Mi-AU-900 Handheld Data Terminal UHF Demo User Manual V1.0

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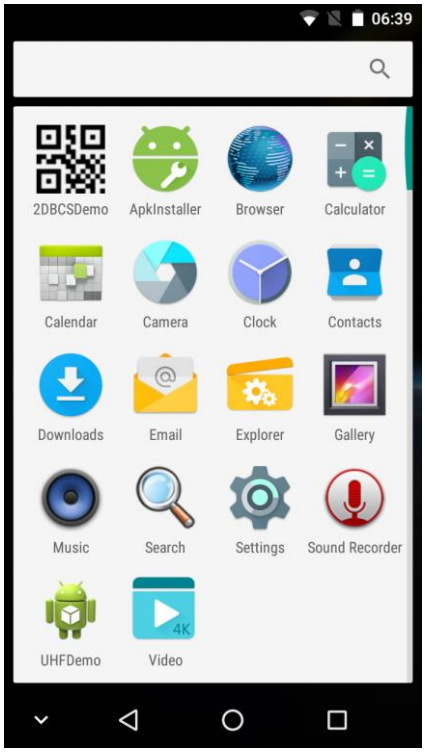
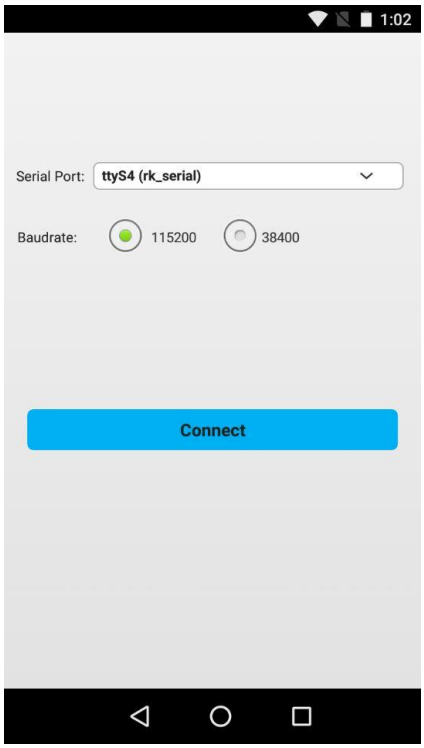
1. Operations and Configurations

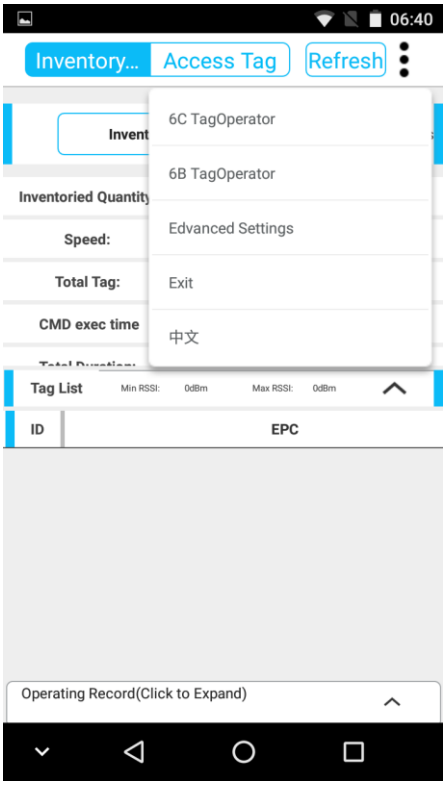
1.1 Initiate UHF Demo

Click UHF Demo icon to access, choose ttyS4 (rk_serial) as its serial port, and connect.





Here it comes to the tag (ISO-18000-6C) inventory page:

