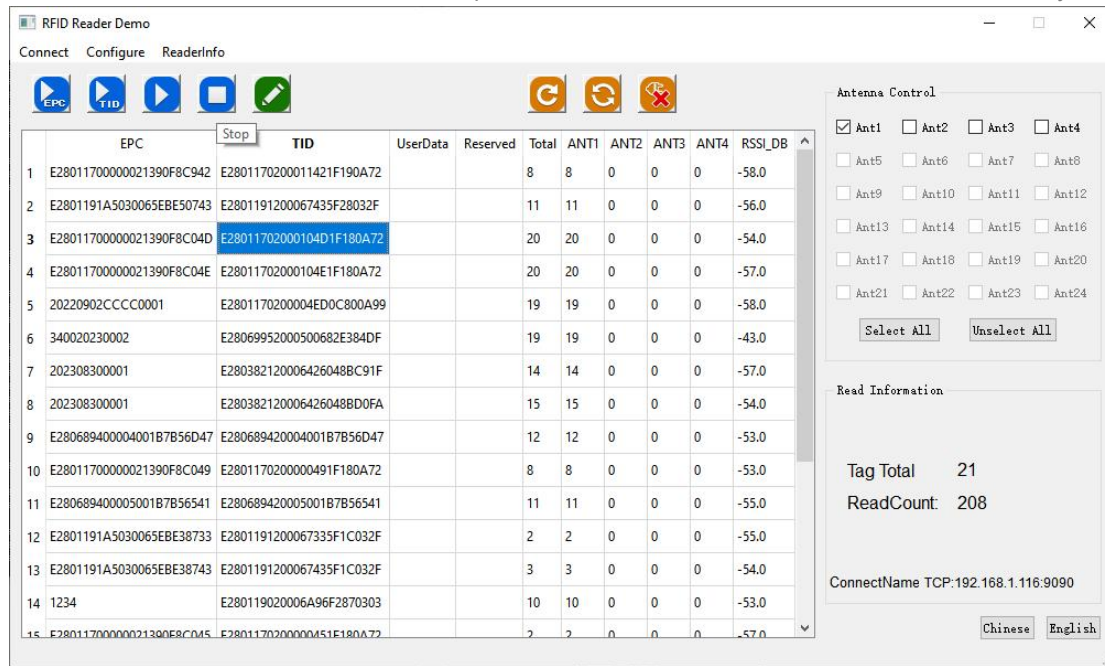
Figure 3-7

3.3 Write a Tag

Under the same power, the applicable distance of reading and writing tags is different. The energy required to write tags is about twice that of reading tags. In other words, being able to read tags does not necessarily mean that you can write successfully. It is recommended to write the tag as close to the antenna as possible, and read the tag by reading TID before writing the tag.

After stop reading, select a tag that need to be written in the list, click to open the Write EPC Interface, as shown in Figure 3-8.
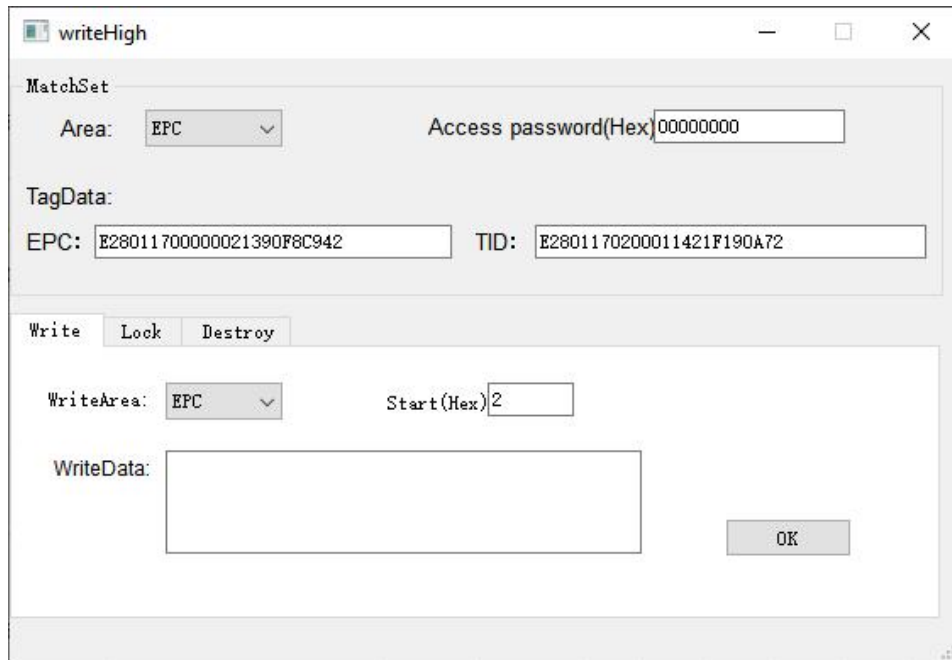
Figure 3-8

Input the data to be written in the WriteData text box below. Note that the data must be hexadecimal and the length is a multiple of 4. If the tag has a password, you need to fill in the tag access password in the Access password(Hex) input box, and then click OK to perform the tag writing operation, as shown in Figure 3-9.
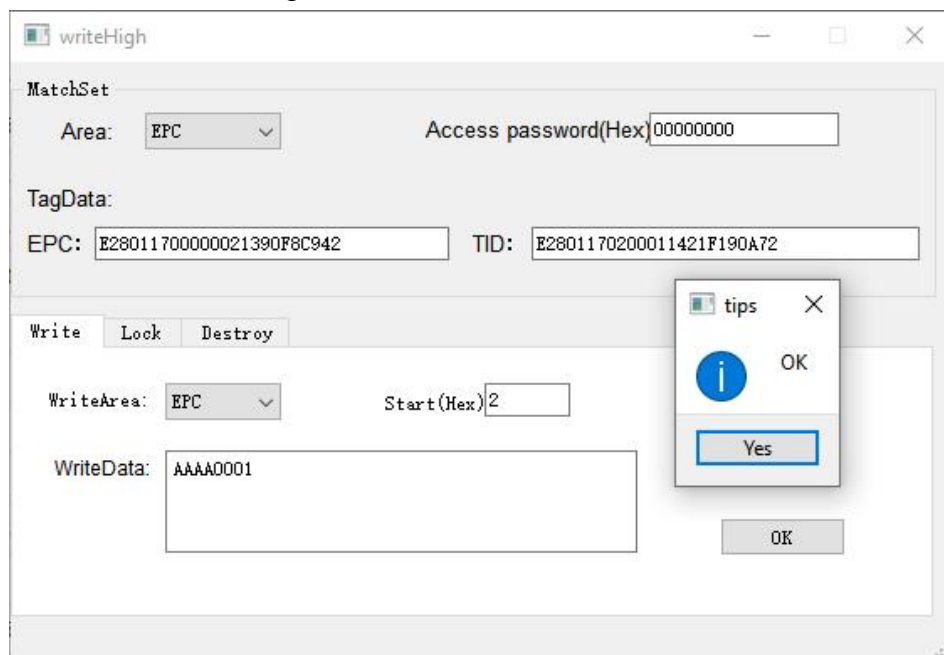
Figure 3-9

