ZETA Android
Demo User Manual

CONTENTS

1. Introduction

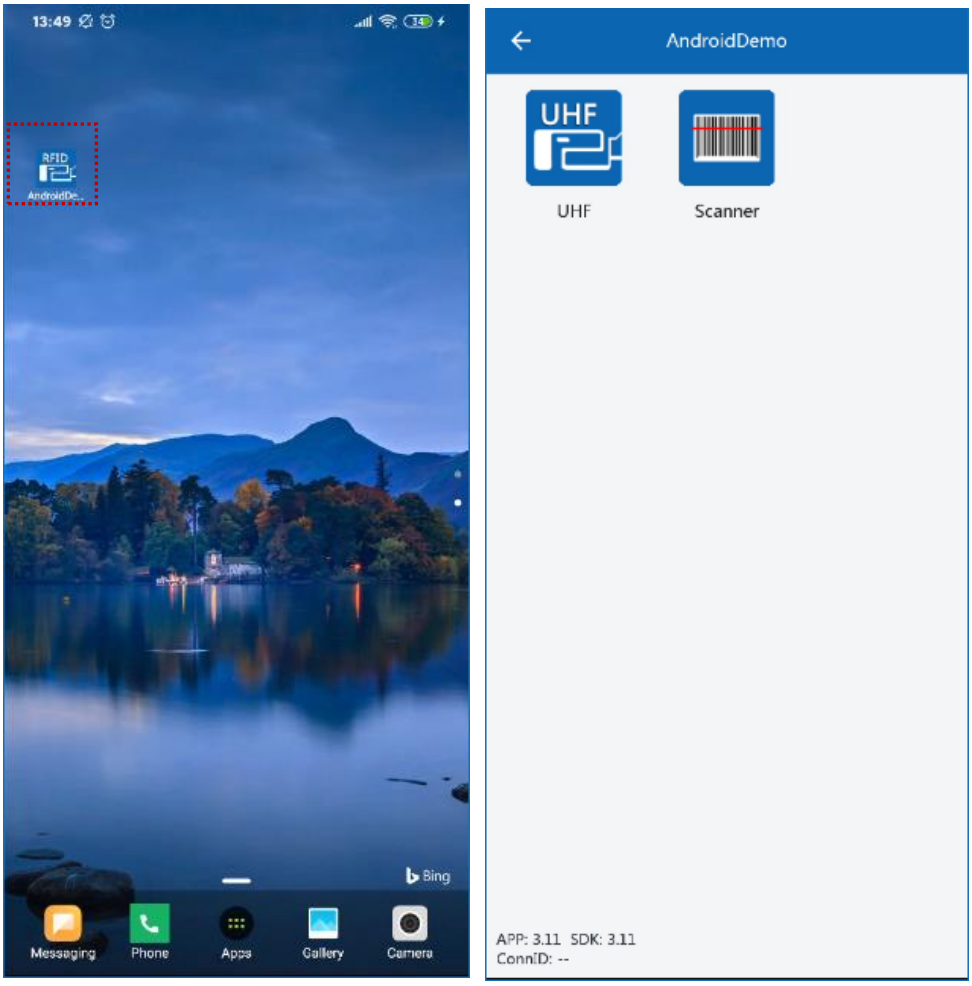
1.1 Purpose and scope

The purpose of this document is to explain the operation and use steps of ZETA Android demo APP.
The ZETAreader demo APP is suitable for many kinds of Android devices to interact with POLARIS readers, integrated readers, Bluetooth readers, etc. Through this document, users can operate various functions of the fixed reader demo APP.

2. Operating Instructions

2.1 Program function description

After installing the reader demo app in the Android device, click the reader demo app icon on the Android device system desktop to start the app.



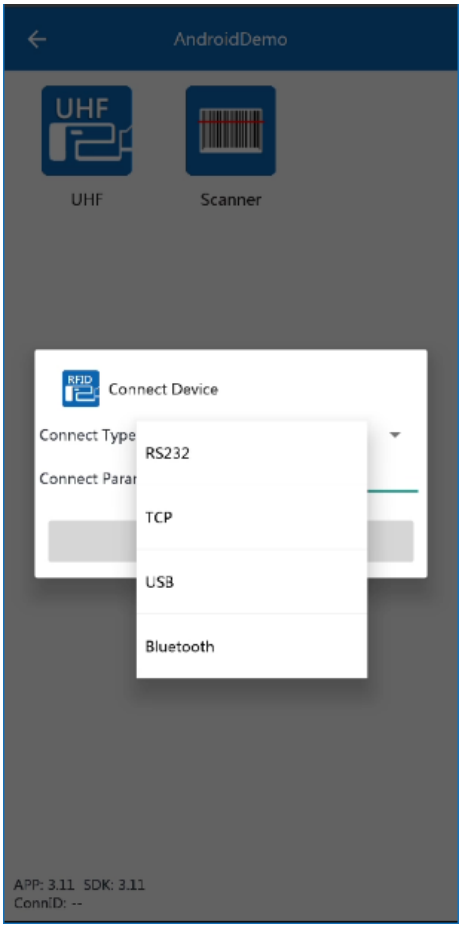
You can find the corresponding xxx.apk installer in the demo folder of the provided

secondary development kit.

The reader demo APP mainly includes connection, UHF, and barcode functions. In addition, functions such as version and device serial number can be displayed.

2.2 Connect Reader

The fixed reader Android SDK supports four connection modes: serial, TCP, USB serial and Bluetooth. We can choose the appropriate connection method according to different situations.