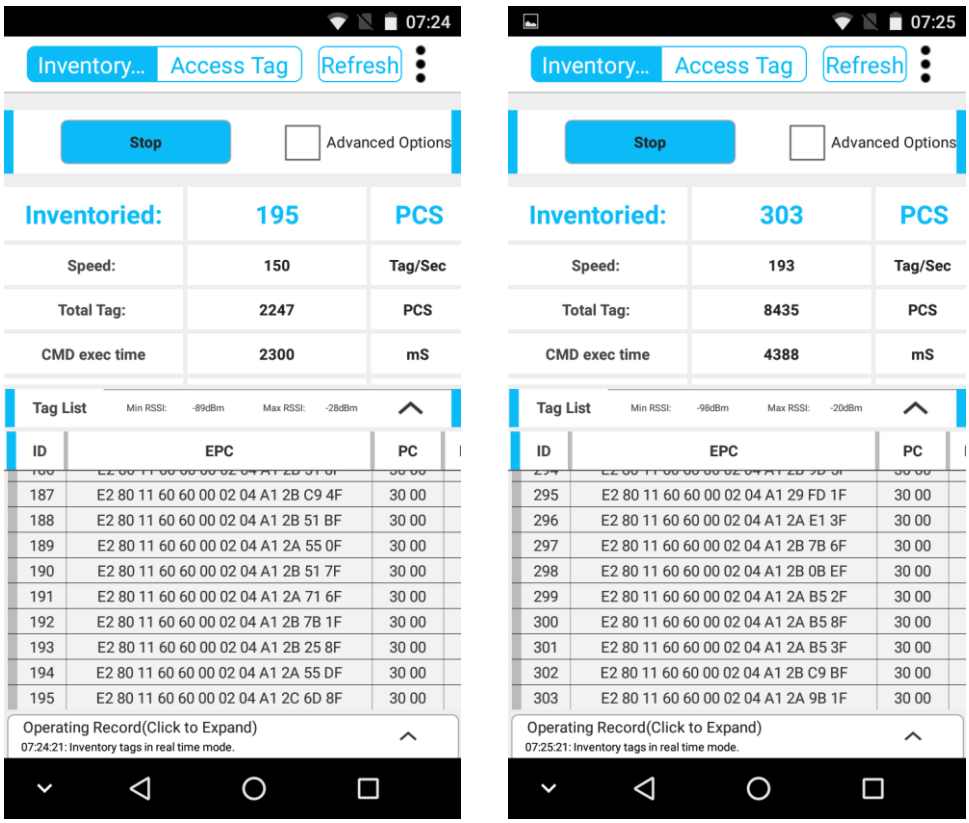


1.2 Tag(ISO-18000-6C) Inventory

Tag inventory, it is to identity the EPC number of multiple tags synchronously, which is the core function of an UHF RFID reader. Therefore, to evaluate the quality of a reader, the performance of a reader takes a decisive part.

1.2.1 Standard Inventory

Click **Inventory** or pull the trigger to start inventory. Tags EPC data will be shown in the EPC column and keeps real-time updating within the scope of tag readable distance. If we don't click **Stop** or loose the the trigger, data will keep updating, continuously and repeatedly.



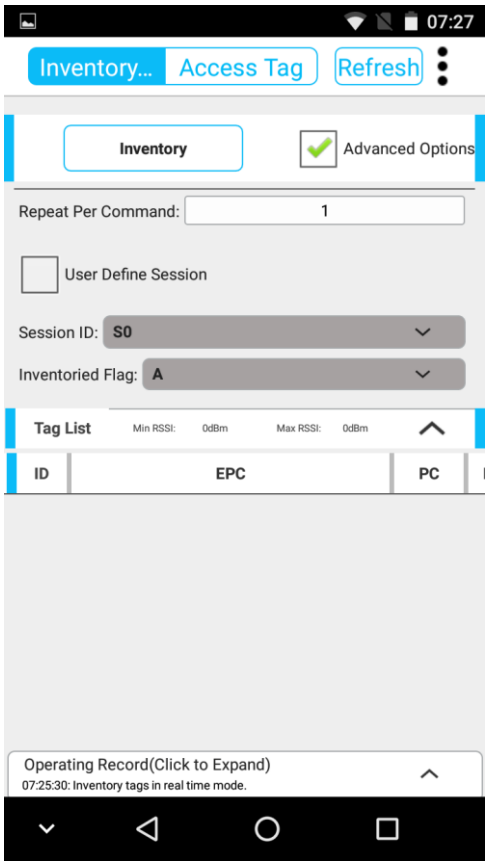
Inventoried	How many different tags have been read since clicking **Inventory**.
Speed	The rate to identity tags, in pcs/s.
Total Tag	A piece of EPC No. recorded as a piece of data. Here we record the total amount of returned data, which includes the data being repeatedly read.
CMD exec time	Time that each inventory command takes, in ms.
Total Duration	Total time it takes from clicking **Inventory** to **Stop**, in ms.

Meaning of the data in EPC column as below:

ID	Serial number of data
EPC	EPC number of tag
PC	Protocol control word of tag
ID CNT	Total times of tags being identified
RSSI	Signal intensity the last time when tag is identified
Carrier Frequency	Carrier frequency the last when tag is identified