If it prompts that writing fails, please follow the failure prompt to determine the next step.

3.4 Information display

Click to clear tag information in the current list, as shown in Figure 3-10.
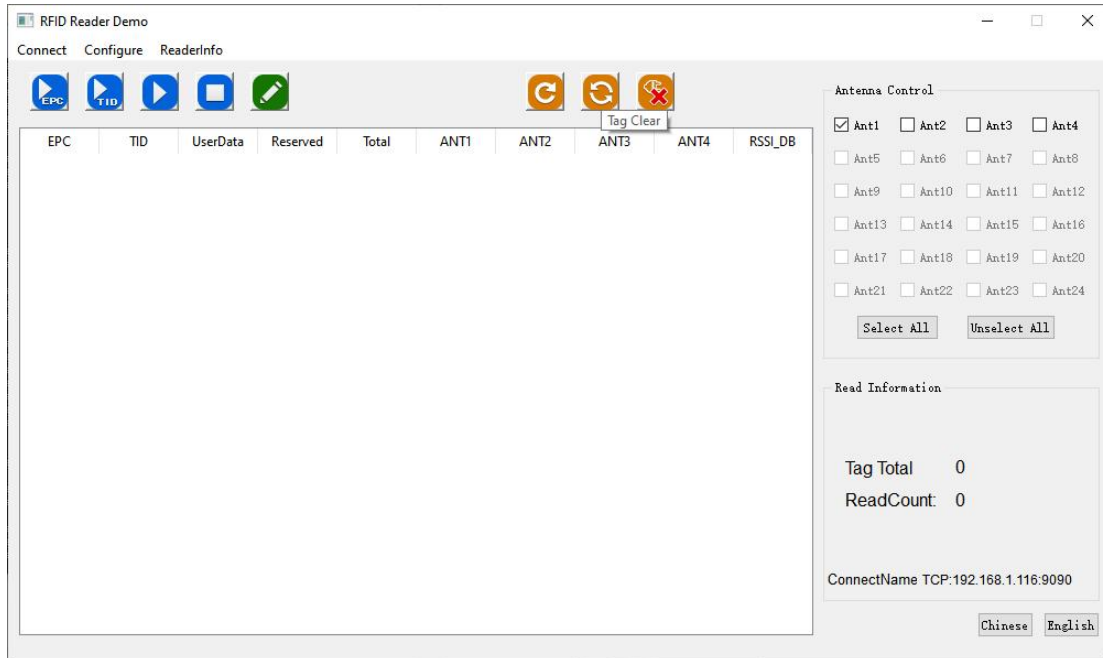
Figure 3-10

3.5 Restart Reader

Click the button to restart the reader. A few seconds later, when you hear

the "Di" sound of the reader, it means that the reader has been successfully

restarted. After that, you can connect again.

3.6 Reader Information

Click the toolbar "ReaderInfo"-"ReaderInfo" to query the information of the
connected reader, including the name of the reader, the version of the reader
application and the time when the reader is powered on, as shown in figure
3-11.
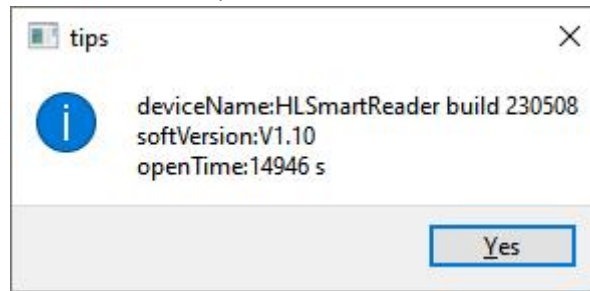
Figure 3-11

3.7 Baseband Version

Click the toolbar "ReaderInfo"-"Baseband Info" to query the baseband version of the connected reader, as shown in figure 3-12.

Figure 3-12

4.Configuration

Click the toolbar "Configure"-"Configure Settings" to enter the parameter setting interface.