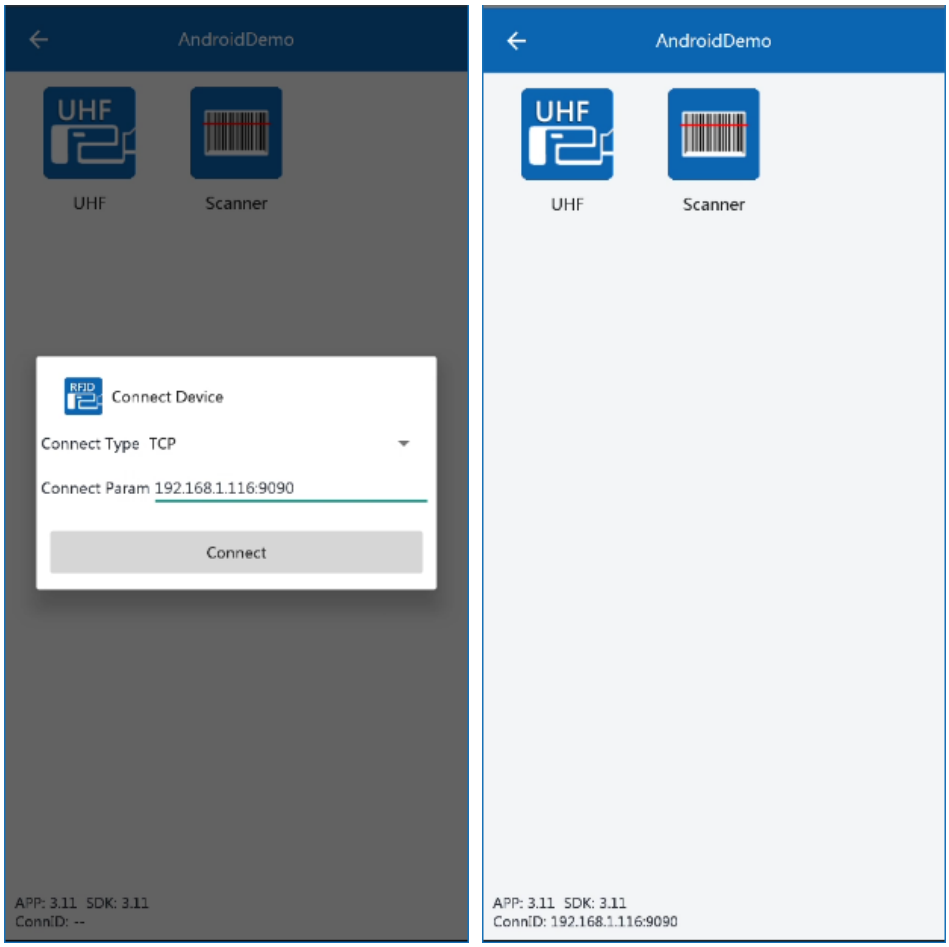
2.2.1 Serial Connection

If the Android device used to connect the reader has its own serial port, you can use the serial port connection method to connect the reader. Select RS232 as Connect Type, the connection parameter is the serial address. The serial port number under the Android system is presented in the form of an address, such as /dev/ttyS1:115200.

2.2.2 Network Connection

If the Android device used to connect the reader has its own network port, you can directly connect the Android device and the reader through the network cable or the Android device has WiFi function, you can connect the Android device and the reader to the same LAN and then Android device can connect to the reader via WiFi wireless. After the connection is successful, the APP will automatically jump to the UHF interface.

Select TCP as Connect Type. The connection parameter is the IP address of the reader + port number. The IP address and port number is separated by a colon. The default IP and port number of the reader is 192.168.1.116:9090.

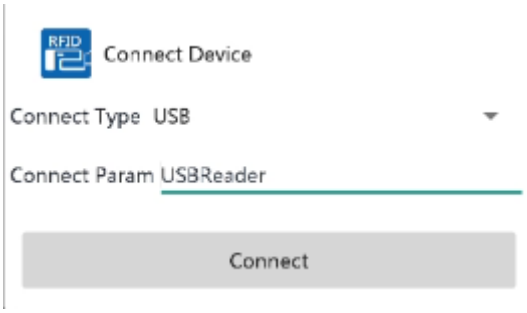


2.2.3 USB Connection

If the Android device supports the OTG function, it can be connected to the serial port of the reader through a USB-to-serial cable for communication.

The connection method is: Android devices (need to support OTG) ->USB-to-serial cable->RS232 serial port of the reader.

Select USB as Connect Type and the connection parameters is similar to /dev/bus/usb/001/028#VID_0403 PID_6001



2.2.4 Bluetooth Connection

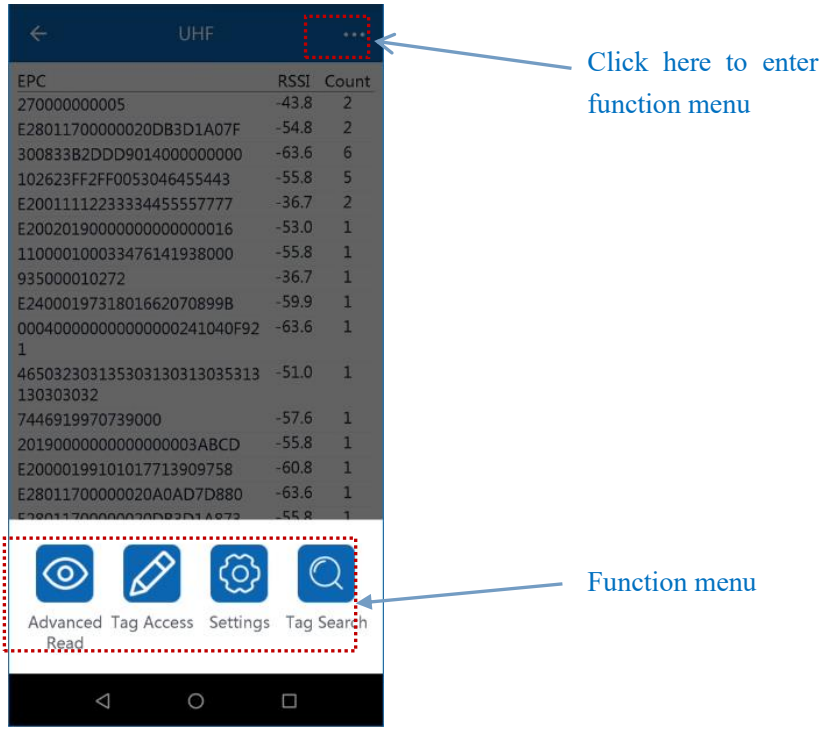
If the Android device supports Bluetooth and the reader also supports Bluetooth, then the Android device can connect to the reader via Bluetooth. Select Bluetooth as Connect Type, and the connection parameter is the Bluetooth name of the reader.