1.2.2 Advanced Options

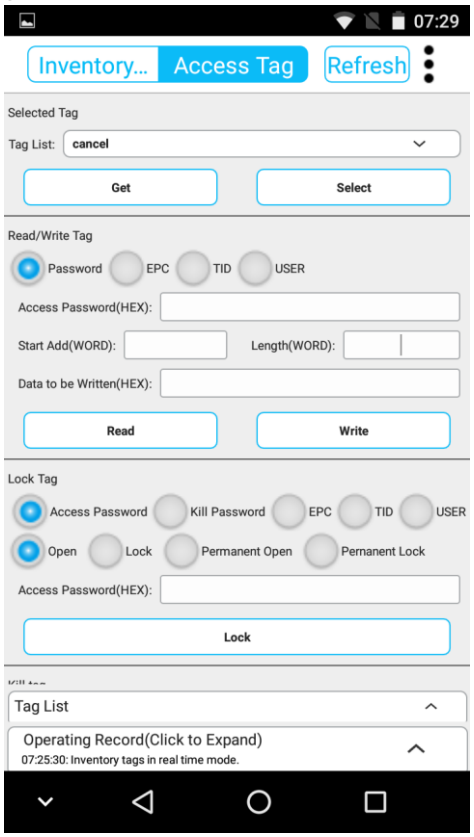
Click **Inventory** and select the **Advanced Options** as below:



Repeat Per Command: times that inventory command implemented repeatedly. For example, to set **Repeat Per Command** as“1”， then each inventory command will implement anti-collision algorithm once; and to set **Repeat Per Command** as“2”， then each inventory command will implement anti-collision algorithm twice...
User Define Session: If we select **User Define Session,** Session ID and Inventoried Flag will be optional; this time when we click **Inventory**, reader will start user define session and target inventory.

1.3 Access Tags(ISO-18000-6C)

Click“Access Tags“ and page will be shown as below:



Here are some procedures to operate Access Tags.

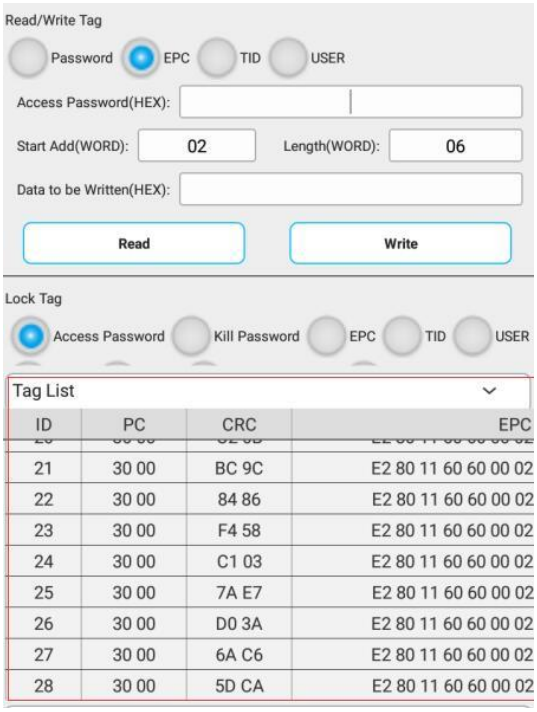
1.3.1 How to read tags

Parameters to read tags are listed as below:

Three parameters are necessary to be put in: password/EPC/TID/USER (choose **one** of those zone which you would like to read)，Start Add and Length. Note: Start Add and Length are counted as WORD，which are double byte of 16 bits. When parameters are set, please click “read”.

Please pay special attention to the parameters you put in, which should abide by the tags specifications, or it might fail.

When all the operations done, page will be shown as below:



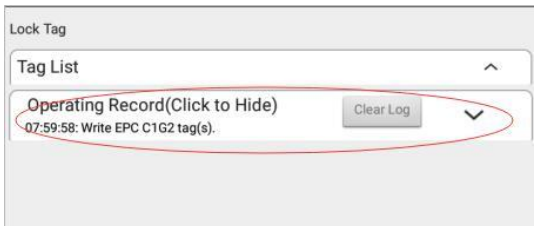
The amount of operated tags will be the same as the data shown on the Tag List.

1.3.2 How to write tags

It is the same operating section with how to read tags. But we need to provide access password and write data for the tag.

Password zone is for password storage including kill password and access password. Both kill password and access password are 4 bytes. The address of kill password is 00H—03H（in bytes） and the address of access password is 04H—07H(in bytes).

When all the operations done, page will be shown as below:



The amount of operated tags will be the same as the records shown on the Operating Record.

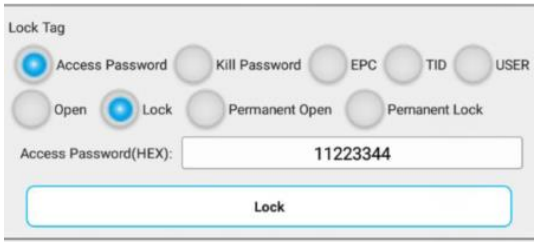
Differ from how to read tags, there is no data shown in the “DATA zone”. Please choose one of the password/EPC/TID/USER zone, which should be the same zone with writing tags, and read to verify if all the

data is written correctly.