4.1 RFID configuration

4.1.1 Antenna Power Configuration

The position of Antenna power configuration is shown in Figure 4-1.
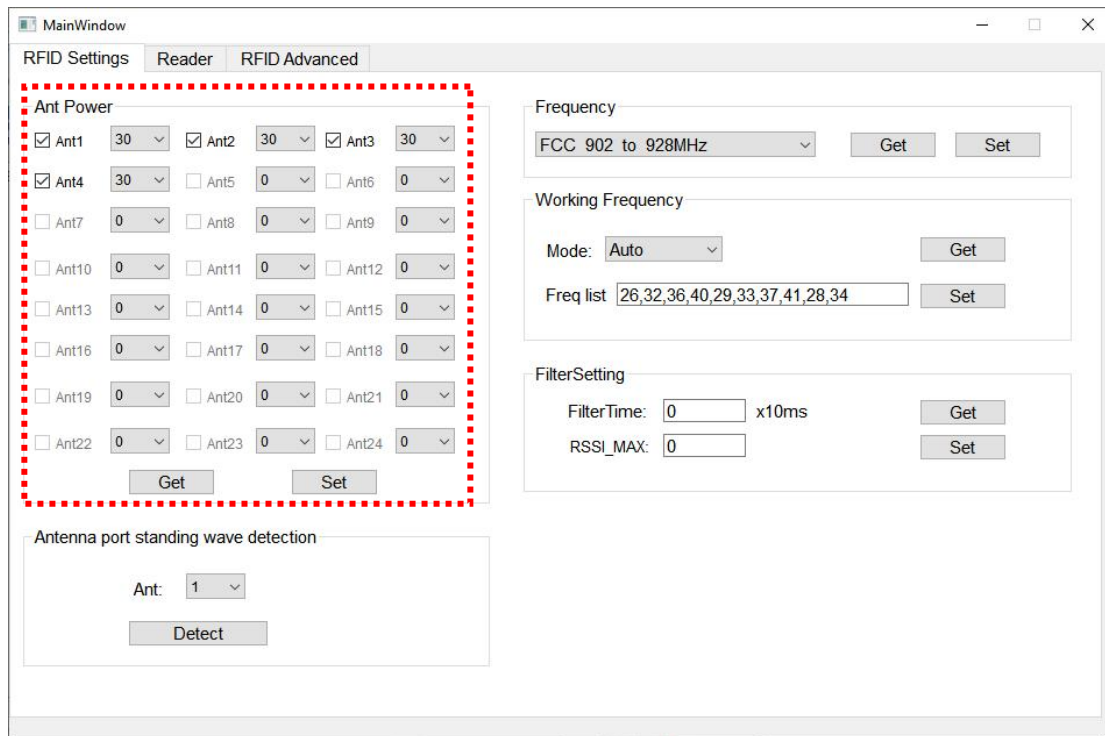
Figure 4-1

After changing the power value through the drop-down box, be sure to check the check box in front of the antenna number before clicking Set, otherwise the power setting for the antenna will not be successful. You can choose more than one.

4.1.2 Configure Frequency Range and Working Frequency

Configure frequency range and working frequency of the reader as shown in Figure 4-2.
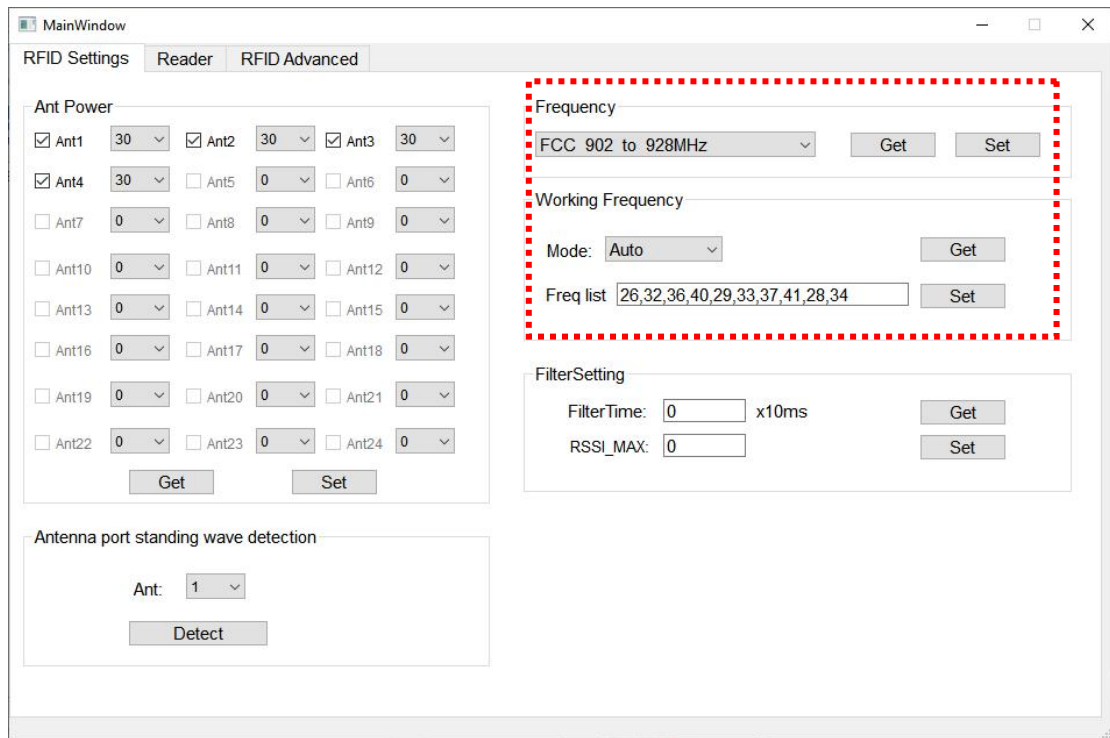
Figure 4-2

Select the Frequency Range to be configured and click Set. The Working Frequency will be automatically switched to the frequency in the Frequency Range, and the frequency hopping mode is Auto by default.
If you need to manually configure the specified frequency points, you need to switch the frequency hopping mode to Specified, and then input the frequency point set that needs to be specified.

4.1.3 Tag Filter

The tag filter setting interface is shown in Figure 4-3.
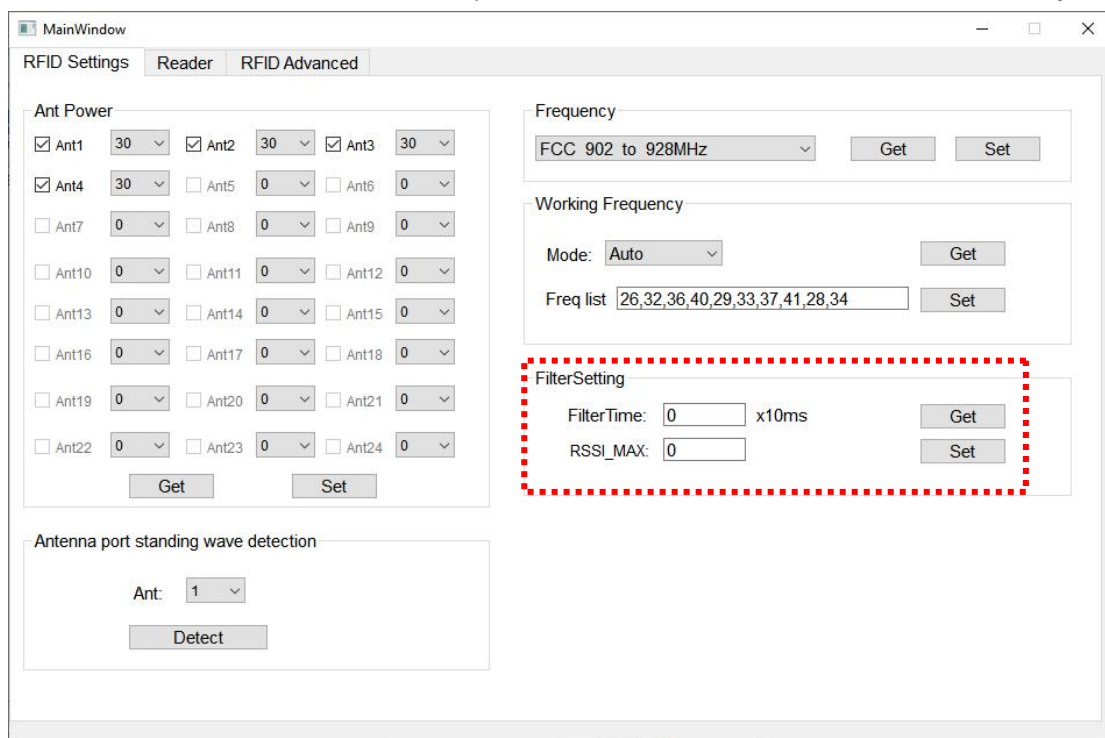
Figure 4-3