2.3 UHF Function

2.3.1 Read Tag

After the reader demo APP successfully establishes a connection with the reader, it will automatically jump to the UHF interface. On the main interface of the reader demo APP, click on the "UHF" icon to enter the UHF interface.

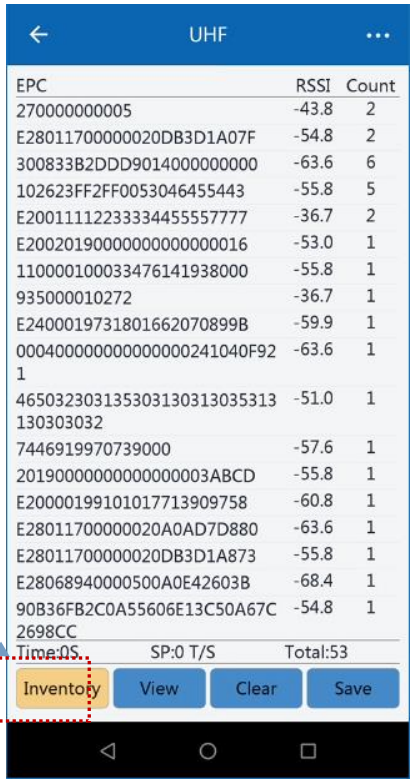
On the UHF interface, click the "Inventory" button to start reading tags. Before reading tags, you can open the Advanced Read interface in the function menu, and you can select "EPC", "TID", "User Area", "Reserved Area" or "EPC Area" to read the corresponding data of the tags.



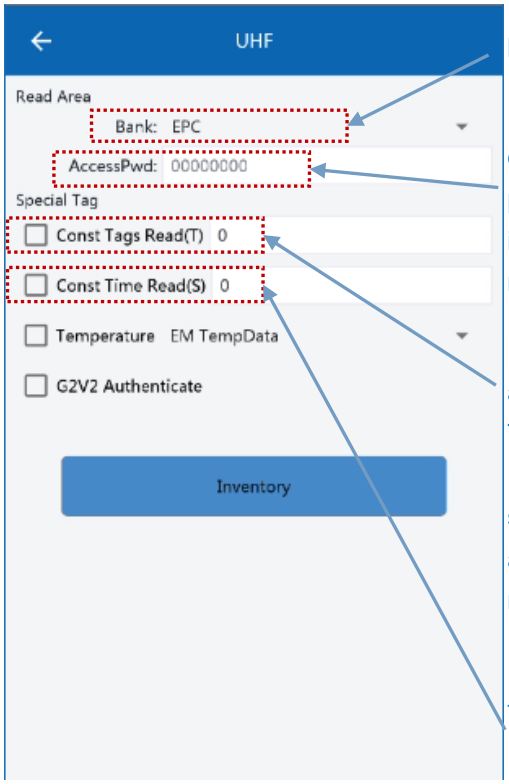
When “EPC” is selected, it means to read the EPC data of the tag.

This function can be used to test the performance (speed and distance) of the UHF module to read ISO18000-6B and ISO18000-6C electronic tags. The APP reads the ISO18000-6C electronic tags by default, which can be set in the setting interface.

The user can also clear or save the tag data, adjust the display format of the tag data (hexadecimal display or ASCII character display) and switch the prompt sound when reading tags. As shown below:



Click inventory, or press and hold the handle button to start the tag reading (switch the RFID/SCAN function switch button at the handle to RFID).

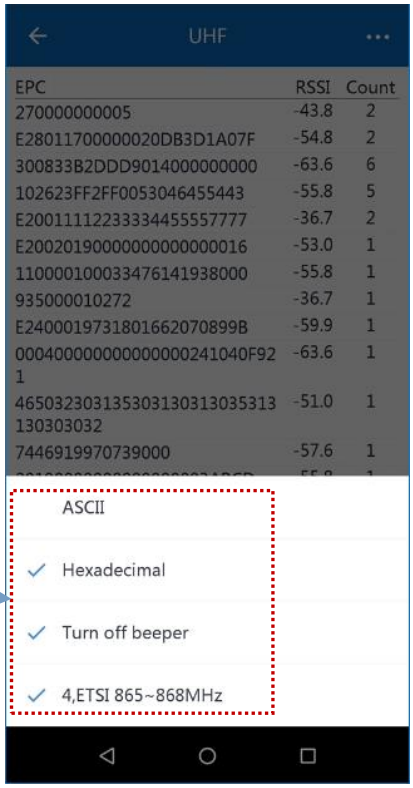


Different data areas can be selected for reading.

In the case that some data area is protected by password, you need to fill in the access password to read.

Enter the number of tags, and check option Const Tags Read, then start Inventory, the reader will stop reading automatically after reading the set number of tags.

Input the time, and check the option Const Time Read, then start Inventory, the reader will stop reading automatically after reading the set time.



After clicking the View button, this interface will appear. You can set the display format of the tag data and whether to turn on the tag reading prompt sound.