Note: The longest input should be 32 Word (64 bytes，512bits).

1.3.3 How to lock tags

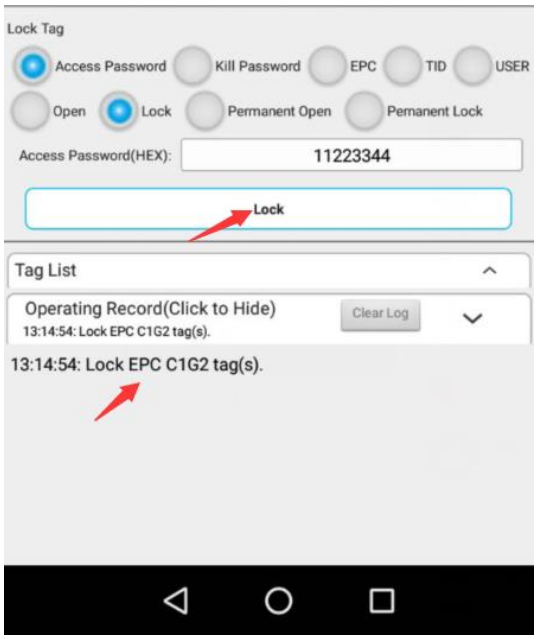
Here are the operations as below:



Access password is required to proceed locking tags.

Note: It is invalid to lock the tags with the default password. Please modify your password first, then proceed locking.

When all the operations done, page will be shown as below:



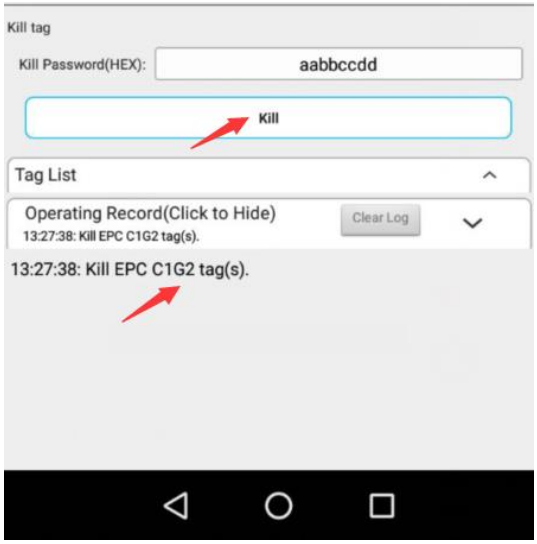
The amount of operated tags will be the same as the data shown on the Tag List.

1.3.4 How to kill tags

Here are the operations as below:

Kill password is required to proceed killing tags , and it cannot be 00 00 00 00. Thus, to kill a tag, we have to write a tag command to modify the kill password.

When tags are killed successfully, there will be records on the Operating Record as below:



The amount of killed tags will be the same as the operating records listed.

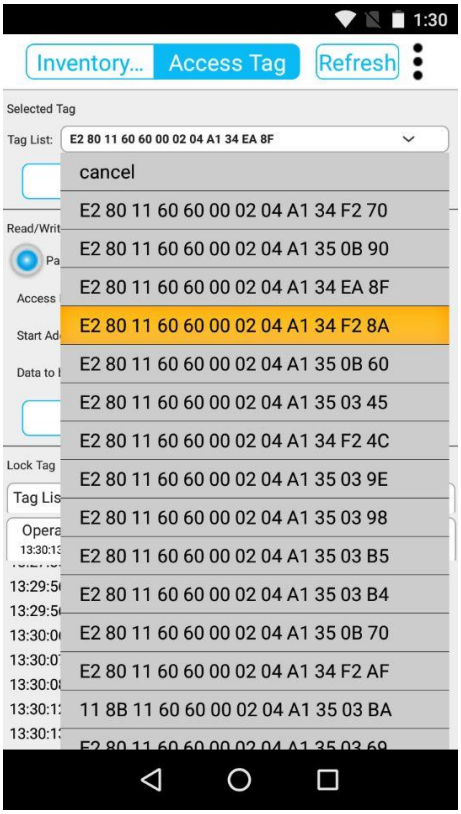
1.3.5 Operations to partial tags

Sometimes when we need to operate on just one tag instead of all the tags, we will use this function (EPC matching).