Click the "Get" to get the current tag filter setting information, change the filter time and signal threshold parameters, then click "Set" to confirm, Setting up success and failure will be prompted. The filter time range is 0-65535 and the RSSI threshold is 0-255.

Repeat Time: The same tag data is uploaded only once within the specified filtering time.

RSSI threshold: When the RSSI value returned by the tag is lower than the threshold, the tag data will not be uploaded and discarded.

4.1.4 Standing Wave Detection

Standing wave detection interface, as shown in Figure 4-4.

Figure 4-4

First select the antenna number and frequency point to be detected, then click Detect button to display the standing wave information, as shown in Figure 4-5

Figure 4-5

The larger the return loss is, the better the impedance matching is.

4.2 RFID Advanced Configuration

4.2.1 EPC Baseband Configuration

The location of EPC Baseband Setting is shown in Figure 4-6.

Figure 4-6

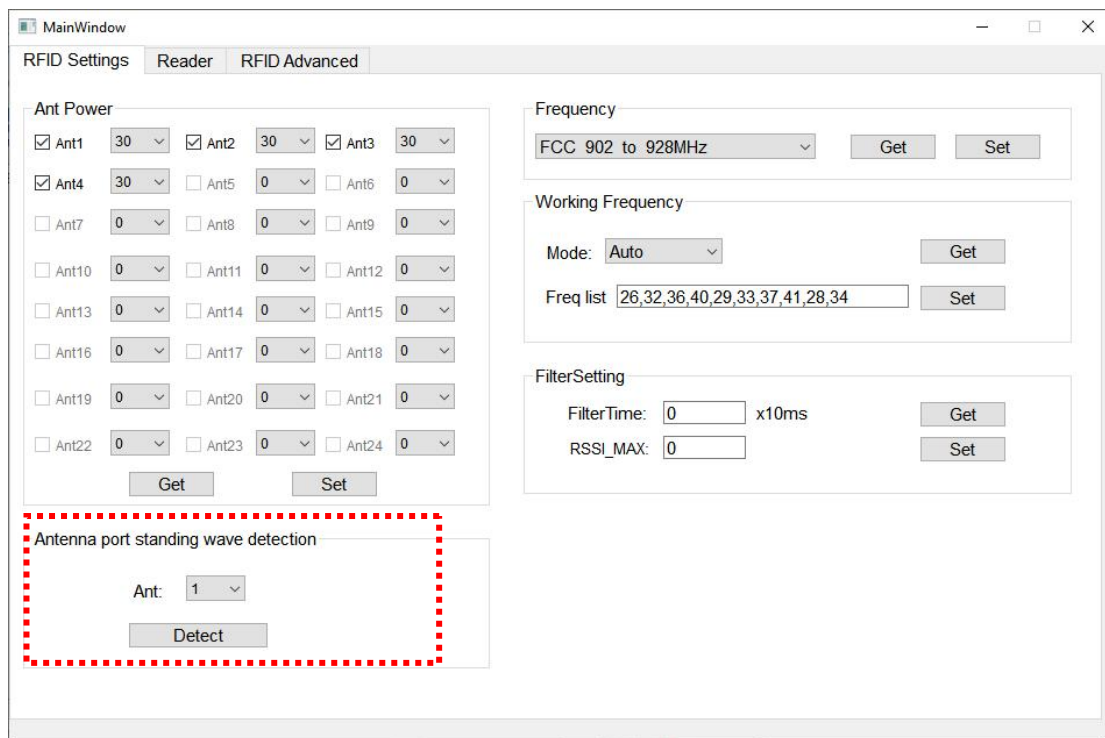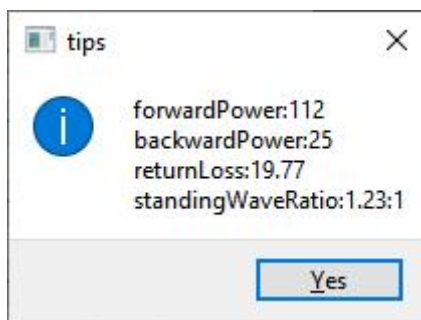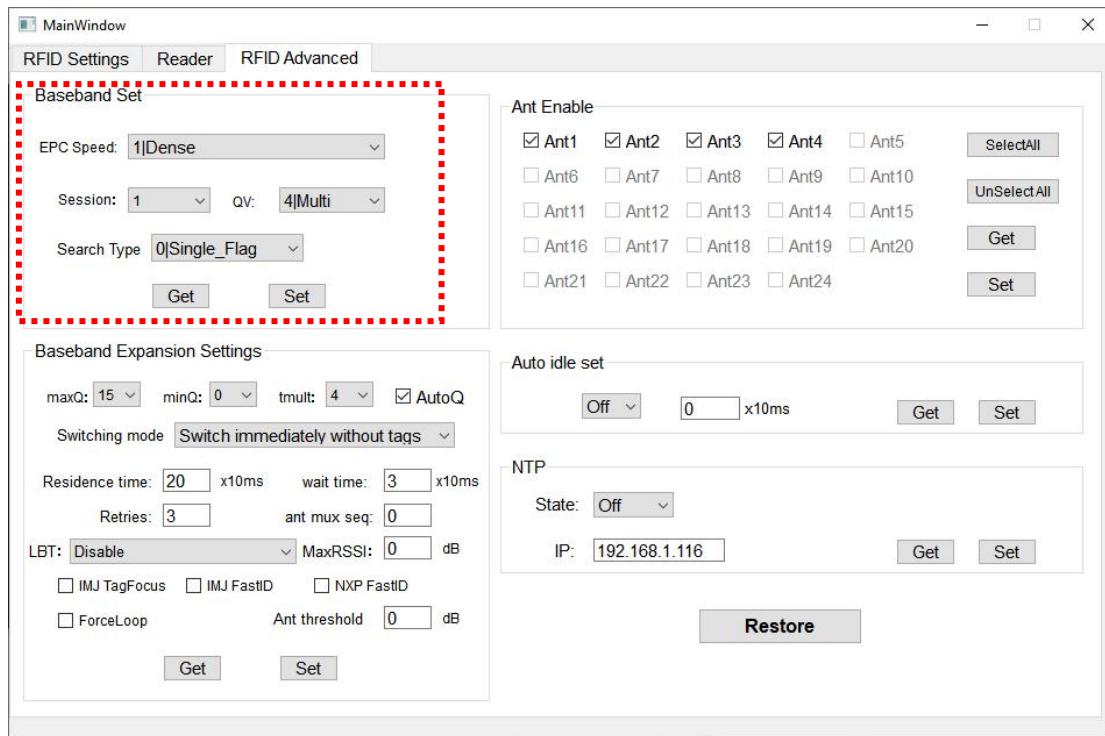EPC baseband rate refers to the modulation, Encoding, and Data Rates between Reader‐Tag Physical and Link Layers.