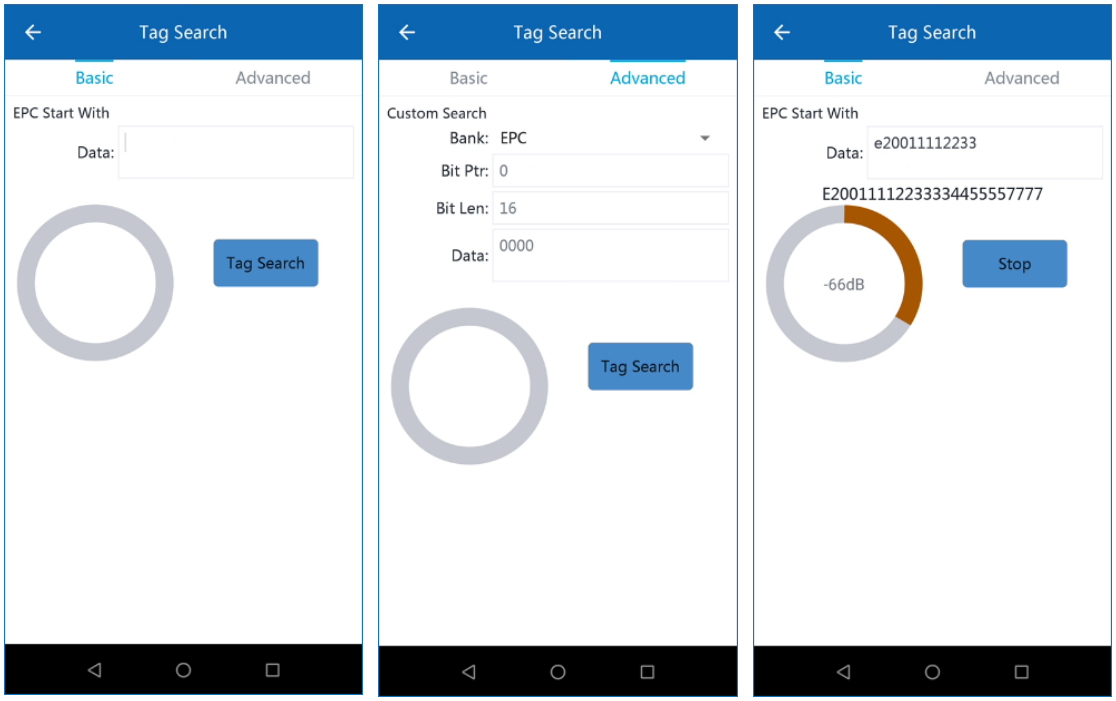
Note: To enter the function setting interface from the UHF interface, you need to stop reading first.

2.3.2 Tag Search

In the UHF interface, the tag search function can be turned on in the function menu. Tag search is used to find tags that meet the matching rules. During the search, the APP will adjust the buzzer rhythm and signal display according to the tag RSSI (Received Signal Strength Indication).

The following figure shows the signal strength returned by the same tag at different positions. The signal strength on the right is obviously better than the signal strength on the left. The stronger the signal, the closer the tag is to the reader antenna.

After entering the data to be matched, click Tag Search, or press and hold the handle button to start the search tag (switch the RFID/SCAN function switch button at the handle to RFID). The operation interfaces are shown in the figures below:



There are two ways to search tag, Basic and Advanced.

Assuming there are 4 tags, these EPC are

E2001122334455667788990 0

E2001111222233334444555 5

E2001111223333445555666 6

B011100000000005031123 77

Basic, match a few digits at the beginning of the tag EPC

Assuming that the matching content is B011, then only the tag with EPC as B011100000000005031123 77 is read. Assuming that the matching content is E200, then the three tags starting with E200 in EPC can be read. Assuming the matching content is E2001122, then only tag EPC is E2001122334455667788990 0 can be read

Note: The length of the matching data needs to be a multiple of 2.

Advanced, use EPC or TID for matching, and you can specify the location of the matching data.

Assumption:

Matching area: EPC,

Start of matching bit: 16 (tag EPC is composed of hexadecimal numbers, a hexadecimal number is 4 bits, 16/4=4, which means the data to be matched is from the 5th hex number of EPC)

Length of matching bit: 32 (32/4=8, which means that 8 hexadecimal numbers need to be matched)

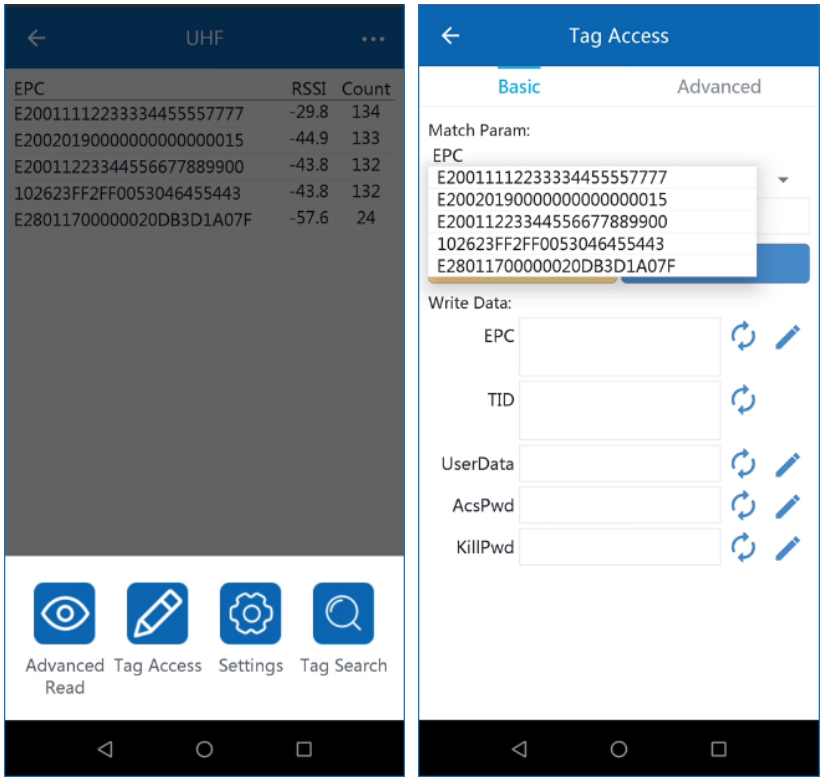
Matching content: 11112233,

Then only the tag with EPC E2001111223333445555666 6 can be read

2.3.3 Tag Access

In the UHF interface, the Tag Access function can be turned on under the function menu. The Tag Access interface can read, write and lock/unlock the tag.

Before opening the Tag Access interface, you need to read a valid electronic tag on the UHF interface. When operating on a tag you need to select the EPC of the tag to be operated. As shown below:



Generally，the storage of EPC C1G2 tag consists of four memory Bank:

Reserved Memory	**Access and Kill Password**
EPC Memory	•EPC Electronic Product Code
	•Code can be written by user
TID	•TID Tag Identifier(preprogrammed & locked)
	•IC Manufacturer information, Unique serial number
User Memory	**•Manufacturing, quality and product related data storage**

EPC Memory: The area where EPC code is stored, the capacity is usually 96 bits. Readable and writable, writable from any state is the default state.