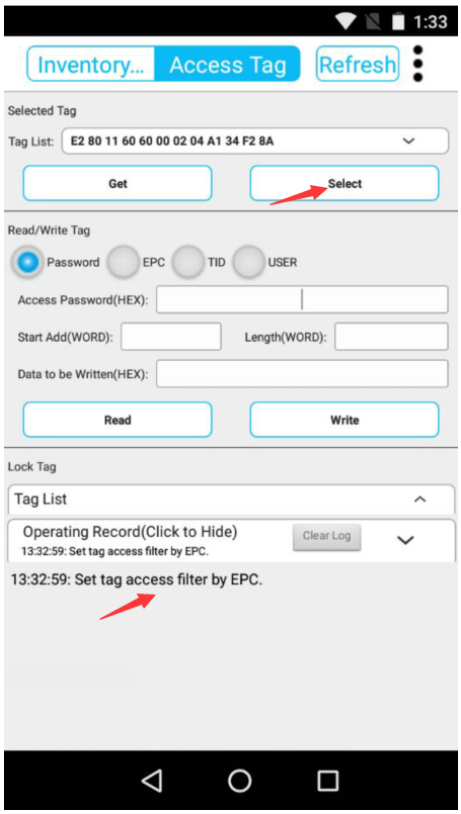
In this UHF Demo, operation procedures as below:

◆Finish the tags inventory and get all the EPC No.

◆Switch to the page of Access Tags， and select the matching EPC No. as below:

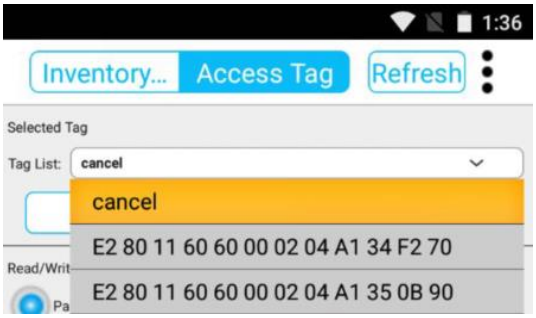


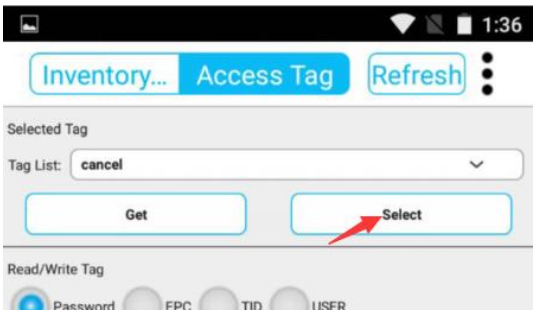
Click “select” after picking the tag. When all the operations done, there will data on the Operating Record:



Then all the next steps will be valid for this selected EPC No.

If we have to cancel the EPC matching, please pick the “cancel” in Tags List, and click “ select” as below:

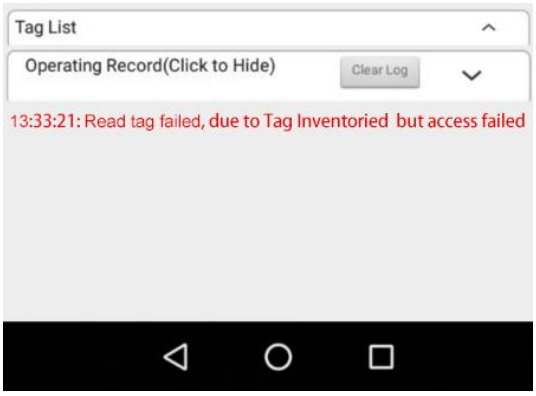




1.3.6 Errors might happen

In the duration of access tags, errors occur due to disoperation. For examples:

◆Inventory Succeeded but Access Failed:

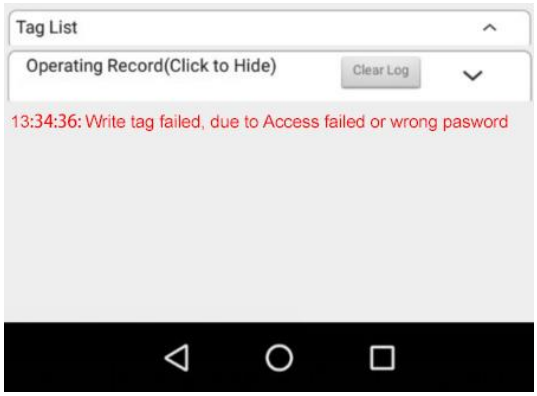


Reasons:

1) Incorrect parameter setting, i.e.: access to a zone which doesn't exist in the inventory.