Generally, we suggest using dense mode or auto mode, other baseband rates can be used according to project conditions.

Q value setting should be associated with the field tag quantity, it is approximately equal to 2 ^ Q. Q values range from 0 to 15

    0 for single tag read 2^0 = 1

    4 for multi tag read 2^4 =16

The default setting is:

    EPC Speed: 1|Dense

    Session: 1

    QV:4|Multi

    Search Type: 0|Single Flag

4.2.2 EPC Extended Baseband Settings

The EPC extended baseband parameter setting interface is shown in Figure 4.7.

In the Baseband Extended Settings interface, antenna switching mode, dynamic Q algorithm, and special tag inventory can be configured.

    ✧   TagFocus: Use TagFocus technology to read tags, and the tags need to support TagFocus technology

    ✧   FastID: FastID technology is used to read tags (TID can be read directly when reading EPC), the tags need to support FastID technology

    ✧   minQ: Minimum Q value of dynamic Q algorithm

✧ maxQ: Maximum Q value of dynamic Q algorithm

✧ tmult: Dynamic Q algorithm coefficient

✧ Antenna mode: The antenna switching mode can be configured to switch immediately without tag or use up the residence time

✧ Residence time: Set an antenna residence time, set to 0 for the default residence time.

✧ Waiting time: Set the waiting time between antenna switching.

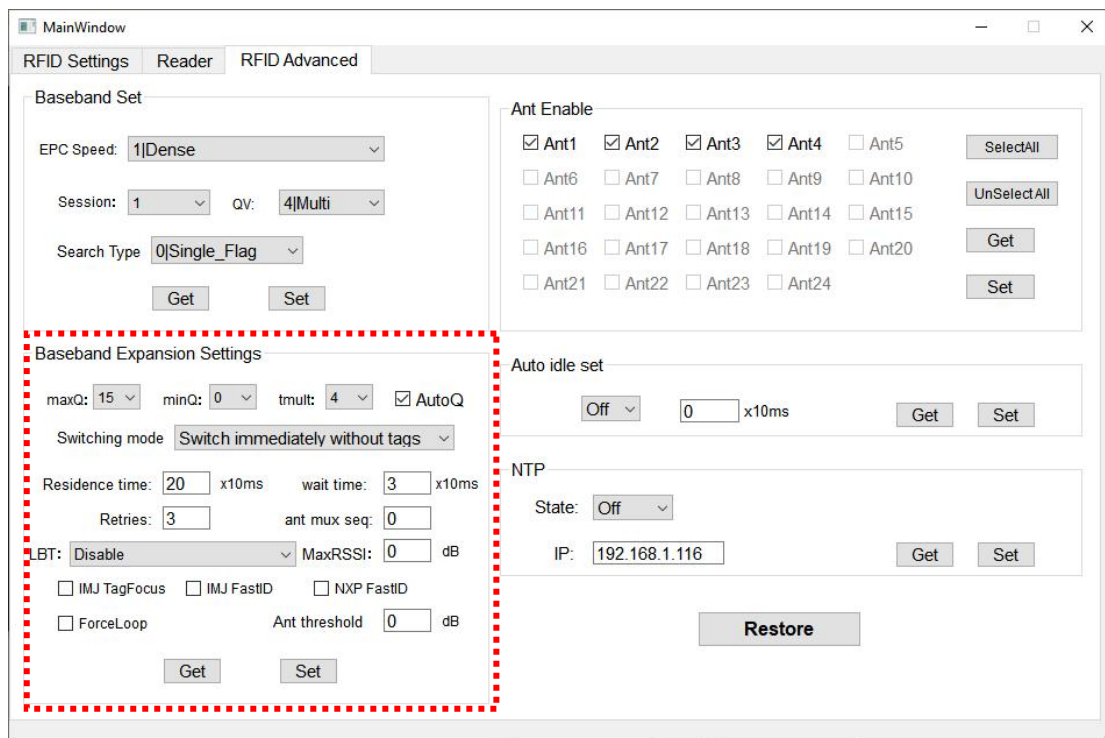✧ Retries: Number of retries without reading any tags, a reference option for antenna switching