TID Memory: Store the TID number set by the tag manufacturer, the capacity is usually 96 bits, read only, unique in the world.

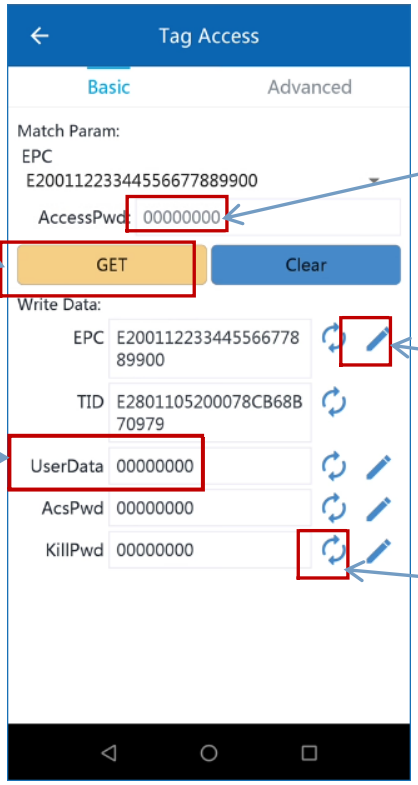
User Memory: The capacity depends on the chip, the default is 0, Readable and writable, writable from any state is the default state.

Reserved Memory: There are 32Bits access Password and 32Bits kill Password. Readable and writable, Readable and Writable from any state is the default state. The first 32Bits is the Kill password, which is 00000000 by default, while the second 32Bits is the access password, which is 00000000 by default.

When reading and writing the tag data area, the operation is performed in words, that is, the minimum boundary of the operation data is one word.

1 Word = 2 bytes = 16 bits = 4 hex numbers

Basic Tag Operations



After selecting a tag EPC to be operated, click "Get", the reader will try to read all the data area of the tag.

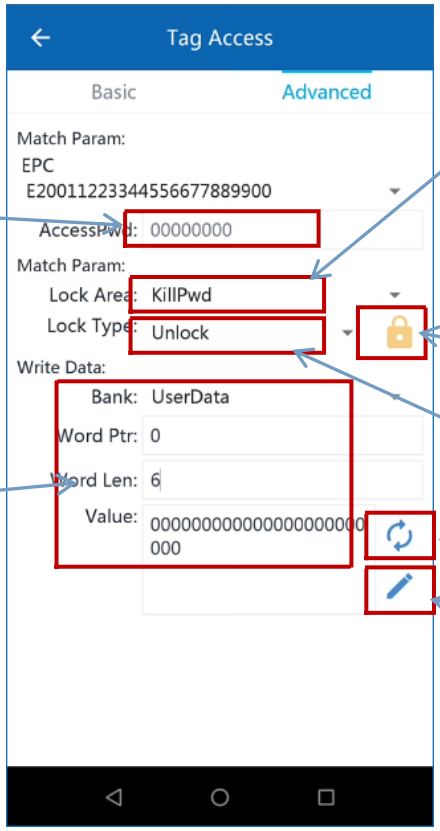
As the user area capacity of the tag is different for different chips, and some tags even have no user area, the app reads only 2Words (32bits) of data by default.

If the data area to be written is locked, you need to fill in the correct access password before writing.

Click the pen icon on the right of each data area to write the data to be written into the tag

Click the refresh icon on the right of each data area to only read the data in this data area

Advanced Tag Operations



If the data area to be written is locked, you need to fill in the correct access password before writing.

Can read and write to the designated location of EPC area and user area

Select a certain data area for lock operation, including Kill password, access password, EPC and user area