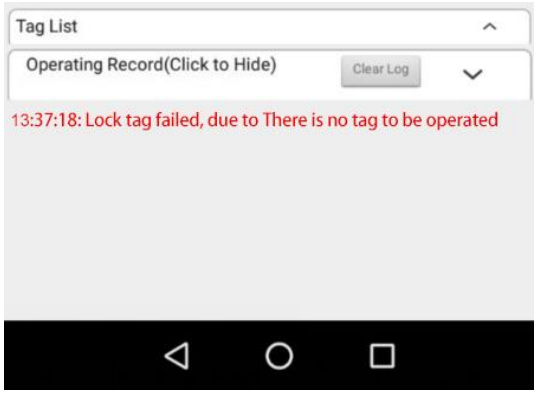
2) Insufficient working Frequency: distance when access to tags usually should be 60% - 70% closer than tags inventory. In this condition, please take the tag closer to the antenna.

◆Wrong Access Password:



As what described, it is because the access password is wrong.

◆No Tags Operable:



There are no operable tags under the working frequency.

Other tips for error codes, please defer to the document "**UHF RFID Reader Serial Interface Protocol V3.1**"

1.4 Tag Inventory and Access Tags for ISO-18000-6B Tag

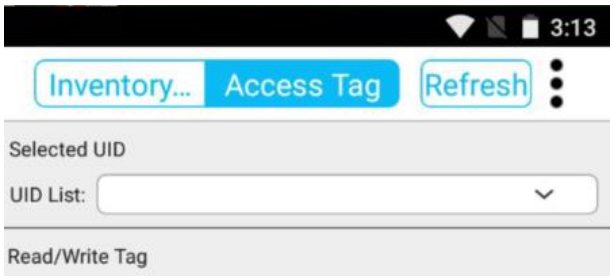
1.4.1 Tag Inventory for ISO-18000-6B Tag

Operations for ISO-18000-6B is basically the same with ISO-18000-6C ta, please see below:

Each time when reader reads the tag UID, the buzzer will sound a short beep. If it is a long beep, it means that reader initiates anti-collision function to avoid multiple tags being read synchronously.

1.4.2 Access Tags for ISO-18000-6B Tag

This function works for one piece of ISO-18000-6B each time. Click “Access Tags” and select the tag you need to operate in the UID List as below:



Tips:

◆Operations of Access Tags are based on the tag UID you selected.

◆Mutil-byte tags is readable, which is no limit to its length.

◆Mutil-byte tags is writable, which is no limit to its length. If error occurs and reader stops operation, data have been written will not be changed, and will be returned.

◆SIMDATA is lockable in one byte each time.

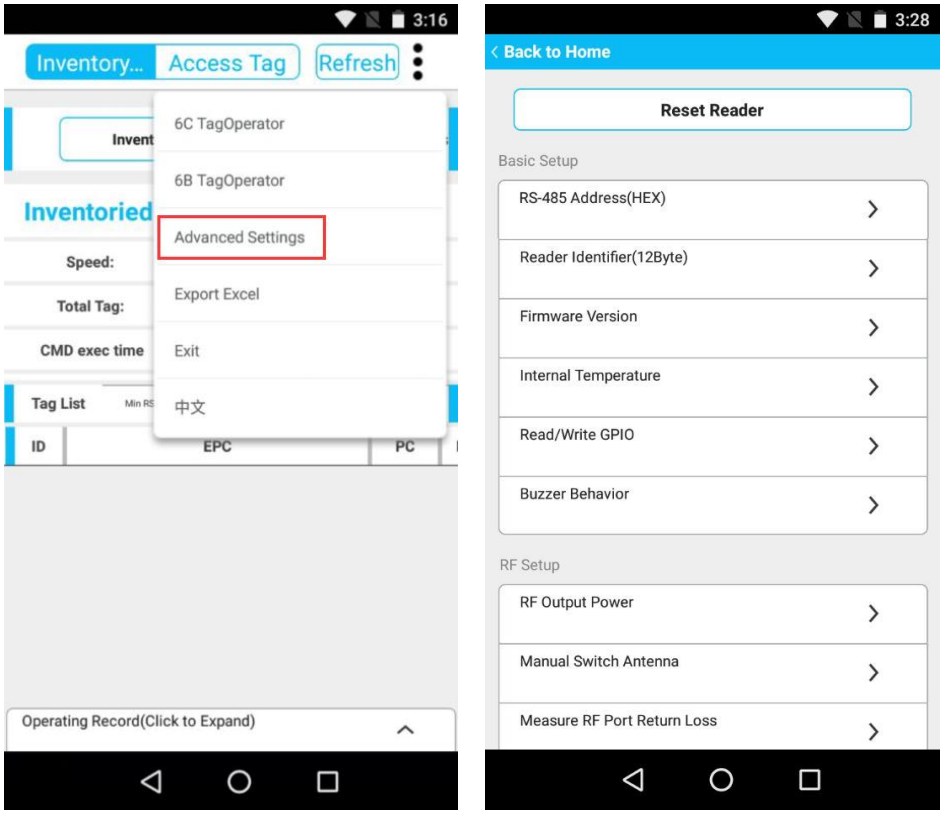
◆Lock state of SIMDATA is queriable in one byte each time.

◆Operations to lock bytes is permanent and irreversible.

1.5 RF setup:

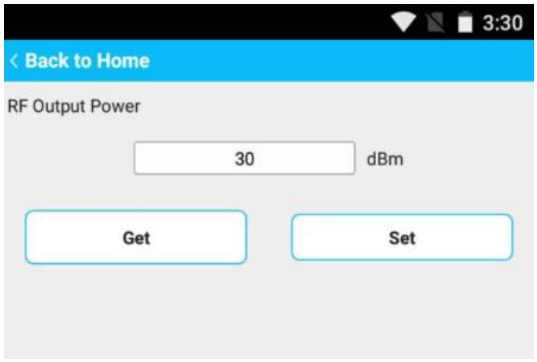
After getting access to the reader, we need to do some settings to RF parameters, i.e.: output power and RF Spectrum...

Please defer to Advanced Settings -> RF Setup as below:



1.5.1 RF Output Power:

Output power is the decisive factor for signal intensity. Its unit is in dBm.



Range of output power is 0dBm – 33dBm, in which we set 30dBm (1 W) as default. When output power is set, it will automatically reserve in reader, which is still valid even the power is off.

1.5.2 RF Spectrum Setup:

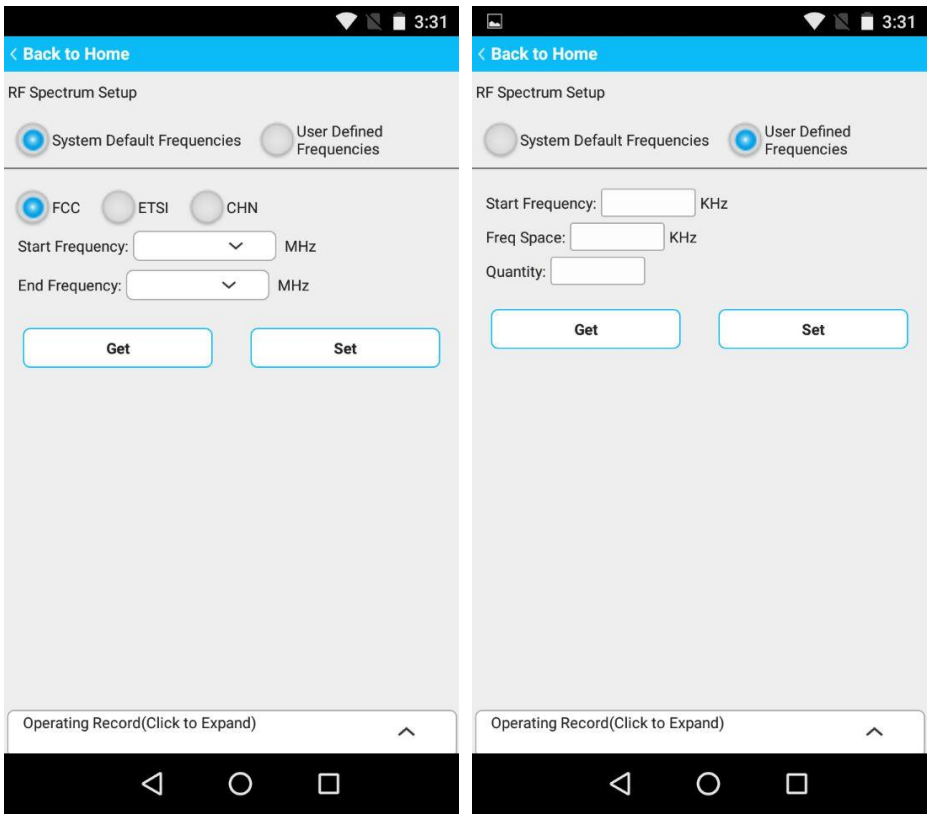
RF Spectrum is required differently in different countries or regions. Here are two ways to set it.

No.1: Apply the default frequencies of the reader.

For Default Frequencies, please defer to the *Frequency Parameter Reference Table* in the document "**UHF RFID Reader Serial Interface Protocol V3.1**".

Supported RF Spectrum: 902MHz – 928MHz.

Try to configure the default frequencies as below:



Tips:

◆Please configure the frequencies within reader's supported range.

◆Start frequency has to be no more than the end frequency.

◆The same start frequency and end frequency will enable fixed frequency operation.