Figure 4-7

4.2.3 Antenna Enable

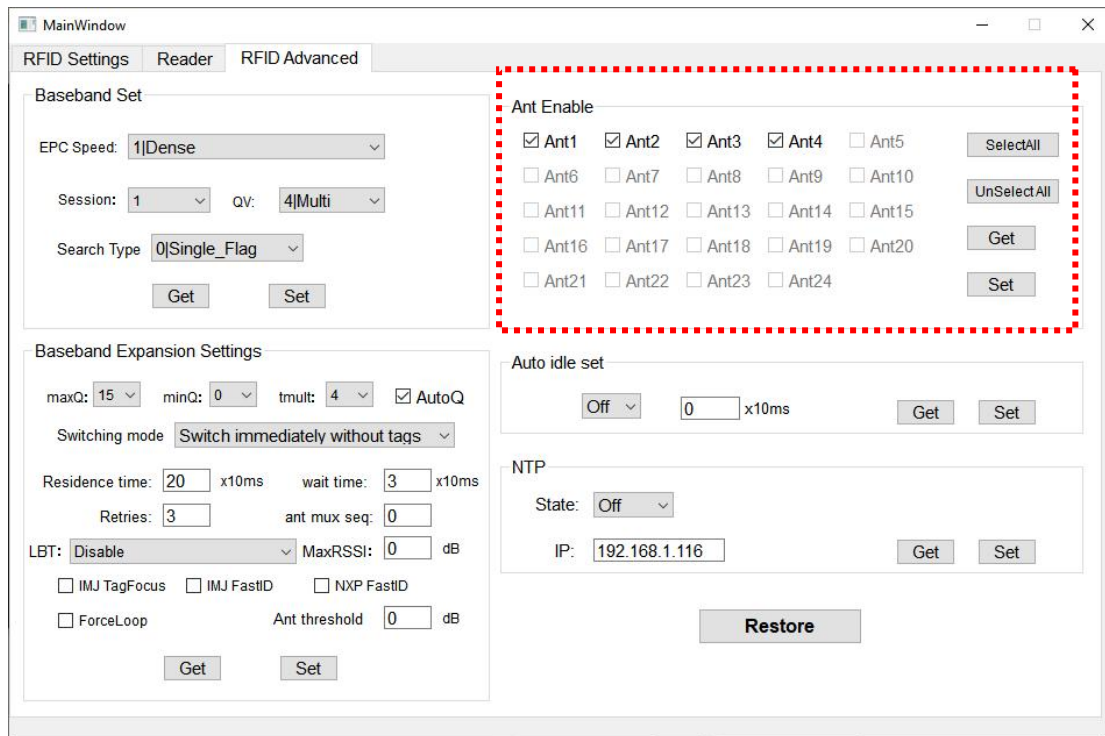The Position of Antenna Enable is shown in Figure 4-8.

Figure 4-8

The antenna enable setting is used to control whether the antenna can be used in read and write operations. Enable the antenna by checking the check box beside the antenna number, click the "Get" button to query which antenna has been checked. Please note the difference of "Antenna enable" and "Antenna power", the "Antenna enable" indicates whether the antenna is available while the "Antenna power" indicates the range of antenna power. If the "Antenna enable" does not turn on, it is not available even the antenna power setting is large.

4.2.4 Automatic Idle

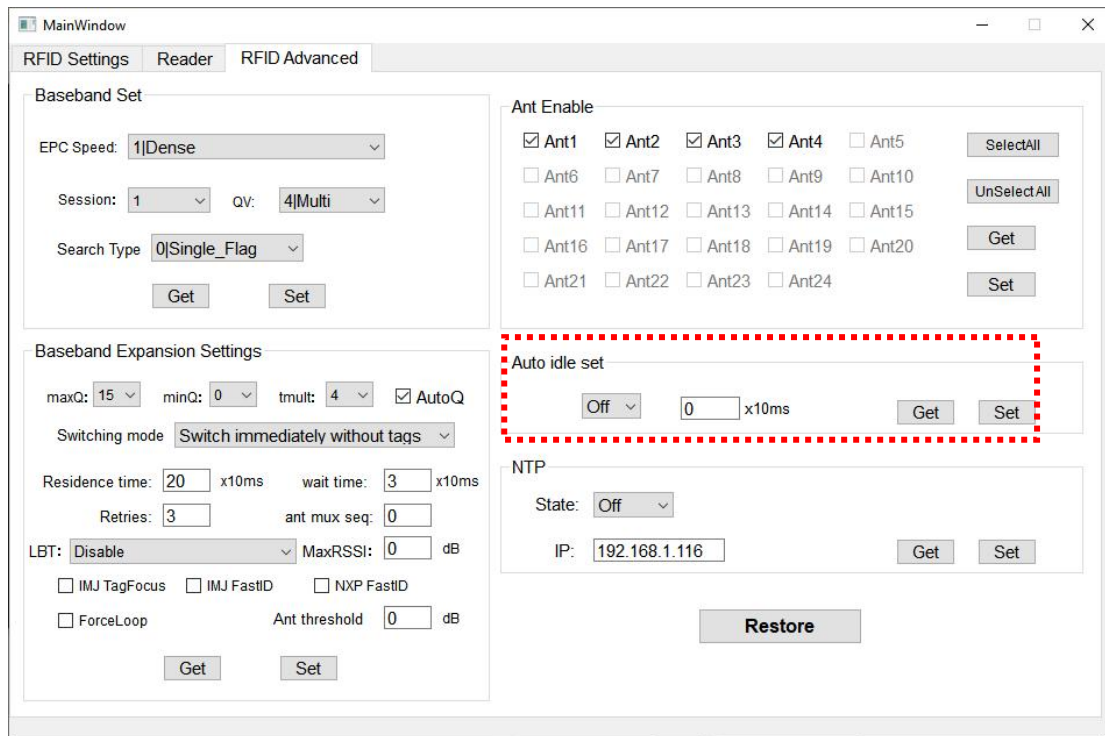The automatic idle setting interface is shown in Figure 4-9.

Figure 4-9

Click the "Get" button to get the current automatic idle setting information, manually change the automatic idle switch and idle time parameters, then click Set to confirm, Setting up success and failure will be prompted.

Assuming that the automatic idle time is set to 10 * 10ms, the reader will automatically enter a rest state for a period of time, that is, a rest time of 100ms, when the reader does not recognize the tag during continuous reading, so as to save power consumption. After the rest time, the reader will automatically re-enter the tag reading state.