Click the lock icon to execute the lock operation

Select Lock Type

Read

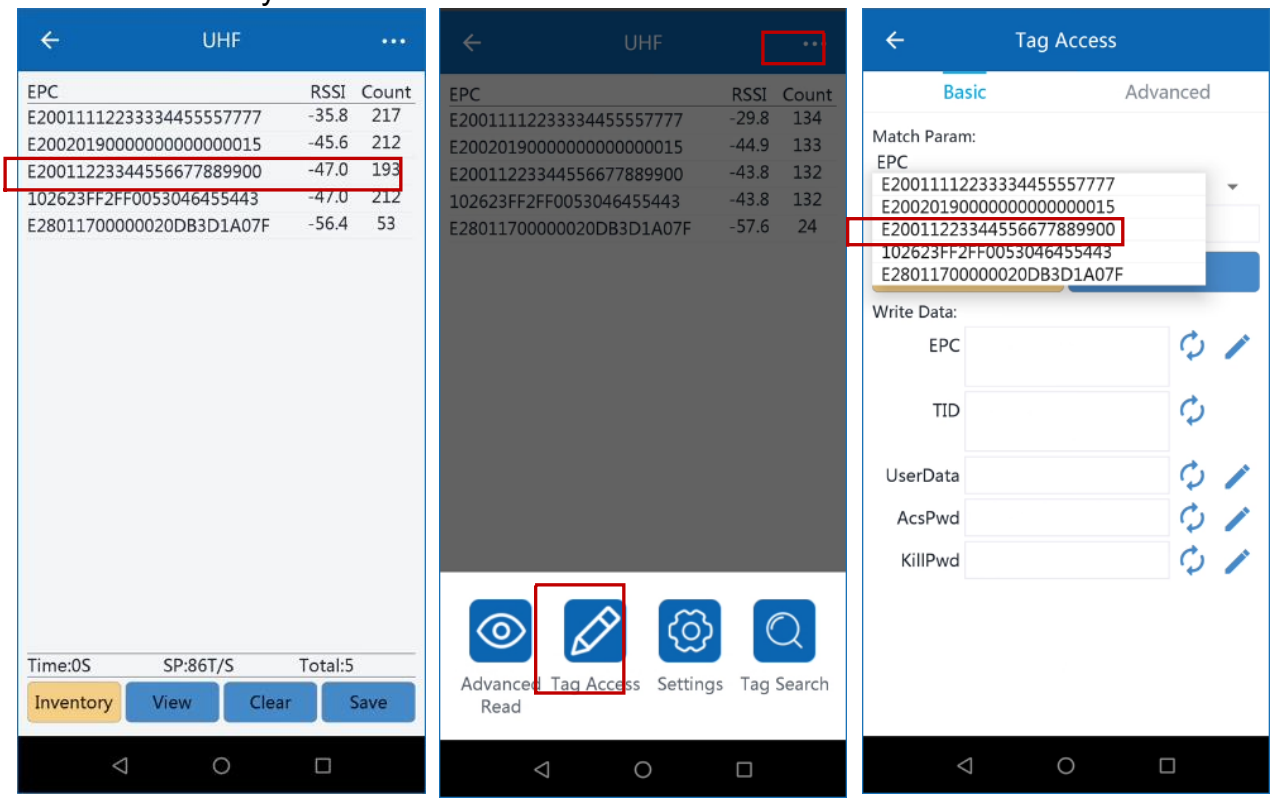
Write

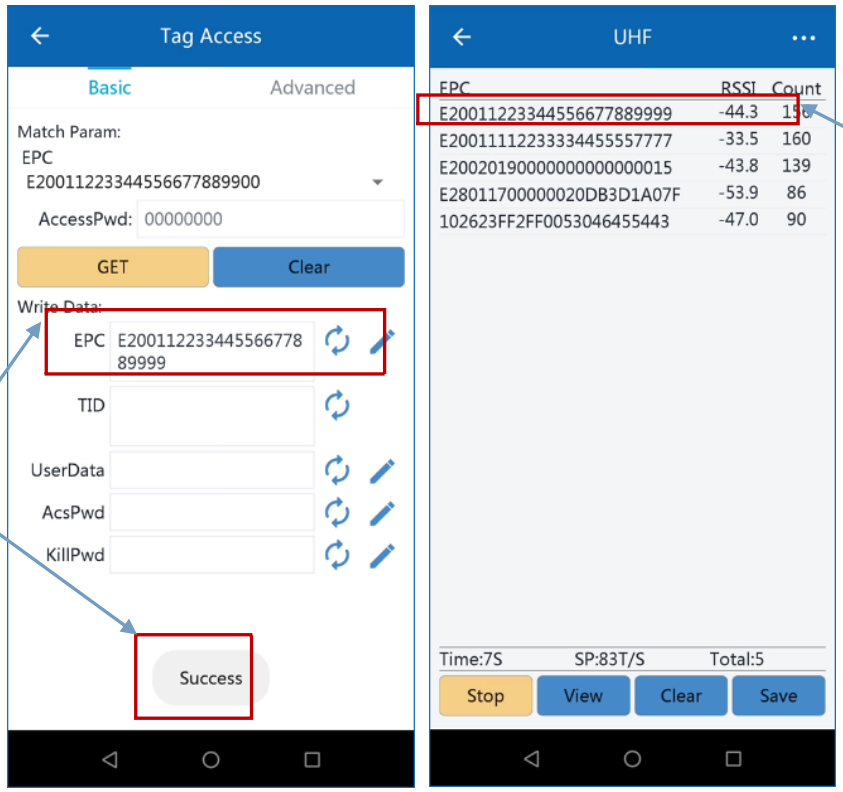
Example:

Write EPC

Assuming that the original EPC of the tag is E200112233445566778899 00, we want to change it to E200112233445566778899 99, the operation is as follow steps:

1. First read the tag to be operated, and then enter the next step
2. Click the upper right corner ··· to enter the function menu, then click Tag Access
3. Select the EPC of the tag to be written, and then operate on this tag
4. Fill in the new EPC, click the pen icon to execute the operation of writing EPC, the result of the success or failure of the operation will be prompted
5. Go back to the UHF interface and read the tag to verify whether the tag EPC has been written successfully.





After inputting the new EPC, click the pen icon on the right to execute the write EPC operation.

Go back to the UHF interface to read the tag and check if the tag EPC has been successfully written.

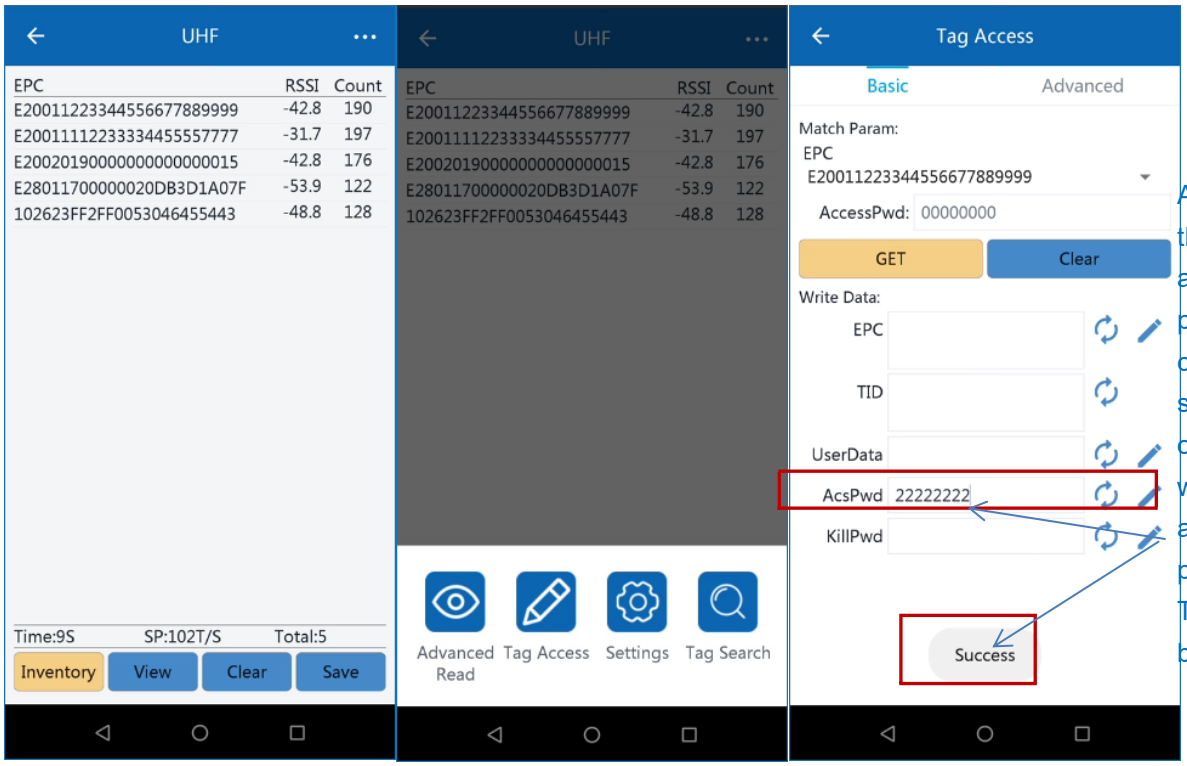
Lock the EPC area so that you can write the EPC area only when you know the access password