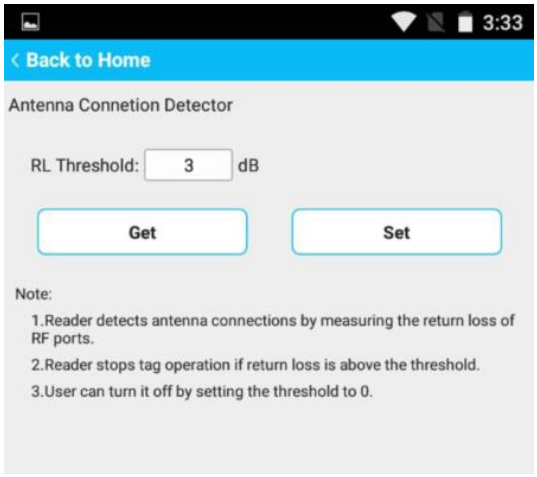
Carrier Frequency will be switched randomly within the default RF spectrum.

The default RF spectrum norm is FCC (902MHz-928MHz).

1.5.3Antenna Connection Detector

Function of Antenna Connection Detector is: Checking whether the port is connected to the antenna before the reader work. If not, users will be notified to connect the antenna.

Please initiate this function before use, as below:

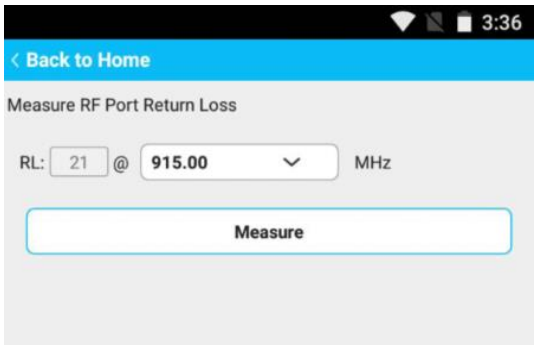


Sensitivity of Antenna Connection Detector is set by users. Sensitivity of Antenna Connection Detector is the Return Loss of antenna port, whose unit is dB. The larger this value, the better the impedance matching requirements between antenna and port. For ordinary antennas, you can set the threshold to 3-6dB. For Ceramic antenna or antenna in handheld reader, the Sensitivity can be lower. To set the threshold to 0, which means we closed the antenna Connection Detector, and the antenna connection status will not be detective.

If the antenna is not connected, Operation Record will report errors when reading or writing tags.

1.5.4 Measure RF Port Return Loss:

Please detect the return loss of antennas as below:

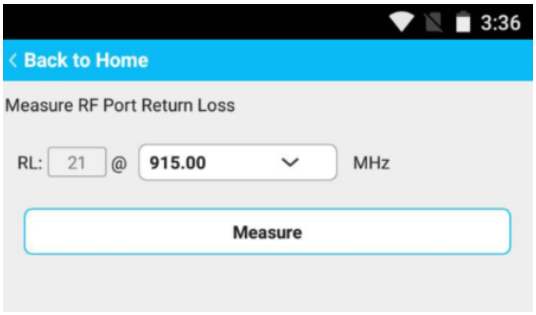


1.6 Other Settings

1.6.1 Internal Temperature:

Reader operation in high-intensity will generate heat, in this case, users can use the built-in temperature sensors to monitor reader internal temperature and avoid overheating (temperature above 65 degrees). If the temperature overheated, you can stop operation for a while to cool down the reader first.

Operations to get the temperature as below:



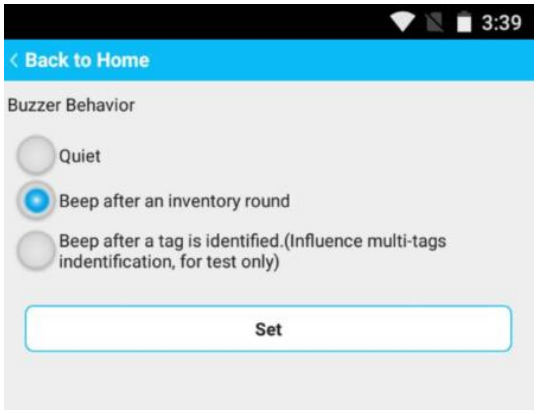
1.6.2 Buzzer Behavior:

Sound of the reader's working status is provided to users through the Buzzer.

Users can turn it off or set it as"beep" after an inventory round.

You can also set it as "beep" after a tag is identified. But this will reduce the efficiency of multi-tag identification.

Operations to set buzzer status as below:



Note: The buzzer will ring when reader is power-on and completes self-test successfully, and it is not controlled by this setting.

After setting completes, the state of buzzer will be saved in the FLASH inside of reader and won't be lost after power off.