4.3 Reader Configuration

4.3.1 RS232 Settings
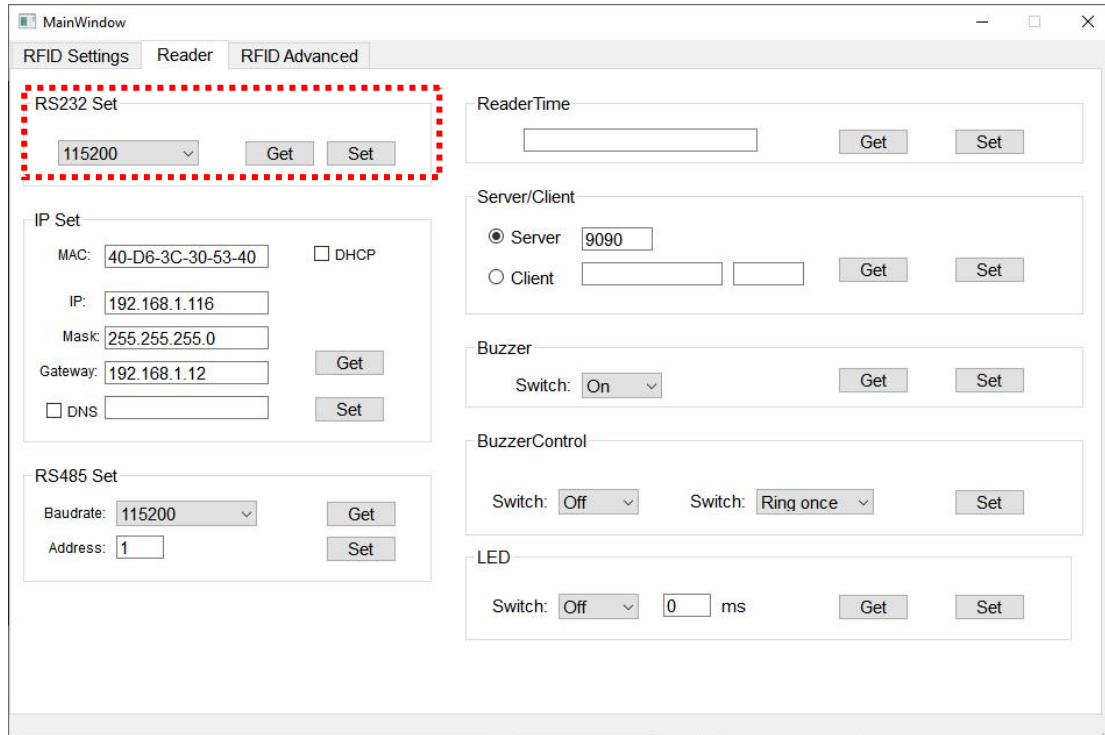
The RS232 setting interface is shown in Figure 4-10.

Figure 4-10

Click the "Get" button to get the current serial baud rate, through the drop-down box to change the baud rate and then click the "Set" button to submit, Setting up success or failure will be prompted.
Note: If the reader is connected through serial port, baud rate changed, you need to use the new baud rate to re-connect, and otherwise the reader cannot continue to operate.

4.3.2 Network Settings

The network setting interface is shown in Figure 4-11.

Figure 4-11

Click the "Get" button to get the current network setting information. You can set the parameters by manually changing the IP, Mask, Gateway, then clicking the "Set" button to submit, Setting up success and failure will be prompted. Note:After the setup succeeded, if the reader is connected through network, you need to use the new IP to reconnect when IP address changed, otherwise the reader cannot continue to operate.

4.3.3 RS485 Settings
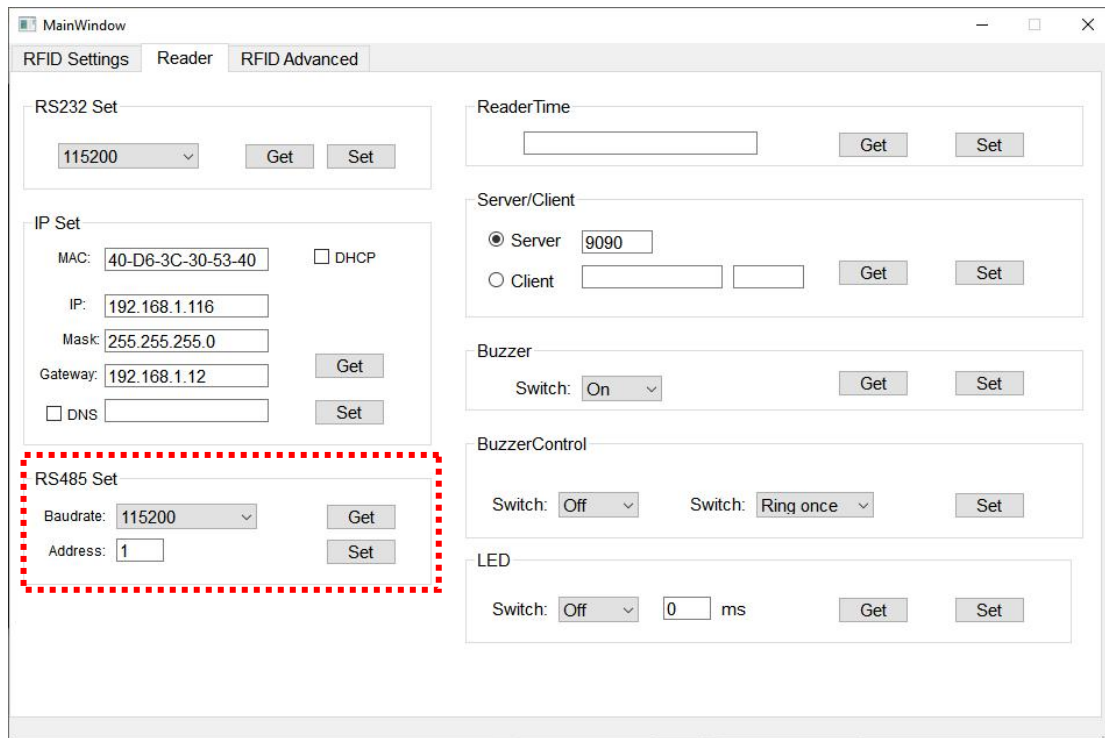
RS485 setting interface, as shown in Figure 4-12.

Figure 4-12

Click the "Get" button to get the current 485 setting, you can set the 485 serial address and Baud Rate by manually change the parameters, then click the"Set" button to submit. Setting up success and failure will be prompted.

Note:After the setup succeeded, if the reader is connected through RS485, you need to use the new address and BaudRate to reconnect when 485 address and BaudRate changed ,otherwise the reader cannot continue to operate . Address range of 485 is 1-254.

4.3.4 Reader Time Setting

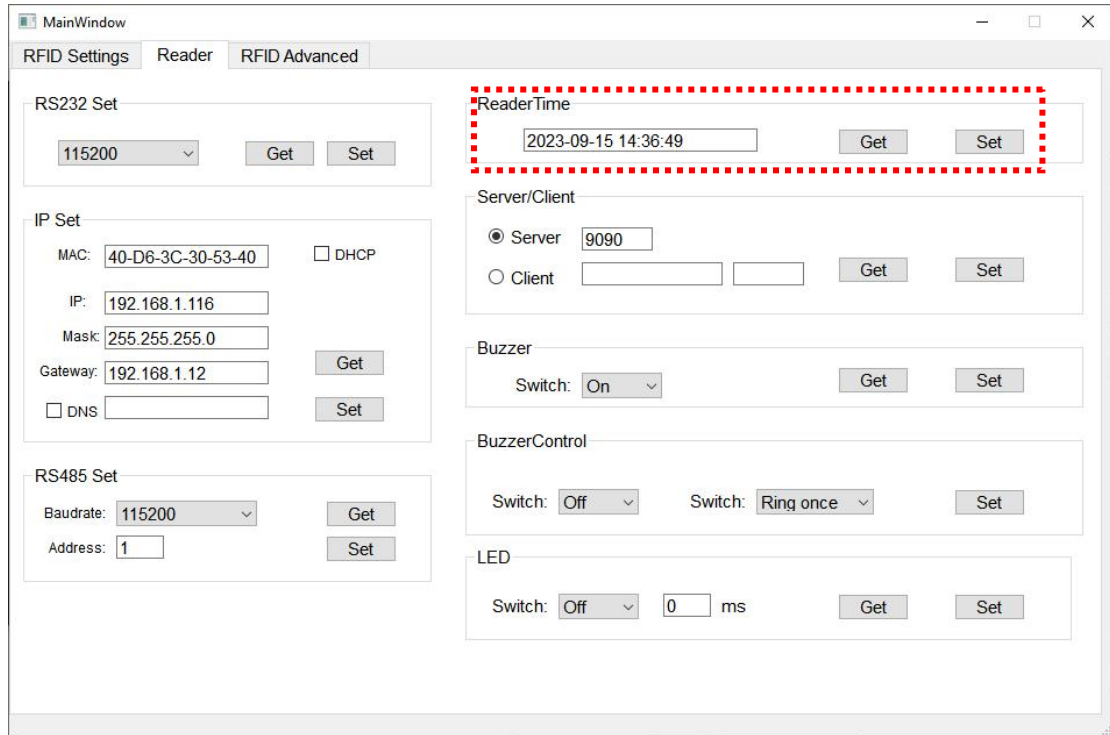The position of the reader time setting is shown in Figure 4-13.

Figure 4-13

Click Get to query the current built-in time of the reader. You can manually set the new time into the reader.

4.3.5 Buzzer Setting

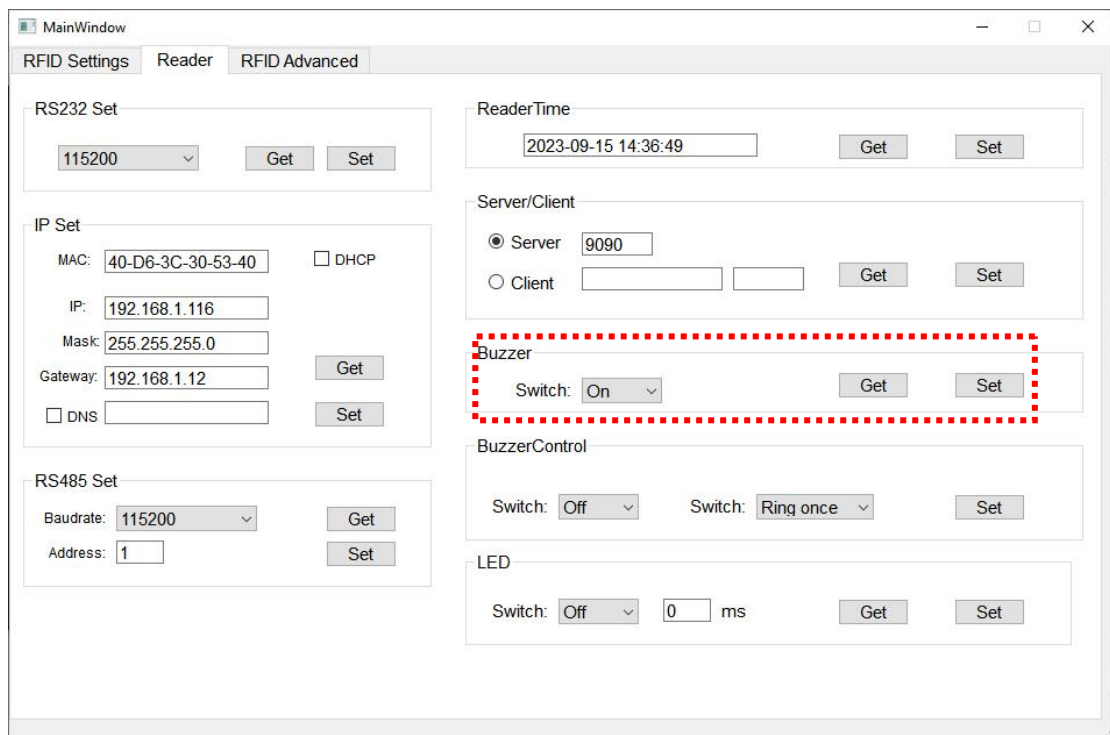The buzzer switch setting interface is shown in Figure 4-14.

Figure 4-14

If the buzzer is set to on, the built-in buzzer will sound when the reader reads the tags. If the buzzer is set to off, the tag reading prompt sound of the built-in buzzer will be turned off.