The idea of locking the EPC is to write-protect the EPC with the access password. Since the access password is used to protect the EPC area, it is impossible to let others know the access password of the tag. In order to ensure that the access password is not known by others, we also need to change the default 00000000 of the access password to other values, and do read and write protection for the access password.

In this way, if anyone else does not know the access password, they cannot read the access password and cannot rewrite the EPC.

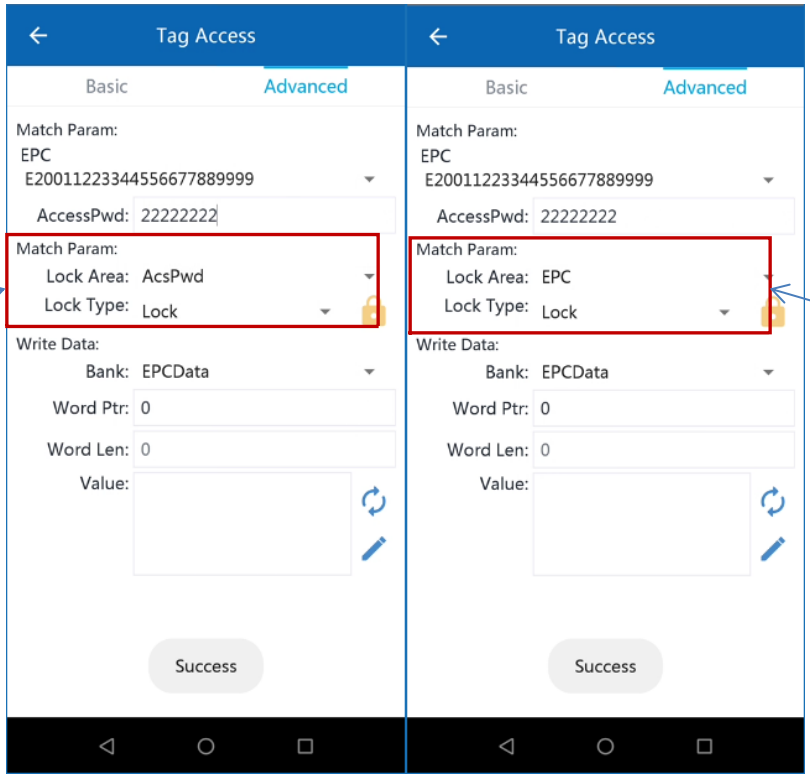
Assuming that the EPC of the tag is E200112233445566778899 99, we need to write-protect the EPC of this tag, the operation is as follows:

1. First read the tag to be operated, and then enter the next step
2. Enter the function menu, then click the Tag Access icon
3. Rewrite the access password to 8 hexadecimal numbers other than 00000000
4. Lock access password
5. Lock EPC
6. Verify, use the default access password to try to rewrite EPC, prompting “The data area is locked”

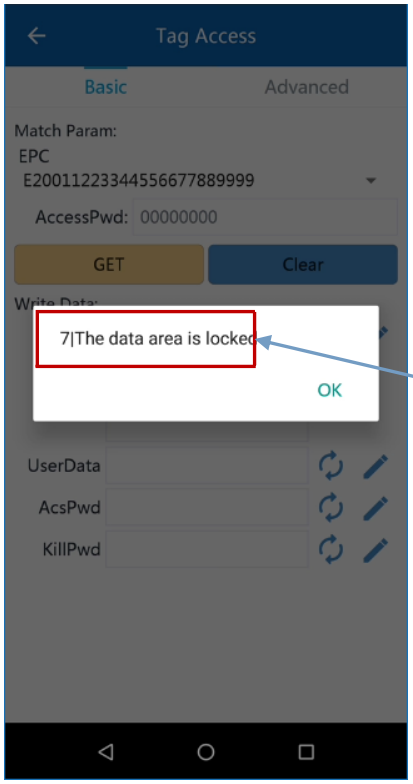


After entering the new access password, click the pen-shaped icon on the right to write the new access password. The result will be prompted

After selecting the lock area and lock type, click the lock icon on the right to perform the lock access password operation



After selecting the lock area and lock type, click the lock icon on the right to perform the lock EPC operation



Use the default access password to try to write to the EPC, prompt "The data area is locked", indicating that the EPC area has been locked

2.3.4 UHF Settings

In the UHF interface, click ... in the upper right corner to open the function menu, and the Settings can be opened under the function menu. UHF module parameters can be set in the Settings interface, including RF output power, frequency, working mode, baseband parameters, etc.

The APP has made preset working mode options for common scenarios, including Standard mode, Portal mode, Point of Sale mode, Label Write mode, Shelf/filling cabinet mode, ETC mode, and Parking Lot mode.

Standard mode, multi-item management, easy to use

Portal mode, item and personnel linkage, safe protection of your assets and storefront

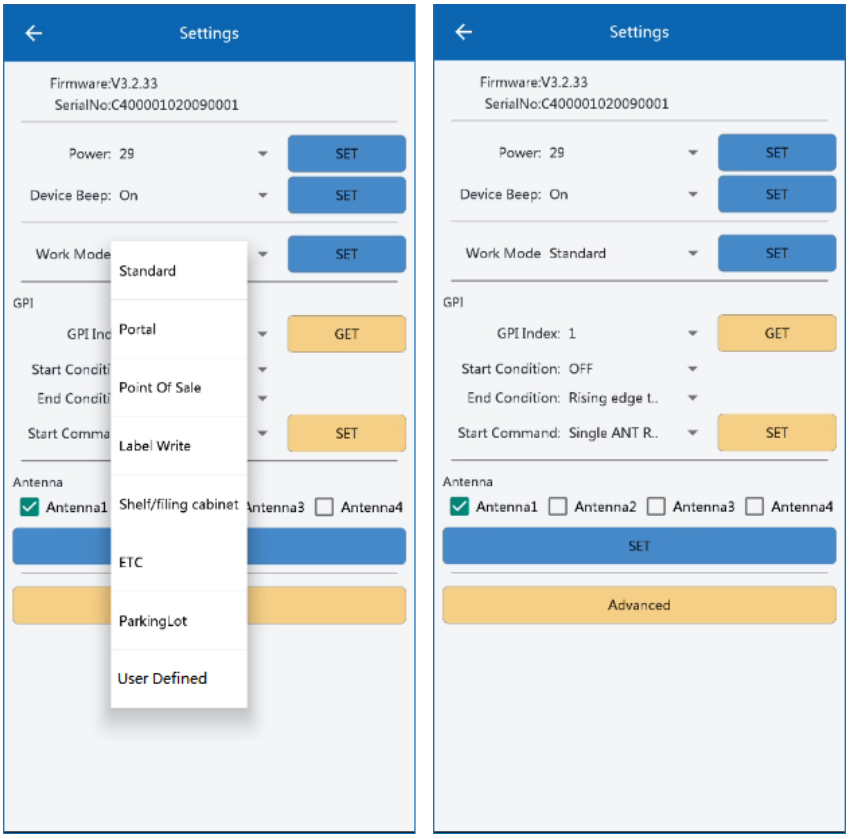
Point of Sale mode helps reduce queuing, fast checkout, improve satisfaction

Label Write mode, write tag accurately, improve tag issuing efficiency

Shelf/filling cabinet mode, fast inventory of a large number of valuable documents and items, real-time status at your fingertips

ETC mode, multi-lane parallel, non-inductive payment, free flow and high speed, fast customs clearance

Parking Lot mode, Parking mode, single vehicle in sequence, unhindered access, easy and convenient



Power: The transmit power of the UHF module, the larger the value, the farther the distance to read the tag

Device Beep: only applicable to Bluetooth readers. After turning on, the built-in buzzer will sound after the Bluetooth reader reads the tag

GPI: It can be used to set the handle button function of the Bluetooth reader. If it is used to set the handle button of the Bluetooth reader, the applicable parameters are as follows:

GPI Index: the default is 1

Start Condition: Falling edge trigger

End Condition: Rising edge trigger

Start Command: Single antenna read EPC

After clicking Advanced, the complete parameter setting interface can be displayed, and the relevant parameters can be set according to the site conditions.

Region: Set the working frequency range of the UHF module. The radio regulations of different countries or regions are different. Please follow the local regulations. For example, it needs to be set to CHN 920~925MHz in China

Frequency: the way of frequency hopping, there are two options of automatic and designated frequency. A working frequency band is composed of several frequency points. The more frequency points, the stronger the anti-interference ability. It is recommended to set to automatic, that is, use all frequency points in the working frequency band to work. If

you need to use multiple readers at the same place at the same time, you can specify a different frequency point for each reader to avoid co-frequency interference.

Power: The transmit power of the UHF module, the larger the value, the farther the distance to read the tag

Carrier: used to test the matching degree between UHF module and built-in antenna. Used for troubleshooting.

Baseband: After setting different working modes, the APP will automatically set the baseband parameters. Generally, no modification is required.

Tag Type: supports 6C and 6B protocol tags, the default setting is 6C.

TagFocus: Only applicable to the tags of Impinj specific chips to optimize inventory speed and efficiency.

FastID: Only applicable to the tags of Impinj specific chips, TID will be automatically brought out when EPC is read

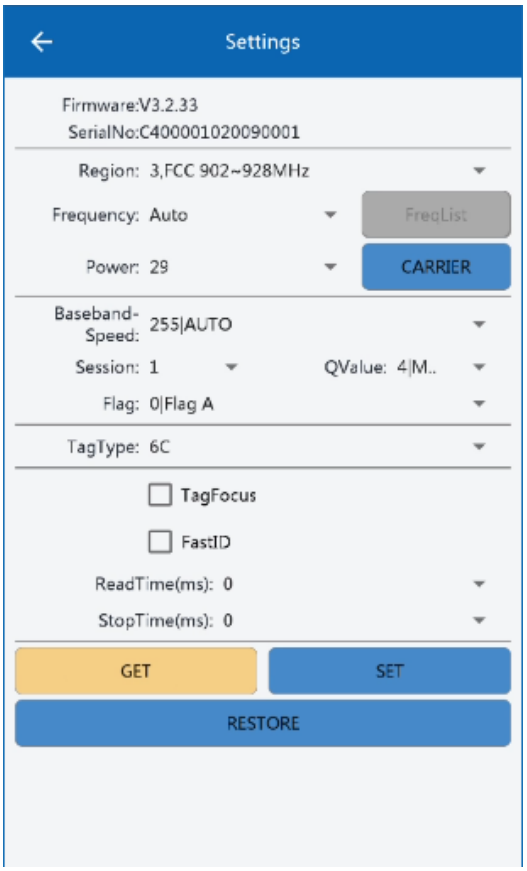
Read Time (ms): Set how long to read

Stop Time (ms): Set how long to rest. The UHF module will read tags circularly according to the Read Time and Stop Time.

Get: Query the current parameters of the UHF module

Set: Set new parameters into UHF module

Restore: Restore the parameters of the UHF module to the factory default values.



Note: You only need to adjust the power to change the reading distance (the larger the farther); do not modify the advanced parameters casually, so as not to affect the reading effect.

2.3 Barcode function (only applicable to Bluetooth readers)

2.3.1 Scan barcode

In the barcode function interface of reader Android demo app, this can identify mainstream one-dimensional barcodes and two-dimensional barcodes. In the application center, click the "Barcode" icon to enter the barcode interface.

In the barcode interface, click the "Trigger" button to start scanning the barcode. Or press the handle button to trigger the barcode scan.

As shown below: