

ATID Co.,Ltd

ATID Reader Sample Demo Guide for Android

Android Demo Guide Manual



ATID Reader Sample Demo Guide for Android

Android Demo Guide Manual

Company

ATID Co.,Ltd

Document

Composer

SDK Team

Date

2019-02-20

Version

v0.5

Revised History

Version	Date of revision	Reason for Revision ¹	Revised Content ²	Writer
v0.1	2018-1-18	First Draft		SDK Team
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v0.3	2018-3-27	Revised	1. Adding Default Barcode Option Settings 2. Change to Barcode Option Screen	SDK Team
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¹Reason for revision : This section explains whether the new content is the addition, revision, or removal of the original document

²Revised content : Description on revised contents and the revised pages



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1. Overview

The purpose of this document is to describe how to use ATID Reader Demo.

ATID Reader Demo is made to test all the functions of ATID’s external accessory device. We recommend it to be used with Android above O/S v6.0.

Currently, ATID Reader Demo is supported by AT188N, AT388, ATS100, and ATD100.

ATD100 has no Barcode function.

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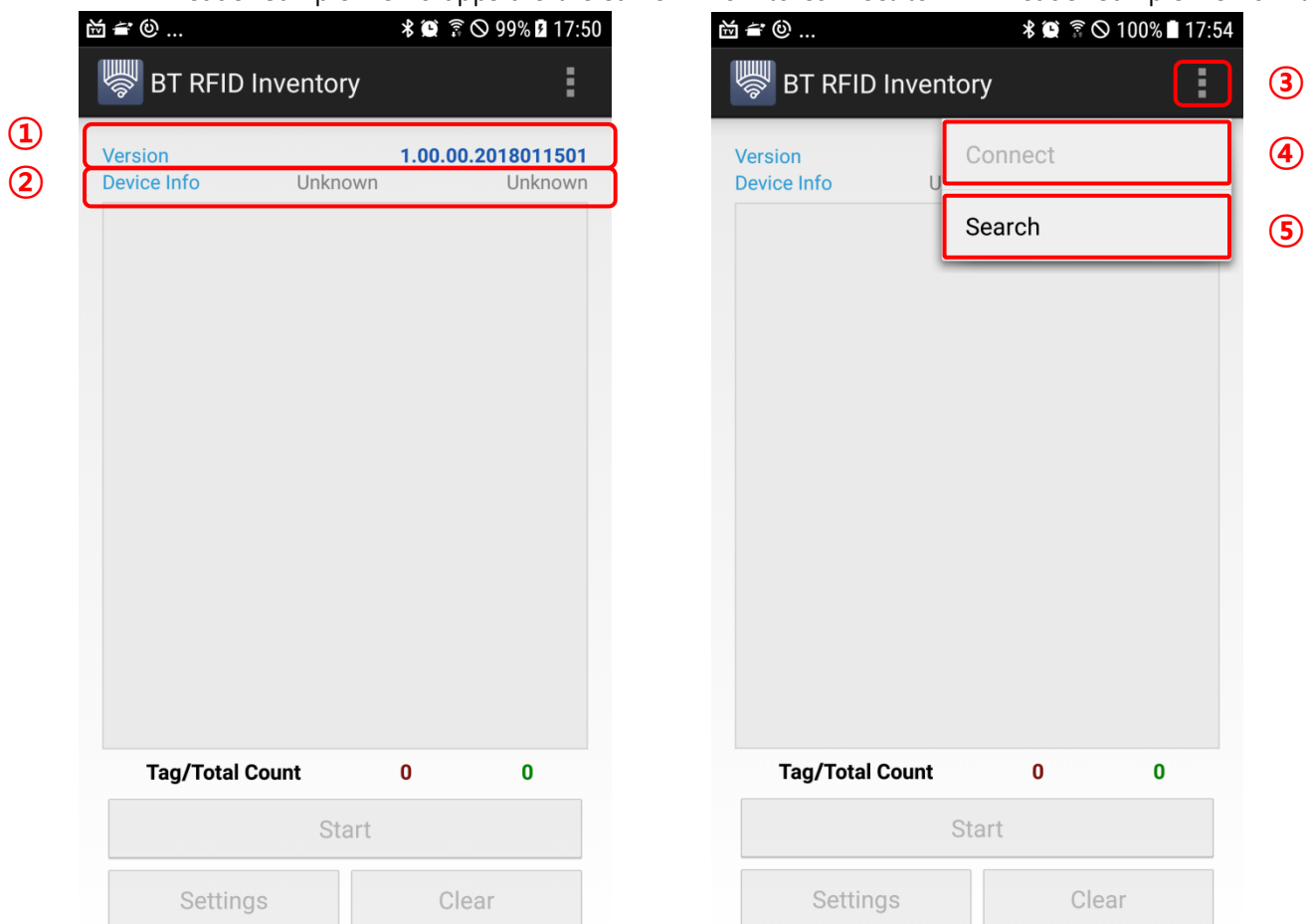
2. Connect Device

Bluetooth , USB and BLE can be used to connect equipment.


2.1. Bluetooth Device

The pictures below are a state that ATID Reader Sample Demo app has been executed for the first time and a description of each part.

All ATID Reader Sample Demo apps are the same in how to connect to ATID Reader Sample Demo Bluetooth.

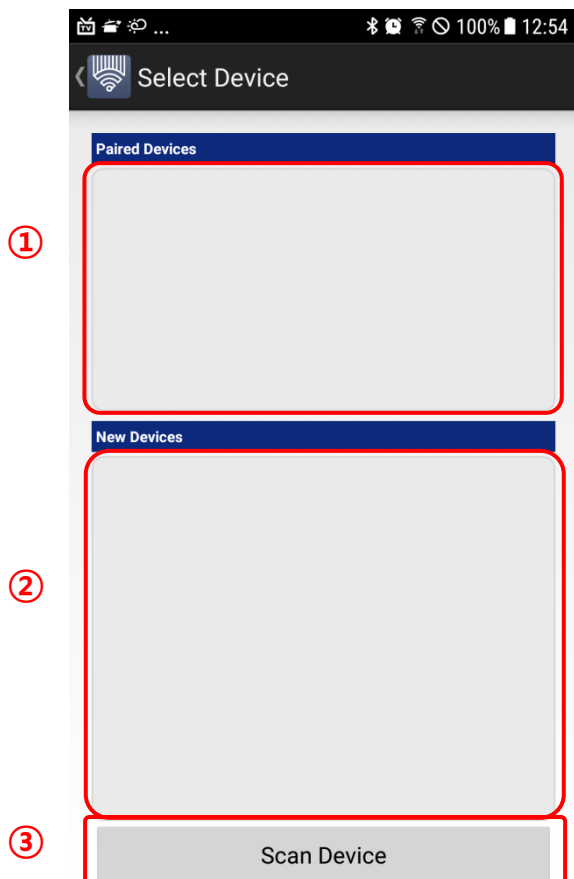


- ① **Version** : Display version of ATID READER Sample Demo App..
- ② **Device Info**: Display information on device connected or to be connected.
Once device is connected, color will be changed.
- ③ **Settings** : You can select connect and search by using Device Setting Menu.
- ④ **Connect** : If Device has not been selected, this will not be enabled.
You can connect and disconnect device by using this function.
- ⑤ **Search** : You can search and select Bluetooth Device.


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2.1.1. How to search a device for Bluetooth

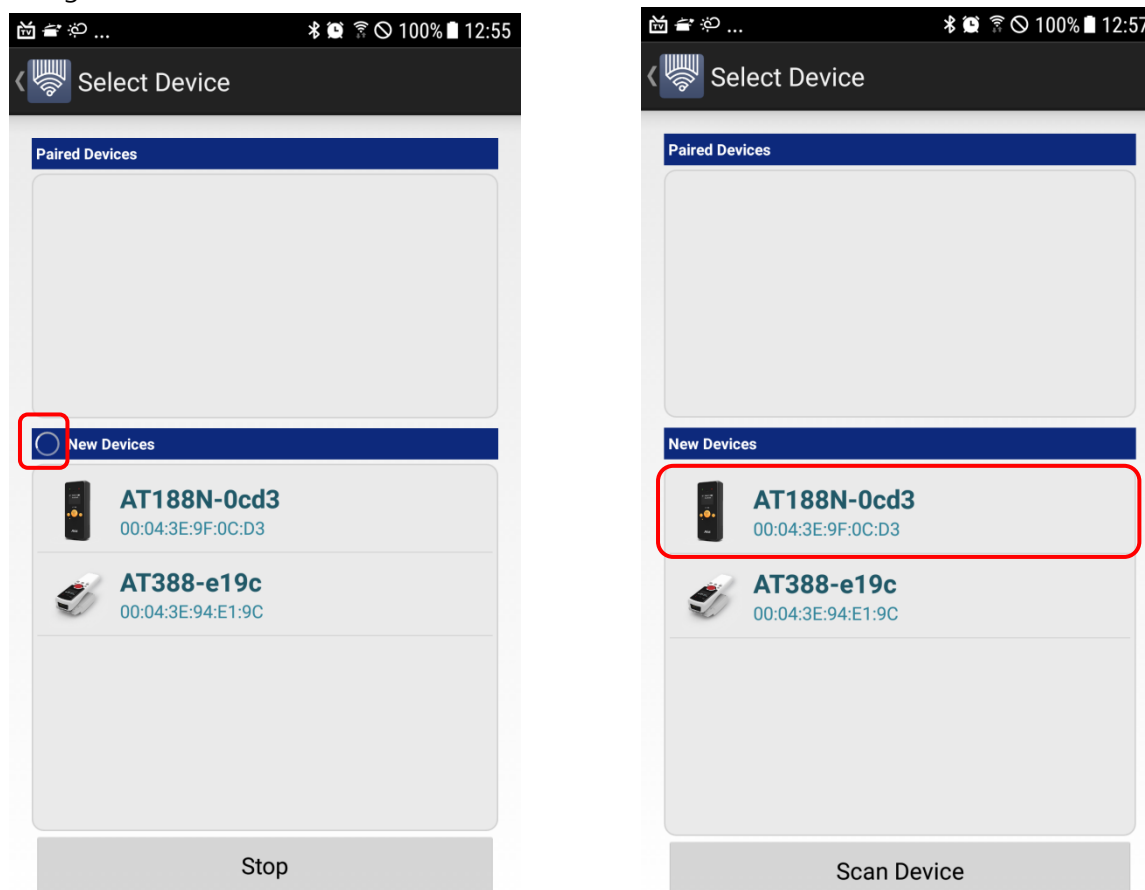
If you click search button to retrieve Bluetooth device, Bluetooth search screen will appear.



- ① **Paired Devices(Registered Devices)** : Enumerate Bluetooth device already searched.
- ② **New Devices** : Enumerate Bluetooth device registered newly by touching "Scan Device" button.
- ③ **Scan Device** : Start search for new Bluetooth device. Once search starts, it will change to "Stop" button.
If you want to stop search, you can stop it by touching "Stop" button.

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If device registration screen appears after you touch "Search" and "Scan Device" button is touched, search for device will begin.



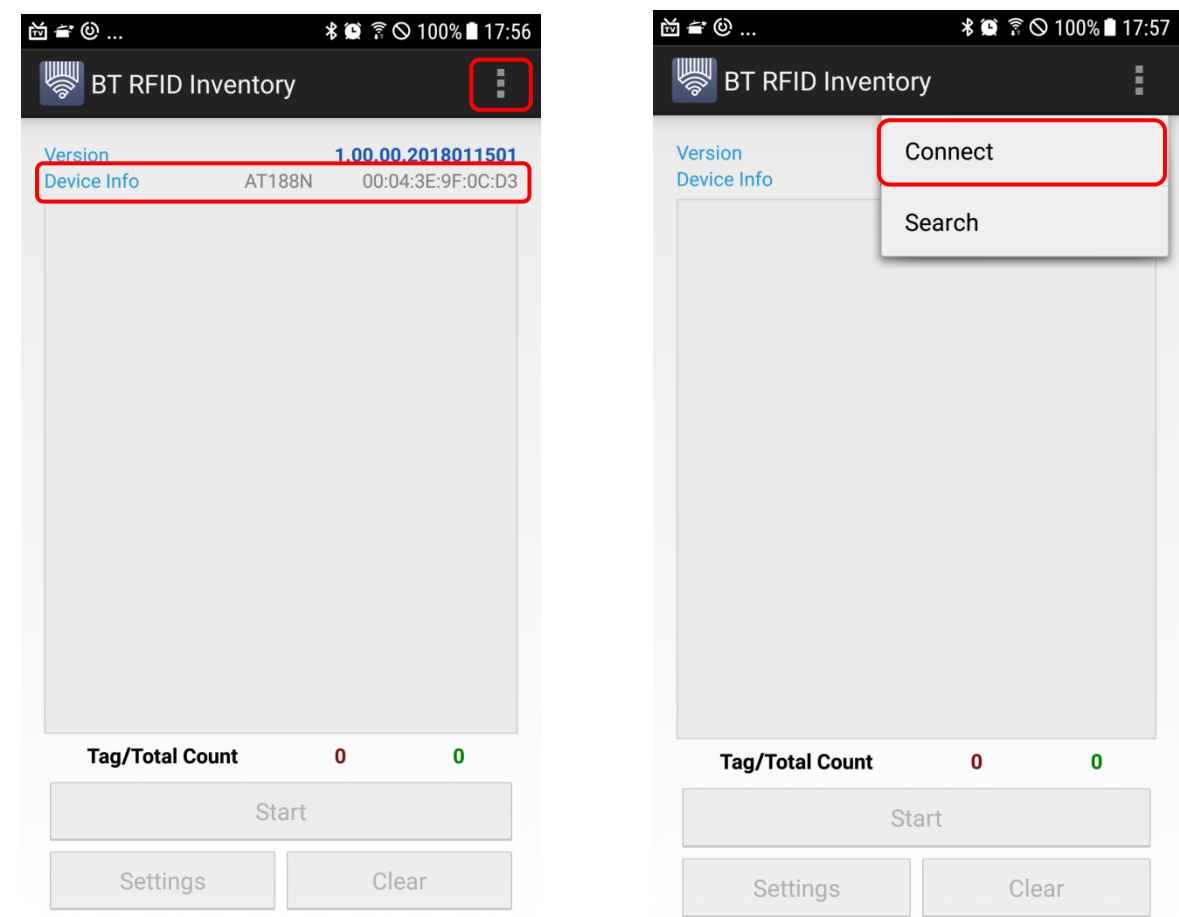
Once device search starts, a progress indicating search is under way on the left of "New Devices" list title is displayed and "Scan Device" button changes to "Stop" button.

If device you want to register has been searched, you can stop search by touching "Stop" button.


If you want to cancel registration, you have only to press "Back" button on smartphone or touch icon on the left of title at the top of screen.

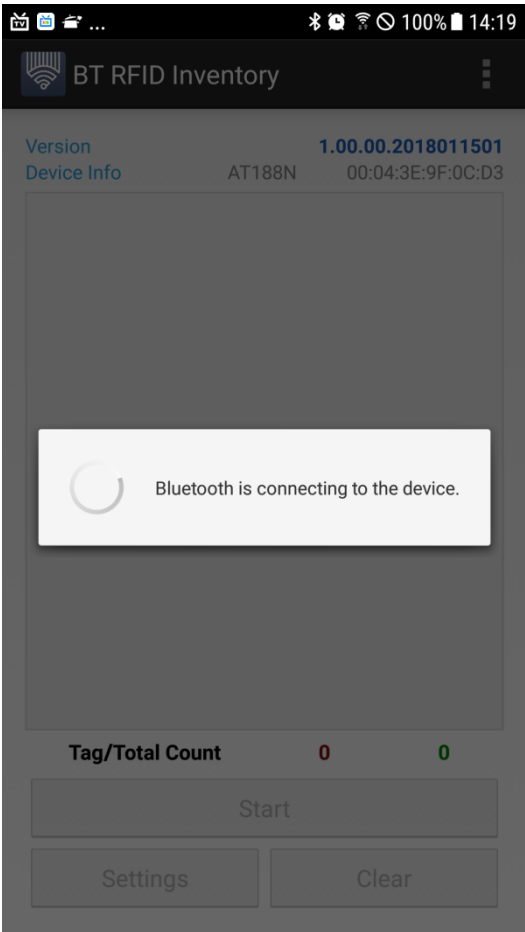
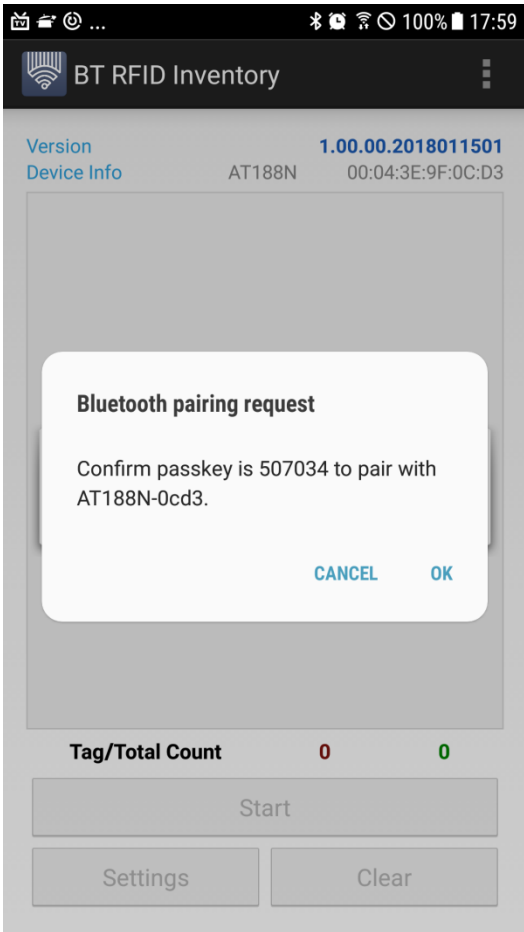
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2.1.2. How to connect a device for Bluetooth




If the device you want to connect has been selected, you have only to click Connect button on Settings to try connection.

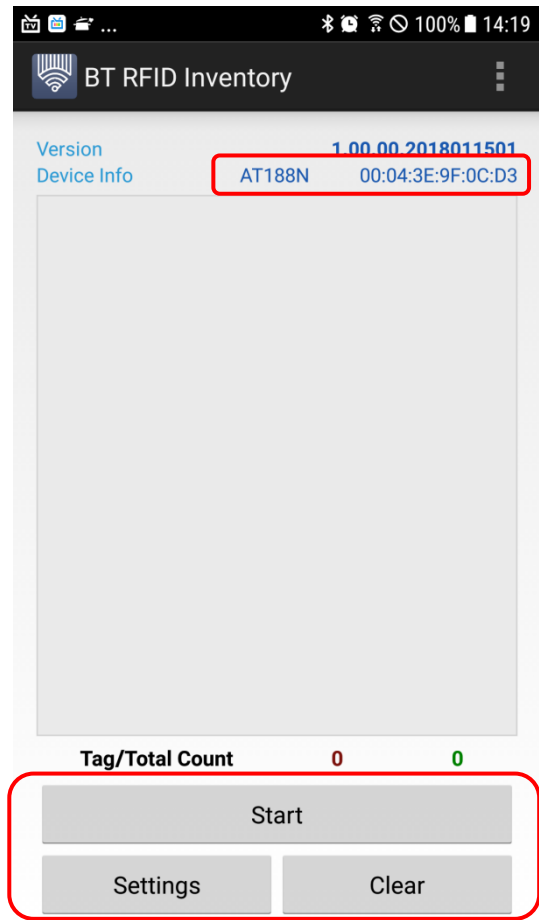
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In case of connection via Bluetooth communication, dialogue box requesting pairing will appear when connected to device for the first time.

Touch "OK" to perform Pairing.

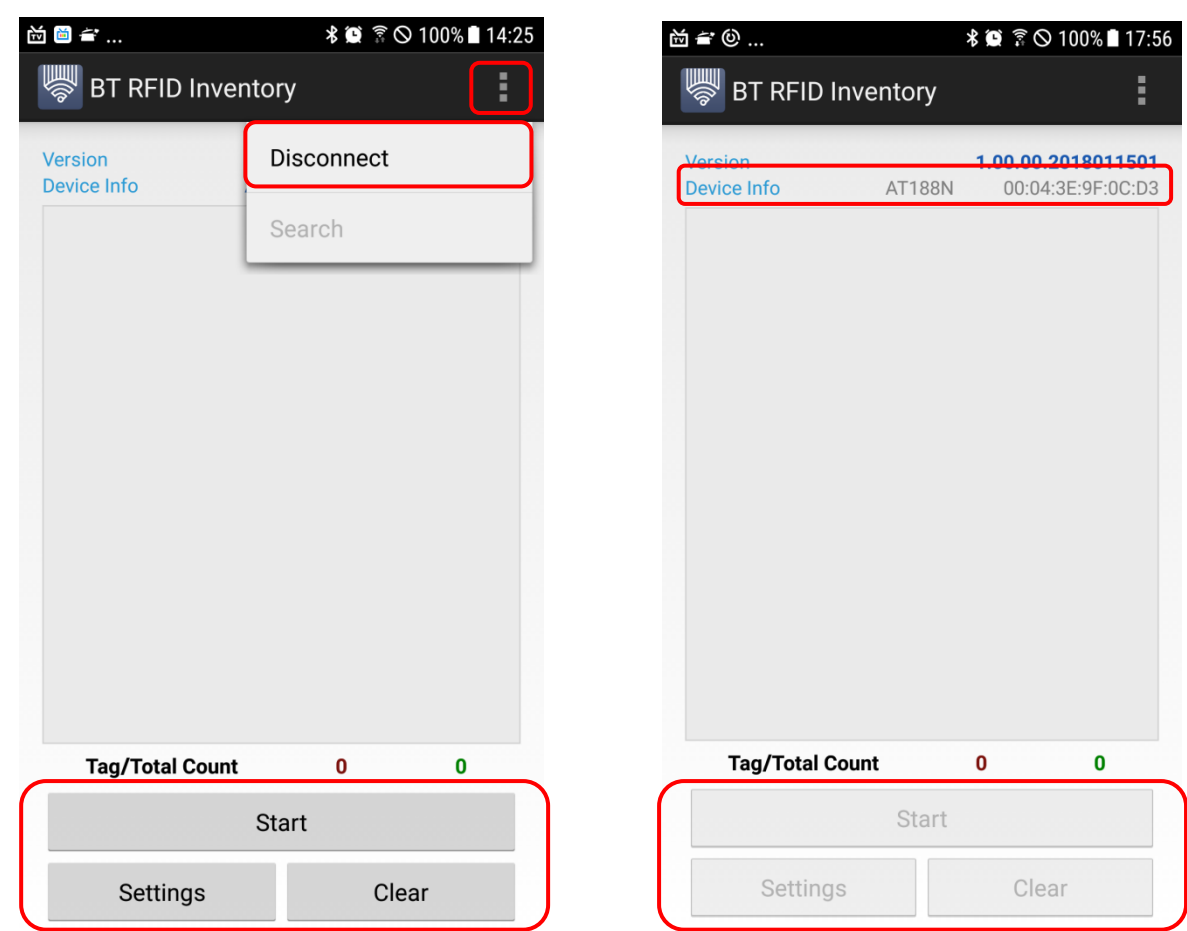
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If connection of device has been completed, Button is enabled and Device Info display color will change. In Device Info, device name andBluetooth Mac Address are displayed. This enables you to execute demo of several functions.

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2.1.3. How to disconnect a device for Bluetooth



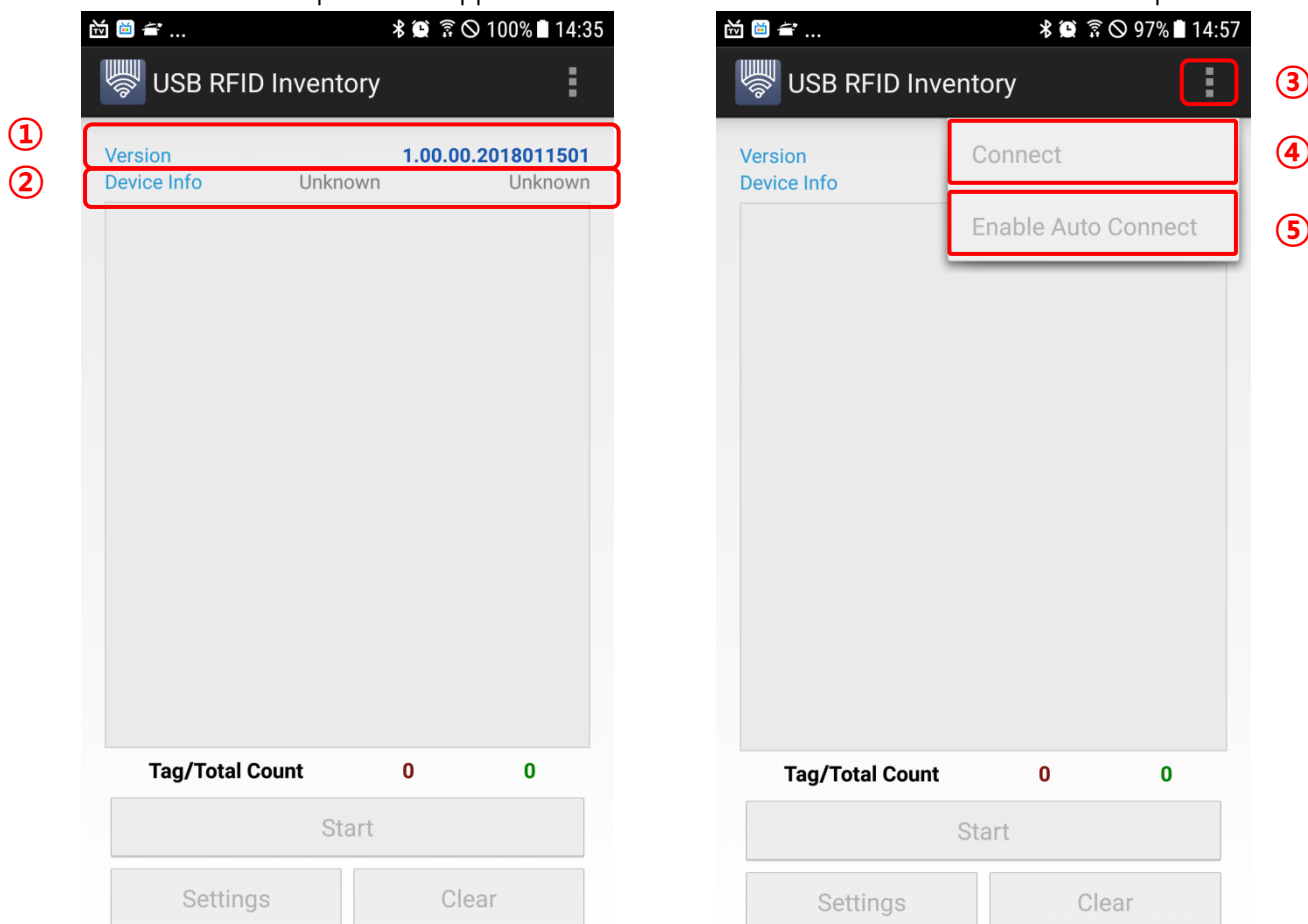
Click Settings and then Disconnect button.
If device is disconnected, button will be disabled and Device Info color will change.

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2.2. USB Device

The pictures below are a state that ATID Reader Sample Demo app has been executed for the first time and a description of each part .

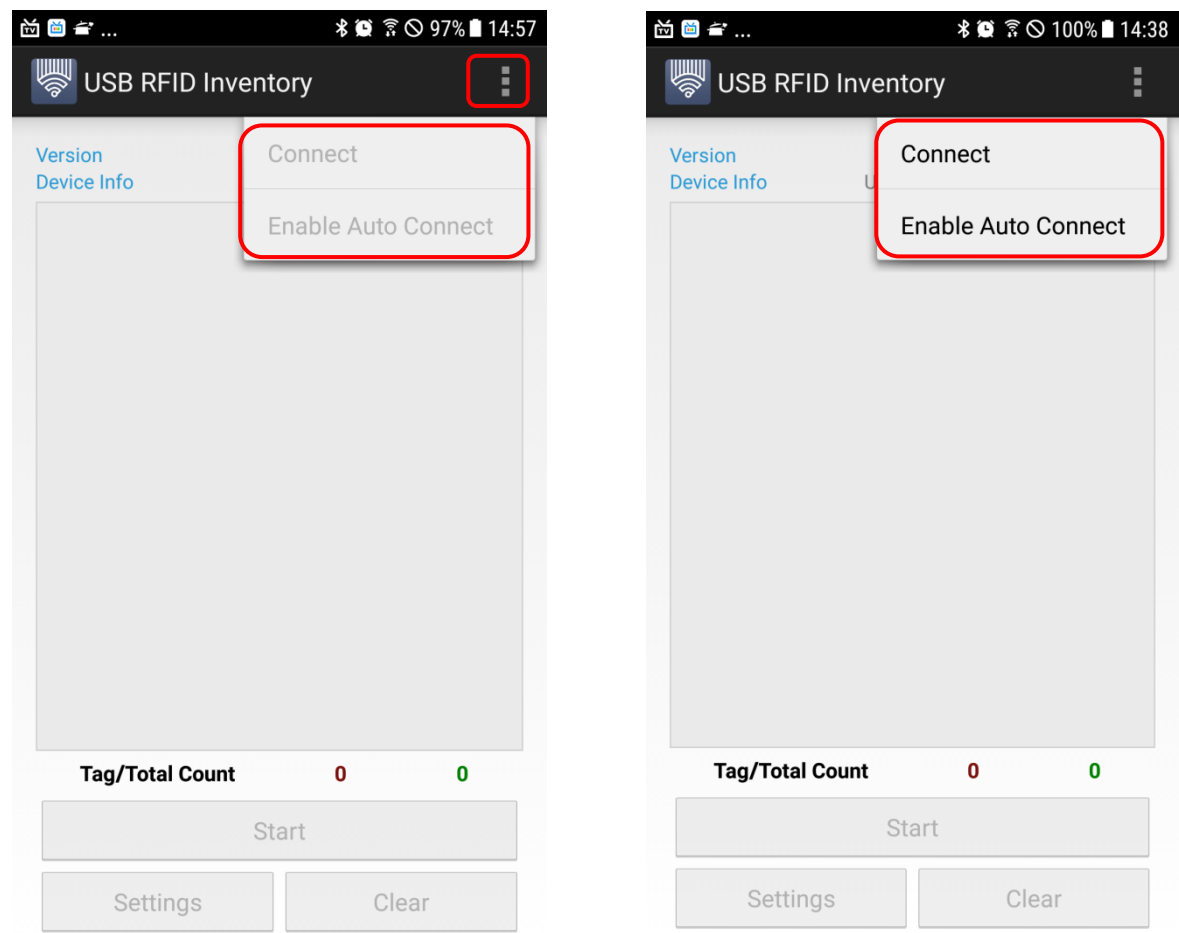
All ATID Reader Sample Demo apps are the same in how to connect to ATID Reader Sample Demo USB.



- ① **Version** : Display version of ATID READER Sample Demo App.
- ② **Device Info**: Display information on device connected.
Once connected, color will change.
- ③ **Settings** : You can select Connect and Search by using Device Setting Menu.
- ④ **Connect** : If Device has not been selected, this will not be enabled.
You can connect or disconnect Device by using this function.
- ⑤ **Auto Connect** : If USB device has been connected, set whether connection will be executed automatically.

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2.2.1. How to connect a device for USB

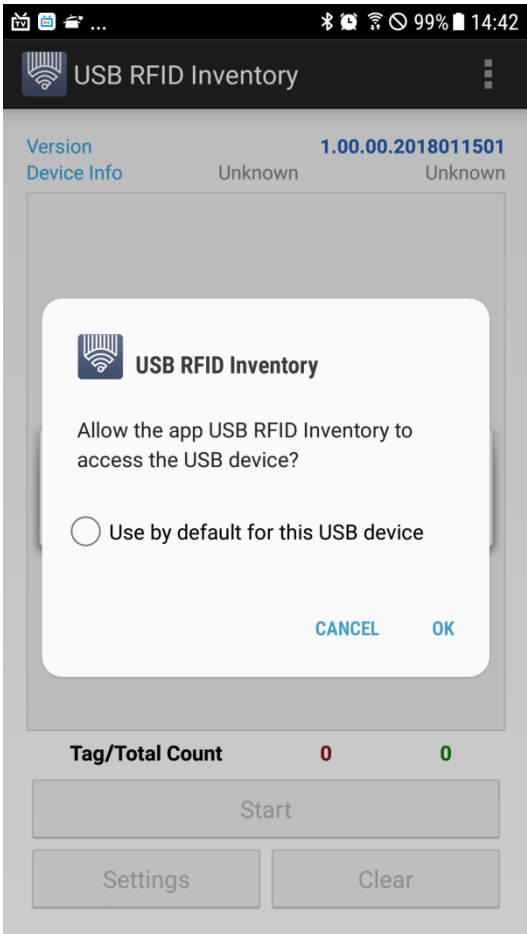


When device has not been connected to USB Cable,Settings Menu is not enabled.


When clicking Settings with USB Cable connected, Menu will be enabled.

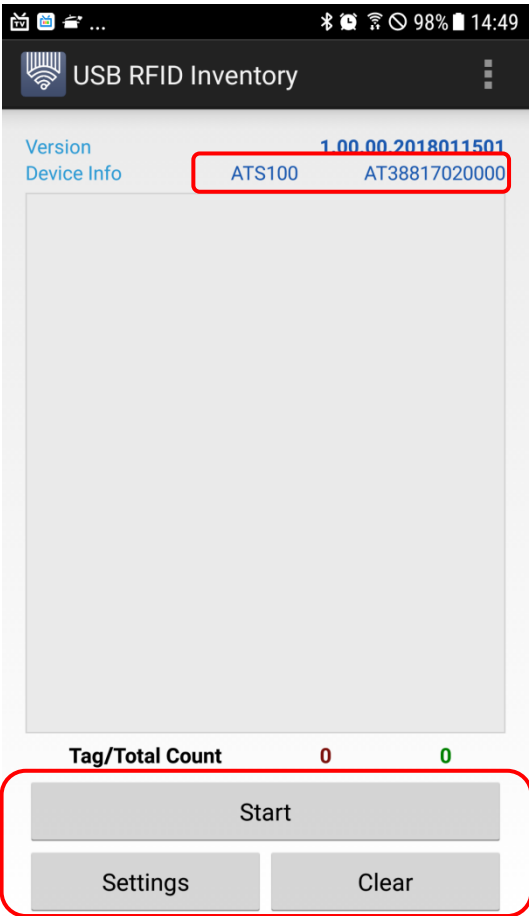
Try connection by clicking connect button on settings after connecting device to USB Cable.

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When device has been connected for the first time, dialogue box checking whetherUSB connection is allowed will appear. Touch "OK" to perform connection.

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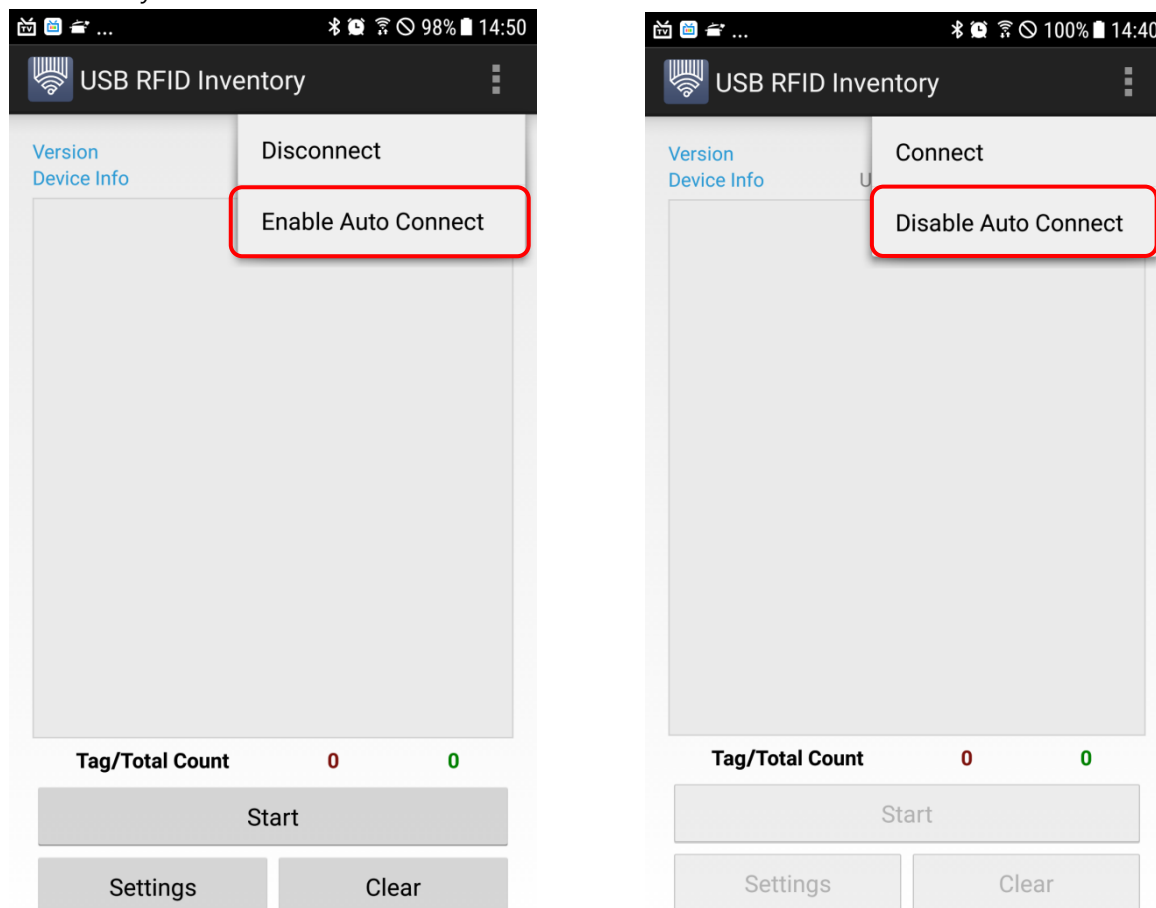


If connection of device has been completed, Button is enabled and Device Info display color will change. In Device Info, device name and Serial Number are displayed. This enables you to execute demo of several functions.

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2.2.2. How to auto connect devices for USB

When connecting smartphone and USB device to USB cable, set whether connection to USB is tried automatically .

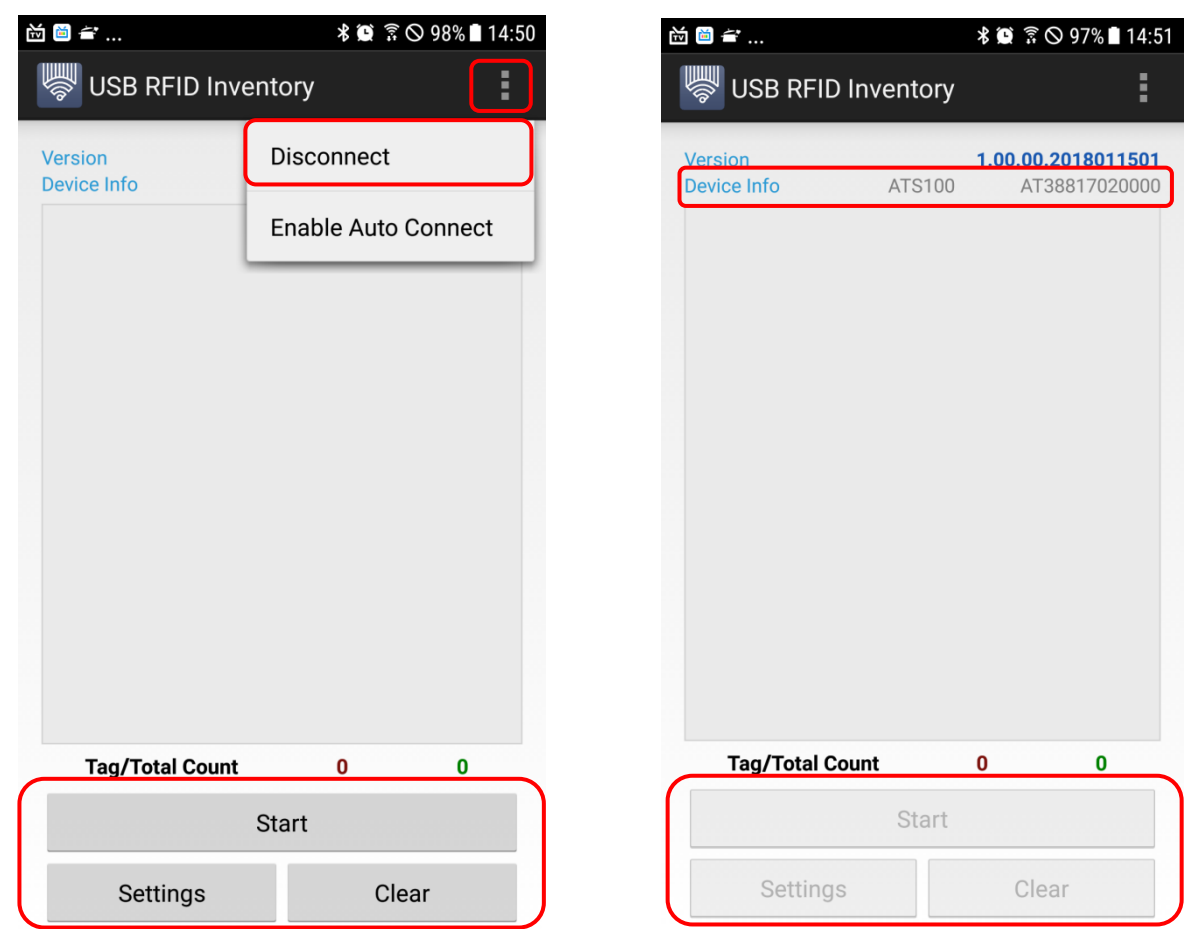


When "Disable Auto Connect" is selected and if USB is connected, do not try automatic USB connection .


When "Enable Auto Connect" is selected and if USB is connected, try automatic USB connection .

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2.2.3. How to disconnect a device for USB



Click Settings and then click Disconnect button.
If device has been disconnected, button will be disabled and Device Info color will change .

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2.2.4. How to charging the phone for USB

This function is to set whether smart phone will be charged when power cable is connected to a device.

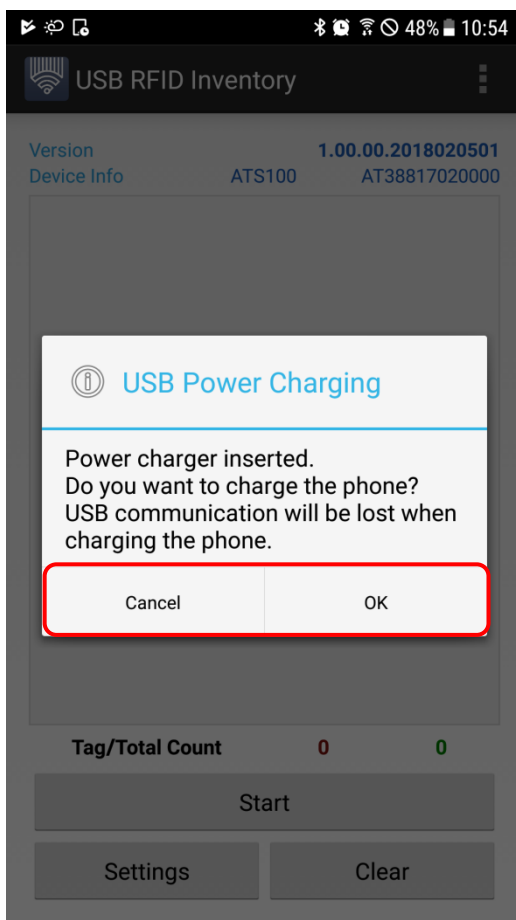
✖ This function is supported in ATS 100 only.


When charge cable has been connected to a device with smart phone and a device connected to USB, a screen you select whether you charge it will be displayed.

If you select "OK", smart phone will be charged.

Once charge starts, USB connection between smart phone and a device will be released.

When you select "Cancel", smart phone will not be charged with USB connection kept.

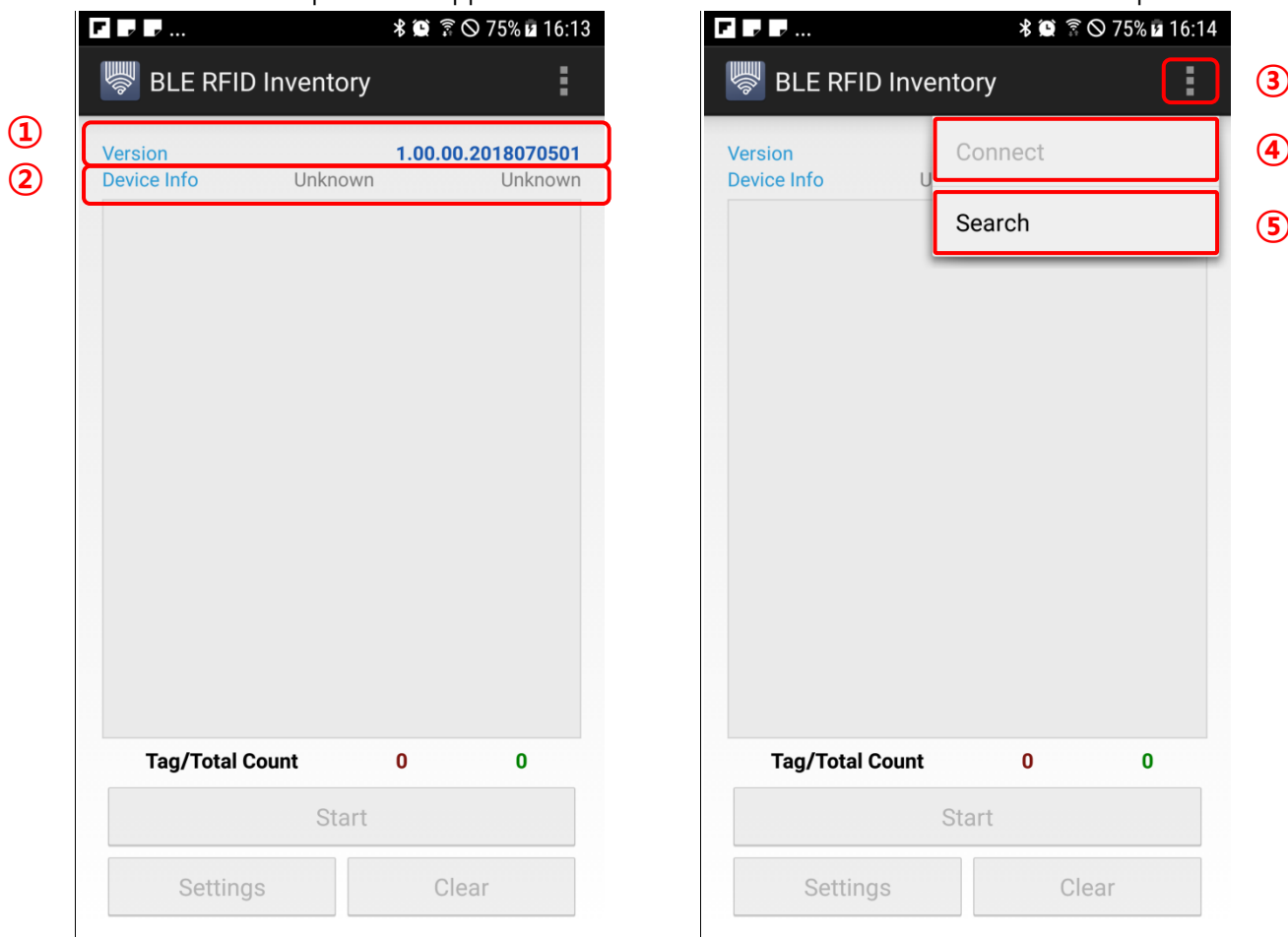


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2.3. BLE Device

The pictures below are a state that ATID Reader Sample Demo app has been executed for the first time and a description of each part.

All ATID Reader Sample Demo apps are the same in how to connect to ATID Reader Sample Demo BLE.

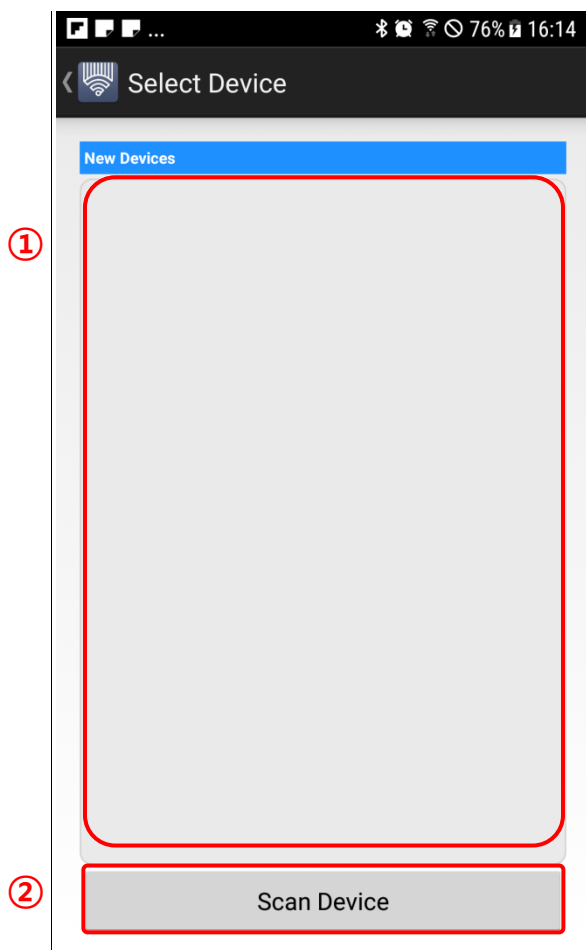


- ① **Version** : Display version of ATID READER Sample Demo App.
- ② **Device Info**: Display information on device connected or to be connected.
Once device is connected, color will be changed.
- ③ **Settings** : You can select connect and search by using Device Setting Menu.
- ④ **Connect** : If Device has not been selected, this will not be enabled.
You can connect and disconnect device by using this function.
- ⑤ **Search** : You can search and select BLE Device.


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2.3.1. How to search a device for BLE

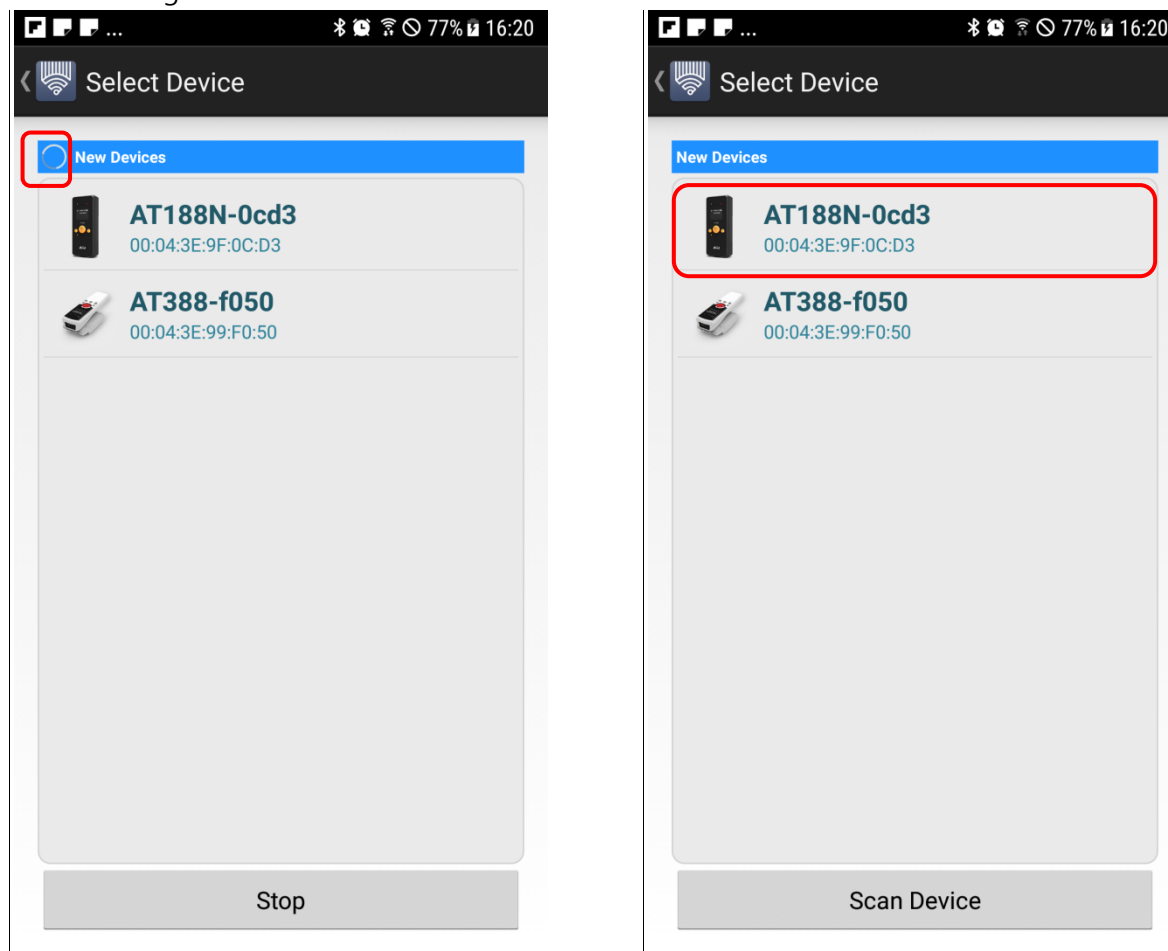
If you click search button to retrieve BLE device, BLE search screen will appear.



- ① **New Devices** : Enumerate BLE device registered newly by touching "Scan Device" button.
- ② **Scan Device** : Start search for new Bluetooth device. Once search starts, it will change to "Stop" button. If you want to stop search, you can stop it by touching "Stop" button.

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If device registration screen appears after you touch "Search" and "Scan Device" button is touched, search for device will begin.



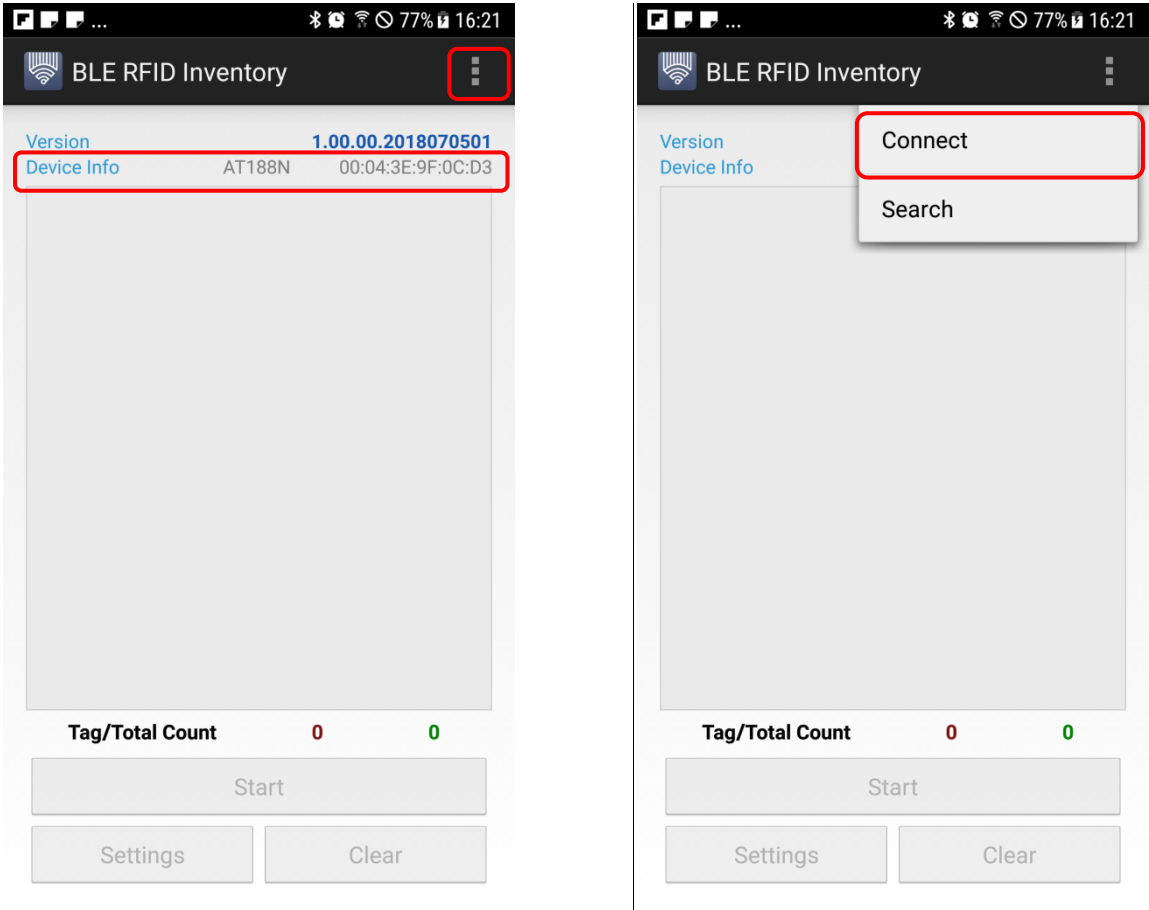
Once device search starts, a progress indicating search is under way on the left of "New Devices" list title is displayed and "Scan Device" button changes to "Stop" button.

If device you want to register has been searched, you can stop search by touching "Stop" button.


If you want to cancel registration, you have only to press "Back" button on smartphone or touch icon on the left of title at the top of screen.

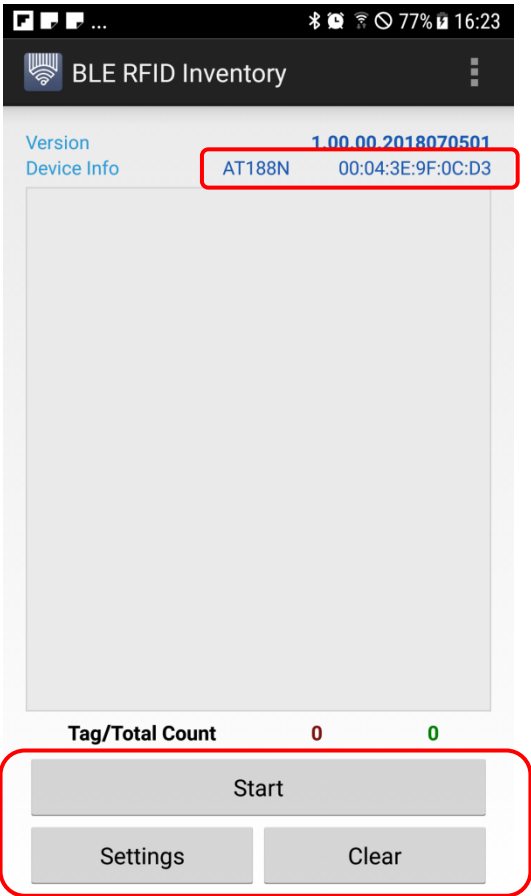
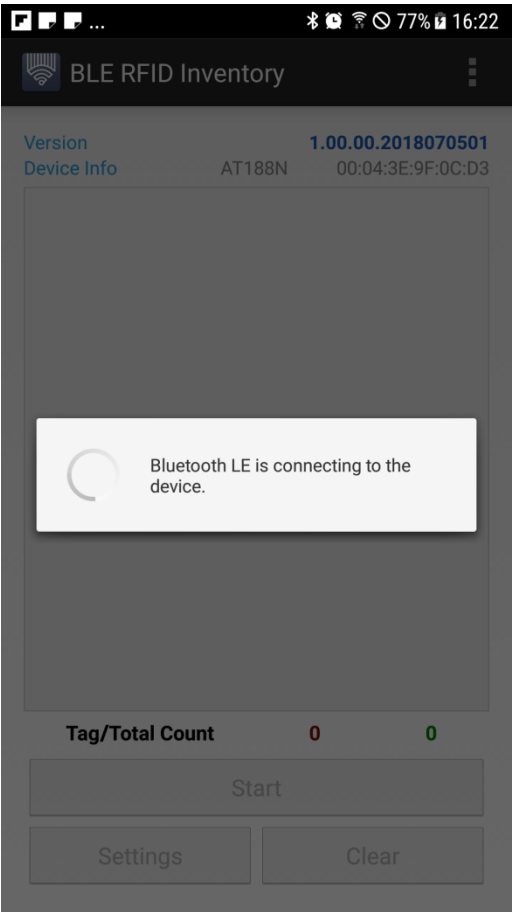
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2.3.2. How to connect a device for BLE




If the device you want to connect has been selected, you have only to click Connect button on Settings to try connection.

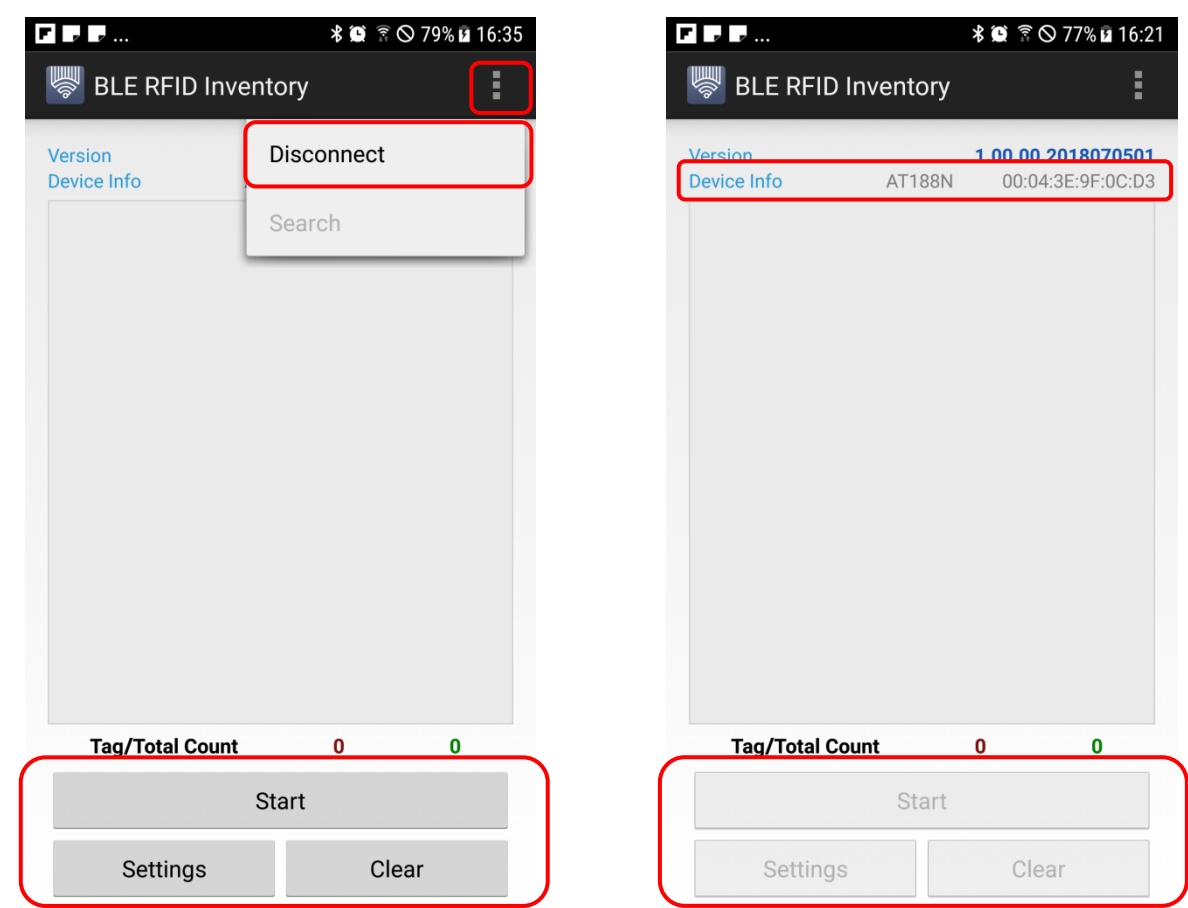
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If connection of device has been completed, Button is enabled and Device Info display color will change. In Device Info, device name andBluetooth Mac Address are displayed. This enables you to execute demo of several functions.

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2.3.3. How to disconnect a device for BLE




Click Settings and then Disconnect button.
If device is disconnected, button will be disabled and Device Info color will change.

3. Demo

Sample Demo consists by functions as follows.

- ① **Inventory RFID** : Demo reading EPC Data on RFID Tag.
- ② **Inventory Barcode** : Demo reading Barcode Symbol Tag .
- ③ **Inventory Trigger** : Demo reading device's Key Events.
- ④ **Stored Data** : Demo reading data stored in a device.
- ⑤ **Read Memory** : Demo reading specific Memory Data in RFID Tag.
- ⑥ **Write Memory** : Demo writing data in specific memory in RFID Tag .
- ⑦ **Lock Memory** : Demo to lock or unlock specific memory in RFID Tag.
- ⑧ **Device Option** : Demo to set device's option.

If device connection mode(Bluetooth , USB , BLE) only differs, functional motions in Demo are same .

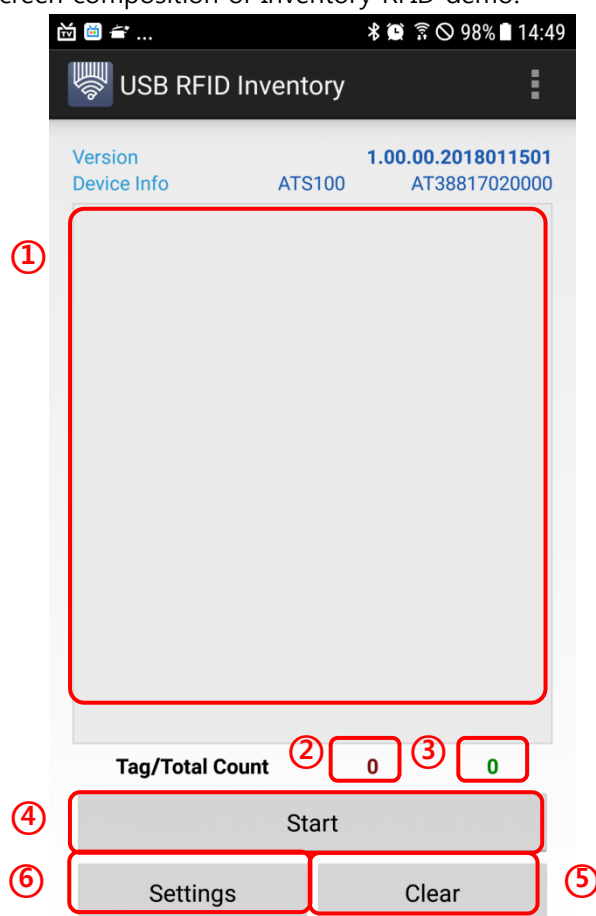
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3.1. Inventory RFID


Inventory RFID Demo is to read EPC Data by executing RFID (UHF).

3.1.1. Screen Composition

A picture below shows screen composition of Inventory RFID demo.

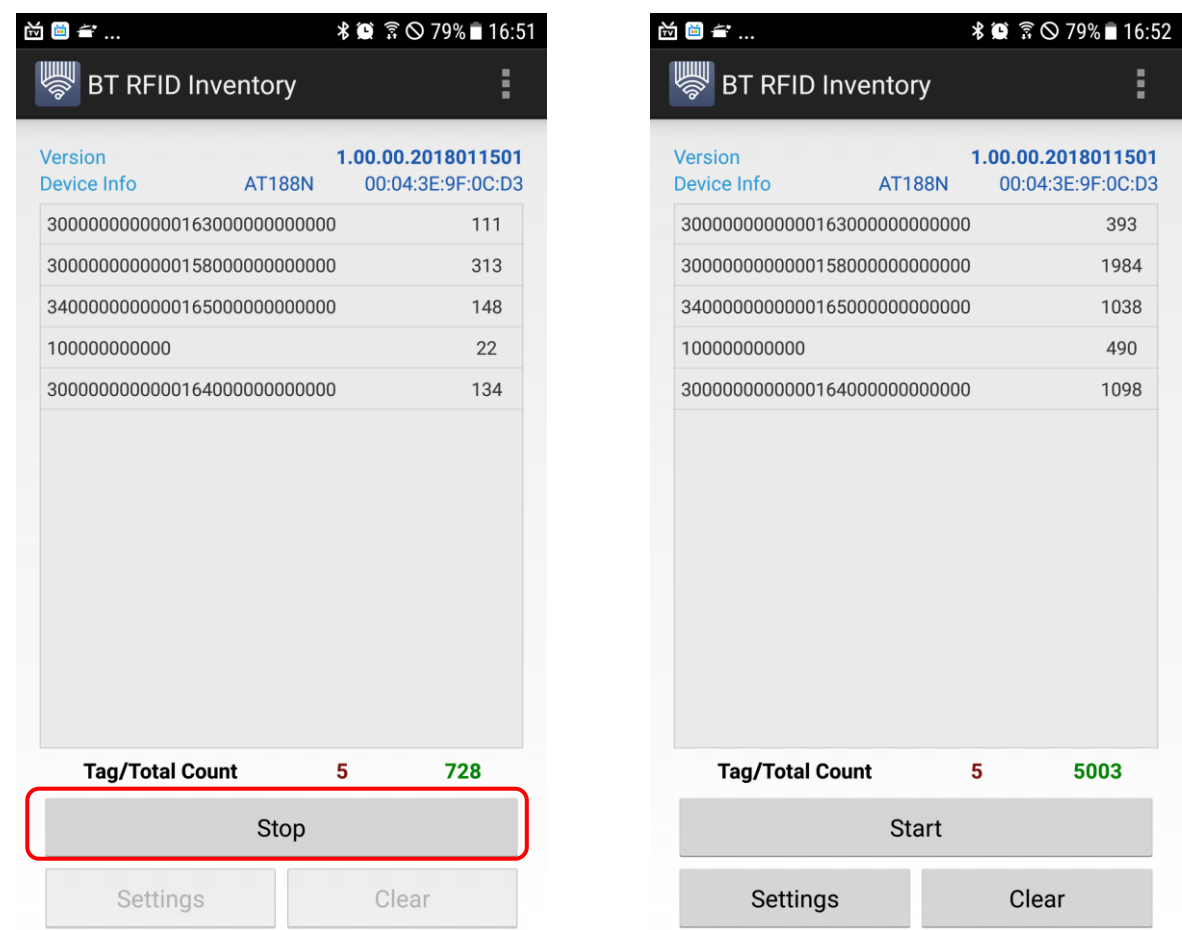


- ① **Data List** : Display RFID tag data read by a device.
- ② **Data Count** : Display the number of tag to be read on Data List.
- ③ **Total Read Count** : Display the number of data read by a device.
- ④ **Start** : Start inventory. Once started, it will change to Stop button.
- ⑤ **Clear** : Delete all data on Data List and initialize each count value.
- ⑥ **Setting** : Move to a screen to set RFID Option.


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3.1.2. How to read the RFID data

Click "Start" button to start Reading.



Once Inventory starts, "Start" button will change to "Stop". You can stop Inventory if you touch "Stop" button. Inventory reads tag and display it on a screen. Tags with the same value are displayed as one on a list. The number loaded is display on the right of tag list. Tag/Total Count display the number of tag displayed on the list. The number of tag loaded from the beginning is display on the right. If the number of tag loaded is great, you can scroll by dragging it with finger.

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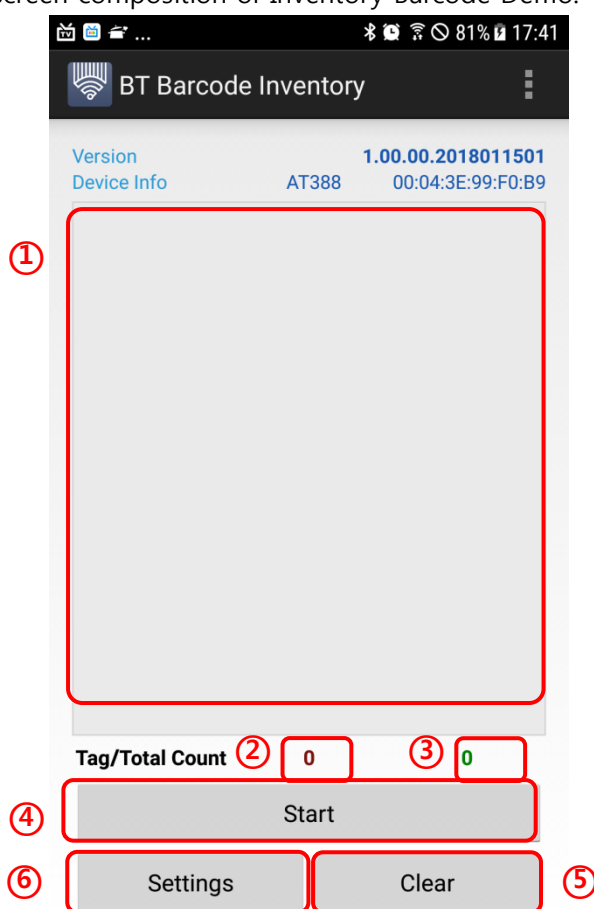
3.2. Inventory Barcode

Inventory RFID Demo is to read Barcode Symbol by executing Barcode.


※ This function is not supported in ATD100.

3.2.1. Screen Composition

A picture below shows screen composition of Inventory Barcode Demo.

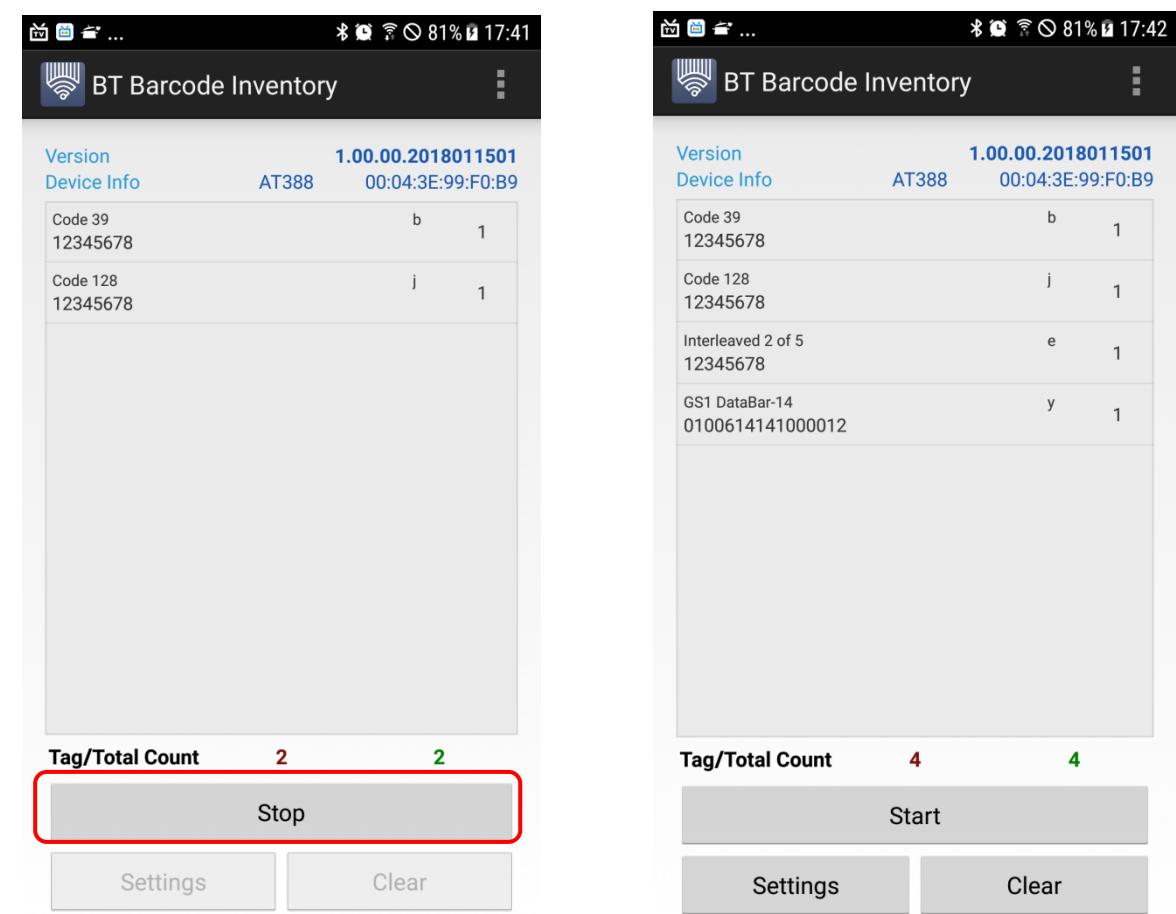


- ① **Data List** : Display Barcode Symbol data read by a device.
- ② **Data Count** : Display the number of tag to be read on Data List.
- ③ **Total Read Count** : Display the number of data read by a device.
- ④ **Start** : Start inventory. Once started, it will change to Stop button.
- ⑤ **Clear** : Delete all data on Data List and initialize each count value.
- ⑥ **Setting** : Move to a screen to set Barcode Option .

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3.2.2. How to read the barcode data

Click "Start" button to start Reading.



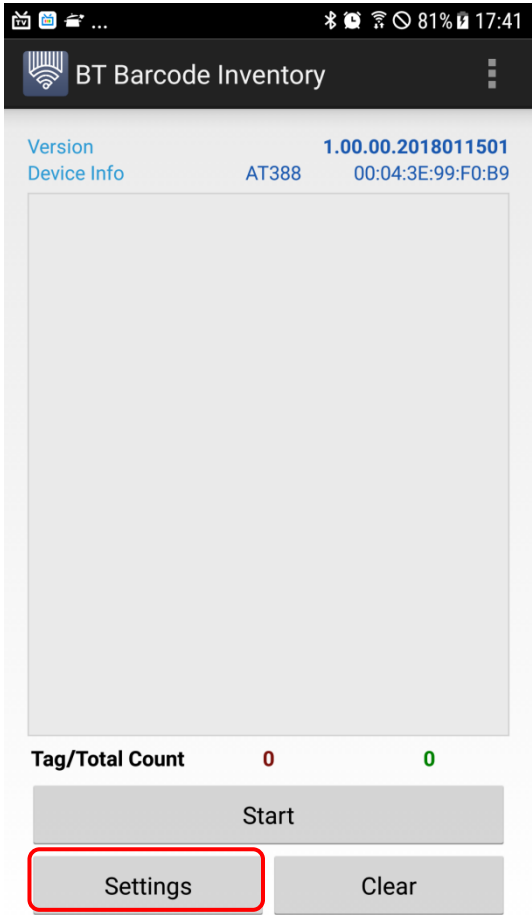
Once Barcode Reading starts, "Start" button will change to"Stop". You can stop Barcode Reading if you touch "Stop" button.

For Barcode Reading, if Barcode Symbol data is read, Barcode Reading will stop automatically.


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3.2.3. How to change barcode options

You can set whether to use symbol of barcode module by using Barcode Option.

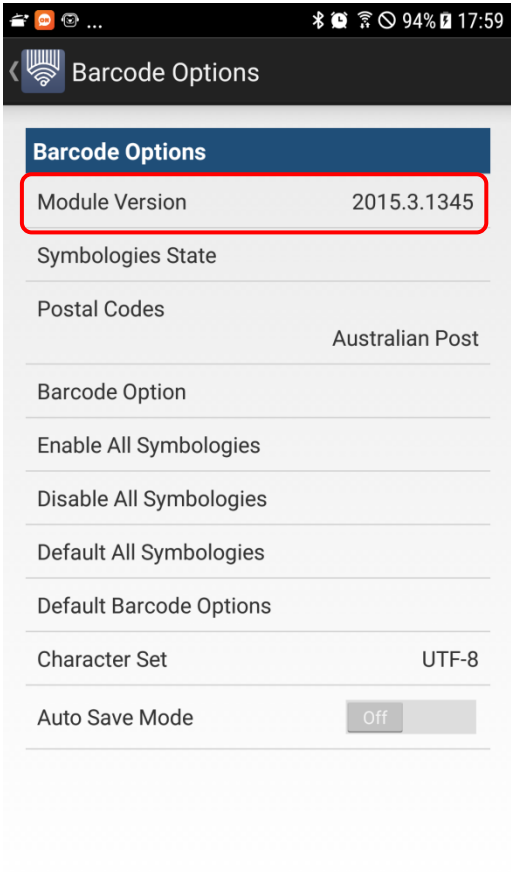



Touch Settings button and Barcode Option menu will be displayed.

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3.2.3.1. Module Version

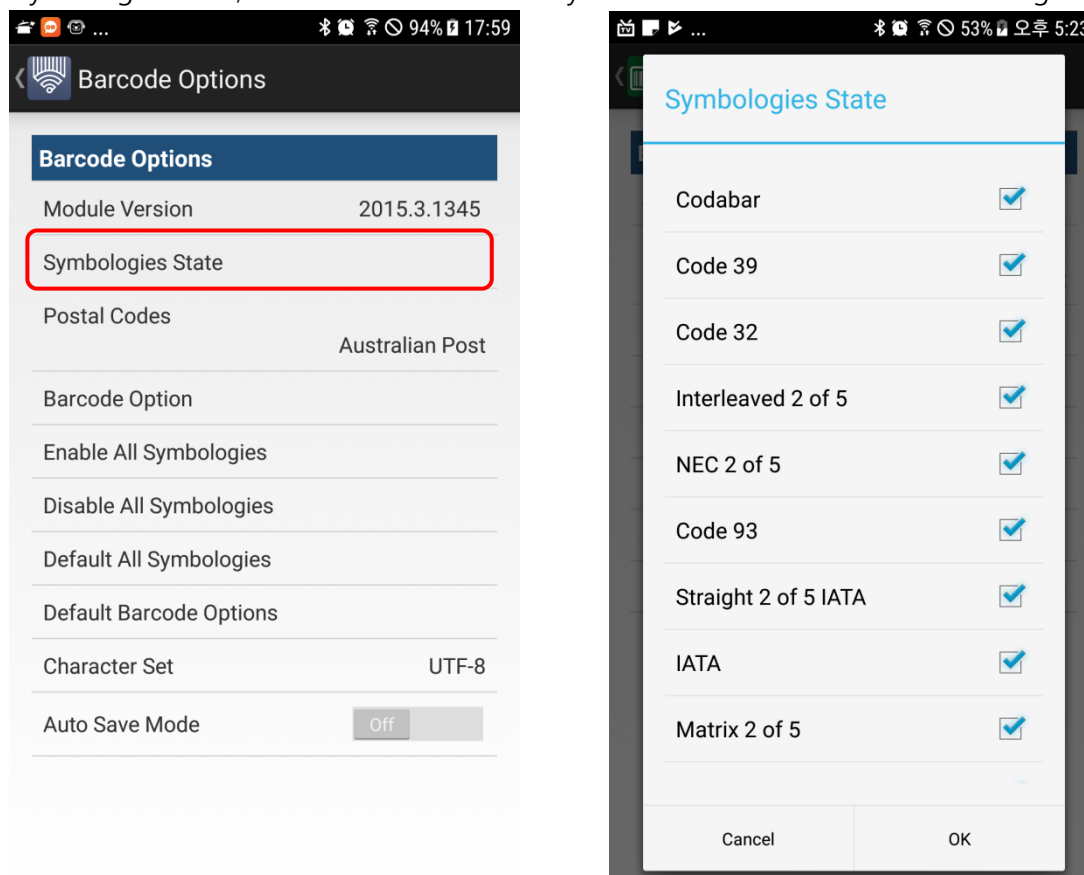
Display information on Version of Barcode module.



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3.2.3.2. Symbolologies State

In Symbolologies State, a user can select barcode symbol which Barcode module can recognize as he wishes.



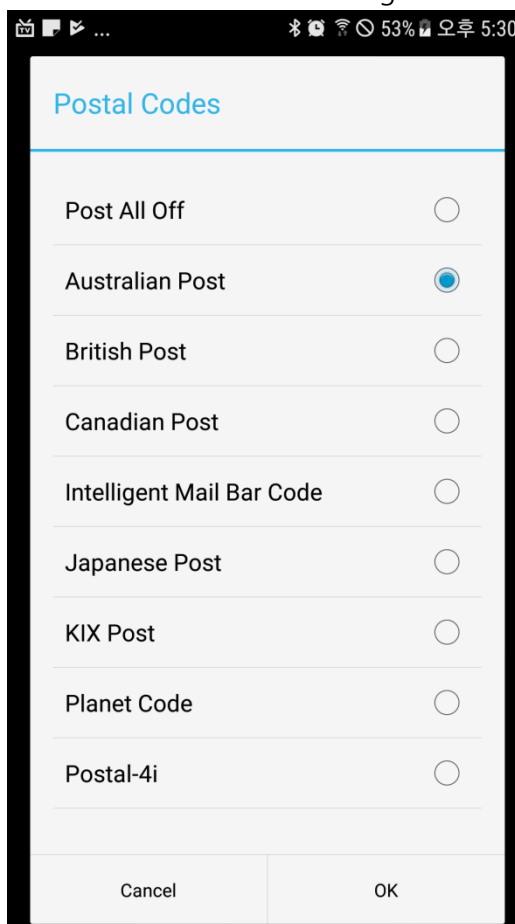
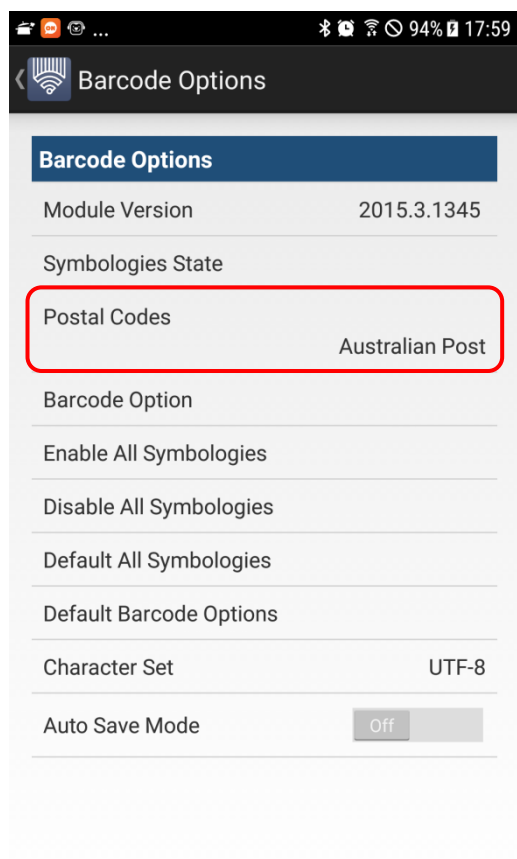
Enabling all barcode symbols that module can recognize too much causes overall performance of barcode recognition to be degraded as time to recognize barcode loaded optically gets longer.

Enabling only barcode symbol used mainly helps to enhance performance of module.

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3.2.3.3. Postal Codes


In Postal Codes, a user can select mail barcode symbol that Barcode module can recognize as he wishes.



A user can select only one mail barcode symbol on a list.

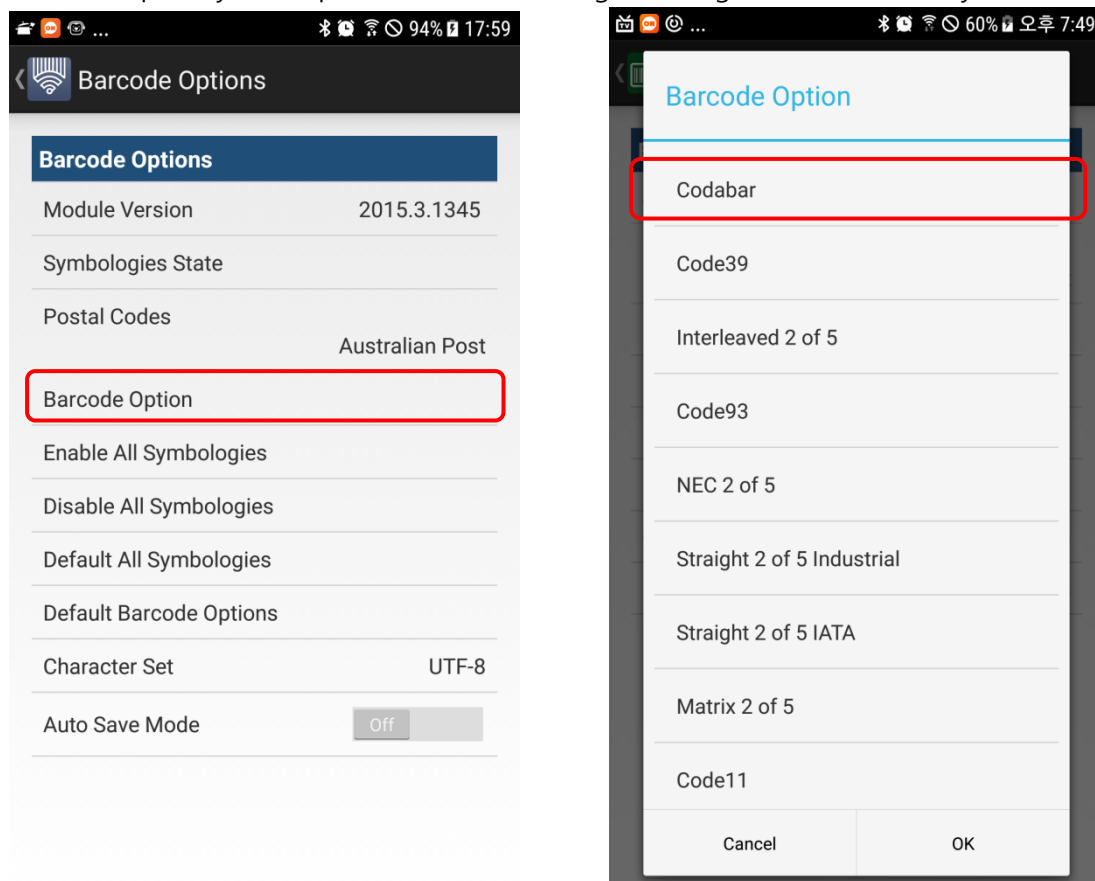
※ This function is supported in AT388 only.

In Symbologies State, AT188N and ATS100 can select mail barcode symbol.

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3.2.3.4. Barcode Option

In Barcode Option, you can perform detailed setting for recognition of barcode symbol in barcode module.



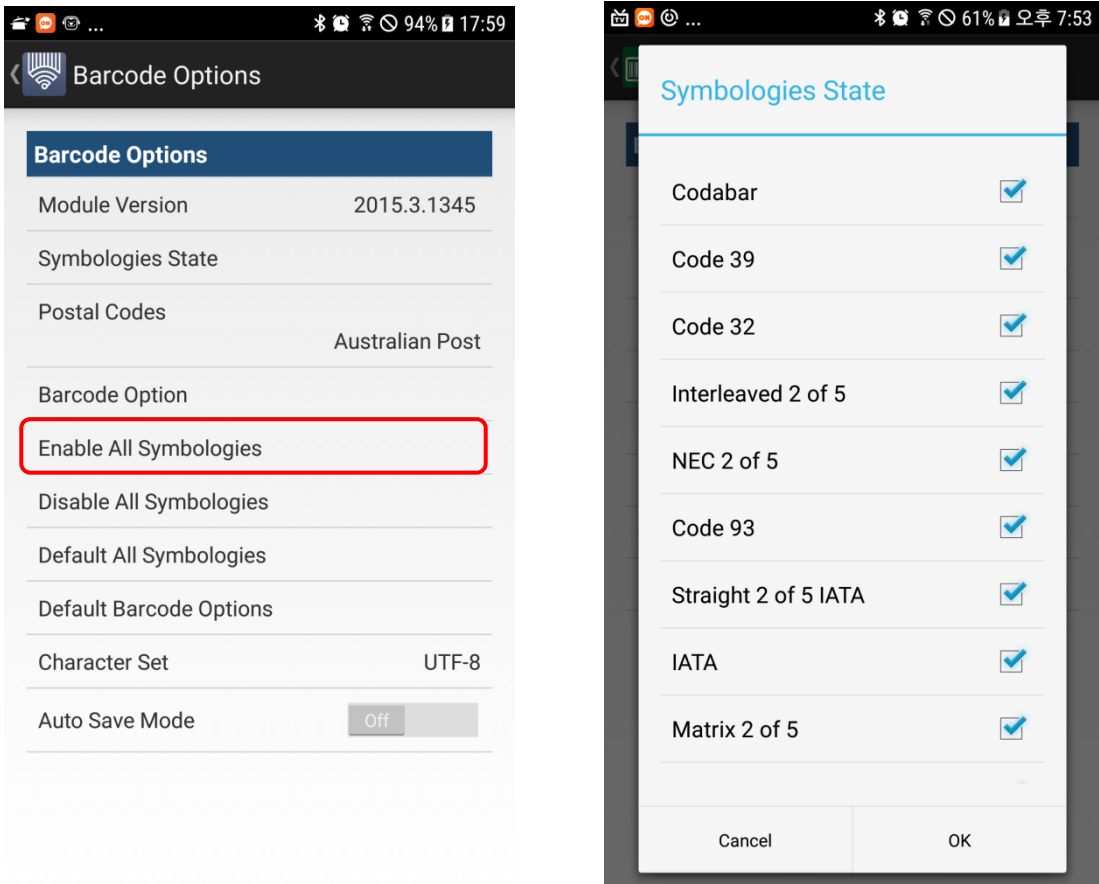
If you touch barcode symbol you want to do detailed setting in Barcode Option, detailed setting screen will be displayed.

Detailed setting items vary according to barcode symbol . For mode details, refer to datasheet of barcode module.


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3.2.3.5. Enable All Symbologies

Enable All Symbologies enables all barcode symbols that barcode module can recognize.

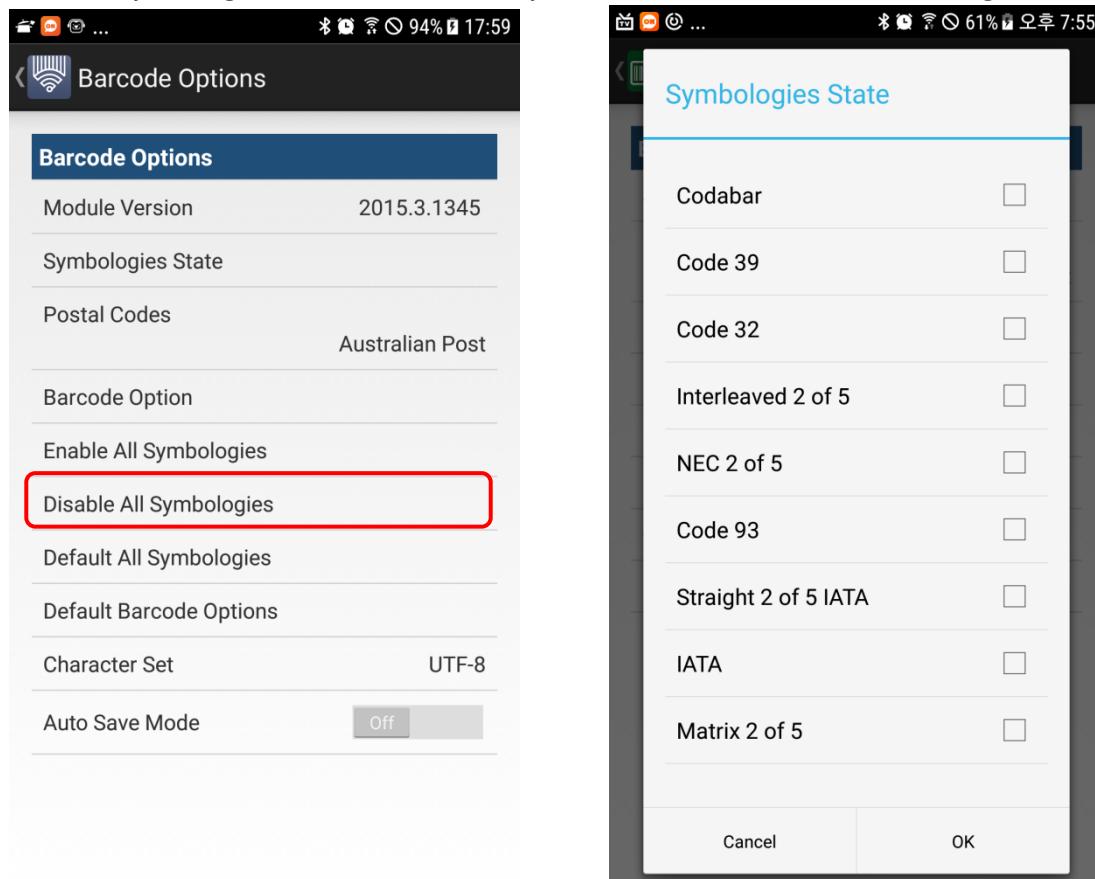


If you touch Enable All Symbologies and then enter Symbologies State to check it, you can check all symbols have been selected.


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3.2.3.6. Disable All Symbologies

Disable All Symbologies disables all barcode symbols that barcode module can recognize.

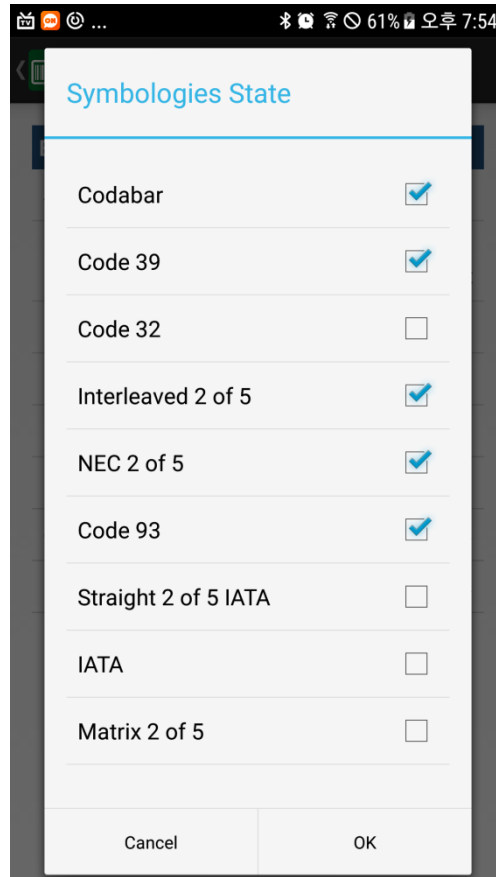
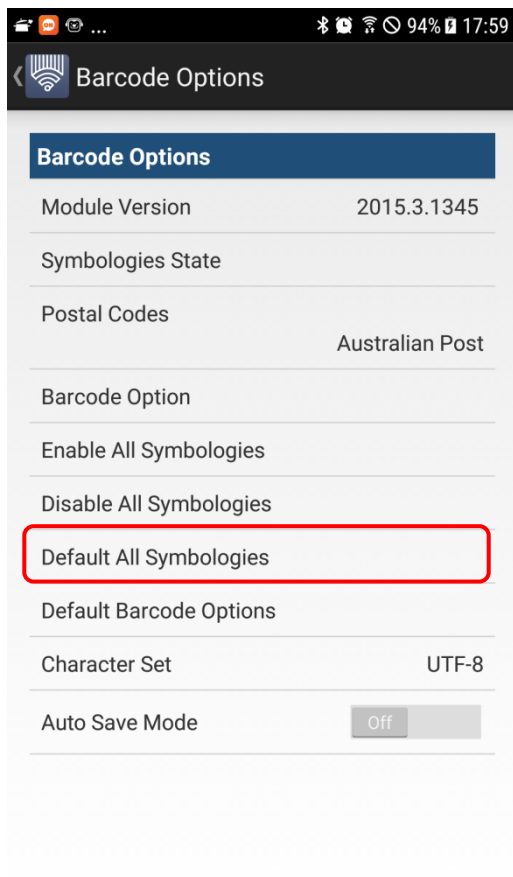



If you touch Enable All Symbologies and then enter Symbologies State to check it, you can check no symbols have been selected.

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3.2.3.7. Default All Symbolologies

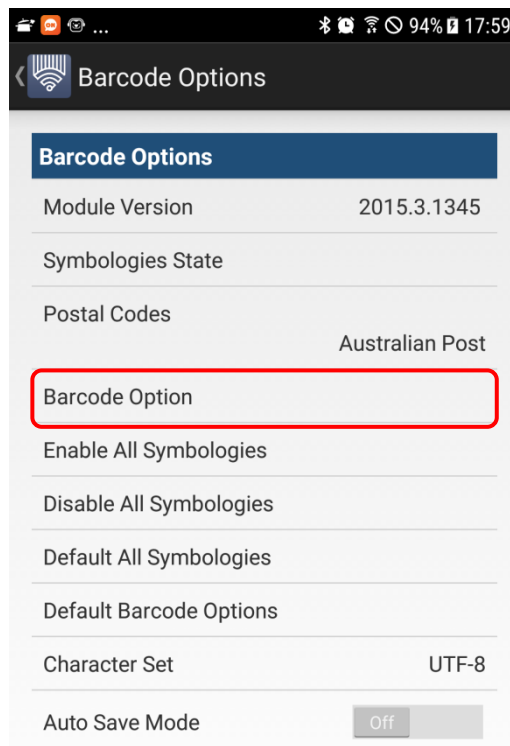
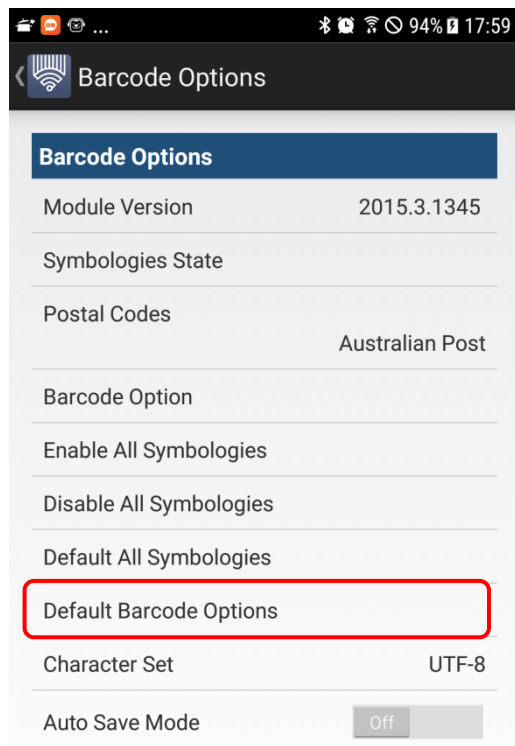
Default All Symbolologies initializes barcode symbol that Barcode module can recognize as factory default of module.



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3.2.3.8. Default Barcode Options

Character Set is used when decoding barcode symbol data that Barcode module recognizes. A user can select Character Set as he wishes.



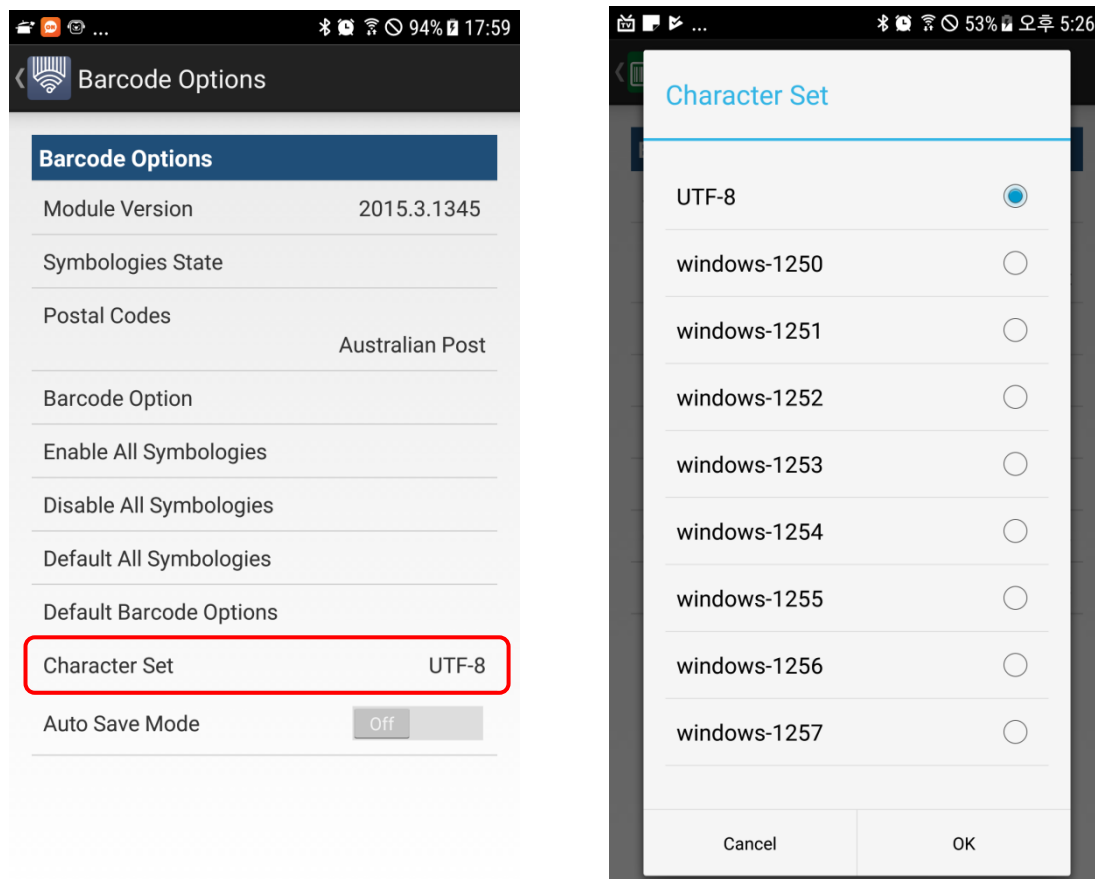
Scanning barcode symbol after invalid setting causes barcode data to be displayed abnormally.

This function is supported in SSI Barcode Module only.


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3.2.3.9. Character Set

Character Set is used when decoding barcode symbol data that Barcode module recognizes. A user can select Character Set as he wishes.



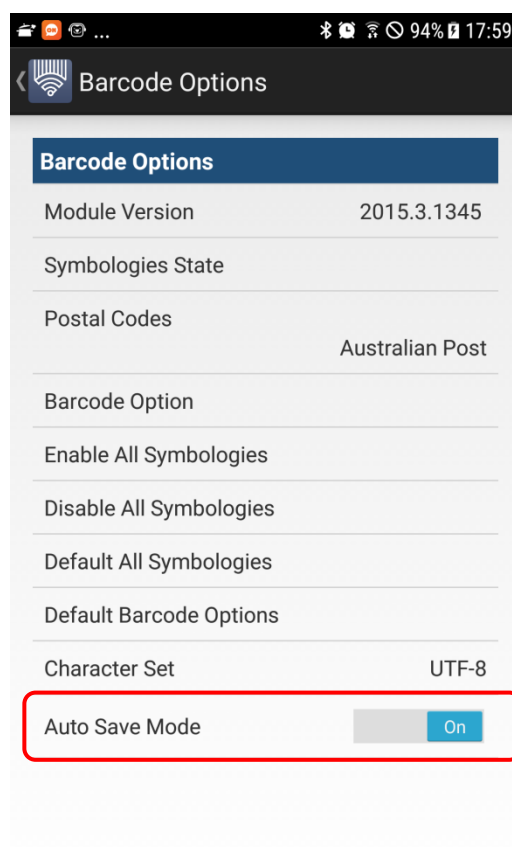
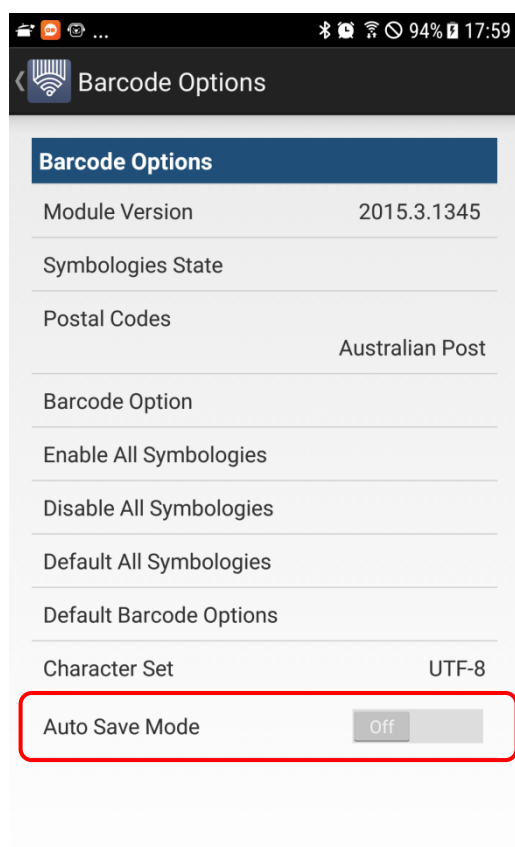
Scanning barcode symbol after invalid setting causes barcode data to be displayed abnormally.

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3.2.3.10. Auto Save Mode


Auto Save Mode Option can select whether to save loaded tag data or barcode in internal memory of a device. Auto Save Mode only affects motion when a device and demo are connected. When a device and demo are not connected, Auto Save Mode is not effective.

Auto Save Mode Option will be described in more detail in a description of Stored Data Screen.



Data inventoried with Auto Save Mode on are saved in a device.

※ This function is not supported in ATS100.

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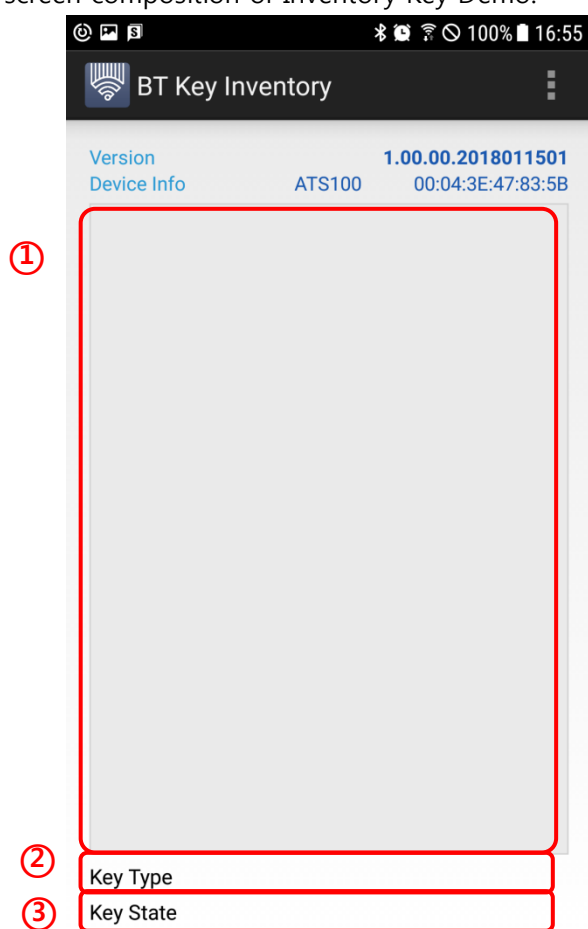
3.3. Inventory Key

Inventory Key Demo is to read Key Event State of device.

※ This function is supported only in ATS100 .

3.3.1. Screen Composition

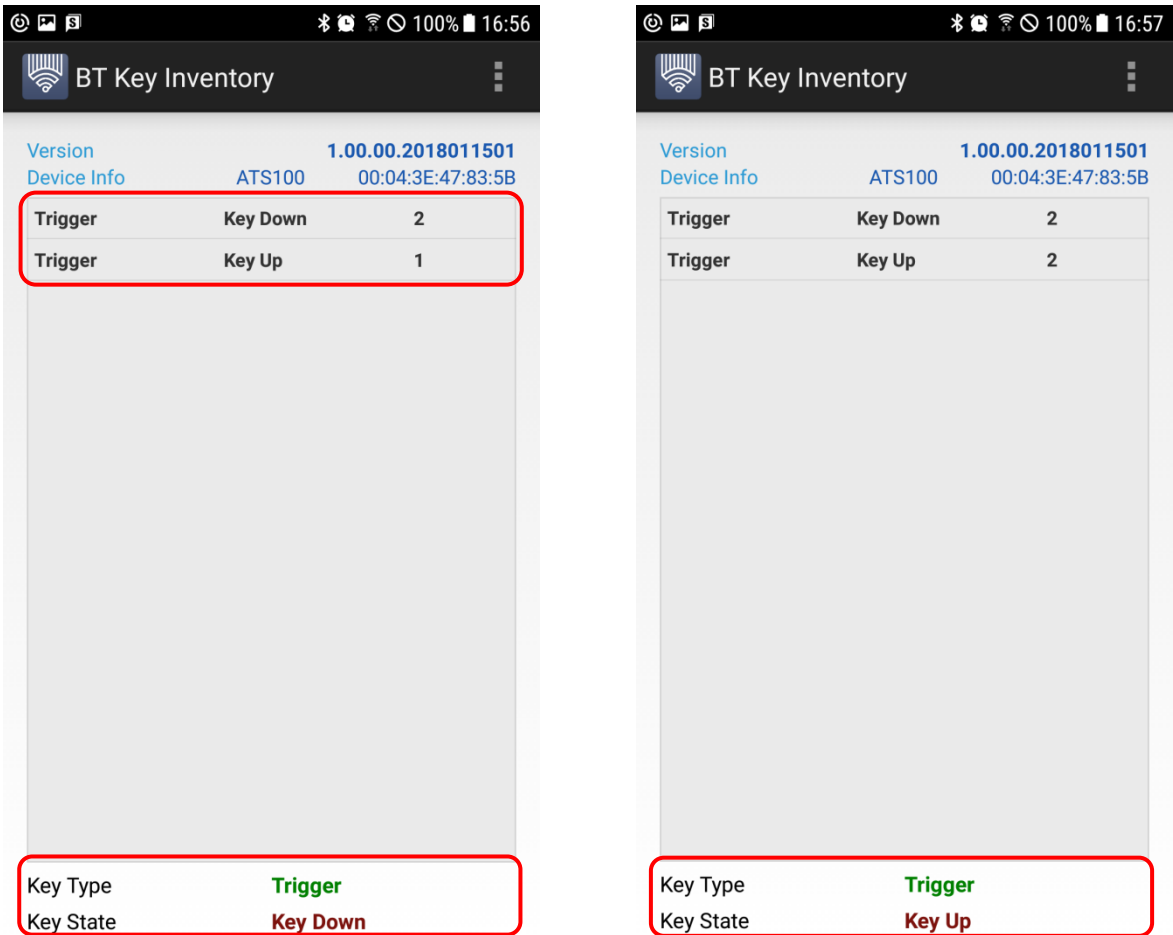
A picture below shows screen composition of Inventory Key Demo.




- ① **Data List** : Display Key Event data read by device.
- ② **Key Type** : Display types of Key.
- ③ **Key State** : Display Up/Down state of Key.

3.3.2. How to read the Key data

Click Trigger button out of device's key to start reading.



Display Up/Down state and number of trigger button of present device.

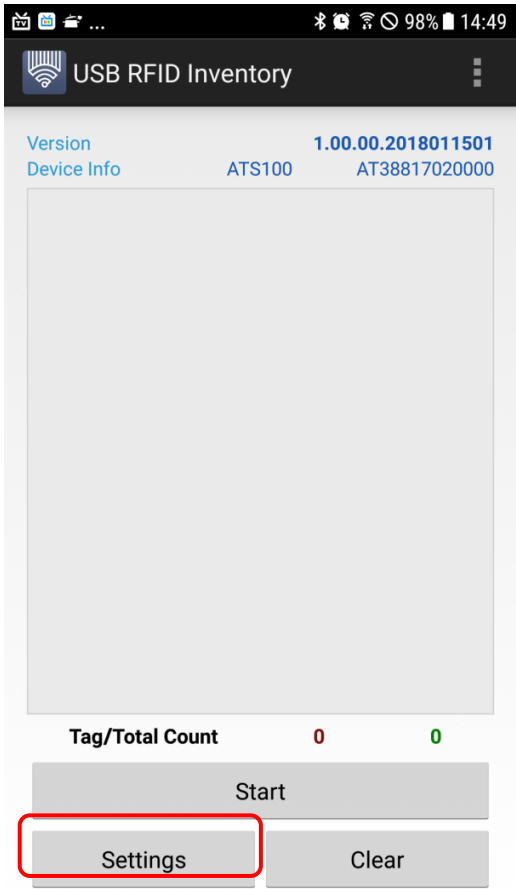
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3.4. RFID options


This option describes how to set RFID when setting RFID by clicking "Settings" button in Inventory RFID , Read Memory , Write Memory , and Lock Memory Demo.

3.4.1. How to change RFID options

RFID Option provides an environment which can operate setting of RFID UHF module.

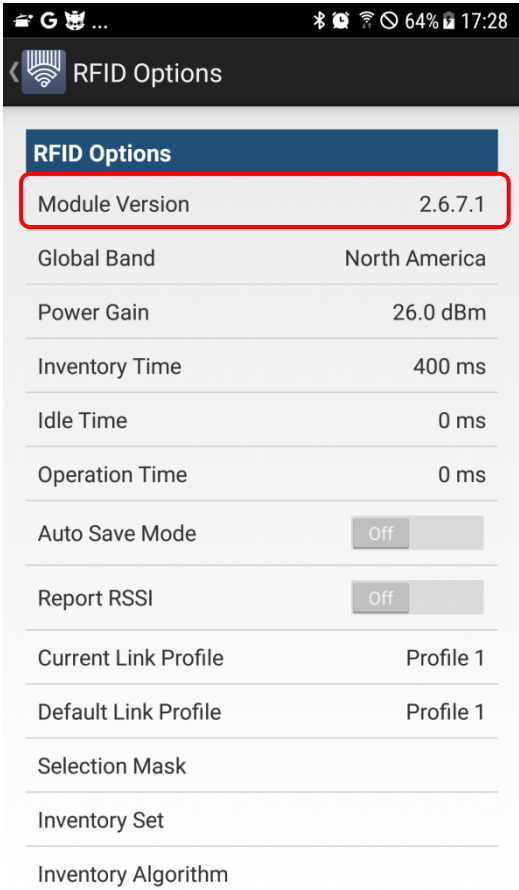



Click "Settings" button" to display RFID Option menu.

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3.4.1.1. Module Version

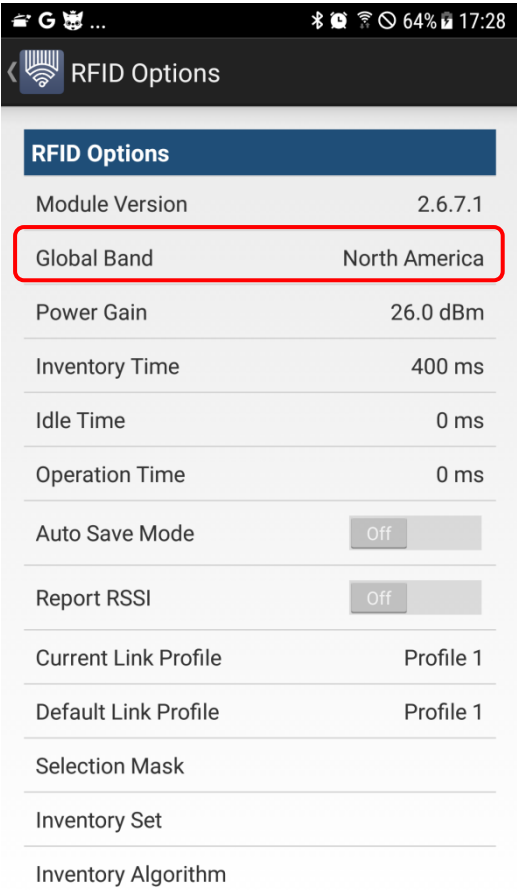
Display information on Versionof RFID UHFmodule.




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3.4.1.2. Global Band

Global Band displays information on nation set in RFID UHF module.



Nation setting information can only be checked and cannot be revised .

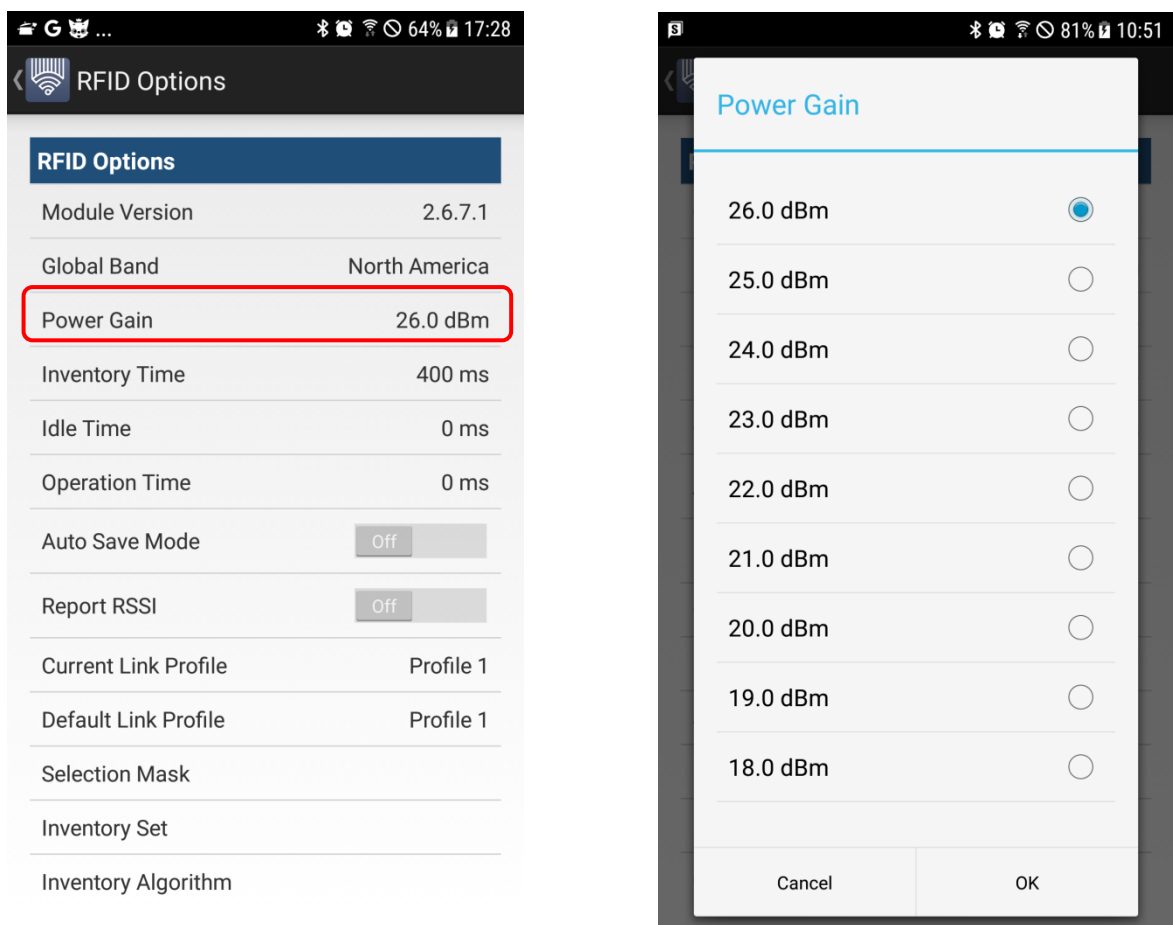
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3.4.1.3. Power Gain

Power Gain can set output of RFID antenna when conducting Inventory.


If you touch Power Gain on Option window, a dialogue box in which you can set Power Gain will appear.

If you select a value you want and touch "OK" button,Power Gain value will be set.



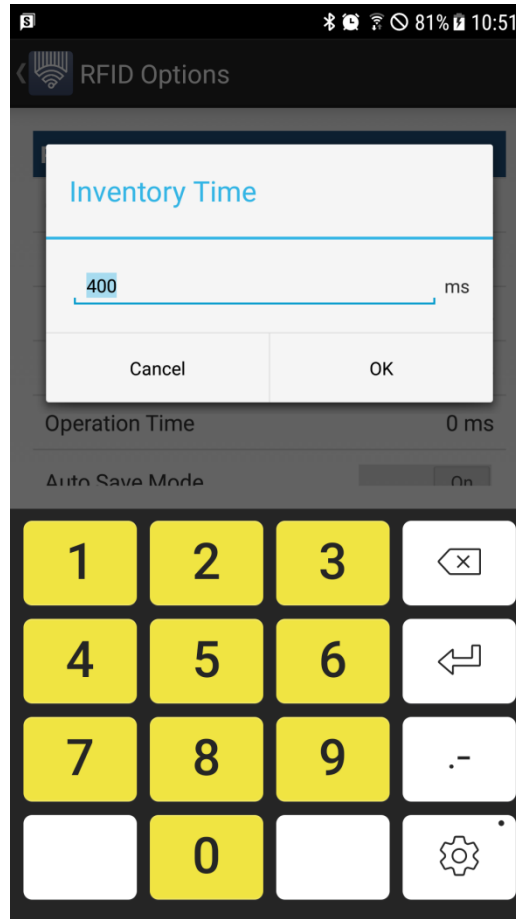
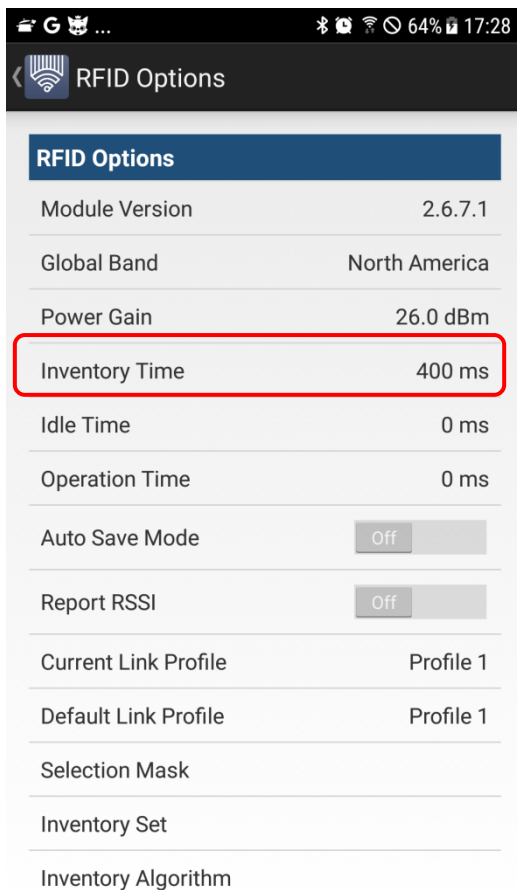
In Power Gain dialogue box, you can scroll a value by dragging it with finger.

If you touch "Cancel" button, Power Gain value is not set and return to Option screen.

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3.4.1.4. Inventory Time

Inventory Time sets time which antenna emits radio wave among Inventory Roundtime of RFID UHF.
The unit of setting is ms.




Inventory Time과 Idle Time은 둘 값을 합쳐서 400ms를 넘지 못 합니다.

Inventory Round time does not exceed 400ms.

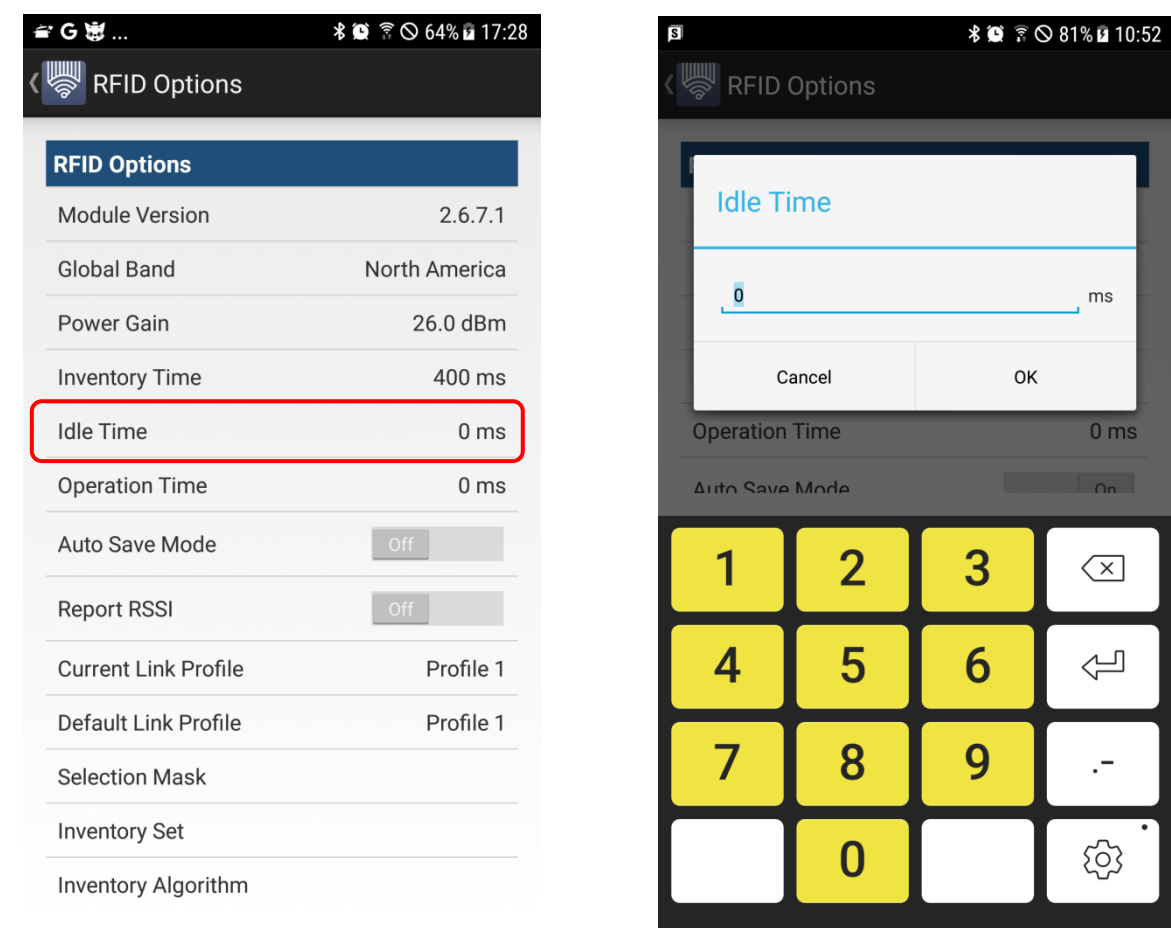
There are time which radio wave is emitted via antenna during Inventory Round and idle time that antenna is idle.

Time which radio wave is emitted is set by using Inventory Time. Idle time can be set by using Idle Time.
A sum of Inventory Time and Idle Time cannot exceed 400ms.


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3.4.1.5. Idle Time

Idle Time sets timewhich antenna is idle without emitting radio wave among Inventory Roundtime of RFID UHF. The unit of setting is ms.



As described in Inventory Time, a sum of Idle Time and Inventory Time cannot exceed 400ms.

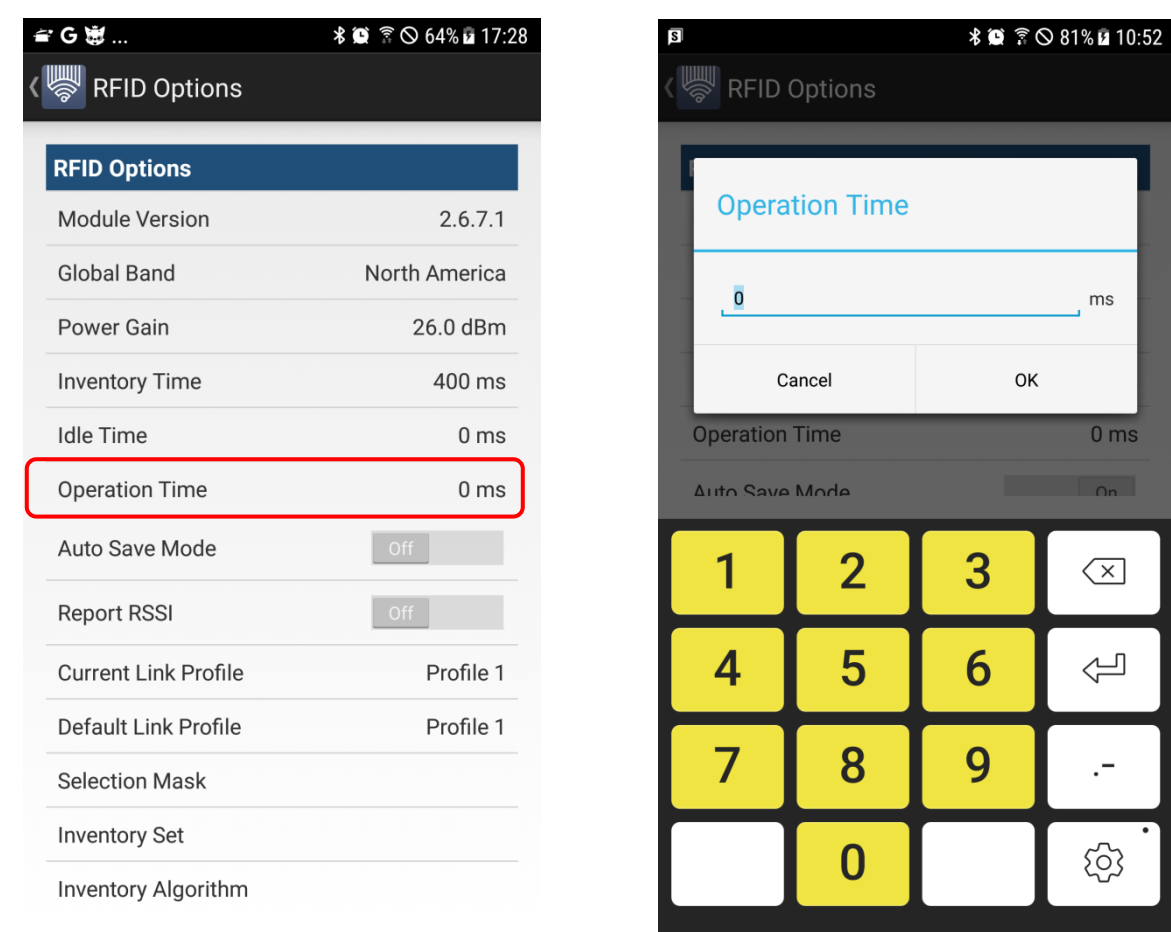
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3.4.1.6. Operation Time

Operation Time Option can set time during which Inventory is conducted.

If Operation Time option is set to 0, time to conduct Inventory performs motion until work stops.

The unit of setting is ms.




If you touch Operation Time, a dialogue box which you can set Operation Time will appear.

If you enter a value and touch "OK" button, Operation Time will be set.

If you touch "Cancel" button, Operation Time will not be set and return to Option screen.

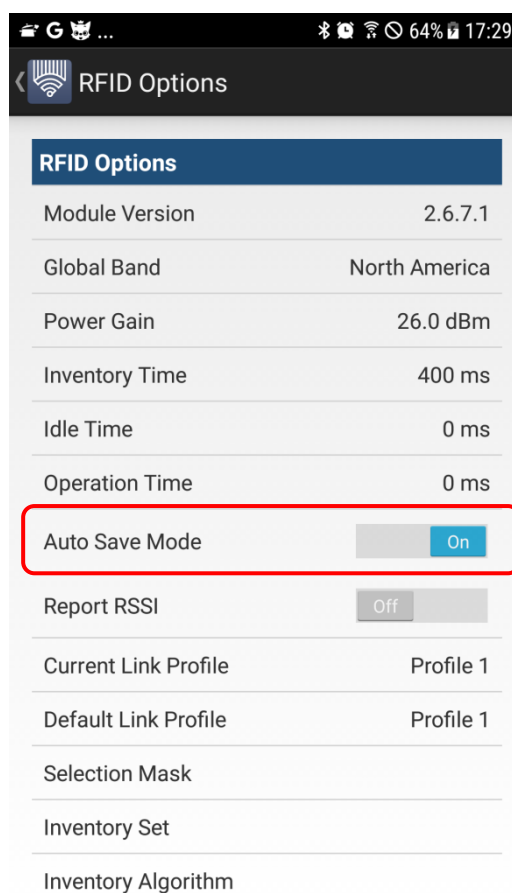
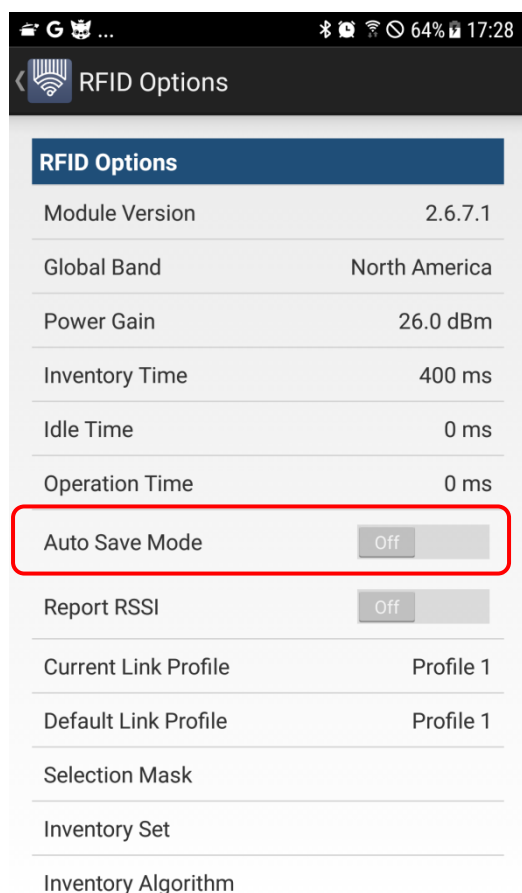
If Operation Time option is set to value other than 0, Inventory motion performs as it has been specified and then stops automatically.

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3.4.1.7. Auto Save Mode

Auto Save Mode Option can select whether to save loaded tag data or barcode in internal memory .
Auto Save Mode affects motion only when a device and demo are connected. Auto Save Mode is not effective when a device and demo are not connected.

Auto Save Mode option will be described in more detail in a description of Stored Data screen.

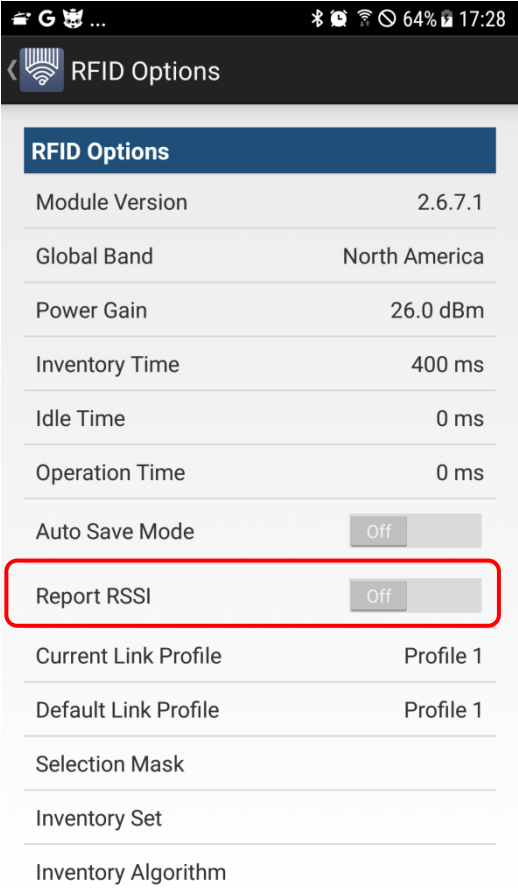


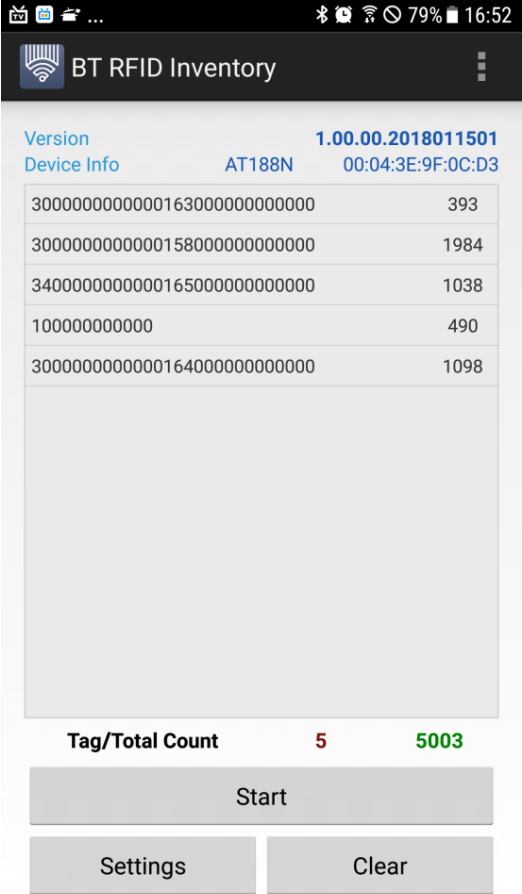
Data to be inventoried with Auto Save Mode on is saved in a device.

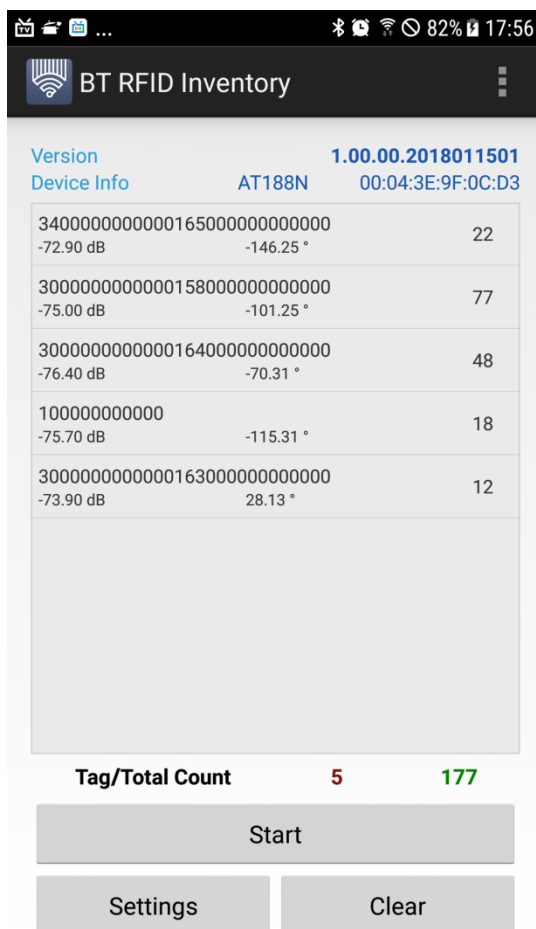
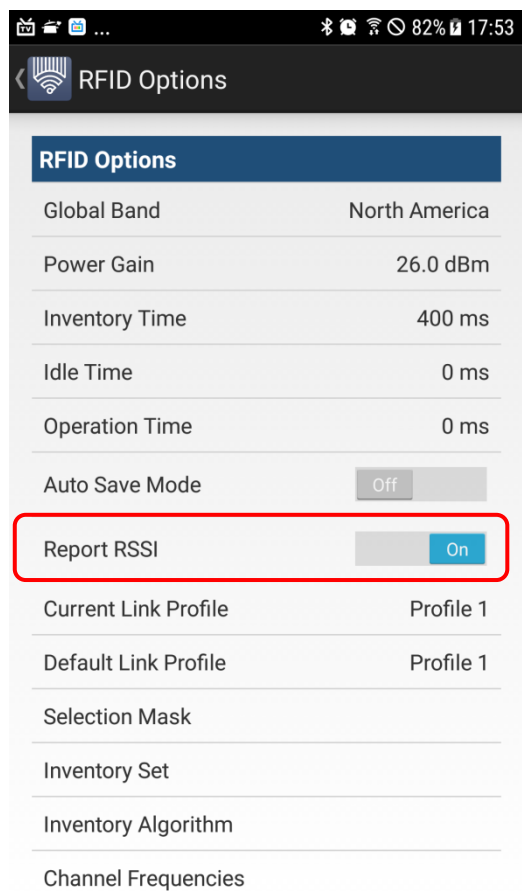
✖ This function is not supported in ATS100 and ATD100 .

3.4.1.8. Report RSSI

Report RSSI can be set in a manner to read RSSI value and Phase value as well as RFID tag value when performing Inventory.





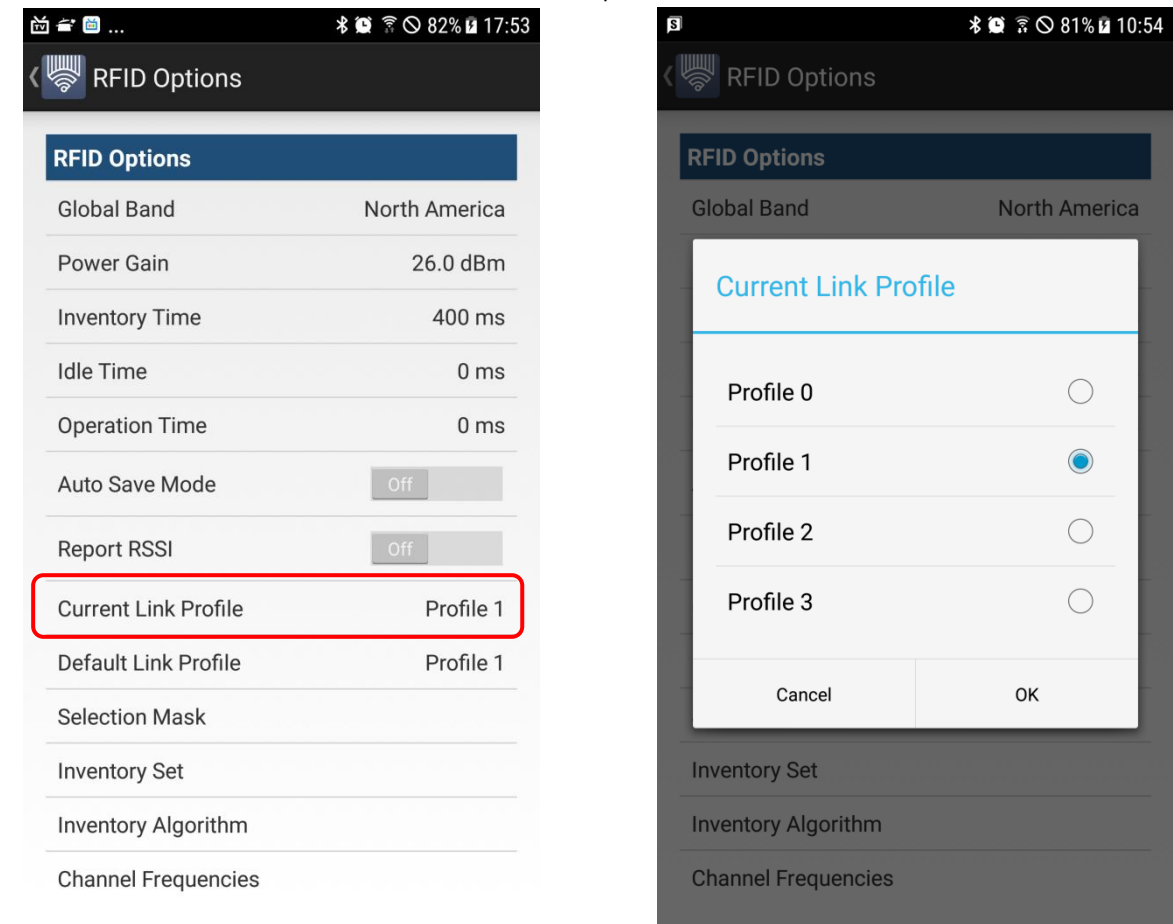


RSSI value displays signal strength at the moment a device senses a tag when performing Inventory. Phase displays phase in frequency at the moment a device senses a tag. You can track the location of tag more precisely by using information on RSSI and Phase. Technology of tracking the location of tag is beyond the purpose of this document.


3.4.1.9. Current Link Profile

Link Profile Option is to set Air Interface mode of RFID UHF.
Link Profile can be set from 0 up to 3.

Current Link Profile will be set to default value if power to device (AT188N, AT388, ATS100) turns off and then On .



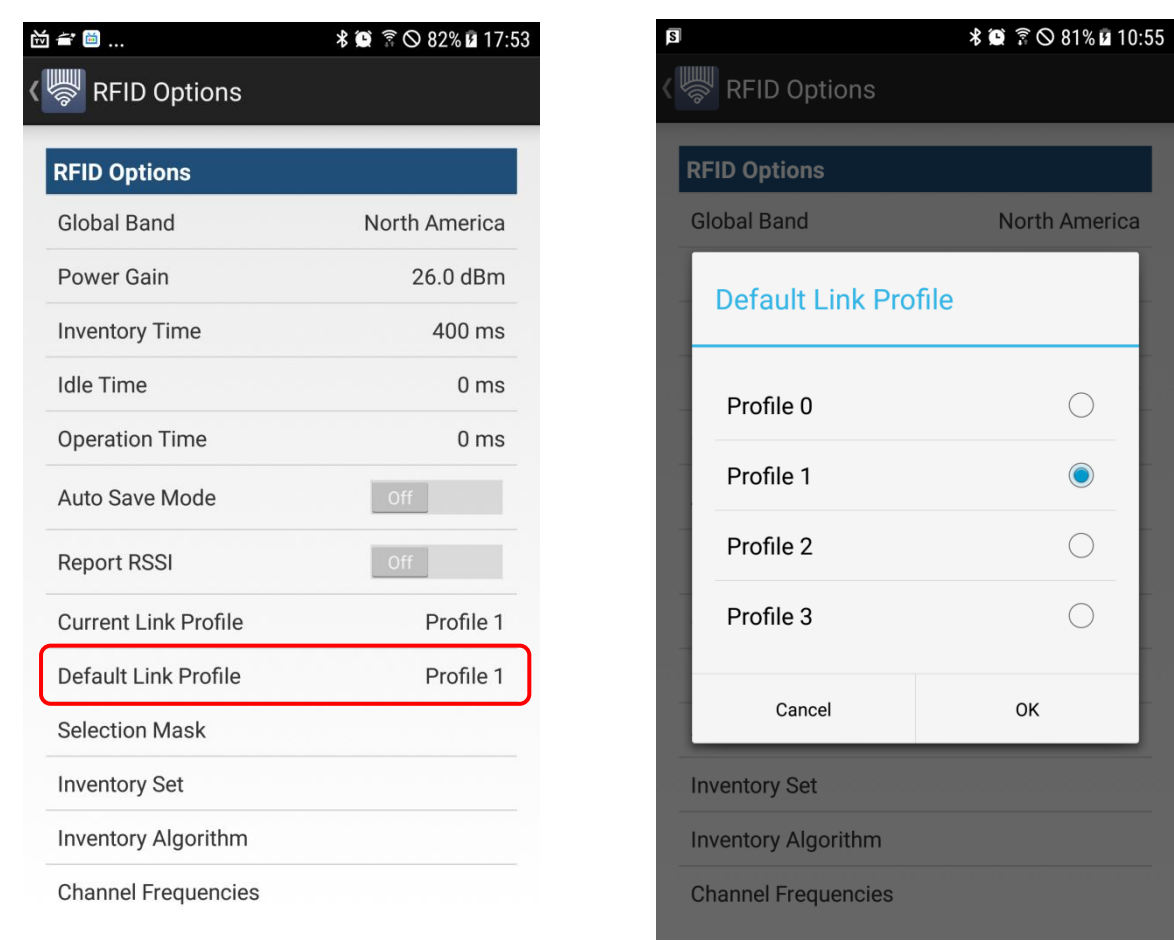
※. AT188N and ATD100 support Link Profile1 only.

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3.4.1.10. Default Link Profile

Link Profile Option is to set Air Interface mode of RFID UHF.
Link Profile can be set from 0 up to 3.

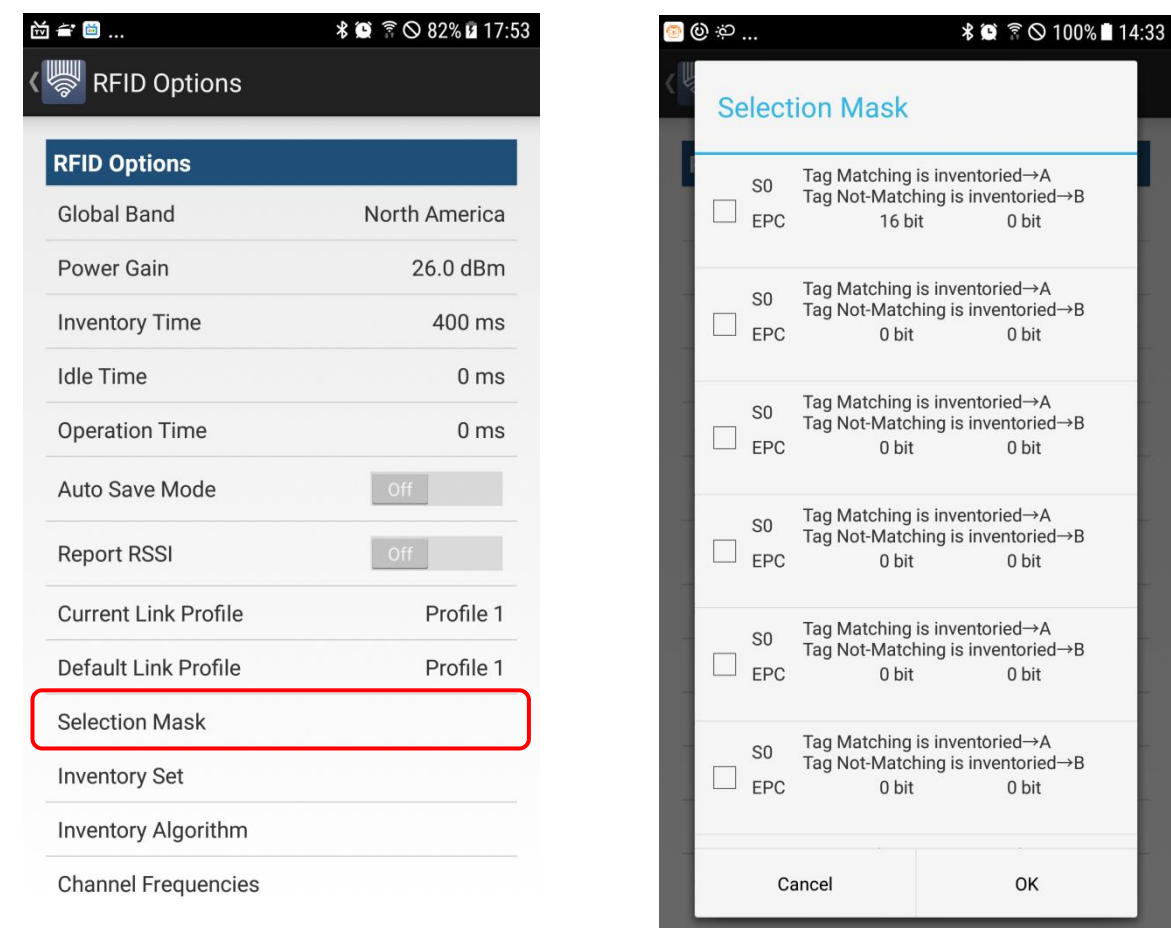
Default Link Profile is kept with set point unchanged even if power to device(AT188N, AT388, ATS100) turns Off and then On .




※ In order for default link profile to be applied to a device, power to a device must turn off/on.
AT188N and ATD100 support Link Profile1 only.

3.4.1.11. Selection Mask

You can specify motion for specific tag only by settingSelection Mask.

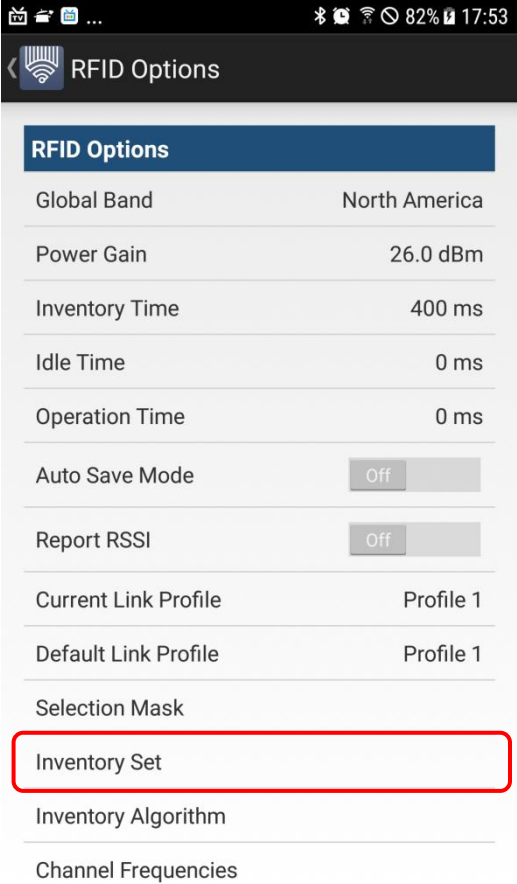


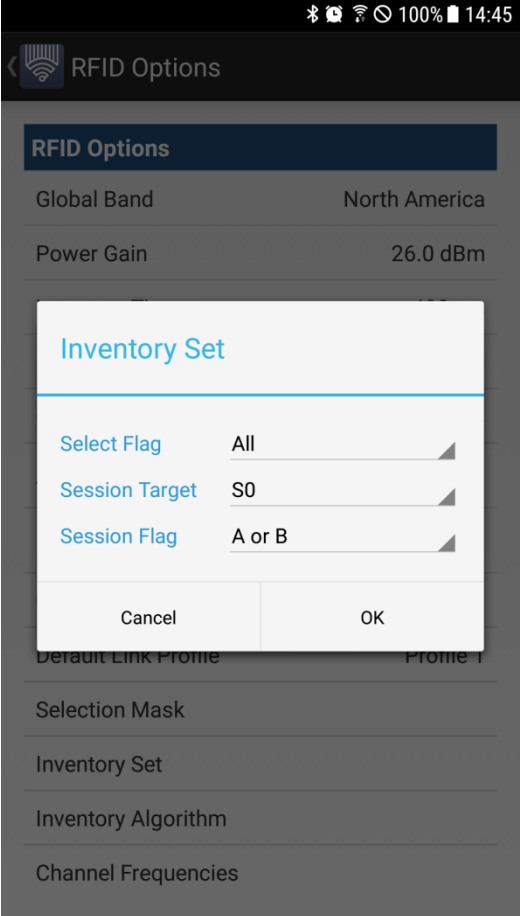
Detailed description is given in Section 3.5 Selection Mask.


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3.4.1.12. Inventory Set

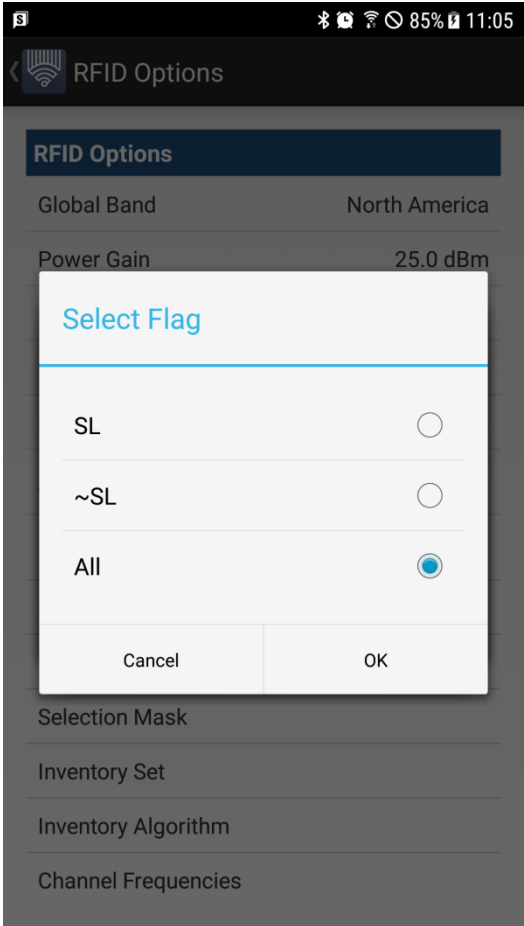
You can inventory specific tag by Inventory Set Settings.






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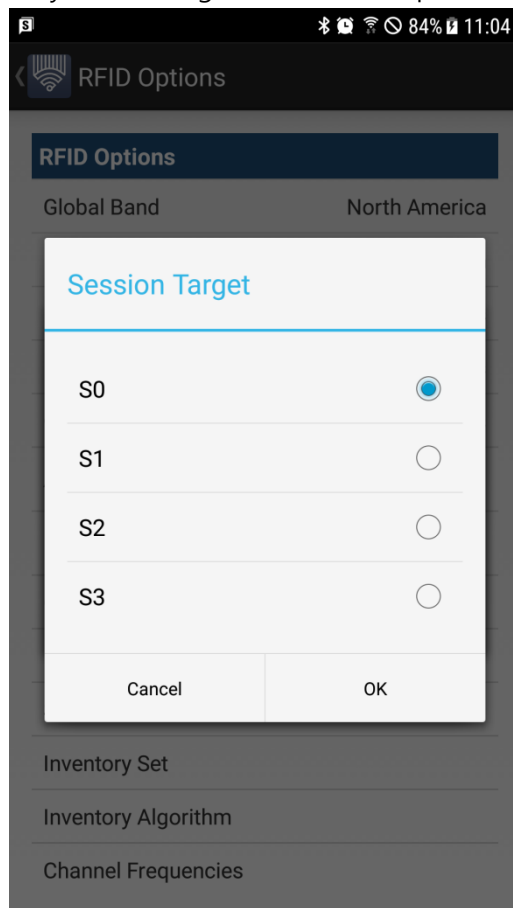
① **Select Flag** : Specify select flag state to be compared among Inventory conditions.




Select Flag	Description	Note
SL	This means inventorying only a tag which selectflagis in assert state.	
~SL	This means inventorying only a tag which selectflagis in deassert state.	
All	This means inventorying all states of tag regardless of state of select flag.	

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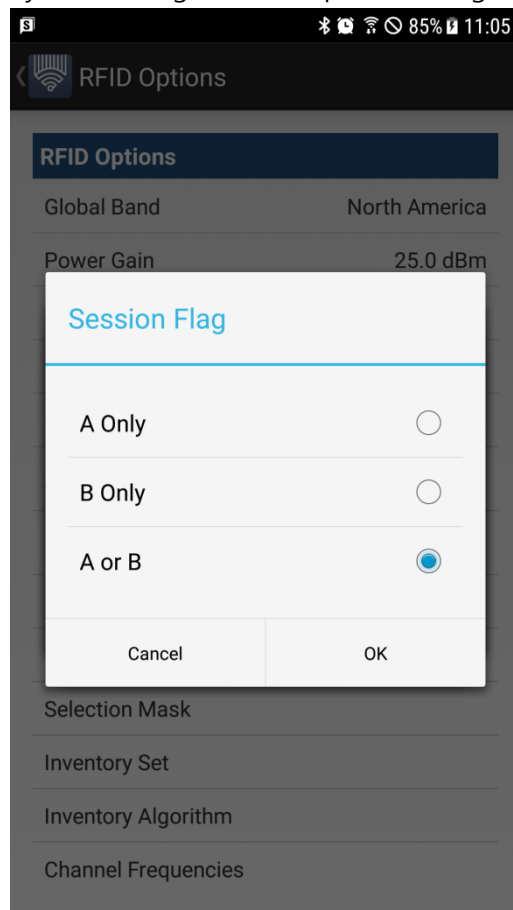
- ② **Session Target** : Specify session flag state to be compared among Inventory conditions.




Session Target	Description	Note
S0	This means that session flag to check a state is S0.	
S1	This means that session flag to check a state is S1.	
S2	This means that session flag to check a state is S2.	
S3	This means that session flag to check a state is S3.	

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- ③ **Session Flag** : Specify session flag to be compared among inventory conditions.

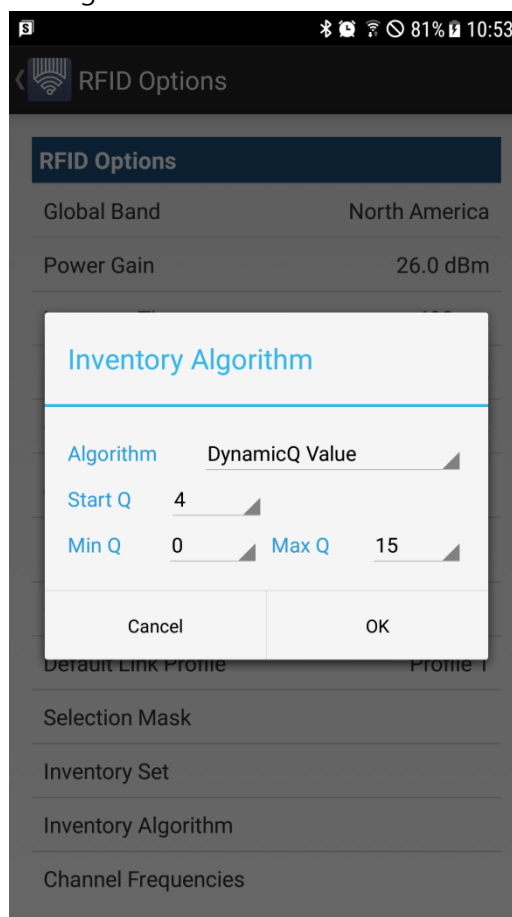
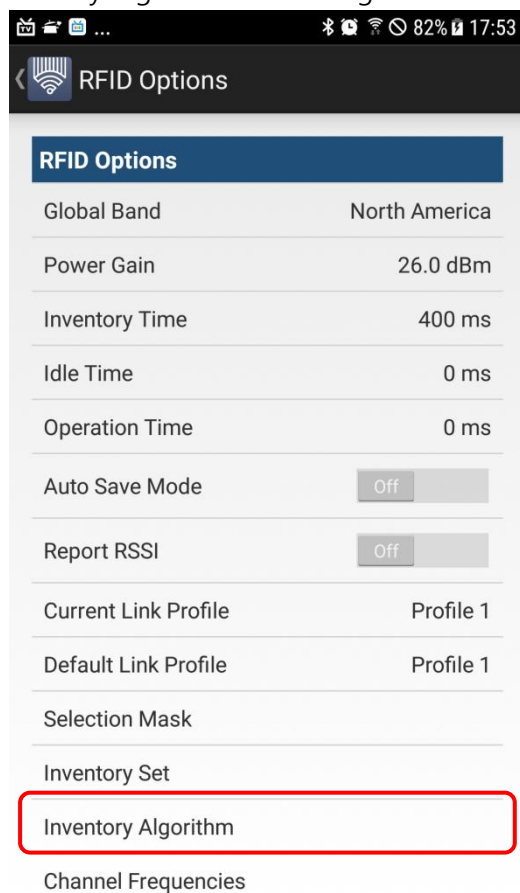


Session Flag	Description	Note
A only	This means inventorying only a tag which Session Flag state is A.	
B only	This means inventorying only a tag which Session Flag state is B.	
A or B	This means inventorying regardless of Session Flag state .	

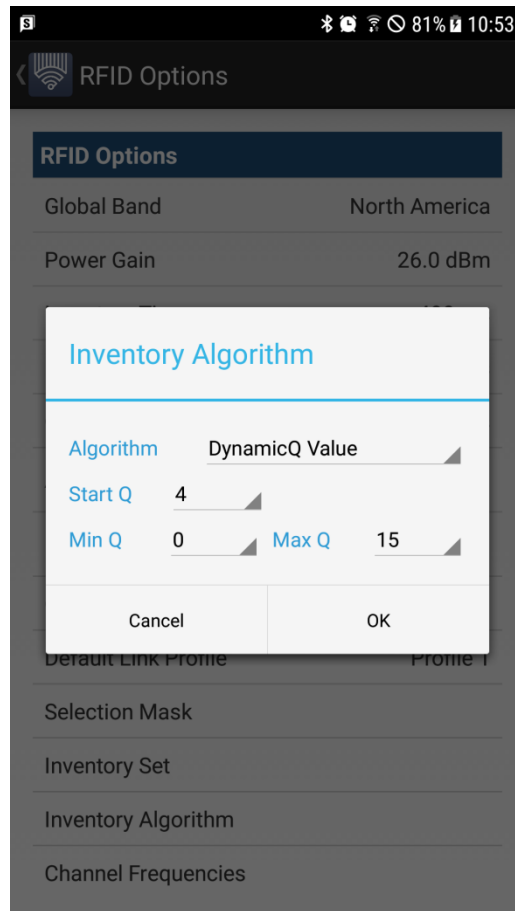
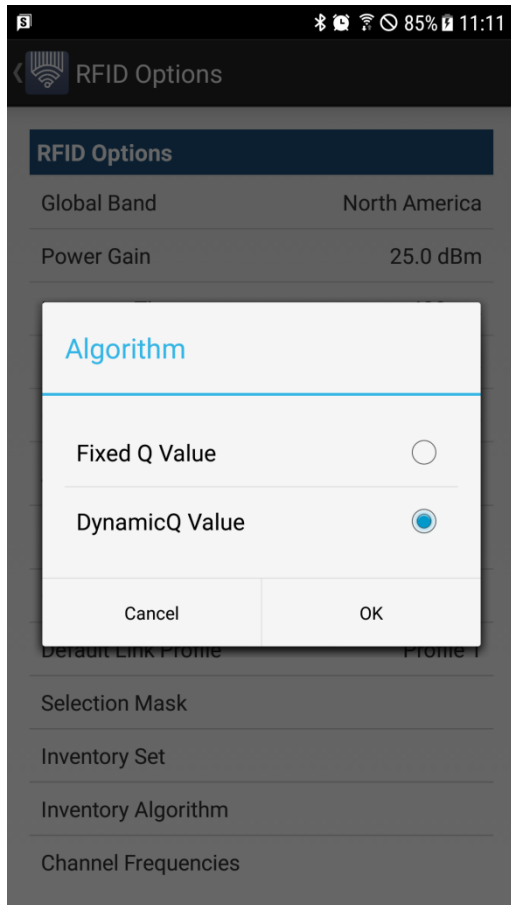
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3.4.1.13. Inventory Algorithm

Inventory Algorithm can set algorithm which inventories a tag in RFID UHF.

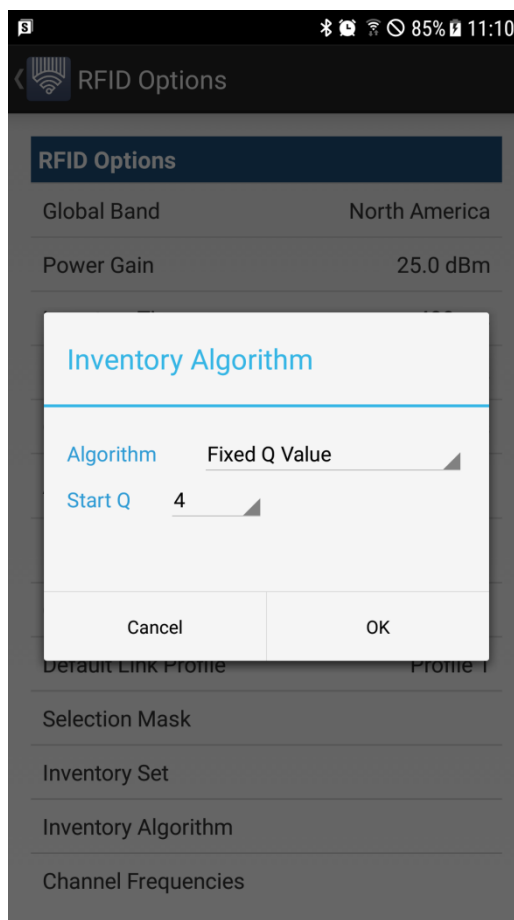
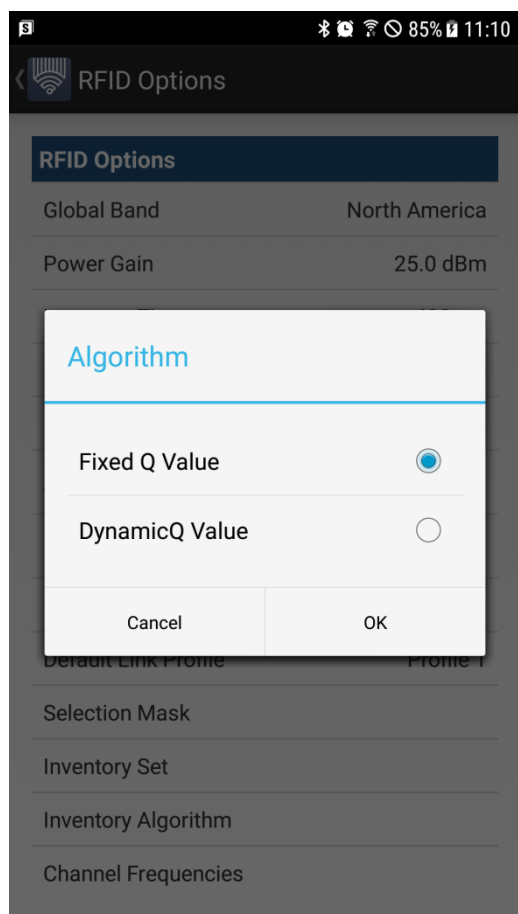


Inventory Algorithm can set algorithm which RFID UHF module uses at present, Start Q value, minimum Q value, and maximum Q value.




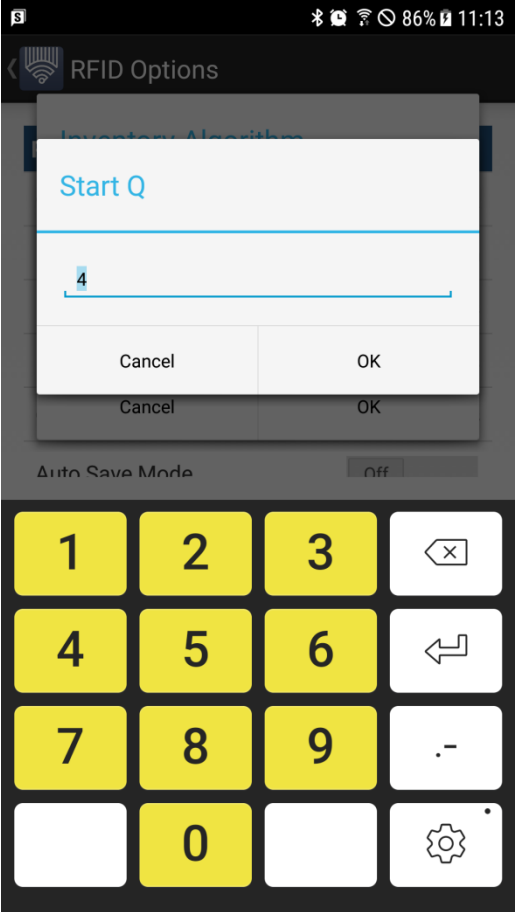
Algorithm can select algorithm using fixed Q value and variable Q value.

When selecting algorithm as variable Q Start Q, Min Q and Max Q can be used.




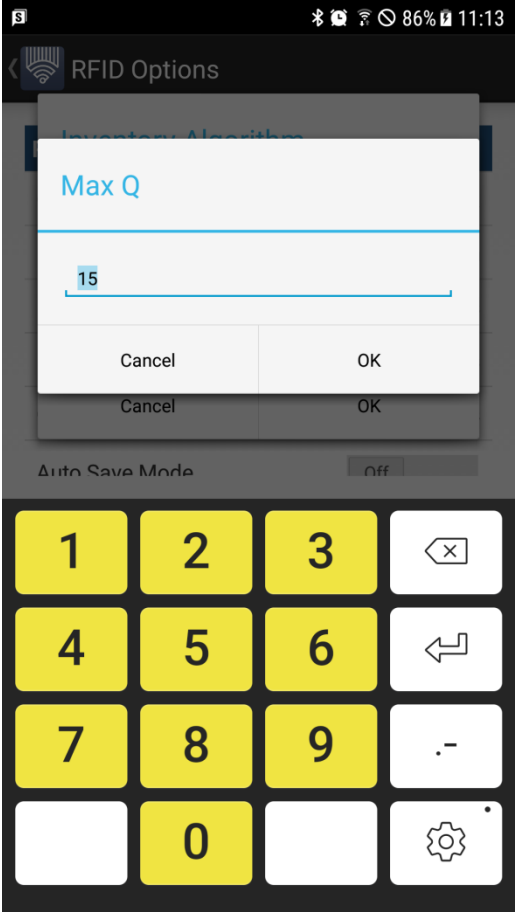
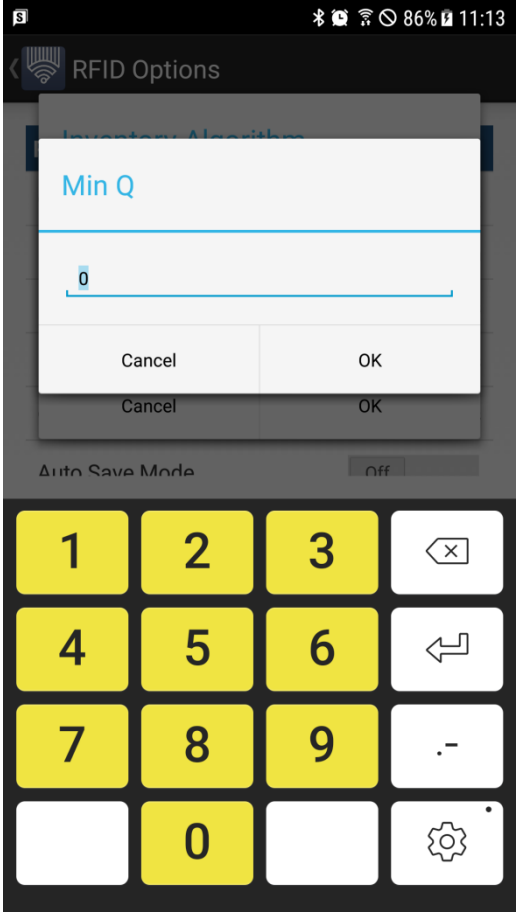
When selecting algorithm as fixed Q , Start Q can be used.

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Start Q valuecan be set from 0 up to 15.

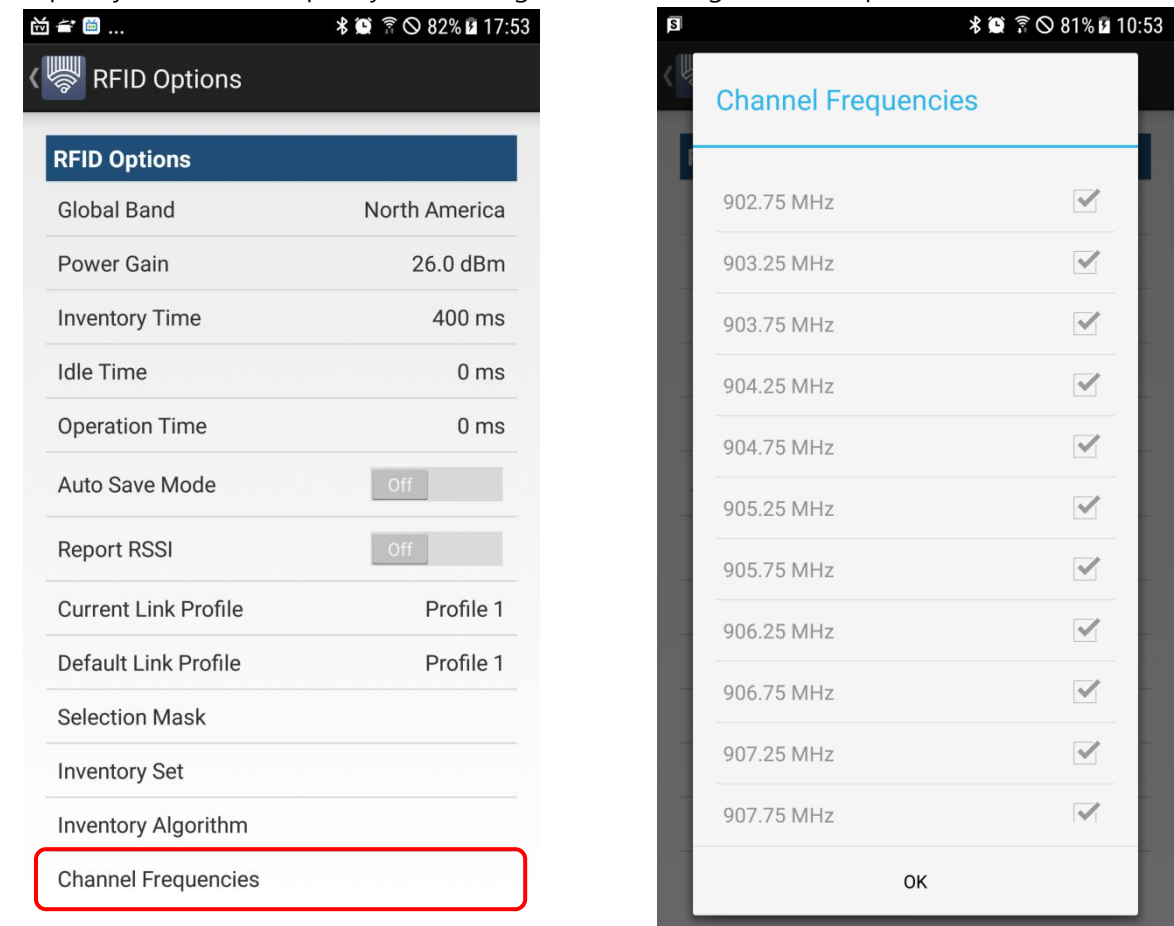
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Min Q means minimum Q value and can use from 1 up to value which is less than Max Q value.
 Max Q means maximum Q value and can use from value which is more than Min Q value up to 15.

3.4.1.14. Frequency

Frequency can check frequency table being used according to nation specified in RFID UHF module.

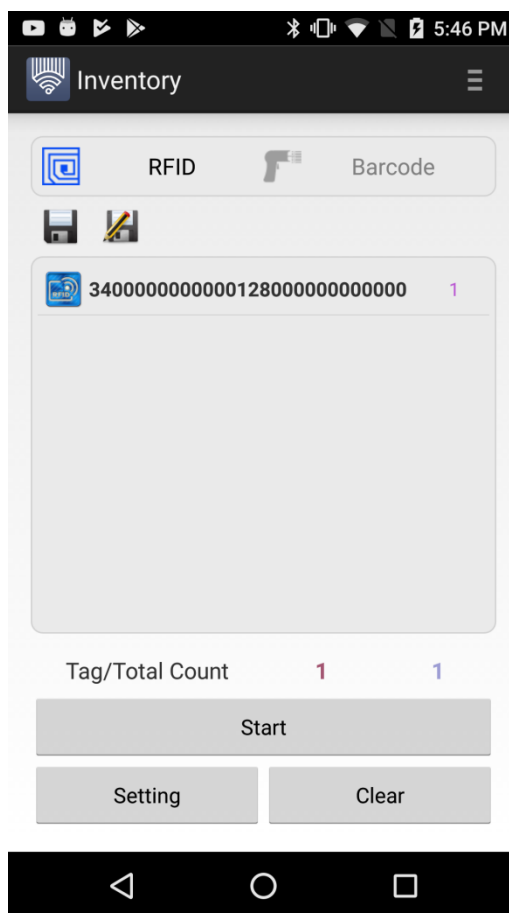
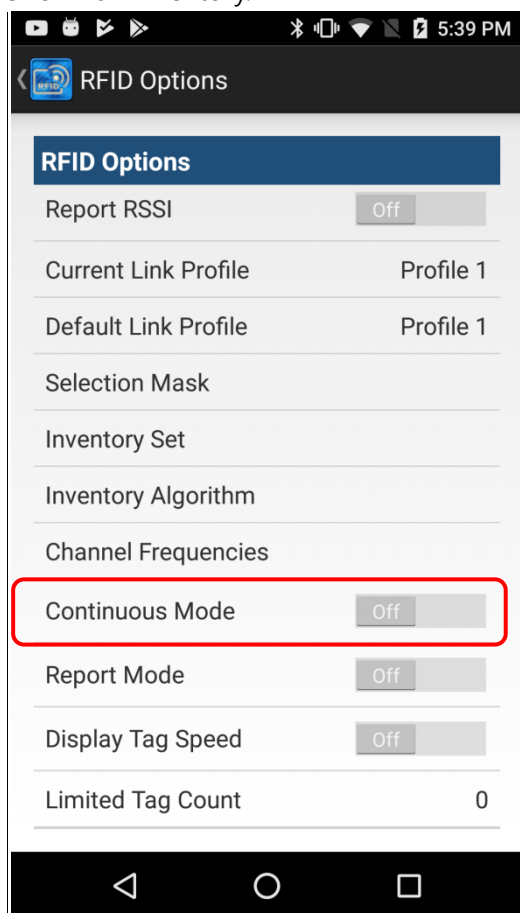


You can see whether frequency table is used or not if you see a check on a check box.


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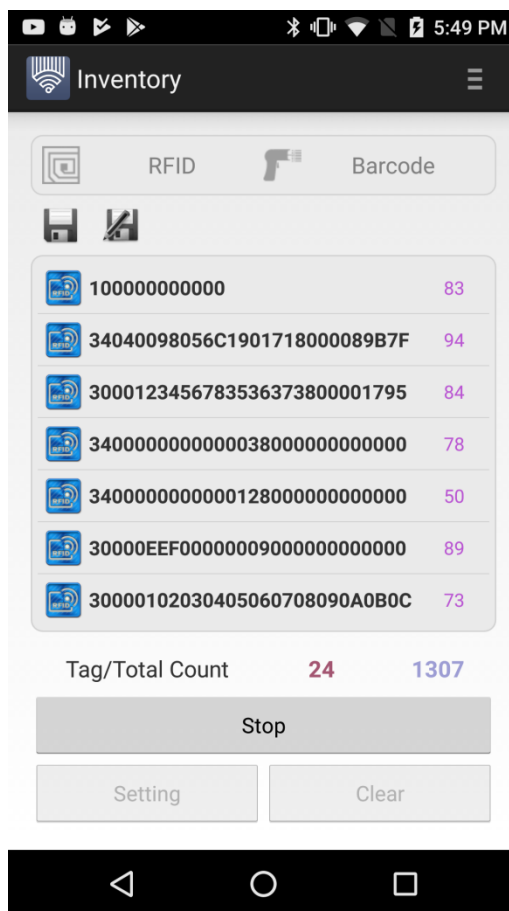
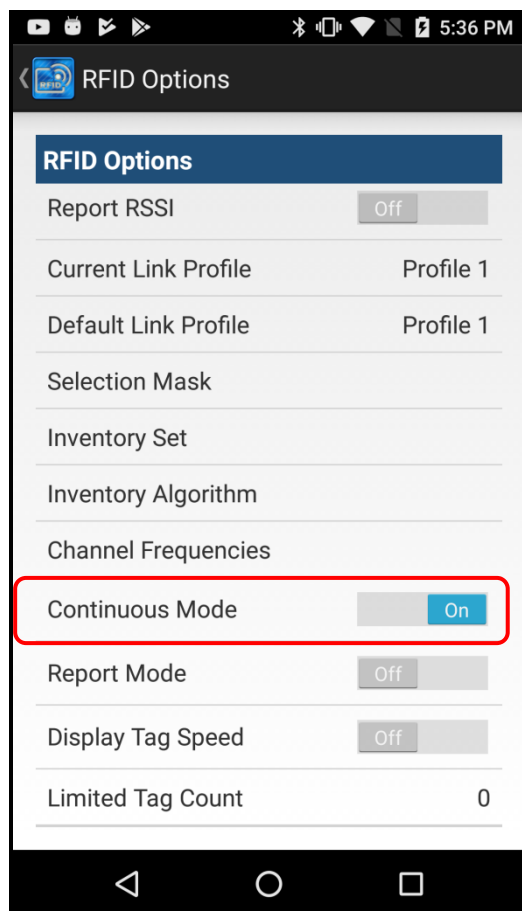
3.4.1.15. Continuous Mode

The Continuous Mode option allows you to set whether to read the RFID tag once and keep reading it when you perform an inventory.




When Continuous Mode is Off, the RFID tag is read once and the RFID tag is automatically stopped when Inventory is executed.

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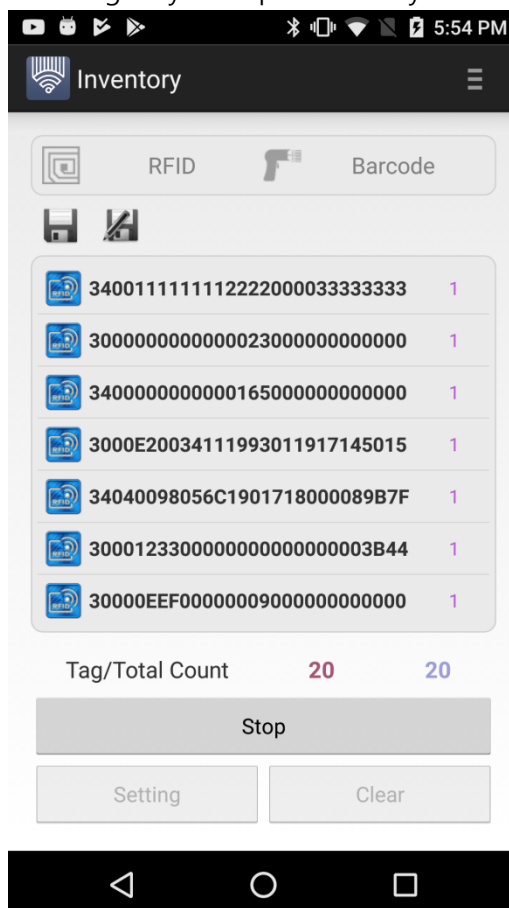
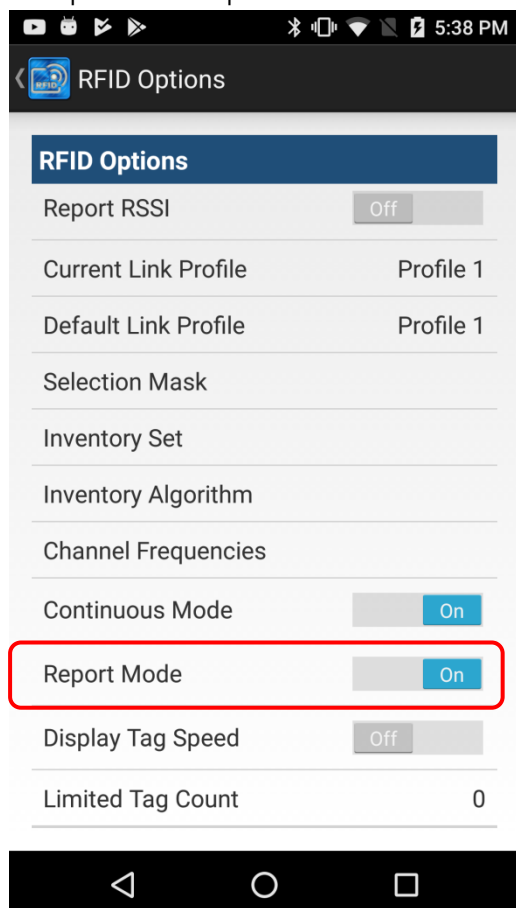


If "Continuous Mode" is On, Inventory will continue to read the RFID tag until the "Stop" button is touched.

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3.4.1.16. Report Mode

The Report Mode option can be set to read the same RFID tag only once per Inventory.



If Report mode is On, the same RFID tag is read once every Inventory.

In the second Inventory, the same RFID tag number is displayed as 2.

※ If you do not want to read the RFID tag read once in Inventory, you must turn on Auto Save Mode together.

※ This function is not support in ATS100 and ATD100.

3.5. Selection Mask

Selection Mask is a function relating to RFID on all screens but Option screen. You can move to Selection Mask setting screen by touching "Mask" button. tag is IC chip that stores data. Therefore, tag has memory and stores data in memory.

Selection Mask is a technique that you set so that only a tag with specific condition can access among RFID UHF techniques.

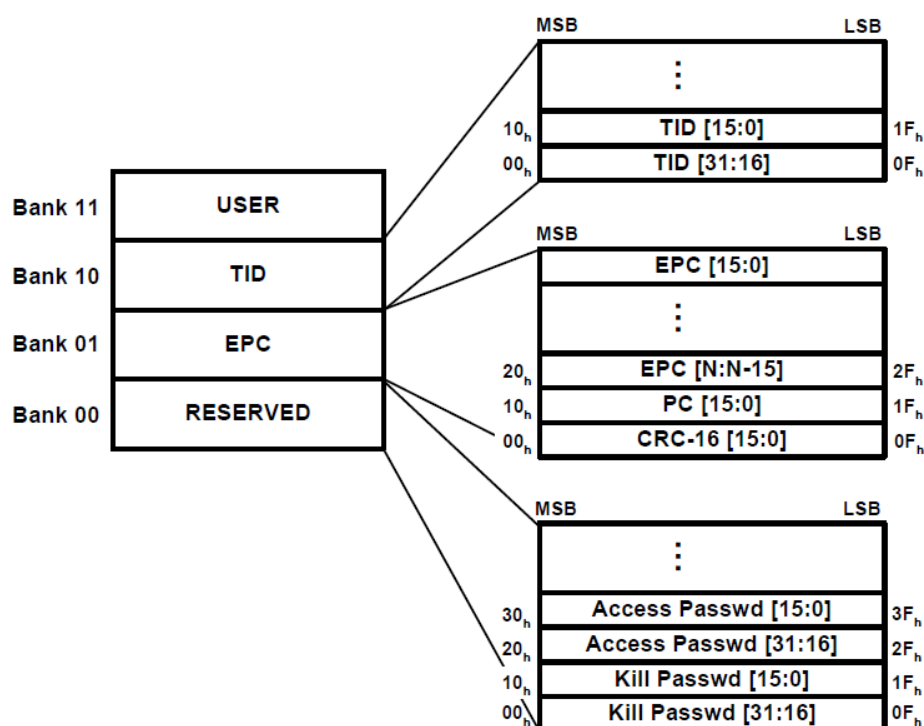
You have to understand a structure of RFID tag to comprehend Selection Mask and a logic that RFID device reads RFID tag.

3.5.1. Tag Memory

RFID tag is IC chip that stores data. Therefore, tag has memory and stores data in memory.

The memory of tag consists of four parts.

A figure below shows a structure of tag memory.



Reserved Memory includes Kill Password and Access Password.

In case of EPC Memory, the first WORD (00h ~ 0Fh) includes Stored CRC and the second WORD (10h ~ 1Fh) includes Stored PC. Starting from 20h, a value to identify is put.

In case of TID Memory, first8bits (00h ~ 07h) include a class identifier allocated from ISO/IEC 15963. After TID memory address07hincludes custom command and selection specification information which enables you to identify a tag.

User Memory, optional specification can read and write data in user memory if a tag has realized a user memory.

3.5.2. Tag Query

A tag supports four Session Flags(S0, S1, S2, S3) and one Select Flag.

A tag specifies Session Flag or Select Flag designated for Selection Mask that a reader inquires. A reader reads tag data based on Session Flag or Select Flag during Inventory Round .

Session Flag has A or B value. Default value is A.

Select Flag has Assert state or Deassert state. Default value is Assert state.

A tag specifies Session Flag or Select Flag according to Selection Mask condition. Read a tag under condition of Session Flag or Select Flag.

Session Flag or Select Flag is initialized in a state which energy is not supplied. In case of a tag which power is not supplied, a radio wave that transmits a reader is used as energy. Therefore, energy supply time is similar to Inventory Round time.

A table below is initialization time according to flag.

Flag	Tag energized	Tag not energized
S0 SessionFlag	Indefinite	None
S1 Session Flag	500ms < Persistence<5s	500ms < Persistence<5s
S2 Session Flag	Indefinite	2s <Persistence
S3 Session Flag	Indefinite	2s <Persistence
Select Flag	Indefinite	2s <Persistence

There are Target, Action, Bank, Offset, Length, Pattern etc. as condition of Selection Mask.

Target specifies Session Flag or Select Flag to set Session Flag or Select Flag with set to Action if Selection Mask's Pattern condition is set to Action.

Action specifies motion if bank, offset, length, pattern conditions agree or not.

A table below shows a motion of action.

Action	Tag Matching	Tag Not-Matching
0	assert SL or inventoried → A	deassert SL or inventoried → B
1	assert SL or inventoried → A	do nothing
2	do nothing	deassert SL or inventoried → B
3	negate SL or (A → B, B → A)	do nothing
4	deassert SL or inventoried → B	assert SL or inventoried → A
5	deassert SL or inventoried → B	do nothing
6	do nothing	assert SL or inventoried → A
7	do nothing	negate SL or (A → B, B → A)

Bank specifies memory of tag to be compared for a given pattern.

Offset specifies an initial address for pattern to begin to be compared in a specified bank.

Length specifies a length of pattern to be compared in a specified bank in bit. Even though pattern is longer than length, only given length is compared.

For example, if you want to read only tag which EPC's PC value begins with 0x3000, you can specify selection mask as follow.

Mask Parameter	Value
Target	SL
Action	0
Bank	EPC
Offset	16bit
Length	16bit
Pattern	0x3000

If data accord after comparing 0x3000 value as long as 16bit(1Word) starting at 16bit(1Word) in EPC memory, select flag is set to assent and if data does not accord, select flag is set to de-assert.

Like this, if tag's selection mask condition has been set, target's flag subject to condition is set with flag specified in action value.

Then, a reader reads a tag which conditions accord in accordance with select flag, session target and session flag specified in inventory condition.

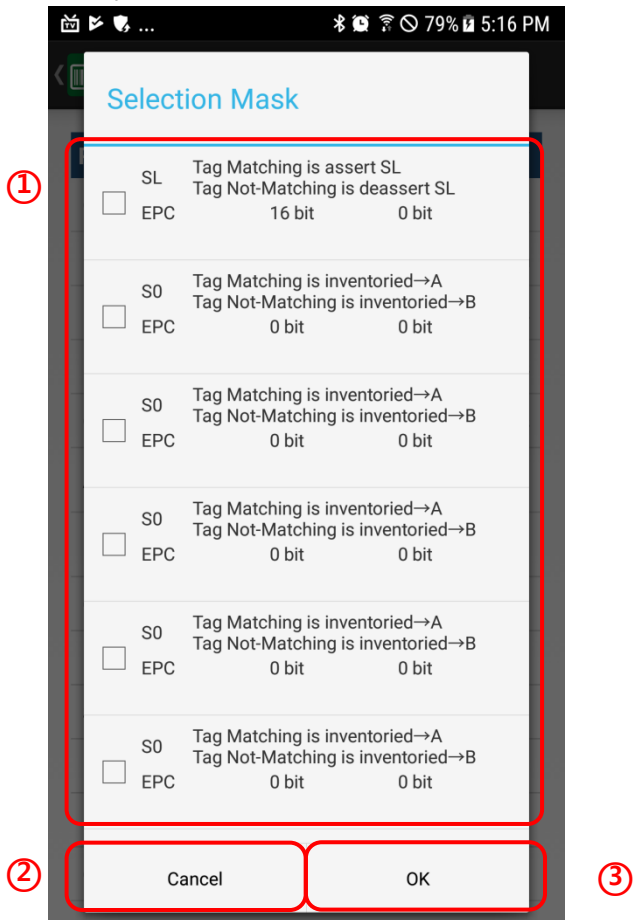
Select Flag specifies whether to read a tag which select flag's state is assert or a tag which select flag's state is deassert or to read both.

Session Target specifies Session Flag(S0, S1, S2, S3) that Session Flag condition will be specified.

Session Flag specifies whether to read a tag which session flag's state specified as Session Target is A or a tag which session flag's state specified as Session Target is B or to read both A and B.

3.5.3. Screen Composition

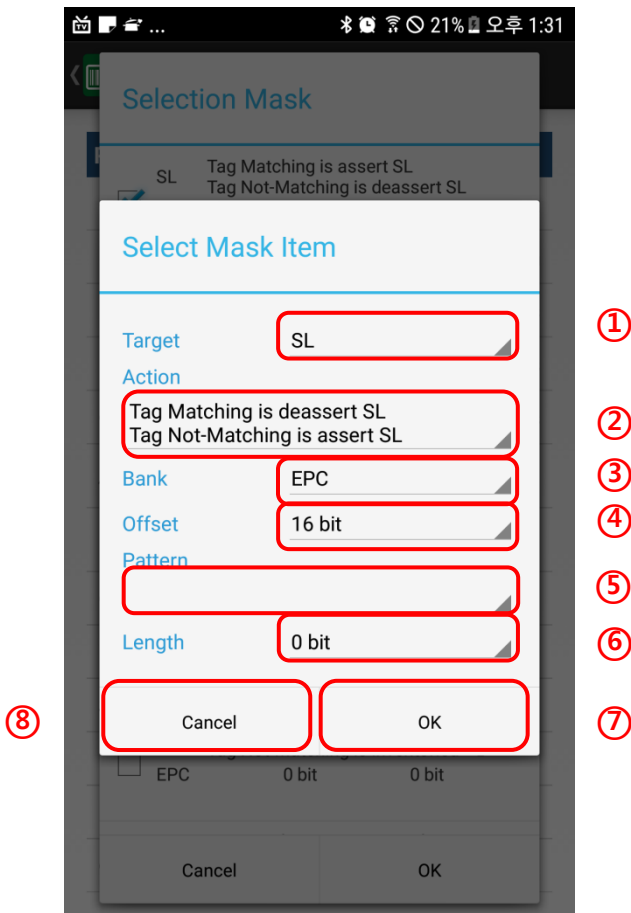
A picture below shows screen composition of Select Mask screen.




- ① **Mask List** : Specify a condition for selection mask. Up to eight can be specified.
 If you touch an item you want to change a condition on Mask List, a dialogue box for detailed setting will appear.
 Detailed description will be provided in Selection Mask Detail Screen Composition.
- ② **Cancel** : Cancel Selection Mask setting and return to previous screen.
- ③ **OK** : Save conditions for selection mask specified in reader.

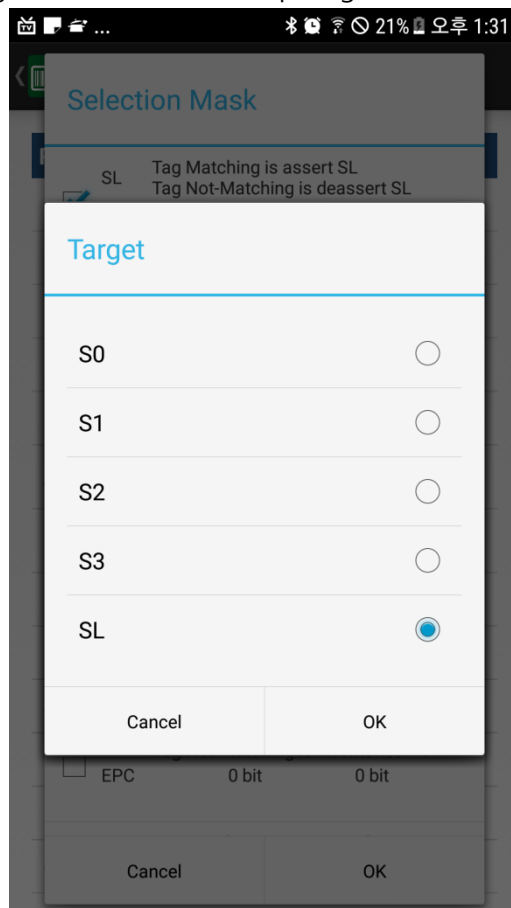
3.5.4. Selection Mask Detail Screen Composition

If you touch selection mask condition item on mask list on selection mask screen, you can see next screen which you can specify detailed condition for Selection Mask.



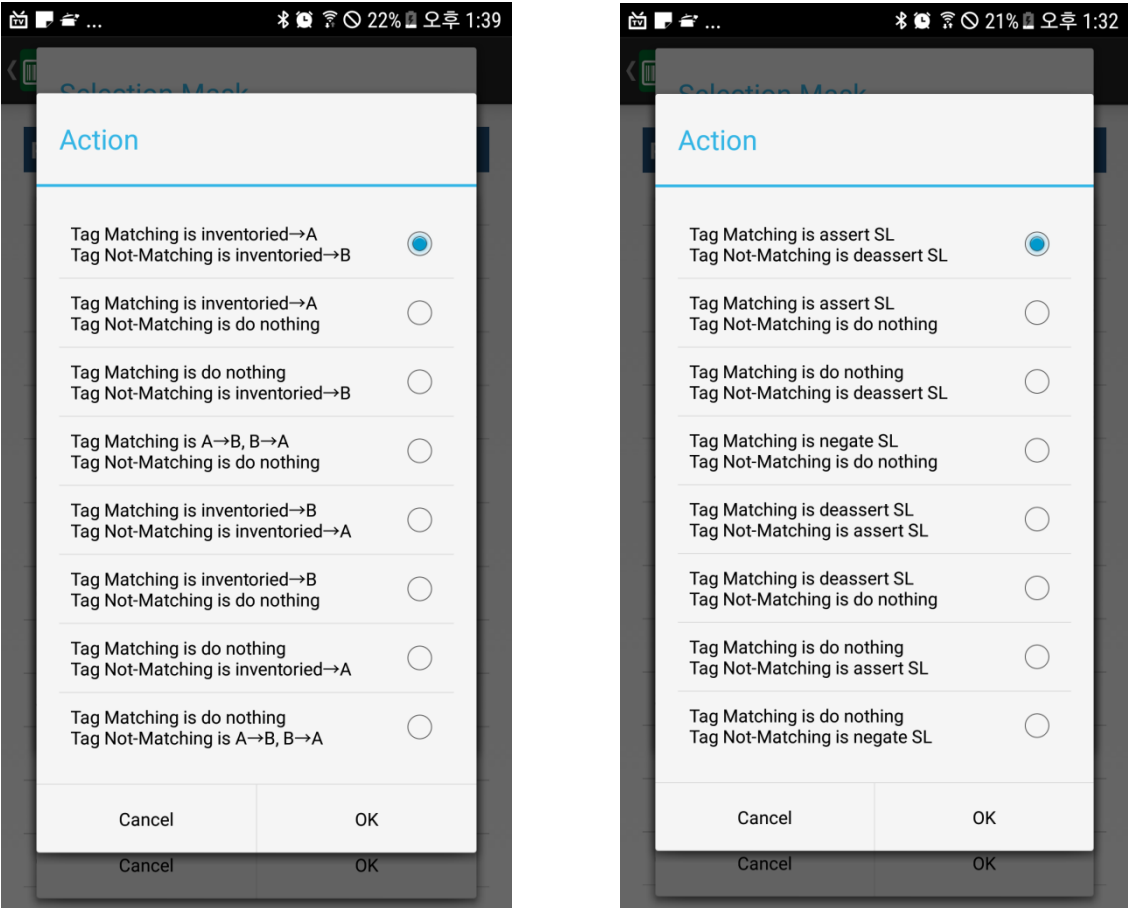
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- ① **Target** : specify a flag which a result of comparing Selection Mask will be saved.




Target	Description	Note
S0	This means that a result of comparing Selection Mask will be recorded in Session Flag's S0 .	
S1	This means that a result of comparing Selection Mask will be recorded in Session Flag's S1.	
S2	This means that a result of comparing Selection Mask will be recorded in Session Flag's S2.	
S3	This means that a result of comparing Selection Mask will be recorded in Session Flag's S3.	
SL	This means that a result of comparing Selection Mask will be recorded in Select Flag.	

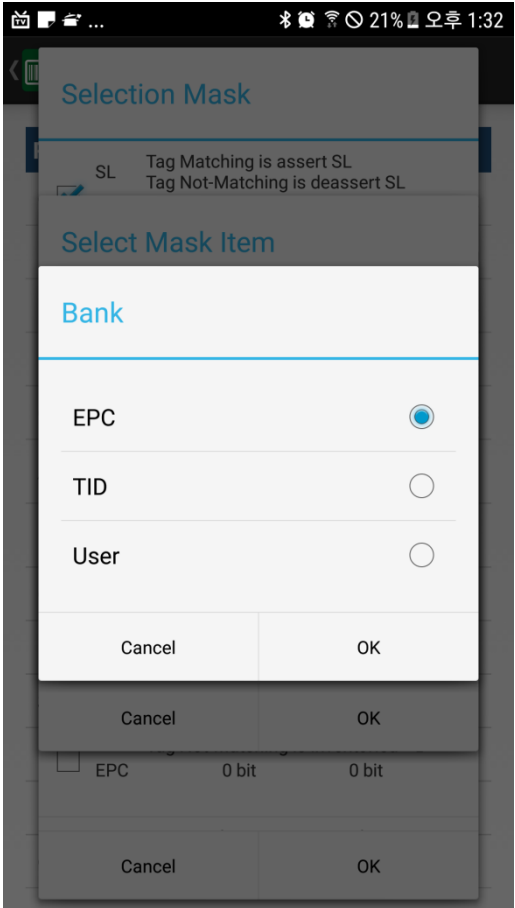
② **Action** : specify how to compare Selection Mask and its result.




Refer to description of action of tag query.

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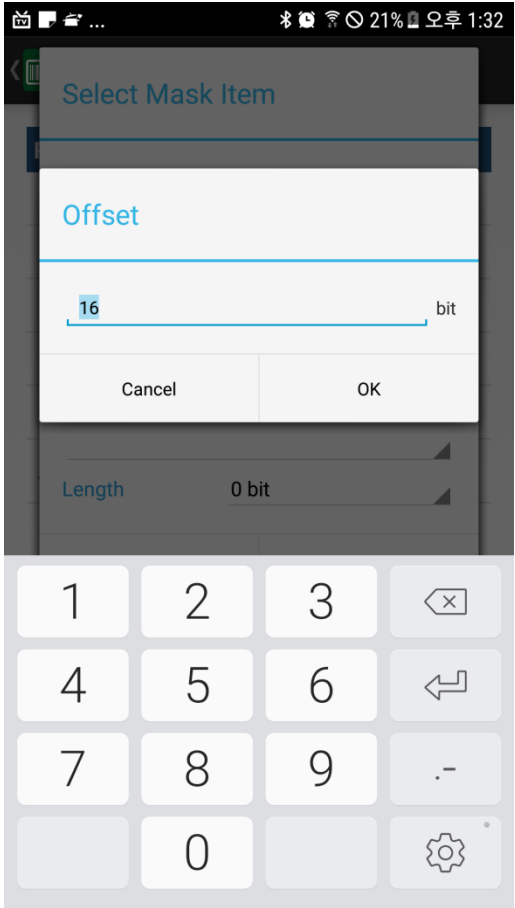
③ **Bank** : Specify tag memory that pattern of selection mask will be compared.




Bank Memory that can be compared by Selection Mask is EPC, TID and User Memory.

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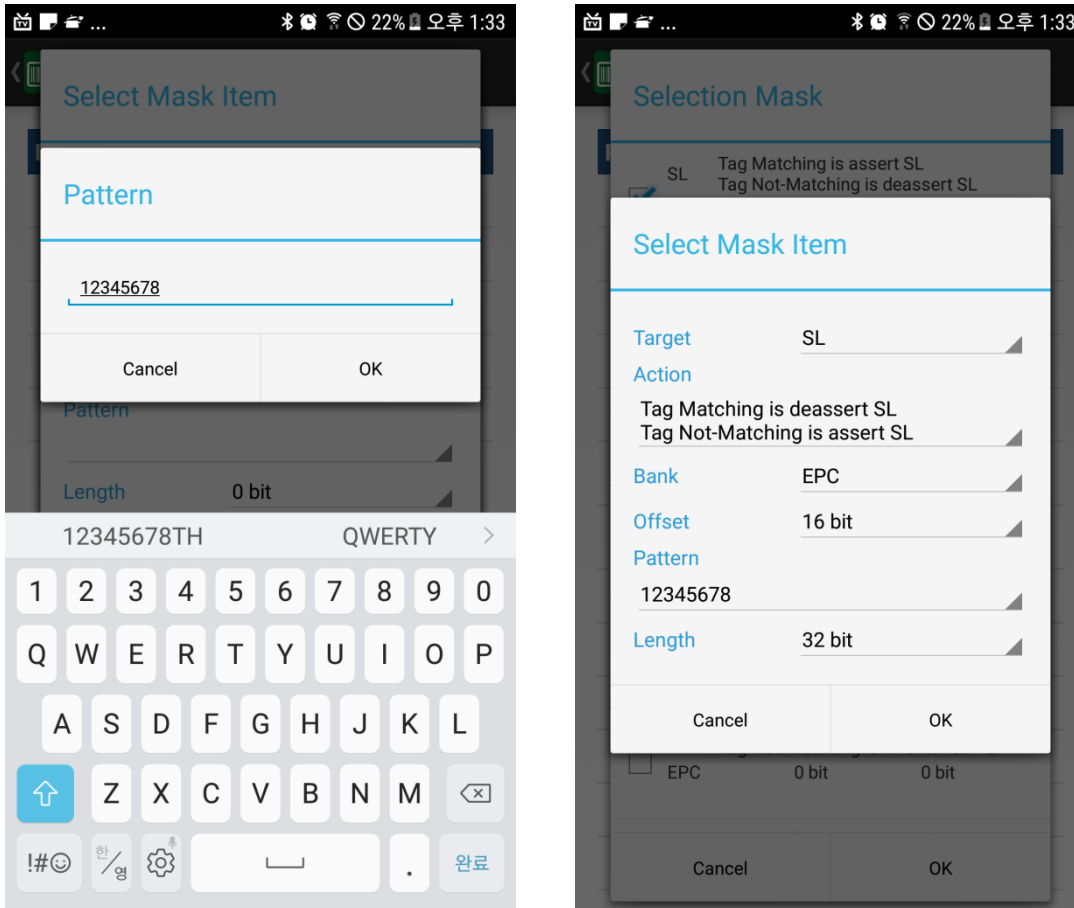
④ **Offset** : Specify initial address that pattern of selection mask begins to be compared in bank in bit.




Initial address of Selection Mask can be specified from 0bit up to 255bit.

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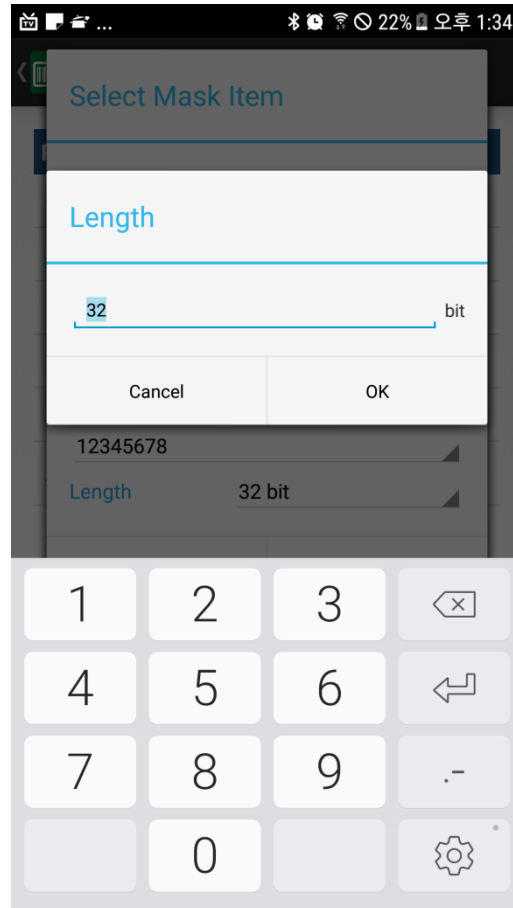
- ⑤ **Pattern** : Specify a value to be compared from initial address from bank specified in selection mask .



Pattern value to be entered is Hex value and up to 32 words can be typed.
When saved with OK button, Length will be set automatically.


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- ⑥ **Length** : Specify length that pattern of selection mask is compared in bit.



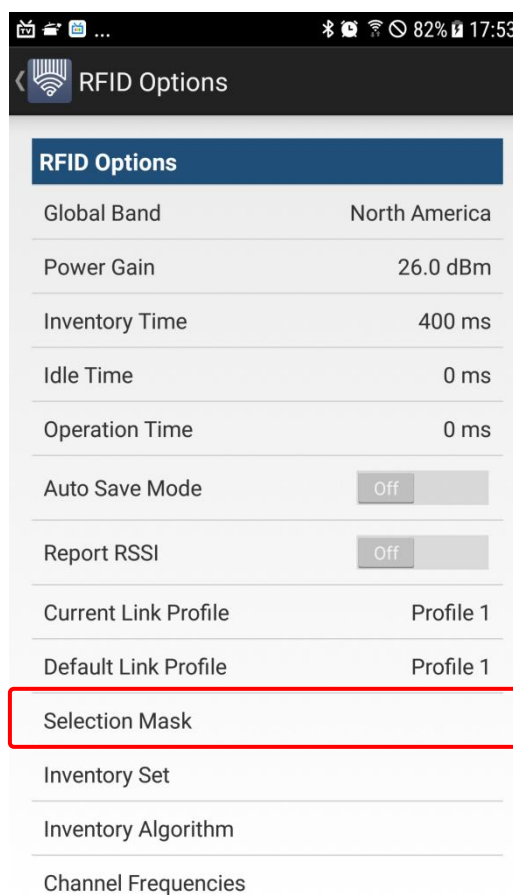
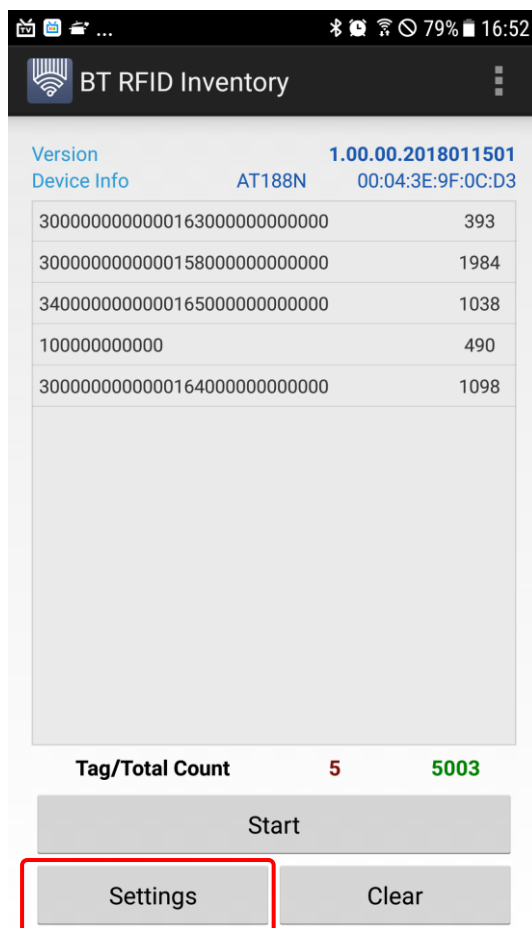
For length of pattern, one word is 8bit. Therefore, up to 255bit can be entered .

- ⑦ **OK** : Save selection mask condition set .
- ⑧ **Cancel** : Cancel selection mask condition set.

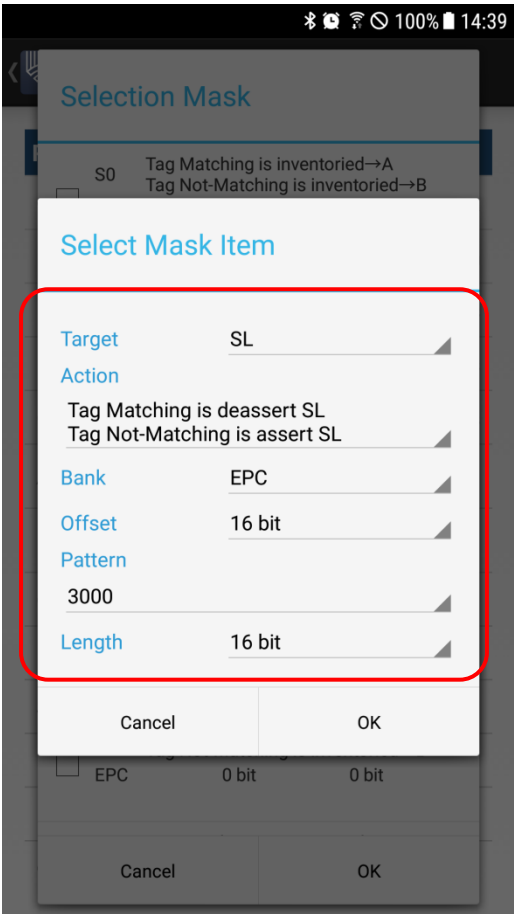
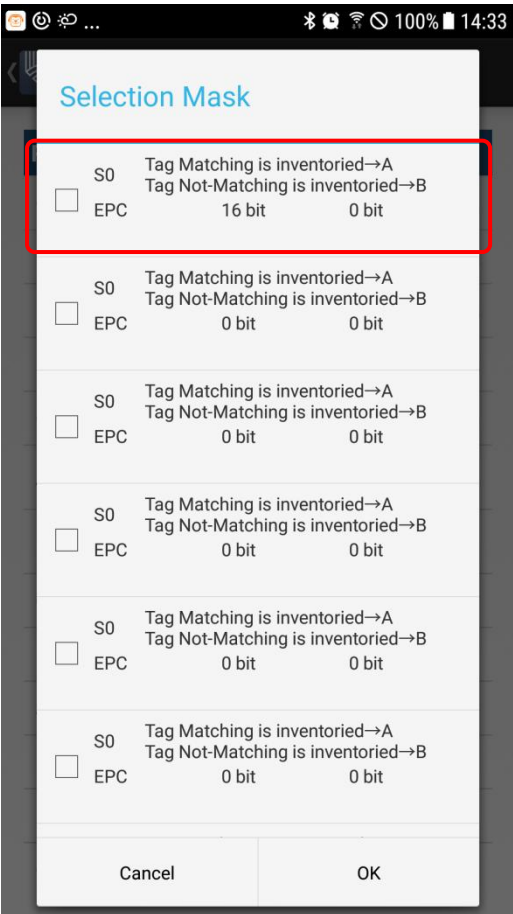
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3.5.5. How to set a selection mask

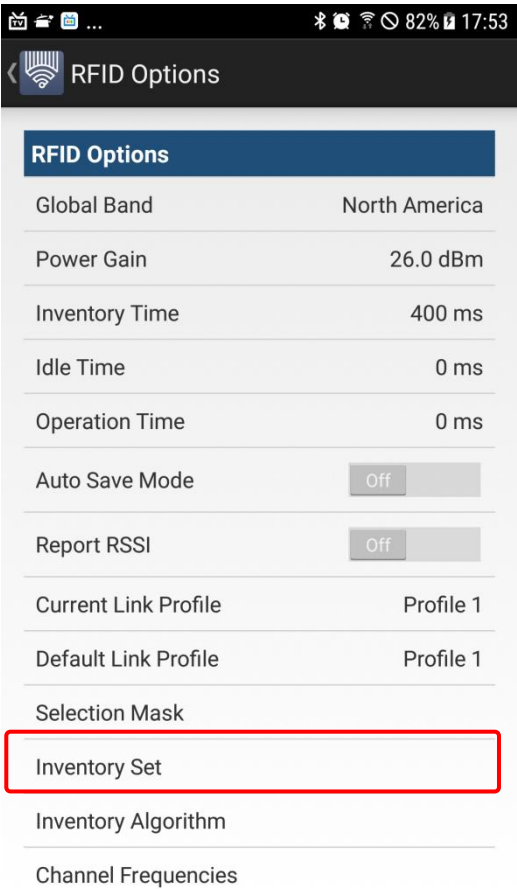
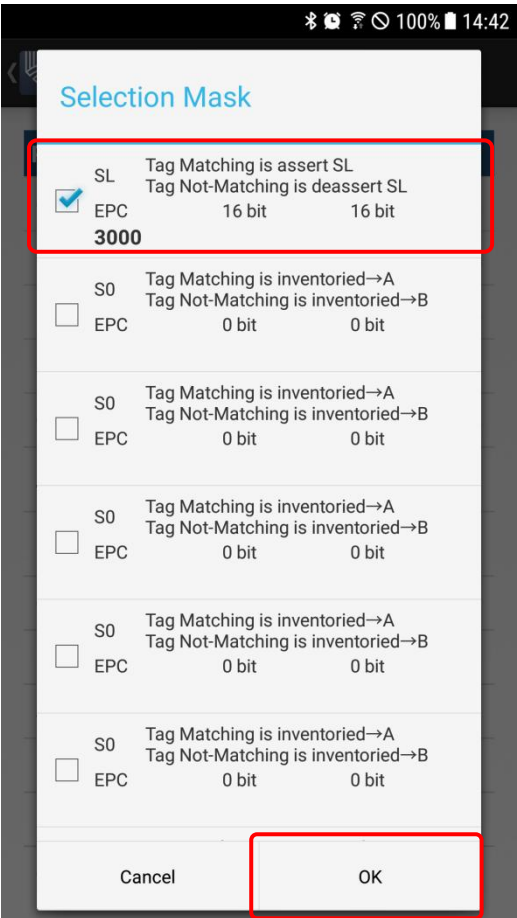
You can set selection mask by touching setting button on Inventory screen, Read Memory screen, Write Memory screen, and Lock Memory screen.



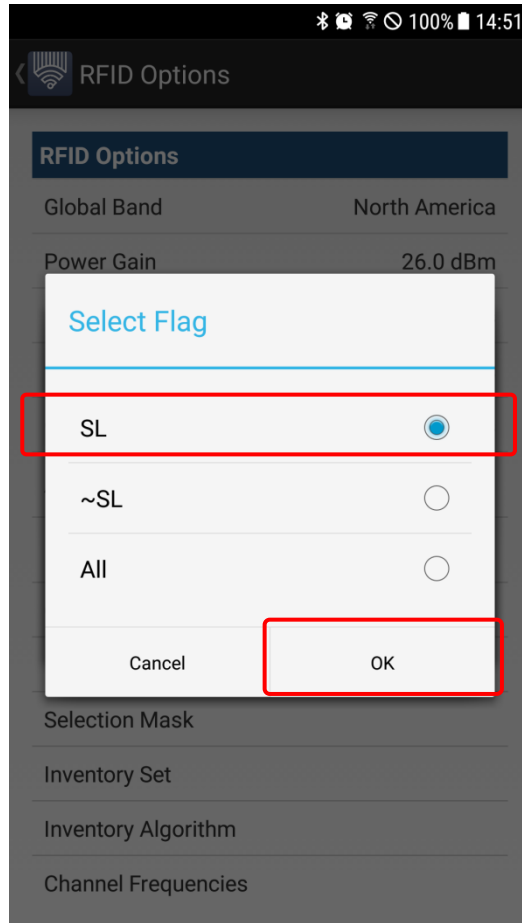
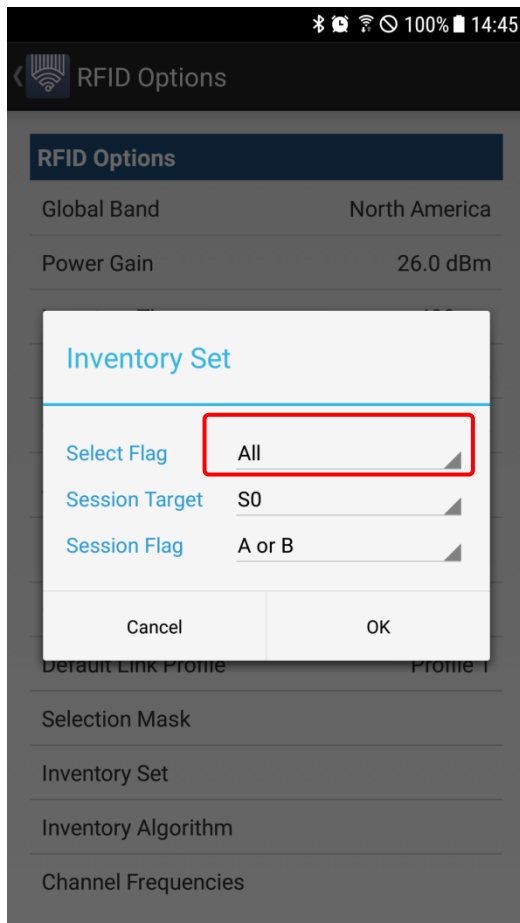
Select Selection Mask to set Selection Mask .



Set empty item to enable selection mask .
 If selected, set Selection Mask Target to SL(Select Flag) .
 Set Bank, offset and pattern and then touch "OK" button.



Set Selection Mask Item and then select Check to use Maskand touch OK button.
 Touch Inventory Set .

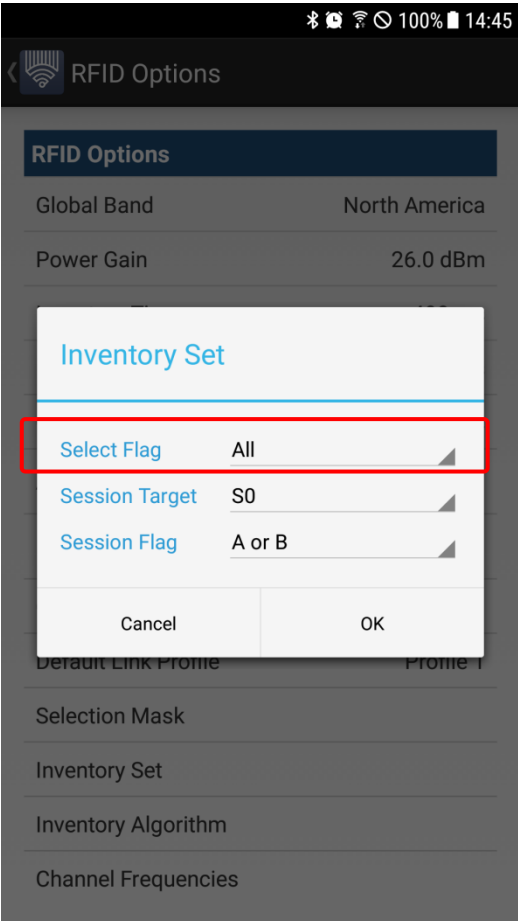
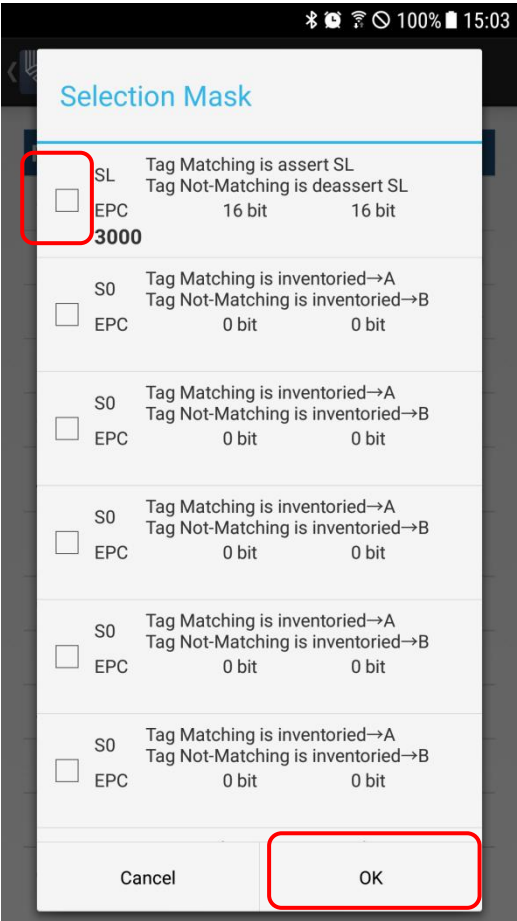


Touch Select Flag.

Select value of Select Flag as SL and then touch OK button.

3.5.6. How to disable selection mask

To disable Selection Mask, uncheck on Selection Maskscreen and touch OK button and change Select Flag from SL to All on Inventory Set.



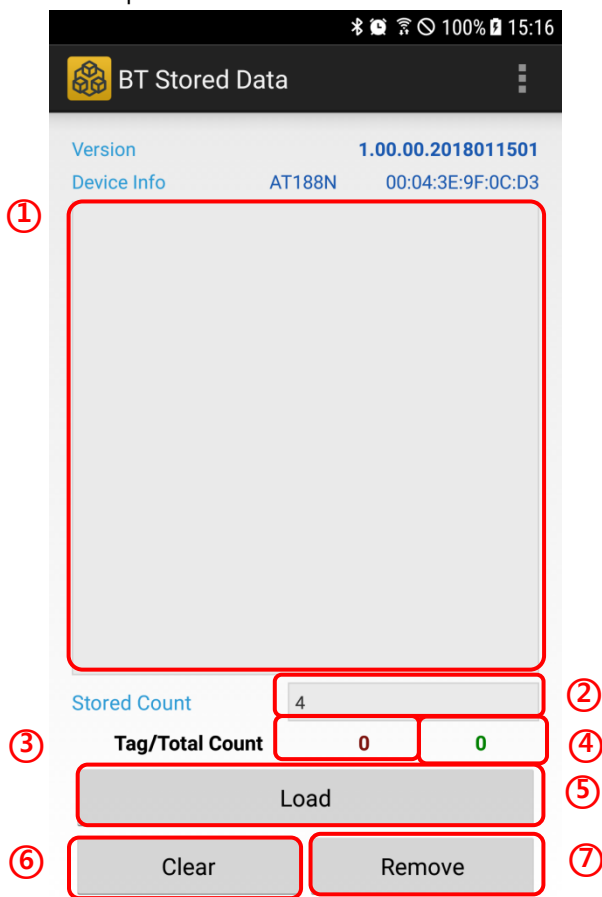
3.6. Stored Data

Stored Data Demo is to read data stored in internal memory by reading RFID tag or barcode with Auto Save Mode option on or data stored in internal memory in a device or RFID tag or barcode with a device disconnected to demo.

※ This function is not supported in ATS100 and ATD100 .

3.6.1. Screen Composition

A picture below shows screen composition of Stored Data Demo.



- ① **Data List** : Display data loaded from a device.
- ② **Stored Count** : Display the number of data stored in a device.
- ③ **Data Count** : Display the number of data displayed on Data List.
The number of duplicated data are displayed on data list and thus it is displayed as one in Data Count.
- ④ **Total Count** : Display the number of data loaded from a device. This number must be equal to Stored Count
- ⑤ **Load** : Read data from a device.



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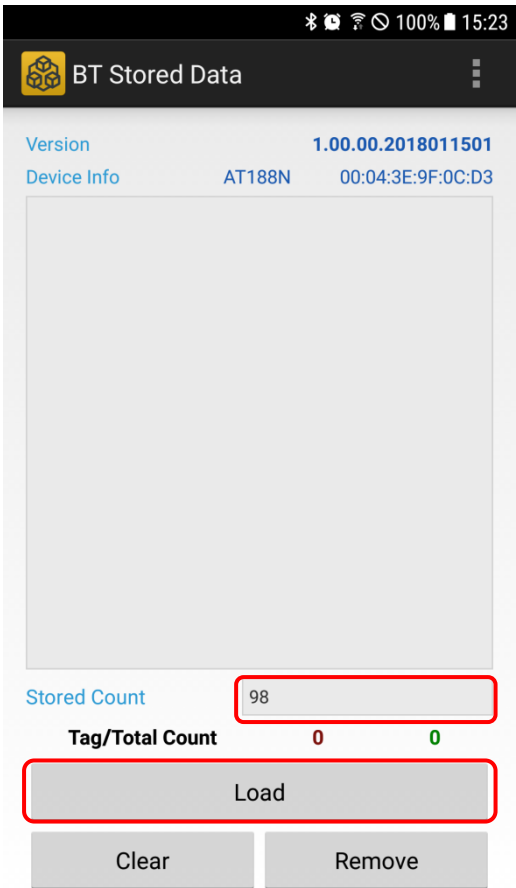
v0.5


- ⑥ **Clear** : Clear Data List and initialize Data Count and Total Count as 0.
- ⑦ **Remove** : Remove all data stored in a device.

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3.6.2. How to load stored data

Check Stored Count on Stored Data screen.
If there is data stored in a device, you can bring it into a screen.
If you touch Load button, a device begins to read data.



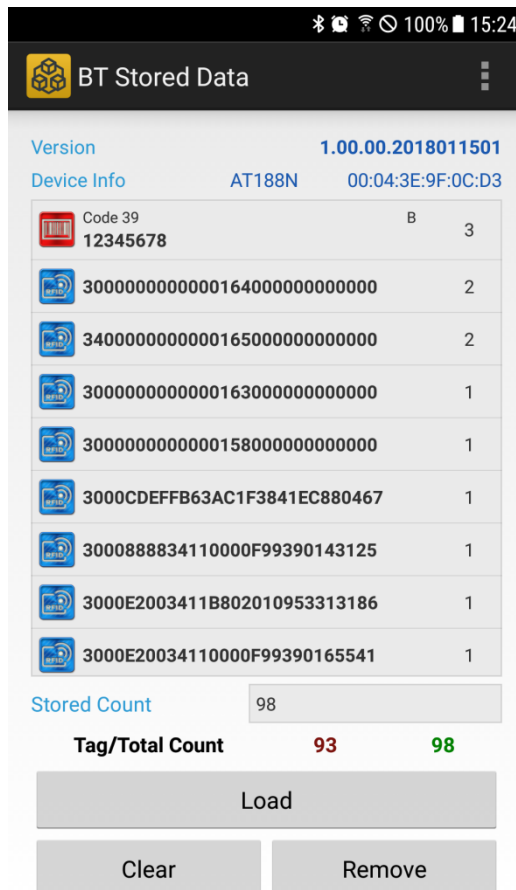
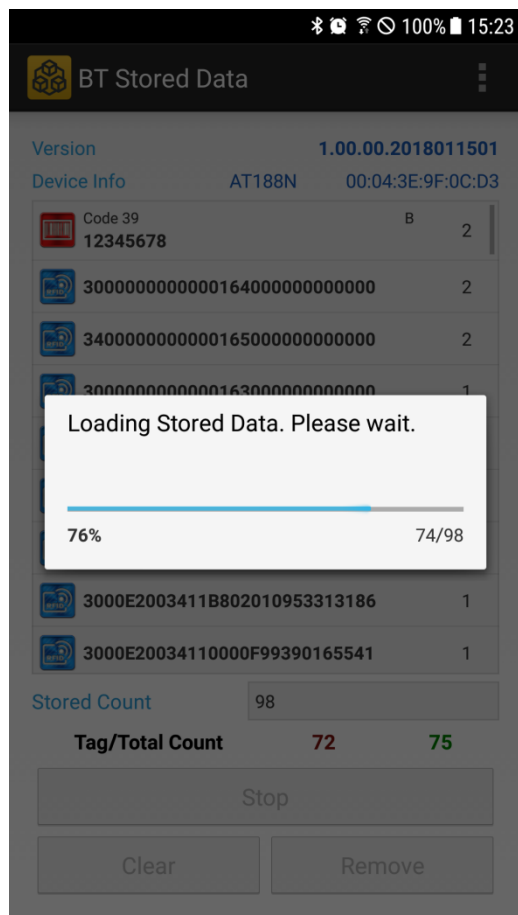
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Once a device reads data, progress bar dialogue box will appear.

You can understand a status that a device reads data.

Immediately after all stored data are read, progress bar dialogue box will disappear and read data will be display on Data

List and Data Count and Total Count will be updated.



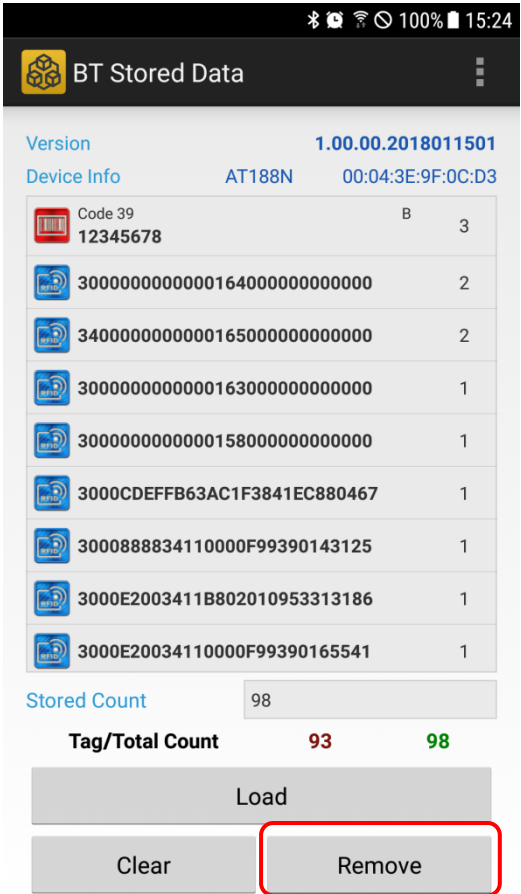
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3.6.3. How to remove all stored data

If data stored in a device has been read, data stored in a device has to be removed.

Stored Datascreen provides a function to remove all data stored in a device.

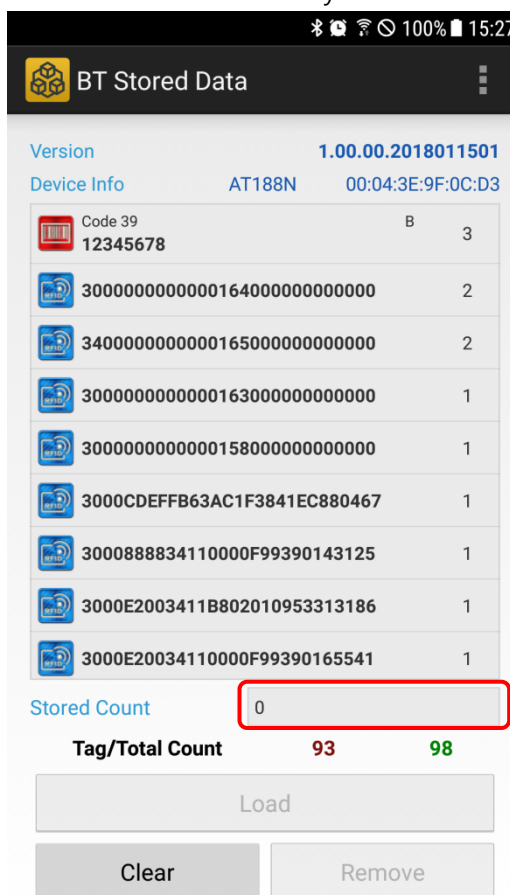
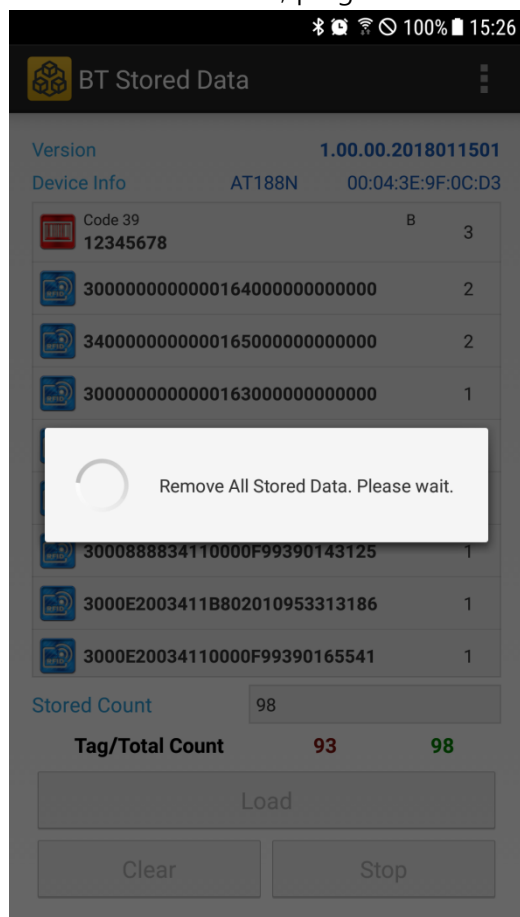
If you touch Remove button at lower right corner on a screen.



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Time for stored data to be removed varies according to the amount of data stored.

While data are removed, progress bar is displayed to show removal is under way.



Immediately after all stored data are removed, progress bar will disappear.

You can see Stored Count value set to "0".

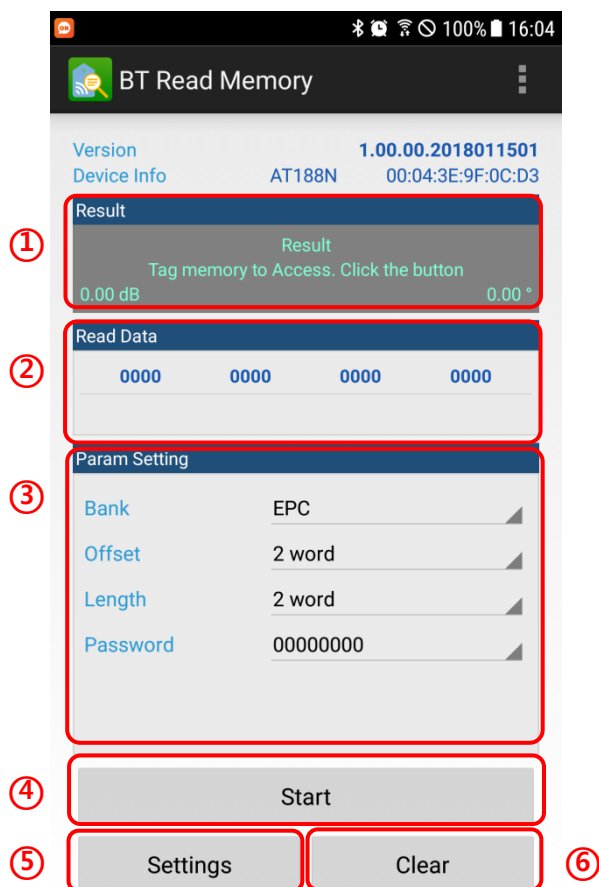
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3.7. Read Memory


Read Memory Demo can use a function to specify memory of RFID tag and read it among functions of RFID (UHF).

3.7.1. Screen Composition

A picture below shows screen composition of Read Memory Demo.



- ① **Result** : Read EPC value of RFID tag that a device accesses and display a result of motion and RSSI , Phase.
- ② **Read Data** : If a device has read RFID tag properly, display read data in WORD.
- ③ **Param Setting** : Set parameter to read memory.
- ④ **Start** : Enable a device to perform Read Memory function.
Once Read Memory function starts, change to Stop button.
- ⑤ **Setting** : Move to a screen to set RFID Option.
- ⑥ **Clear**: Initialize Result, Read Data , etc.

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3.7.2. How to change read memory option

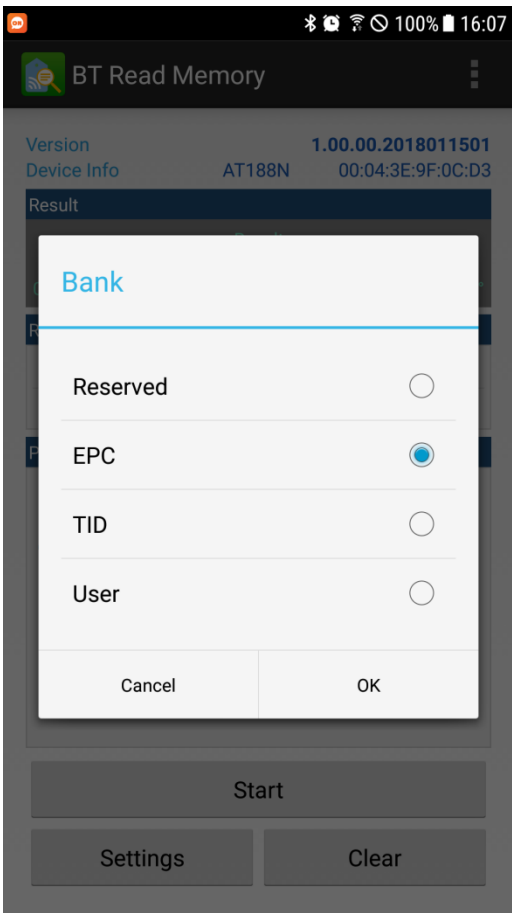
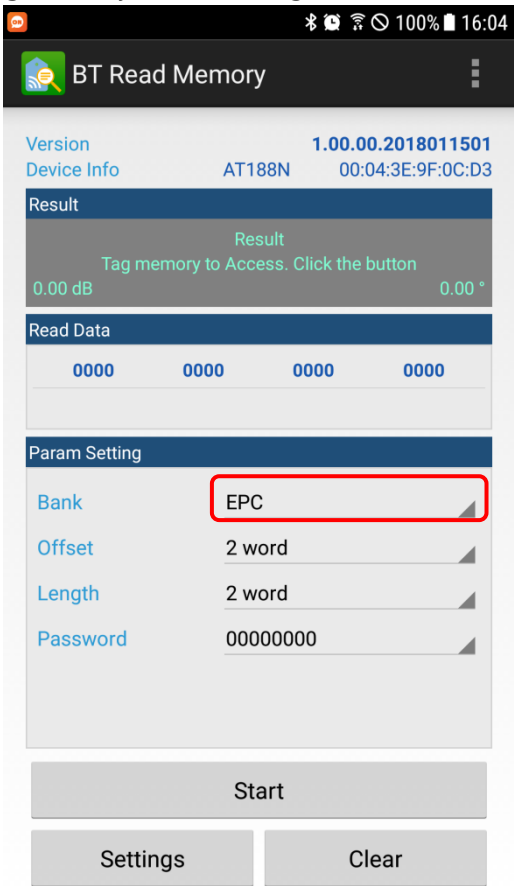
Param Setting can set information needed to perform Read Memory.


In order to perform Read Memory, you have to specify memory bank of a tag you want to read, an address for specified memory bank to start to read and a length of memory to read in WORD.

3.7.3. Bank

Bank option performs Read Memory to set which memory will be read in RFID tag.

Tag memory bank that tag can read is Reserved, EPC, TID, User .

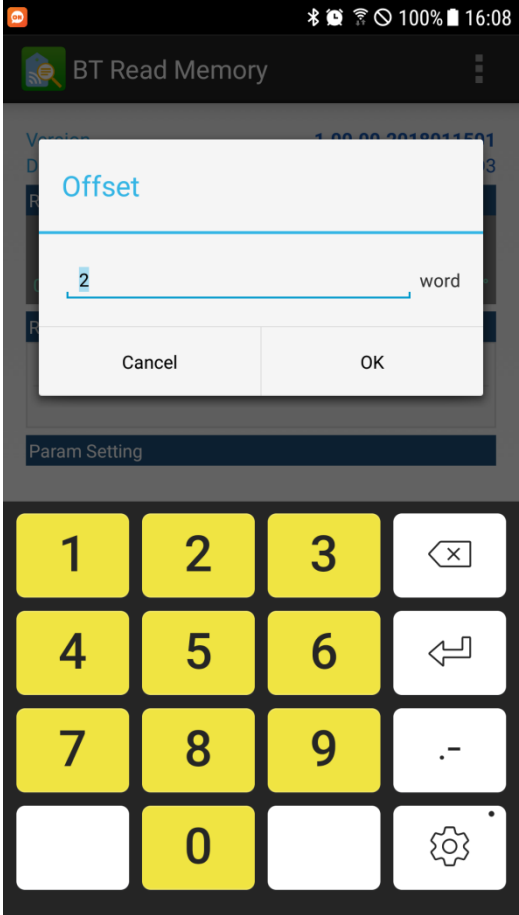
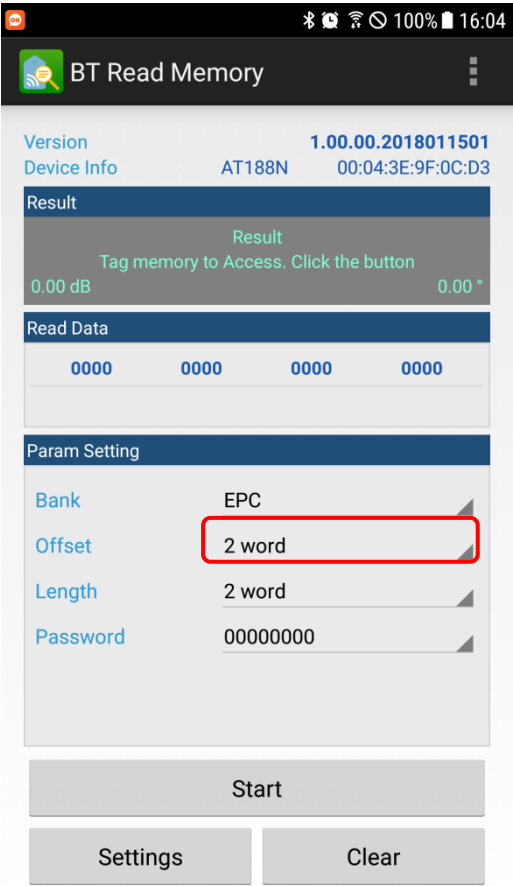



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3.7.4. Offset

Offset option performs Read Memory to start reading data in memory bank specified.

Unit which you can specify is WORD.

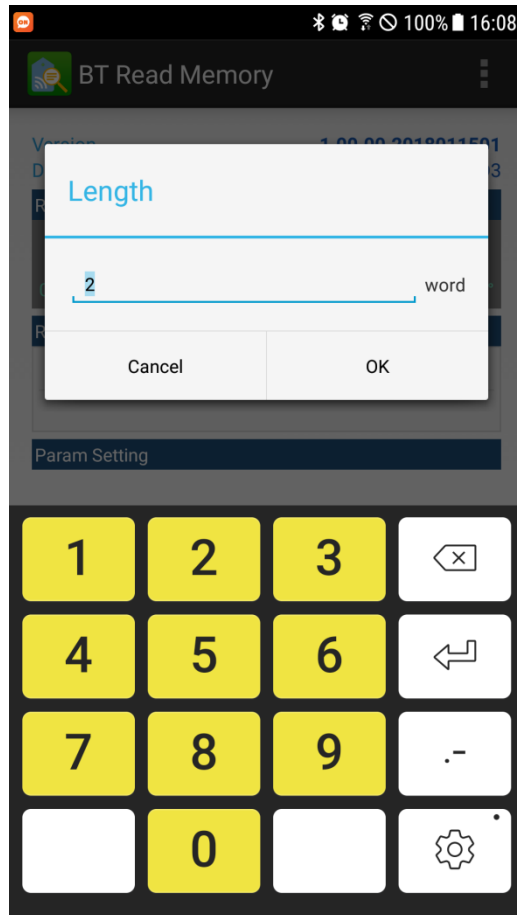
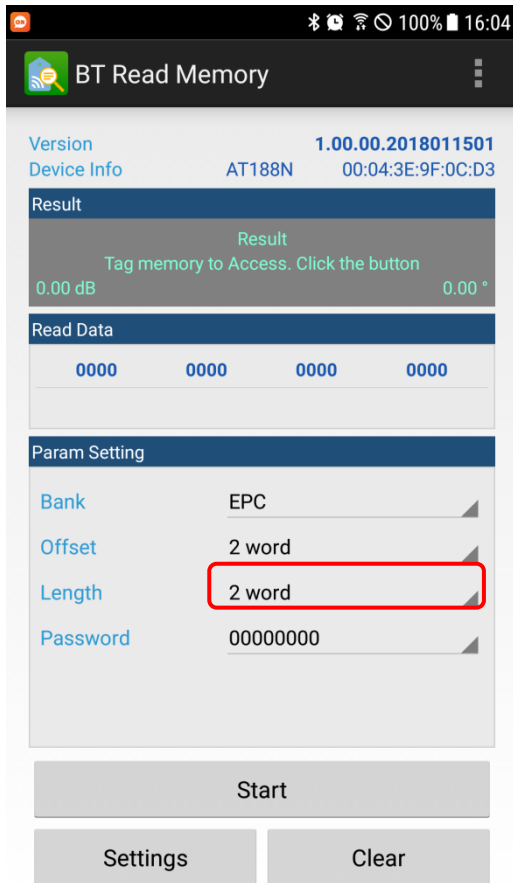


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3.7.5. Length

Length option performsRead Memory to specify length to read data in memory bank specified.

Unit which you can specify is WORD.

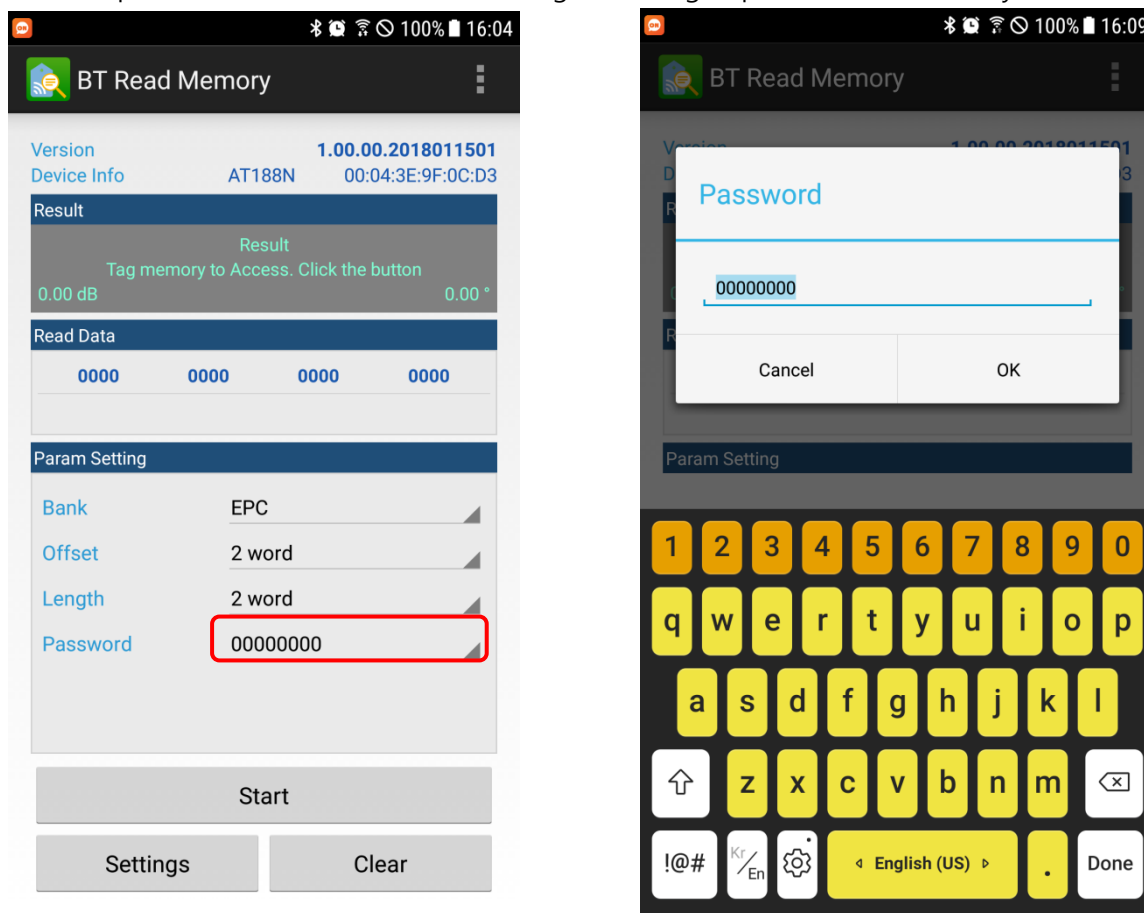


※ Maximum length of data you can read by using Read Memory at once is 64WORD.

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3.7.6. Password


Password option is set on a device to access a tag if RFID tag to perform Read Memory has been locked.



If RFID tag has been locked, you cannot read data of Reserved Bank .

To read data in Reserved Bank, you have to set password which is the same with Access Password saved in a tag and performs Read Memory in tag.

If Password is different from Access Password saved in RFID tag, performing Read Memory will fail.

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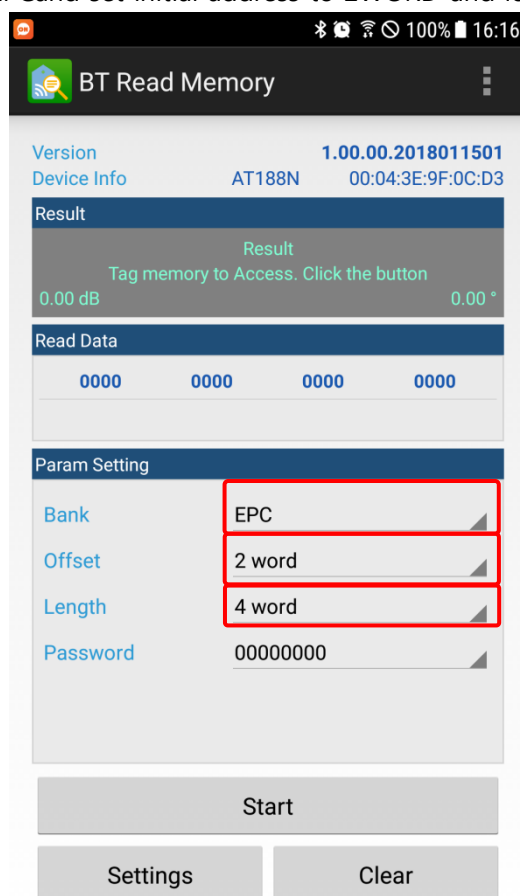
3.7.7. How to read tag memory

In order to test reading of RFID tag, let's read 4WORD in EPC area of RFID tag.

If you want to read a specific tag, you have to set it to Selection Mask.

If you want to read any tag, you can omit what is mentioned above and move to the next.

On Read Memory screen, in Read Memory Parameter, select memory bank you want to read in RFID tag as EPC and set initial address to 2WORD and length to read to 4WORD .



BT Read Memory

Version 1.00.00.2018011501

Device Info AT188N 00:04:3E:9F:0C:D3

Result

Result

Tag memory to Access. Click the button

0.00 dB 0.00 °

Read Data

0000 0000 0000 0000

Param Setting

Bank EPC

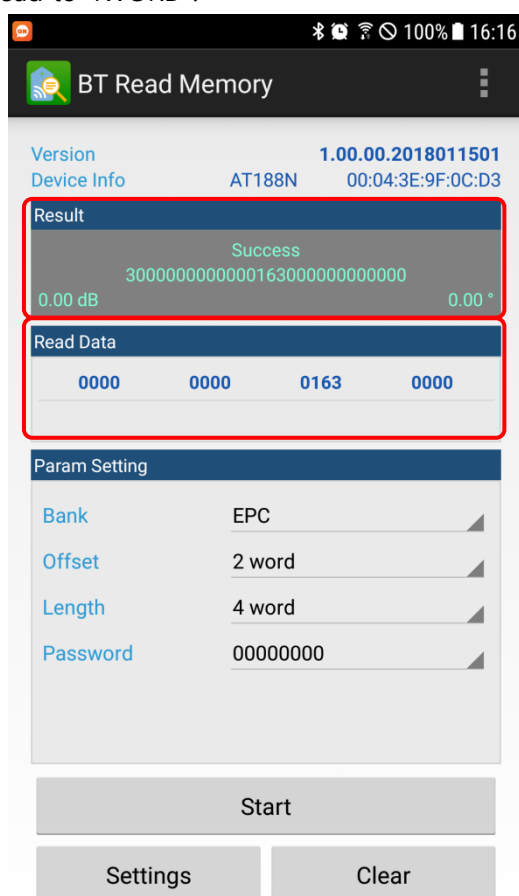
Offset 2 word

Length 4 word

Password 00000000

Start

Settings Clear



BT Read Memory

Version 1.00.00.2018011501

Device Info AT188N 00:04:3E:9F:0C:D3

Result

Success

3000000000000163000000000000

0.00 dB 0.00 °

Read Data

0000 0000 0163 0000

Param Setting

Bank EPC

Offset 2 word

Length 4 word

Password 00000000

Start

Settings Clear

If you are ready to read memory in RFID tag, touch Start button to read memory in tag.

If you have read memory in tag properly, display EPC value accessed , a result of motion after a device read RFID tag, RSSI, and Phase in result area.

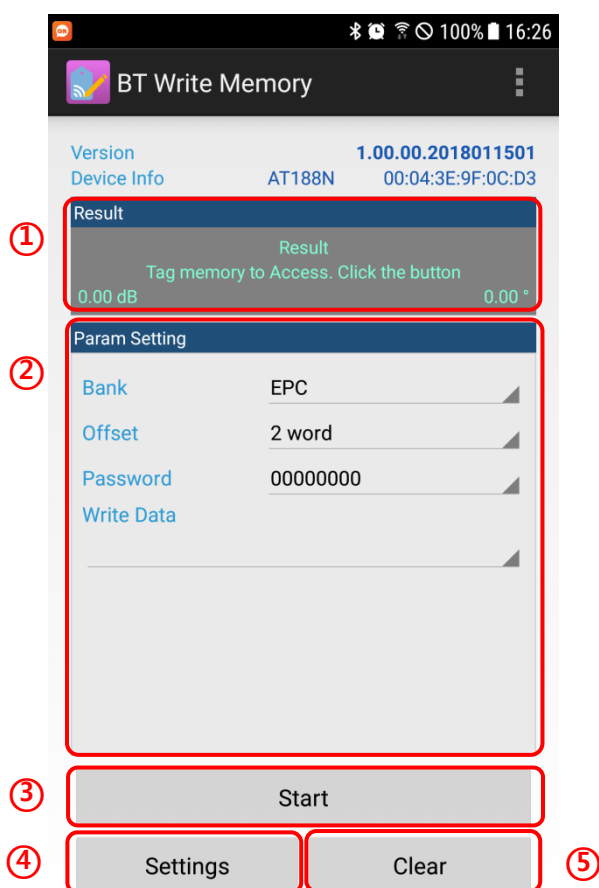
Display read tag memory value on Read Data.

3.8. Write Memory


Write Memory Demo can use a function to write data on memory specified in RFID tag among RFID (UHF) functions.

3.8.1. Screen Composition

A picture below shows screen composition of Write Memory Demo.



- ① **Result** : Write EPC value of RFID tag that a device accesses and display a result of motion and RSSI, Phase.
- ② **Param Setting** : Set parameter to write memory.
- ③ **Write** : Enable to perform Write Memory function.
Once Write Memory function starts, this changes to Stop button.
- ④ **Setting** : Move to a screen to set RFID Option.
- ⑤ **Clear**: Initialize Result.

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3.8.2. How to change write memory option

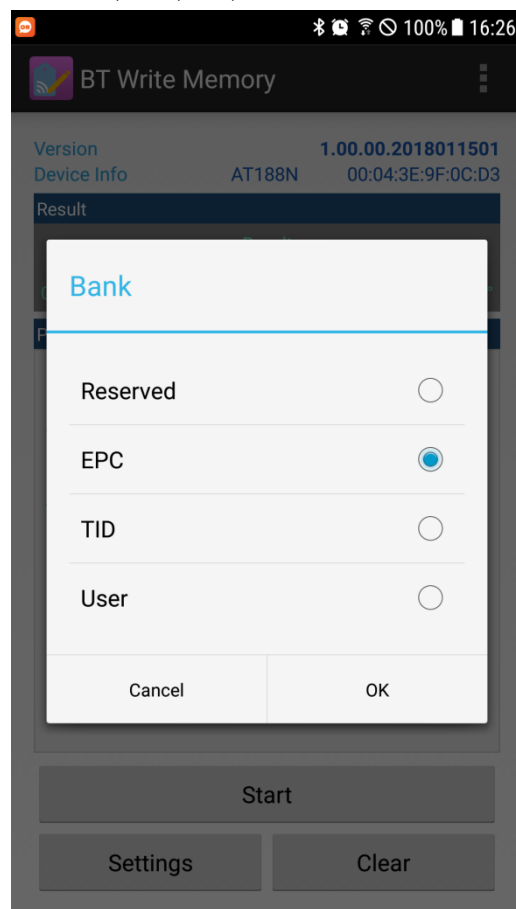
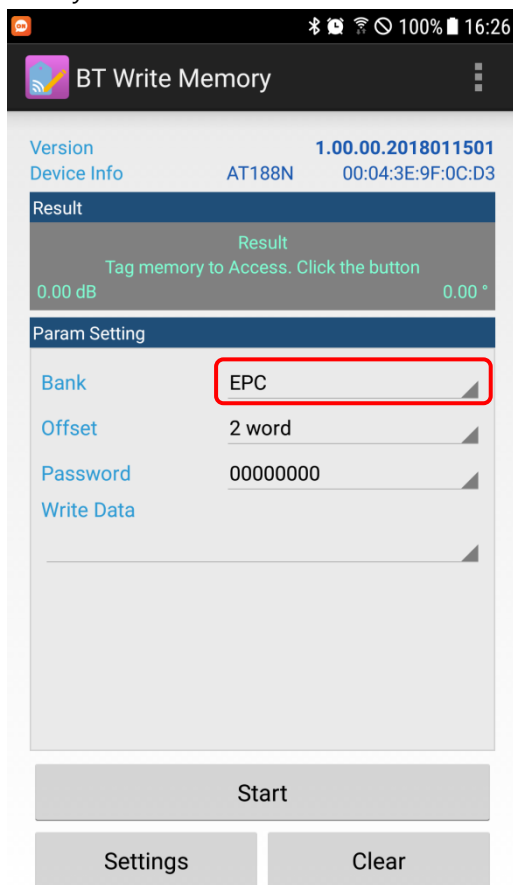
Param Settings can set information needed to perform Write Memory.


In order to perform Write Memory, you should specify memory bank of tag you will write data and an address to be written in a specified memory bank in WORD and specify data you will write in WORD(4words)

3.8.3. Bank

Bank Option performs Write Memory to set on which memory in RFID tag data will be written .

Memory bank in a bank which data can be written is Reserved, EPC, TID, and User.

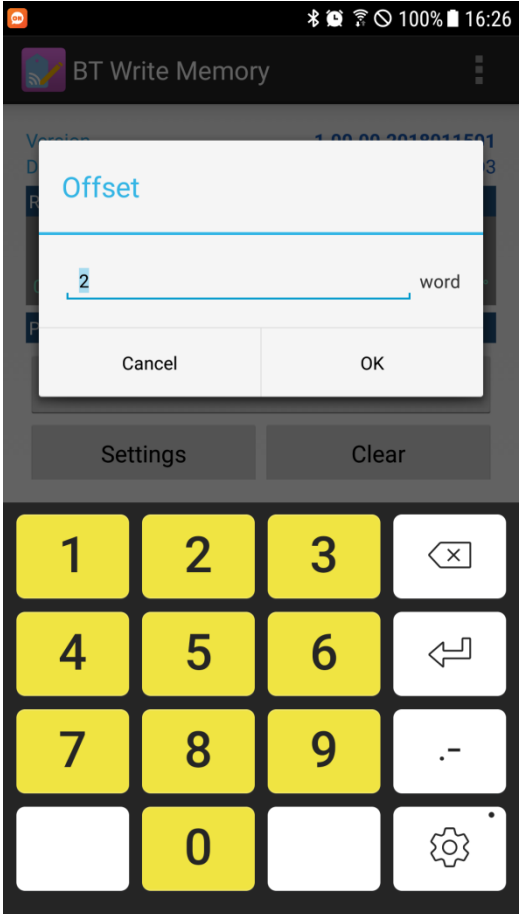
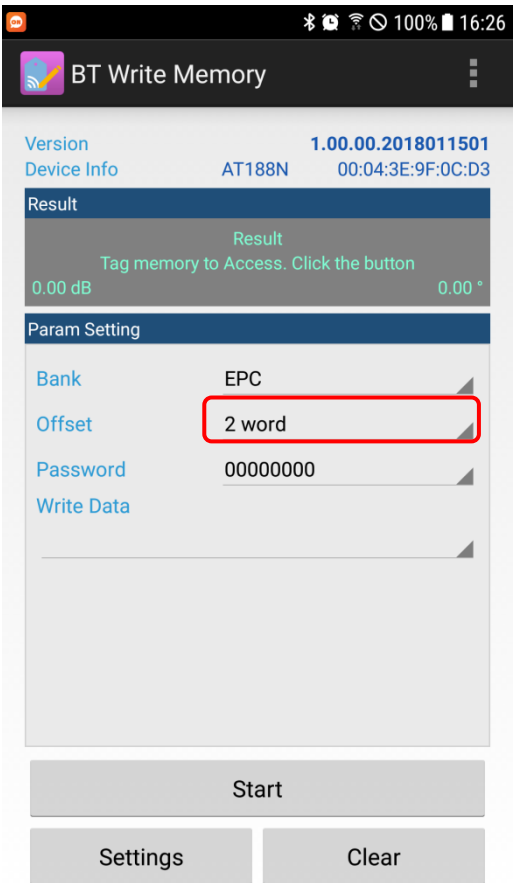



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3.8.4. Offset

Offset Option performs Write Memory to specify initial address which data starts to be written on specified memory bank.

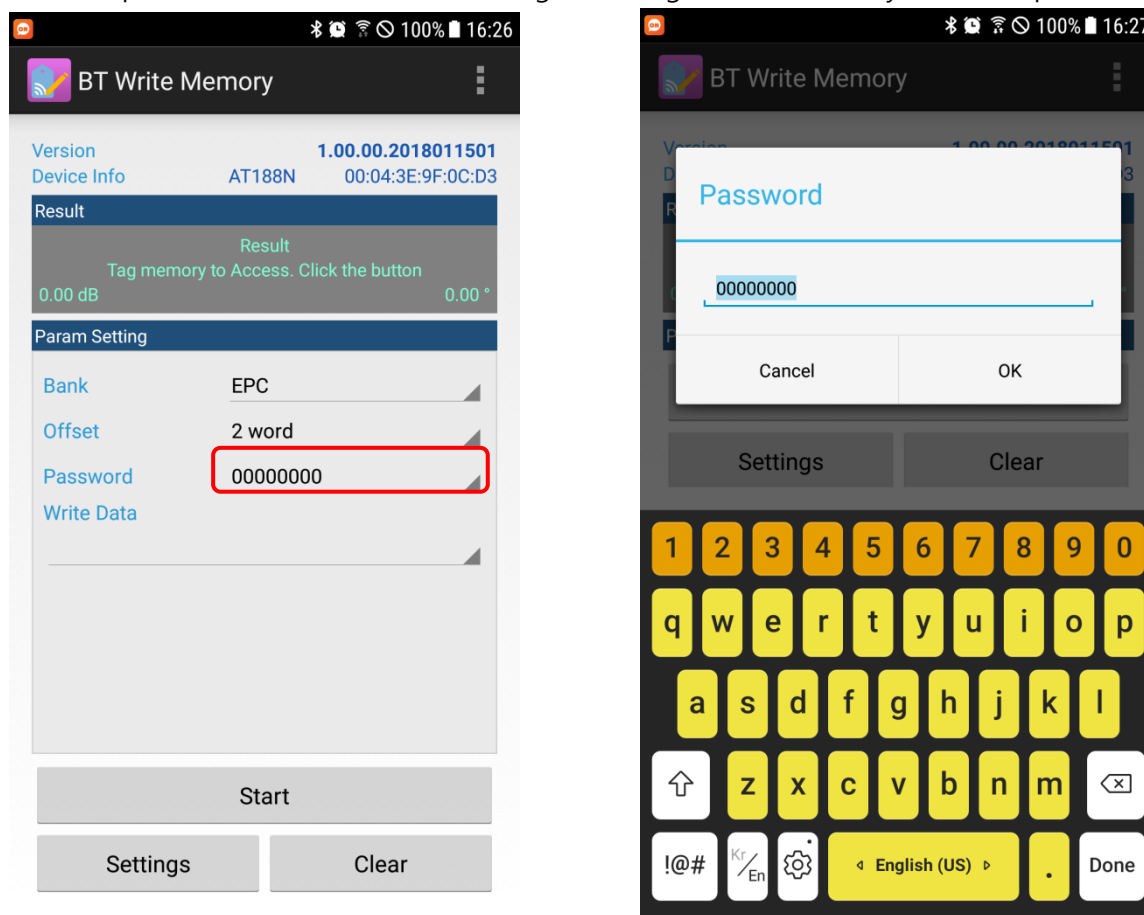
Unit which you can specify is WORD.



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3.8.5. Password


Password Option is set on a device to access tag if RFID tag has been locked you want to perform Write Memory.



If RFID tag has been locked, you cannot write data on a bank which is locked.

If you want to write data on specific bank memory in RFID tag which has been locked, you have only to set Password which is the same with Access Password saved in a tag and perform Write Memory on a tag.

If Password is different from Access Password saved in RFID tag, performing Write Memory will fail.

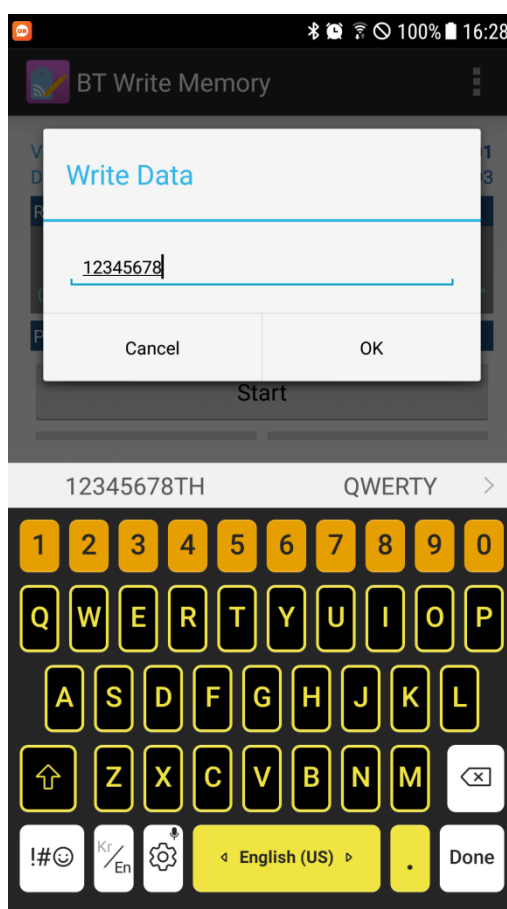
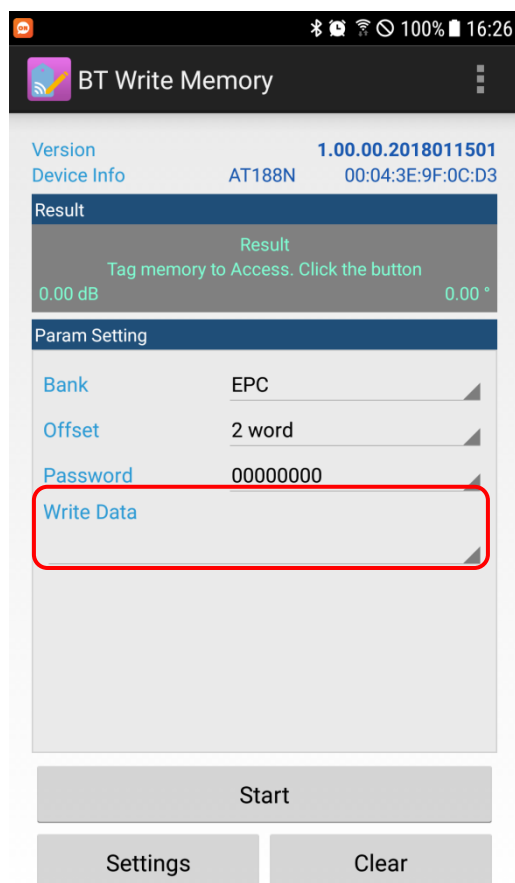
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3.8.6. Write Data


Write Data Option performs Write Memory to enter data to write data on specified memory bank.

Data to be typed is HEX value.

Data to be typed should be WORD (four character).



※ Maximum length of data that can be written by using Write Memory at once is 32WORD.

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3.8.7. How to write tag memory

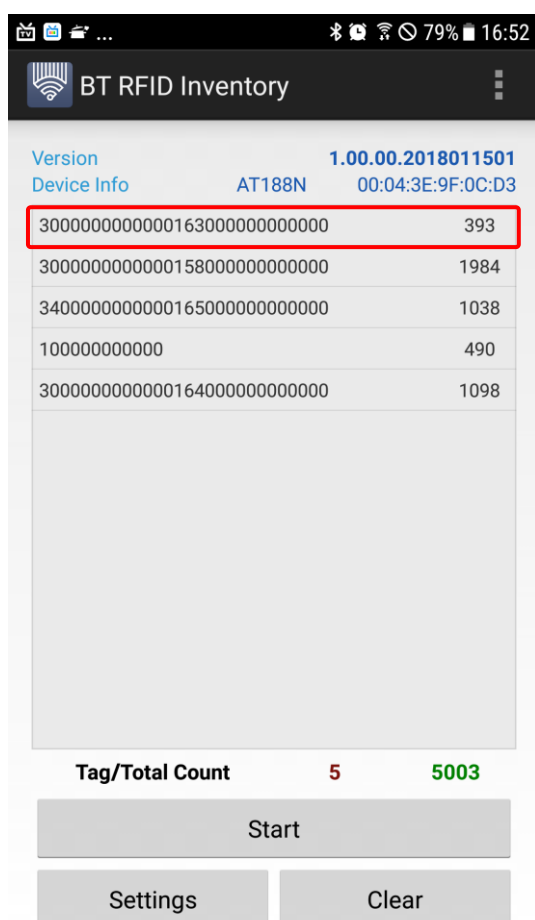
In order to test writing , let's write EPC value as 4WORD on specific EPC area of RFID tag.

Value to be written on EPC area is"12345678" in a format of HEX.


On EPC area, EPC value starts from 2WORD.

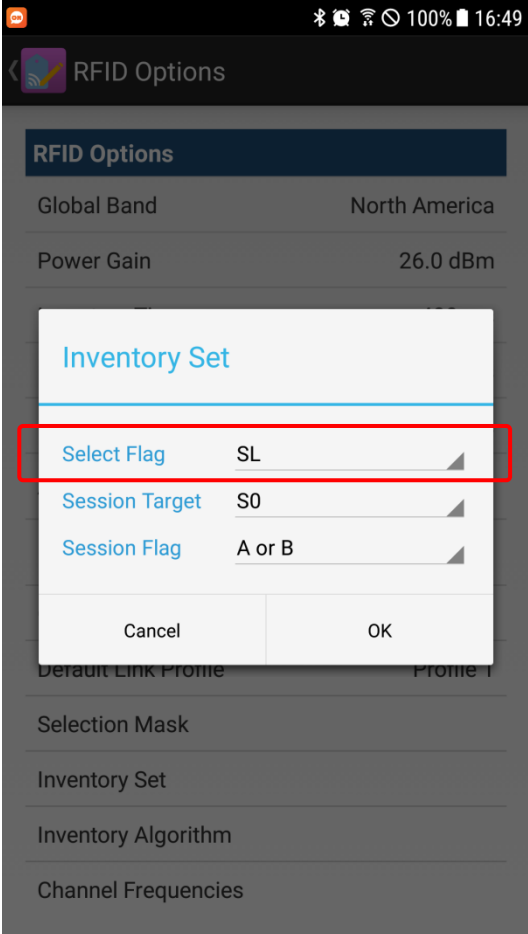
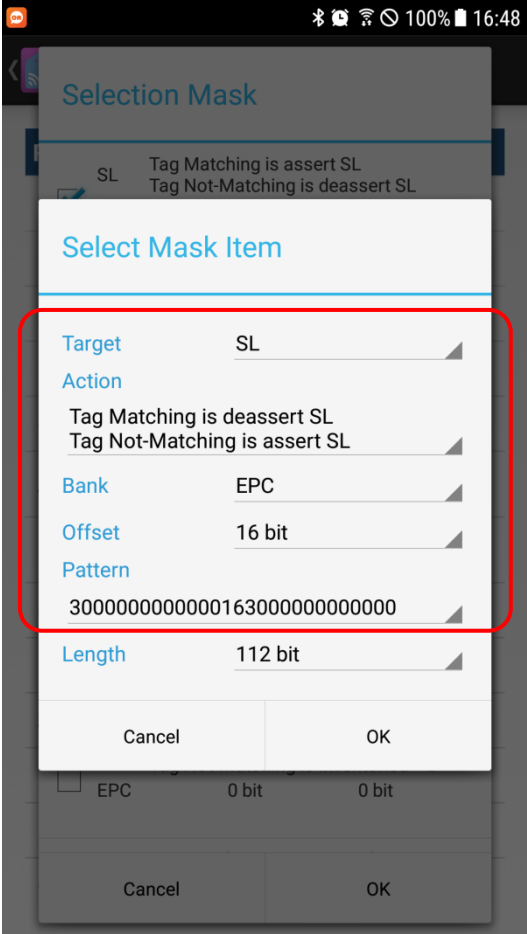
To prevent Write Memory from being written on another tag, search for a tag with Inventory and have one tag locked on Selection Mask based on EPC and access memory of tag.

Perform Inventory on Inventory screen to search for a tag to read memory.




If RFID tag has been searched that you want to access on Inventory, stop Inventory and then set as retrieved Selection Mask .

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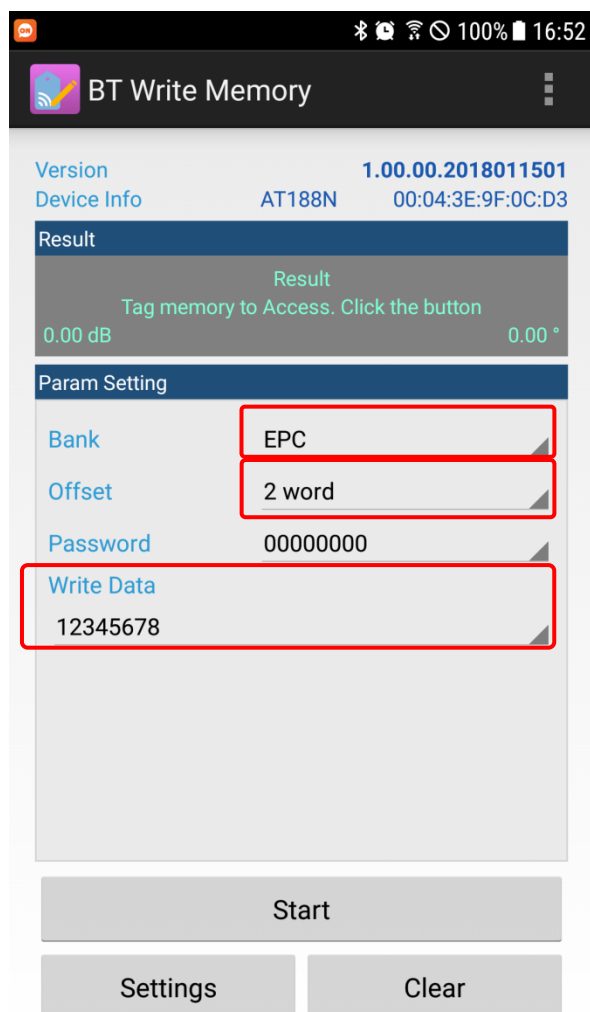
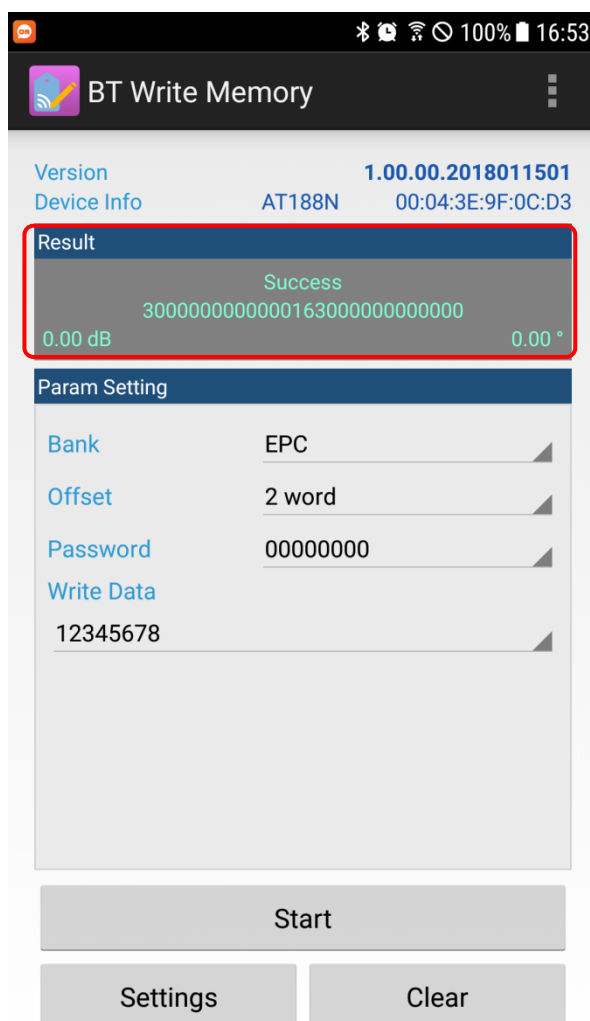
Refer to Section 3.5 on how to set Selection Mask.

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If Selection Mask has been set, move to Write Memory screen in a main menu.

On Write Memory screen, select memory bank to be written on RFID tag in Param Setting as EPC and set initial address to 2WORD.


Enter data value to be written in Write Data.

If you are ready to write data on memory of RFID tag, touch Write button to write data on memory of tag.

If data has been written on memory of tag properly, display access result, EPC of a tag to access, RSSI, and Phase on Result area.

If data on EPC area has been changed, you have to unlock setting for Selection Mask because value is different from EPC value set as Selection Mask previously.

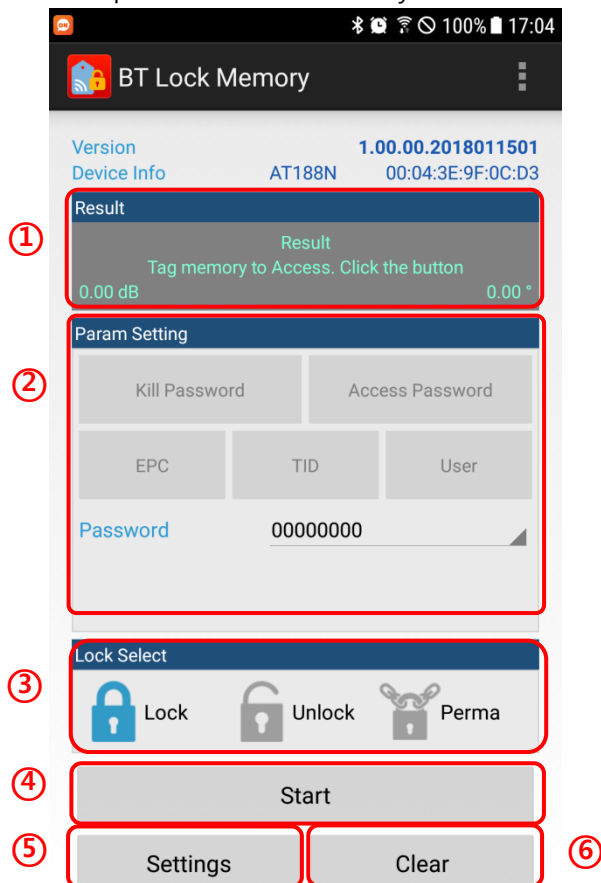
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3.9. Lock Memory


Lock Memory Demo can use a function to lock or unlock a tag among functions of RFID (UHF).

3.9.1. Screen Composition

A picture below shows screen composition of Lock Memory.



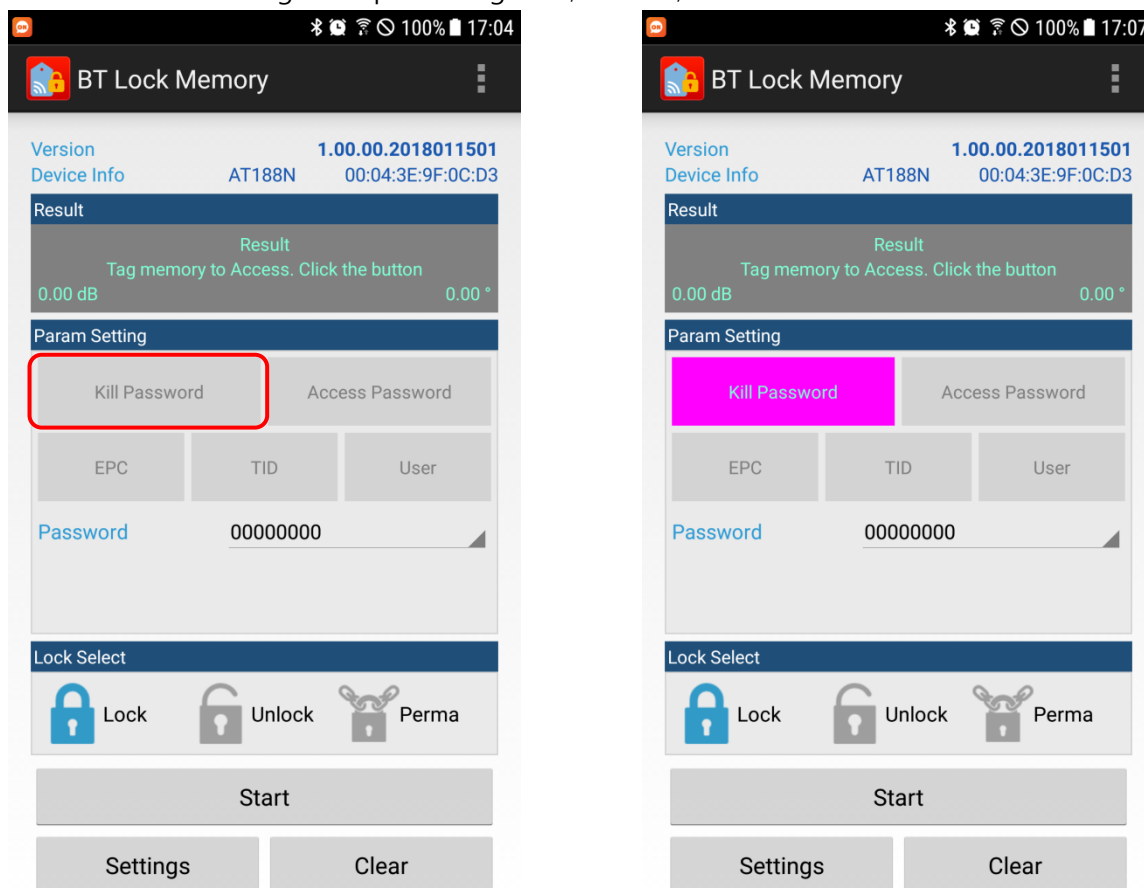
- ① **Result** : Display a result of motion as message after a device locks or unlocks RFID tag.
- ② **Param Setting** : Set parameter to Lock Memory.
2WORD Password sets Access Password on RFID tag.
Saved in Access Password area of RFID tag Reserved Bank.
- ③ **Lock Select**: Select what motion a device will perform on a tag.
ou can select Lock, Unlock or Perma Lock.
- ④ **Start** : Enable a device to perform Lock, Unlock , or Perma Lock selected in Lock Select.
- ⑤ **Setting** : Move to a screen to set RFID Option.
- ⑥ **Clear**: Initialize Result.

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3.9.2. How to change lock memory option

3.9.2.1. Kill Password


Kill Password is an option that offset sets Kill Password area of length of 0 word to 2 word as job destination in Reserved area of RFID tag when performing Lock, Unlock, or Permalock.



If Kill Password area has been locked by Lock or Permalock, you cannot read, write, lock or unlock unless you set Password by using Access Password set in a tag.

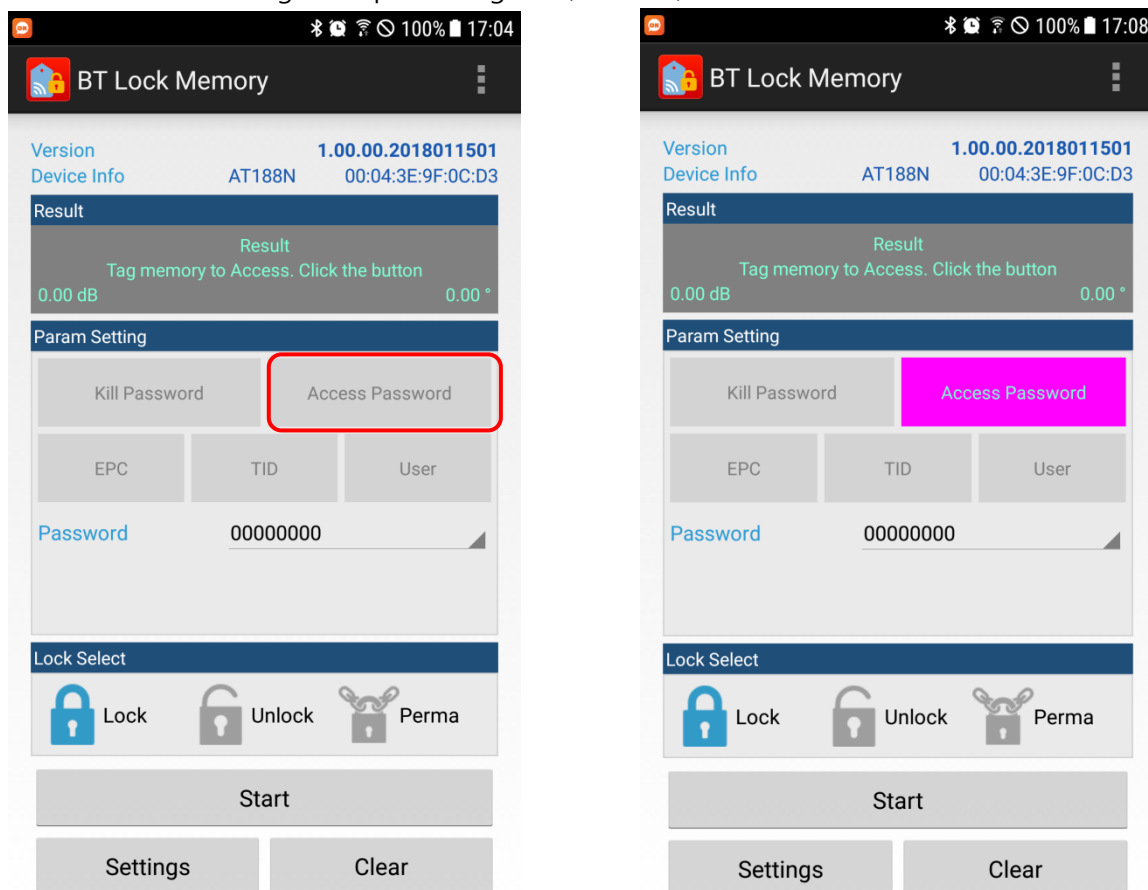
You can set Kill Password, Access Password, EPC, TID, User options with them overlapped.

Area set overlapped can be processed at once when performing Lock, Unlock or Permalock.

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3.9.2.2. Access Password

Access Password is an option that offset sets Kill Password area of length of 2 word to 2 word as job destination in Reserved area of RFID tag when performing Lock, Unlock, or Permalock.




If Access Password area has been locked by Lock, you cannot read, write, lock or unlock unless you set Password by using Access Password set in a tag.

If Access Password area has been locked by Permalock, you can read but cannot write or unlock unless you set Password by using Access Password set in a tag.

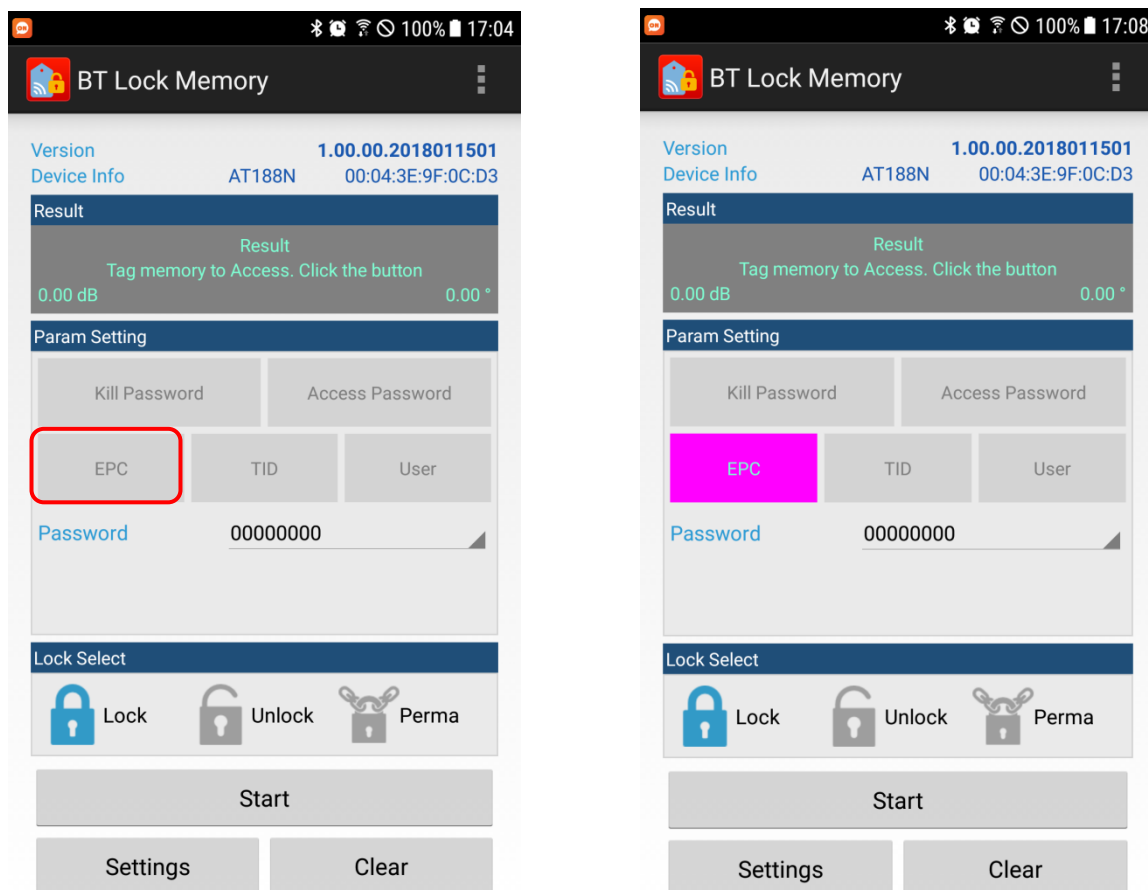
You can set Kill Password, Access Password, EPC, TID, User options with them overlapped.

Area set overlapped can be processed at once when performing Lock, Unlock or Permalock.

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3.9.2.3. EPC

EPC is an option that sets EPC bank area in RFID tag as job destination when performing Lock, Unlock, or Permalock.




EPC area has been locked by Lock, you cannot read, write, lock or unlock unless you set Password by using Access Password set in a tag.

If EPC area has been locked by Permalock, you can read but cannot write or unlock unless you set Password by using Access Password set in a tag.

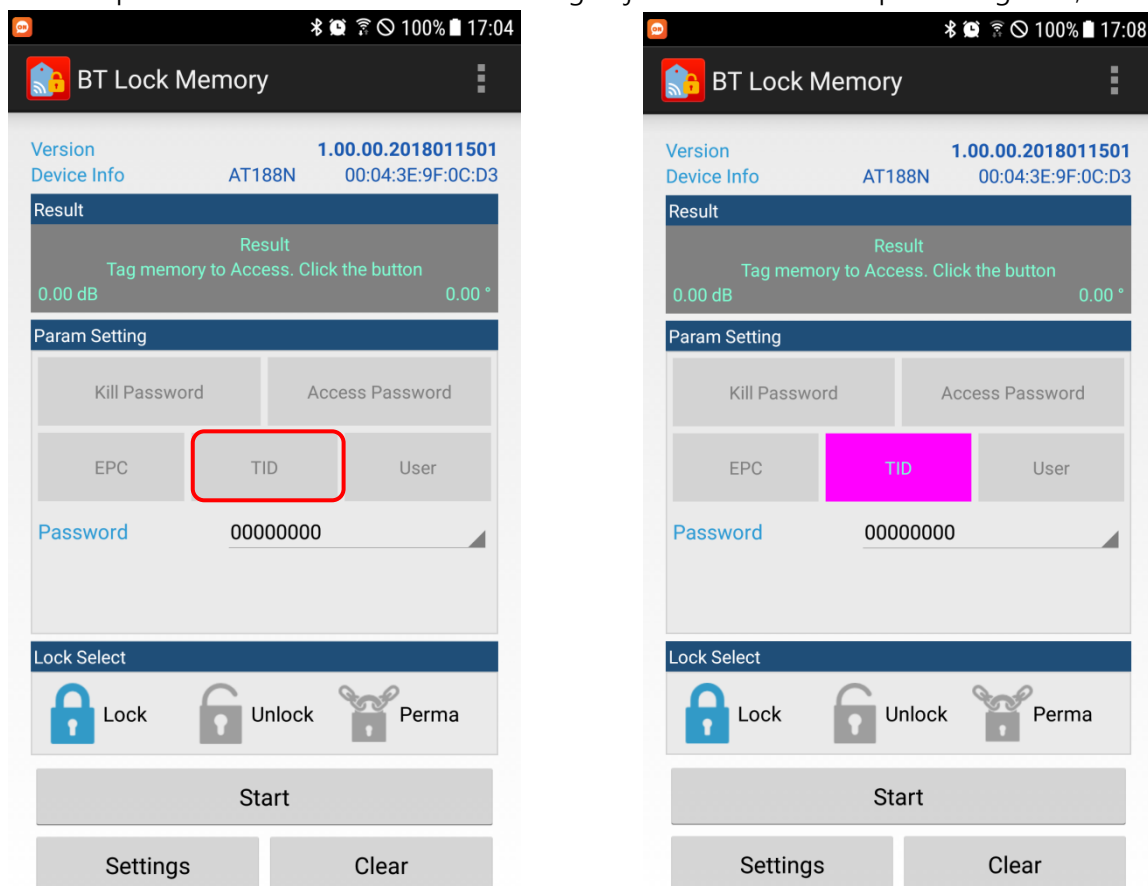
You can set Kill Password, Access Password, EPC, TID, User options with them overlapped.

Area set overlapped can be processed at once when performing Lock, Unlock or Permalock.

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3.9.2.4. TID

TID is an option that sets TIP bank area in RFID tag as job destination when performing Lock, Unlock, or Permalock.




If TID area has been locked by Lock, you cannot read, write, lock or unlock unless you set Password by using Access Password set in a tag.

If TID area has been locked by Permalock, you can read but cannot write or unlock unless you set Password by using Access Password set in a tag.

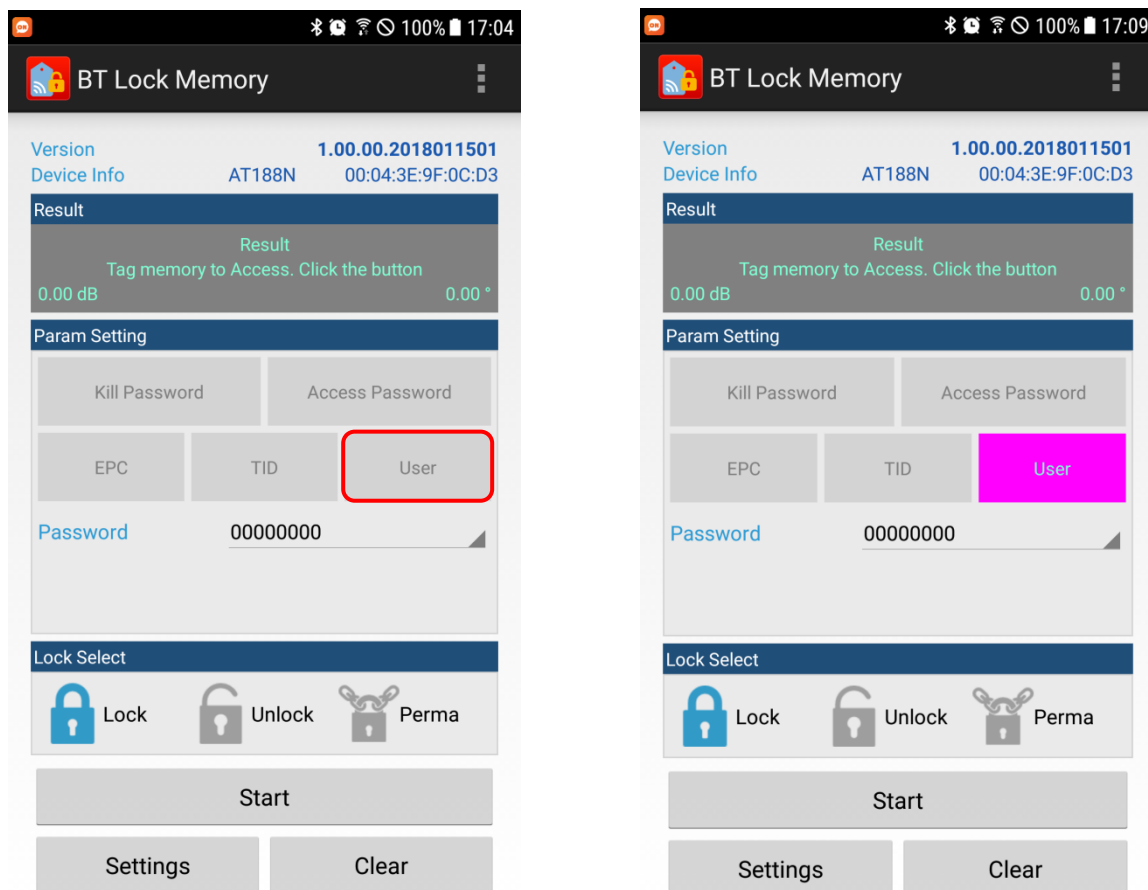
You can set Kill Password, Access Password, EPC, TID, User options with them overlapped.

Area set overlapped can be processed at once when performing Lock, Unlock or Permalock.

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3.9.2.5. User

User is an option that sets User bank area in RFID tag as job destination when performing Lock, Unlock, or Permalock.




User area has been locked by Lock, you cannot read, write, lock or unlock unless you set Password by using Access Password set in a tag.

If User area has been locked by Permalock, you can read but cannot write or unlock unless you set Password by using Access Password set in a tag.

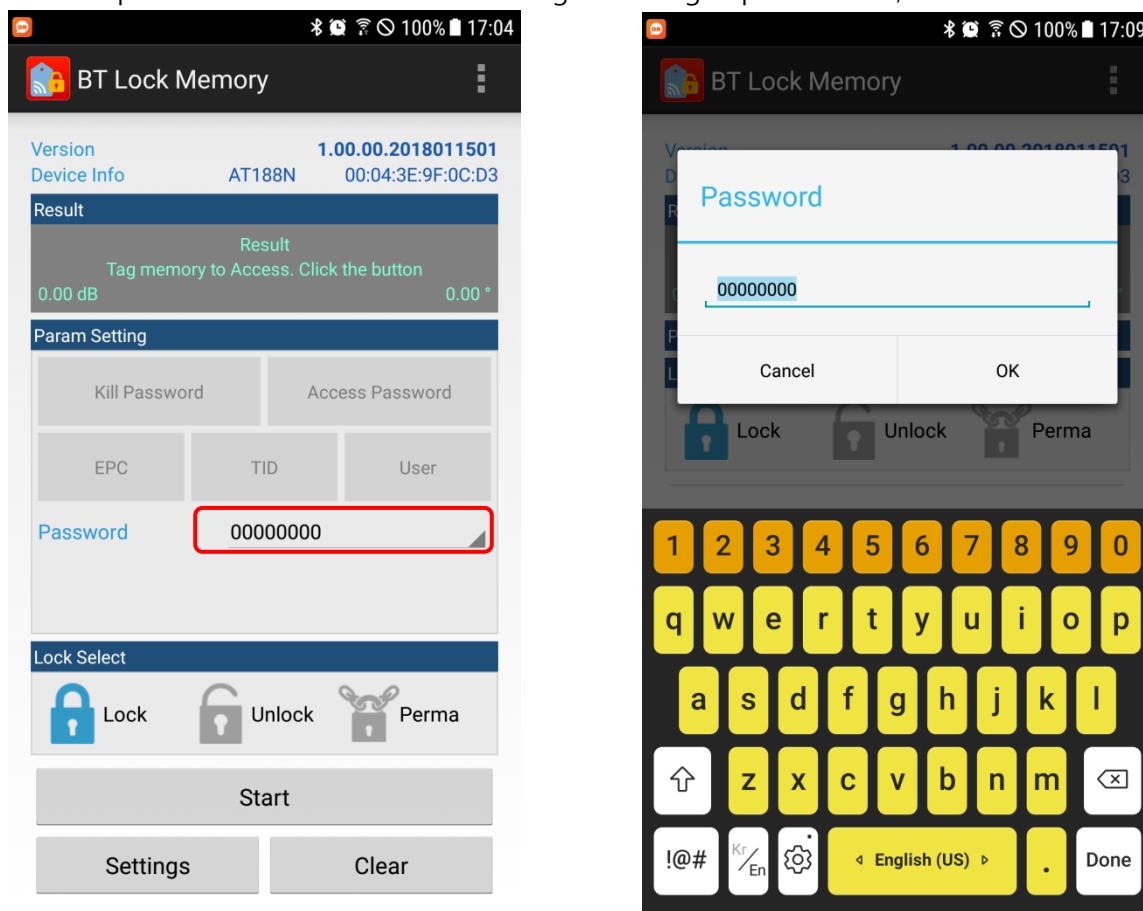
You can set Kill Password, Access Password, EPC, TID, User options with them overlapped.

Area set overlapped can be processed at once when performing Lock, Unlock or Permalock.

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3.9.2.6. Password

Password option is set on a device to access a tag if RFID tag to perform Lock, Unlock or Permalock has been locked.




If RFID tag has been locked, you cannot lock or unlock an area which has been locked.

If you want to lock or unlock memory on specific area in RFID tag which has been locked, you have only to set Password which is the same with Access Password saved in a tag and perform Lock or Unlock on a tag.

You cannot unlock a memory in specific area in RFID tag which PermaLock has been placed.

If Password is different from Access Password saved in RFID tag, performing Lock, Unlock or Permalock will fail.

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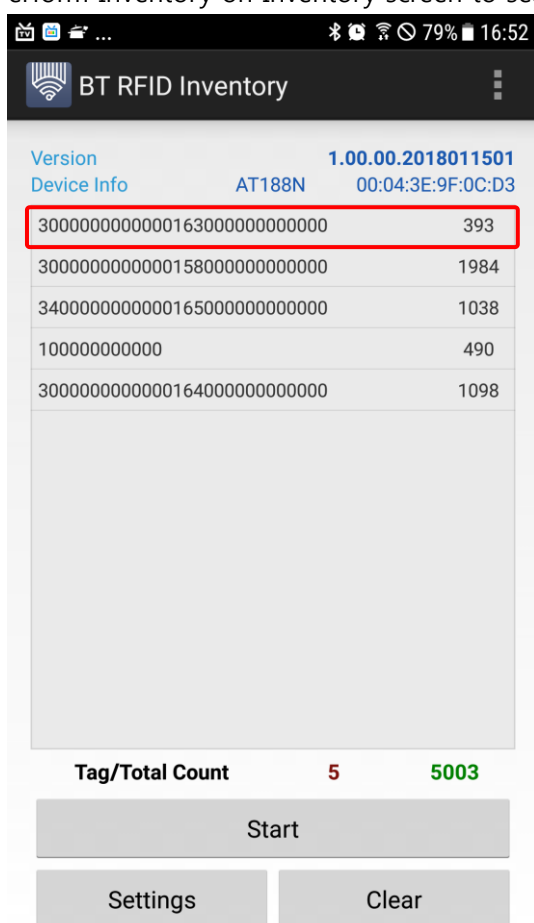
3.9.3. How to set access password in tags

In order to test how to lock RFID tag, let's set Access Password in Reserved area in specific RFID tag and place Lock on Access Password.

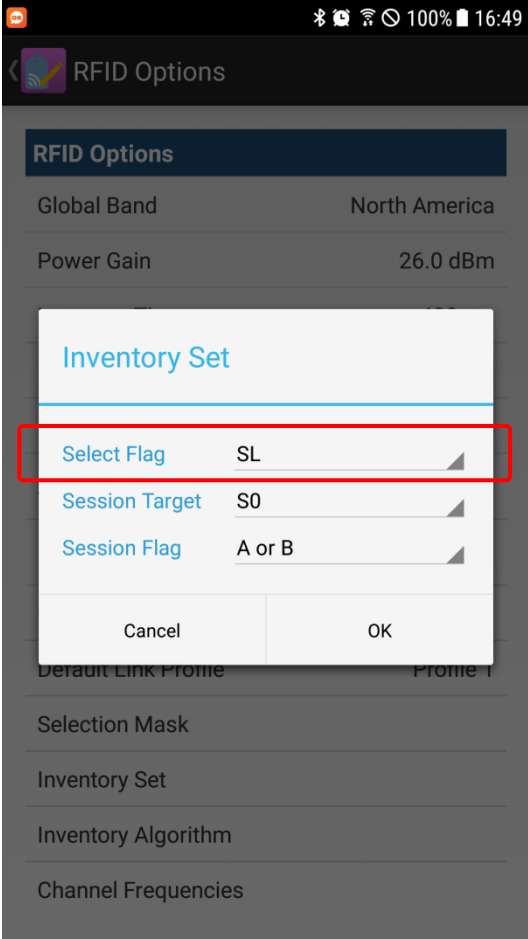
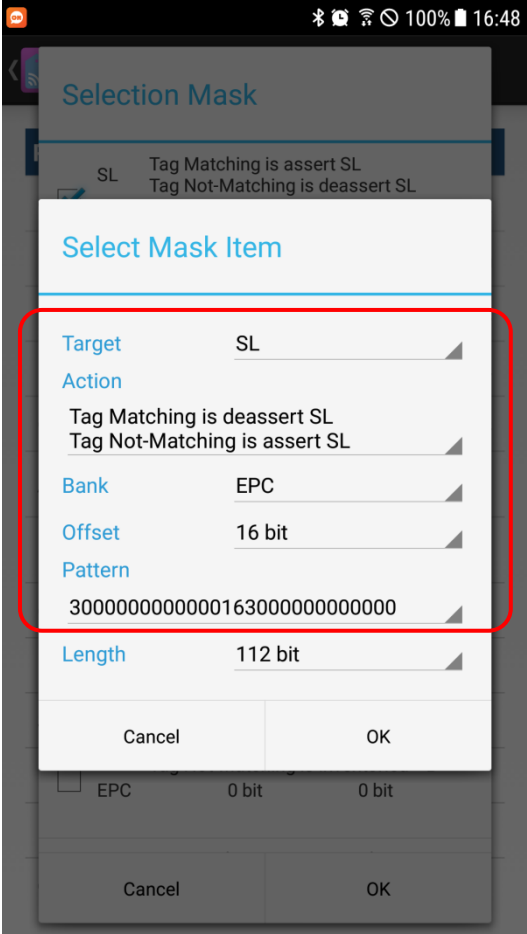
Access Password is the length of 2Word starting from 2Word in Reserved area.

Prior to Lock Memory, access memory of tag by searching tag with Inventory and placing Selection Mask on one tag based on EPC.


Perform Inventory on Inventory screen to search for a tag to read memory.



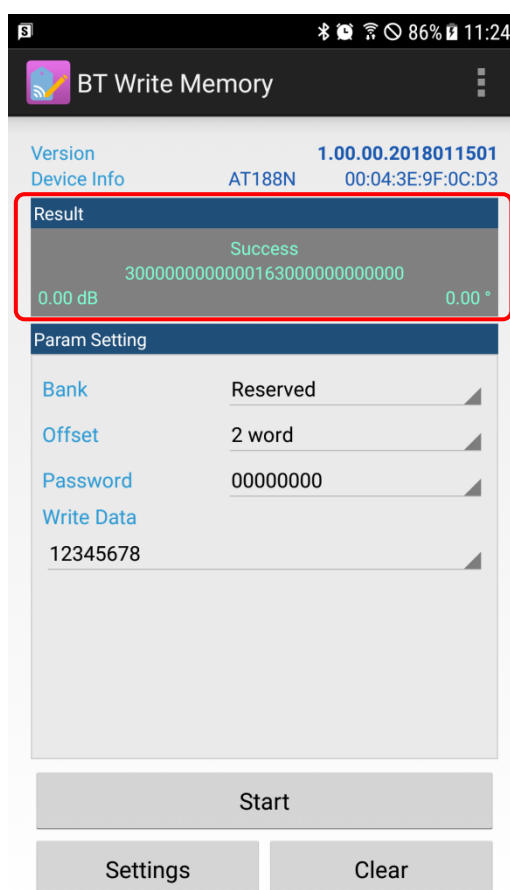
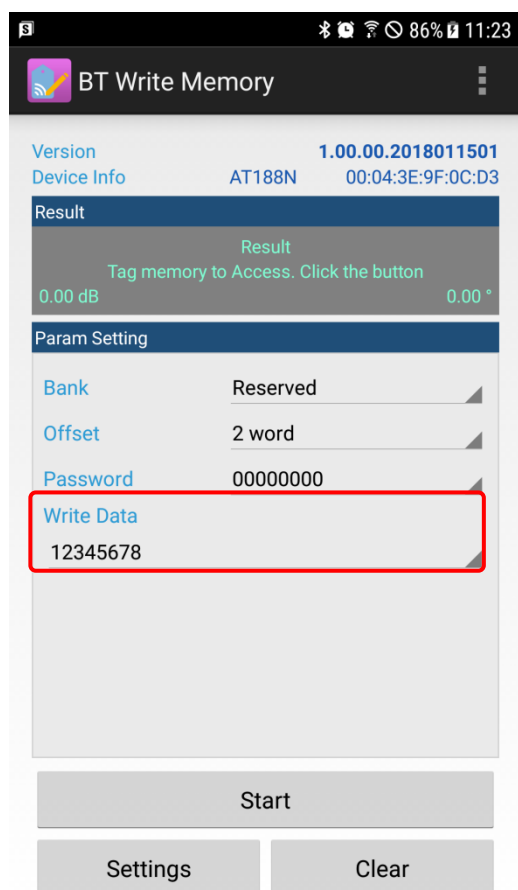
If you have searched for RFID tag which you want to access in Inventory, stop Inventory and set searched Selection Mask.




Refer to Section 3.5 for how to set Selection Mask.

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If you has set Selection Mask, set Access Password for Tag.



On Write Memory screen, if you execute Write Memory by seting Bank to Reserved and Offset to 2WORD and typing "12345678" of Write Data and touching Write button, motion which is the same with Set Password on Lock Memory screen will be performed.

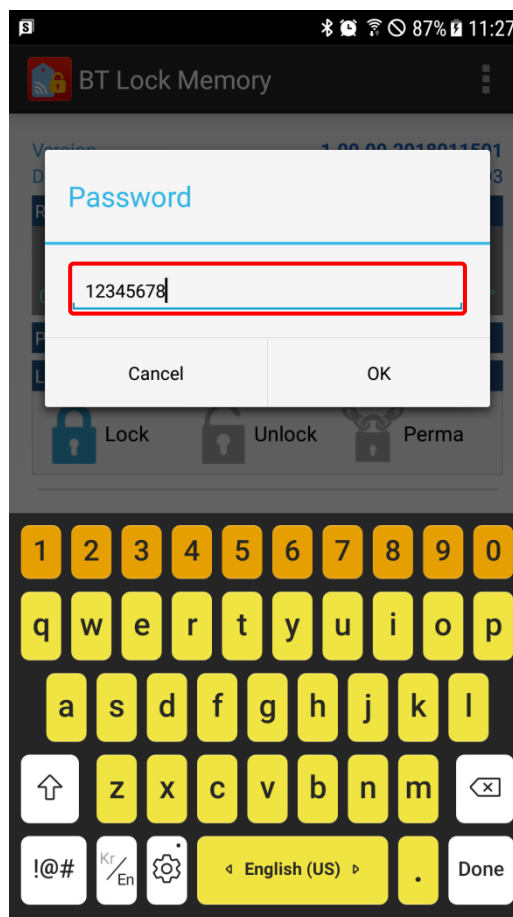
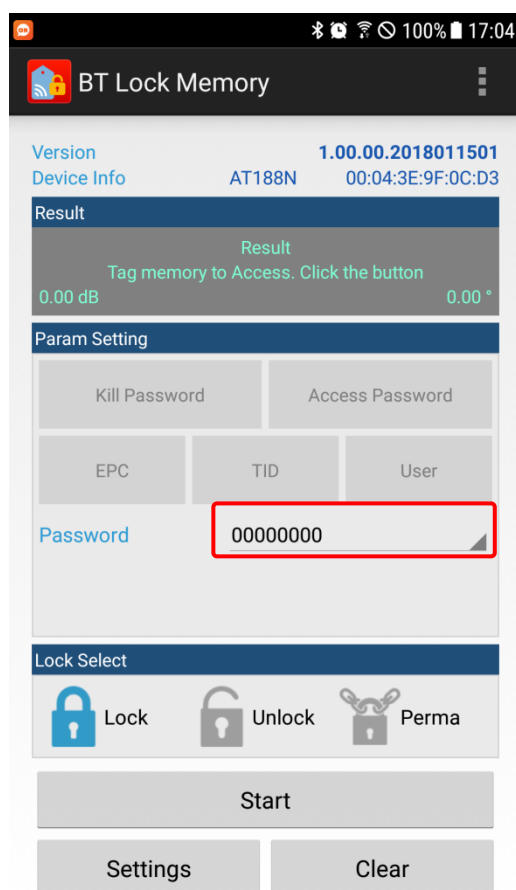
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If you have set Selection Mask, move to Lock Memory in a main menu.

On Lock Memory screen, a function which allows you to write Access Password easily is provided.

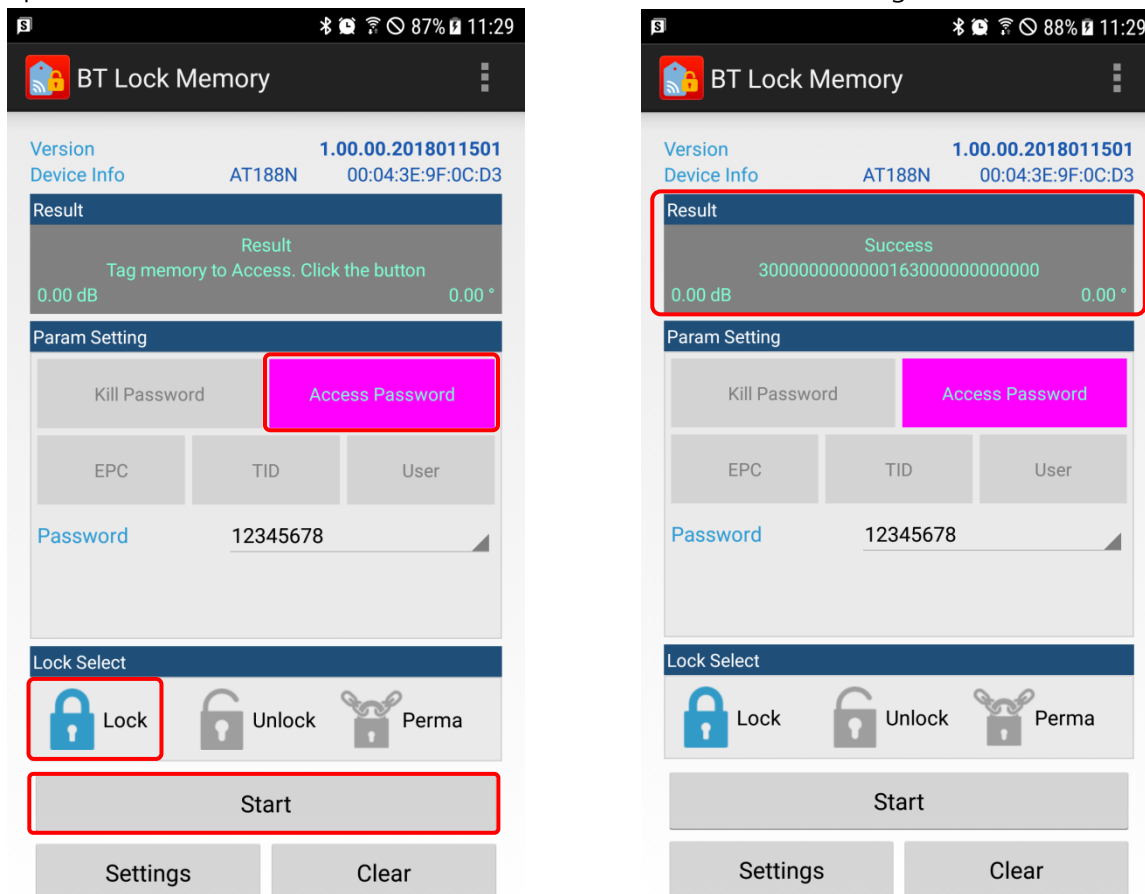
Touch Password area and enter Access Password you want to set on RFID tag.

Let's enter "12345678".




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To place Lock on Access Password, select Access Password in Param Setting and Lock in Lock Select .



If you are ready to place Lock on RFID tag, touch Start button to place Lock on Access Password area.
If Lock has been set to a tag, display Access result, EPC, RSSI, and Phase in a tag to access in Result area.
You cannot read or write data in Access Password area if Access Password is not valid for this RFID tag.

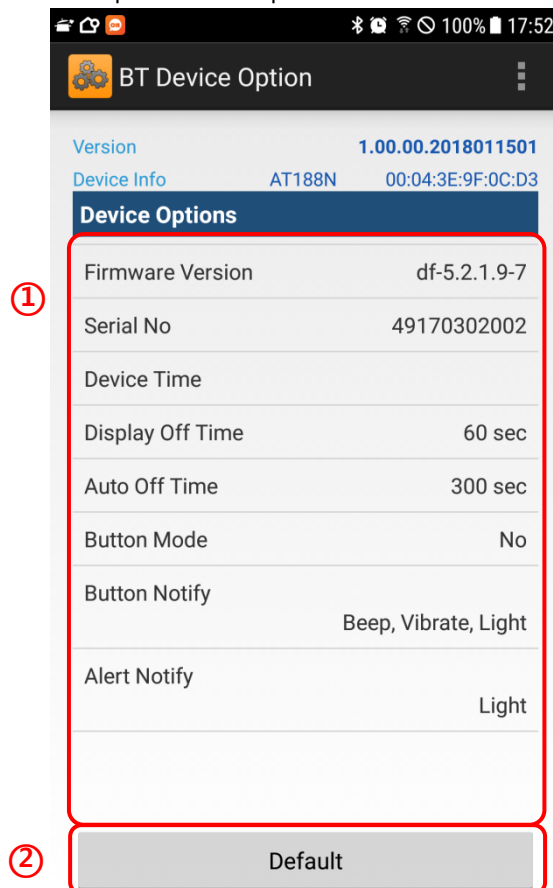
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3.10.Option


Option Demo can set a device.

3.10.1.Screen Composition

A picture below shows screen composition of Option Demo.

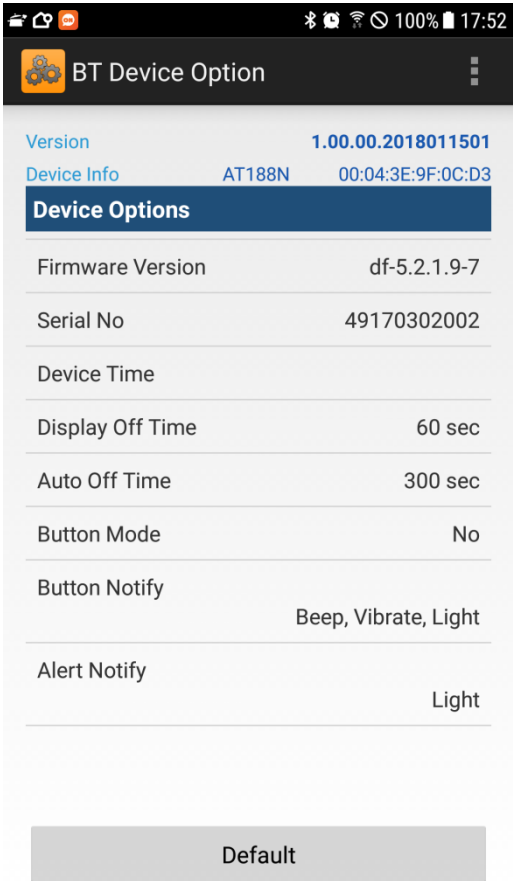


- ① **Option List** : Enumerate options of a device.
List item shows option names and set value.
If you touch an option, you can set it.
- ② **Default** : Initialize options values for a device.

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3.10.2.How to change device options

A device consists of modules and main unitsto control modules.
Device Option provides an environment in which you can operate setting for main units.




3.10.2.1. Firmware Version

Firmware Version display a version of main program that is operated in a main unit.

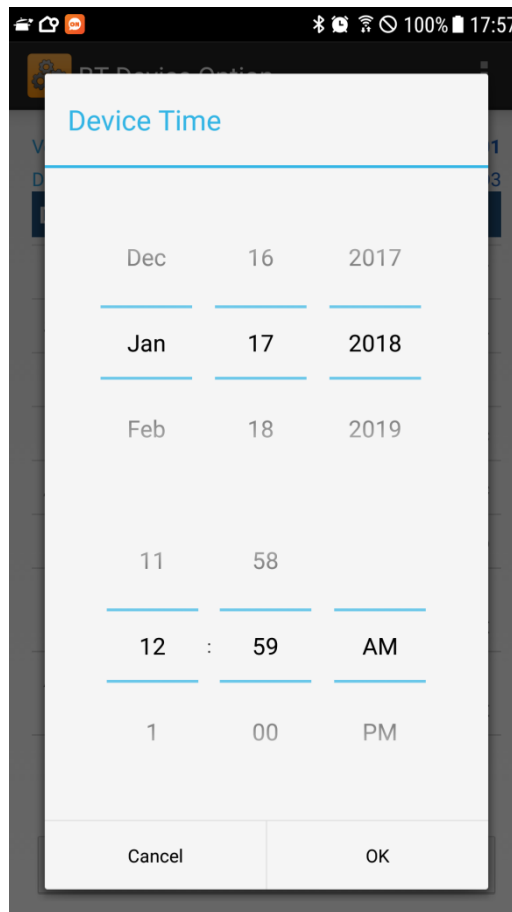
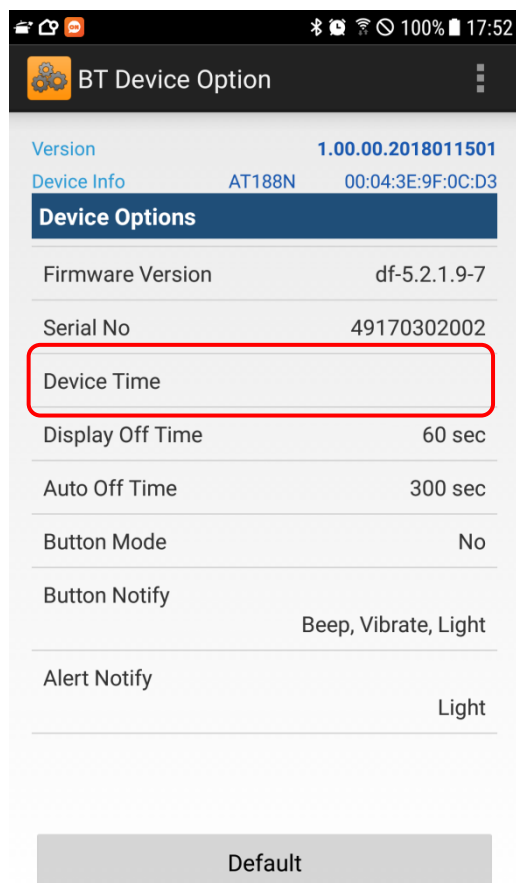
3.10.2.2. Serial No

Serial No display control number to control a device.

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3.10.2.3. Device Time

Device Timesets time of internal clock to a device.




If you touch Device Time, a dialogue box in which you can set Device Time will appear.

If you have set date and time in a dialogue box and touch "OK" button, time for a device will be set.

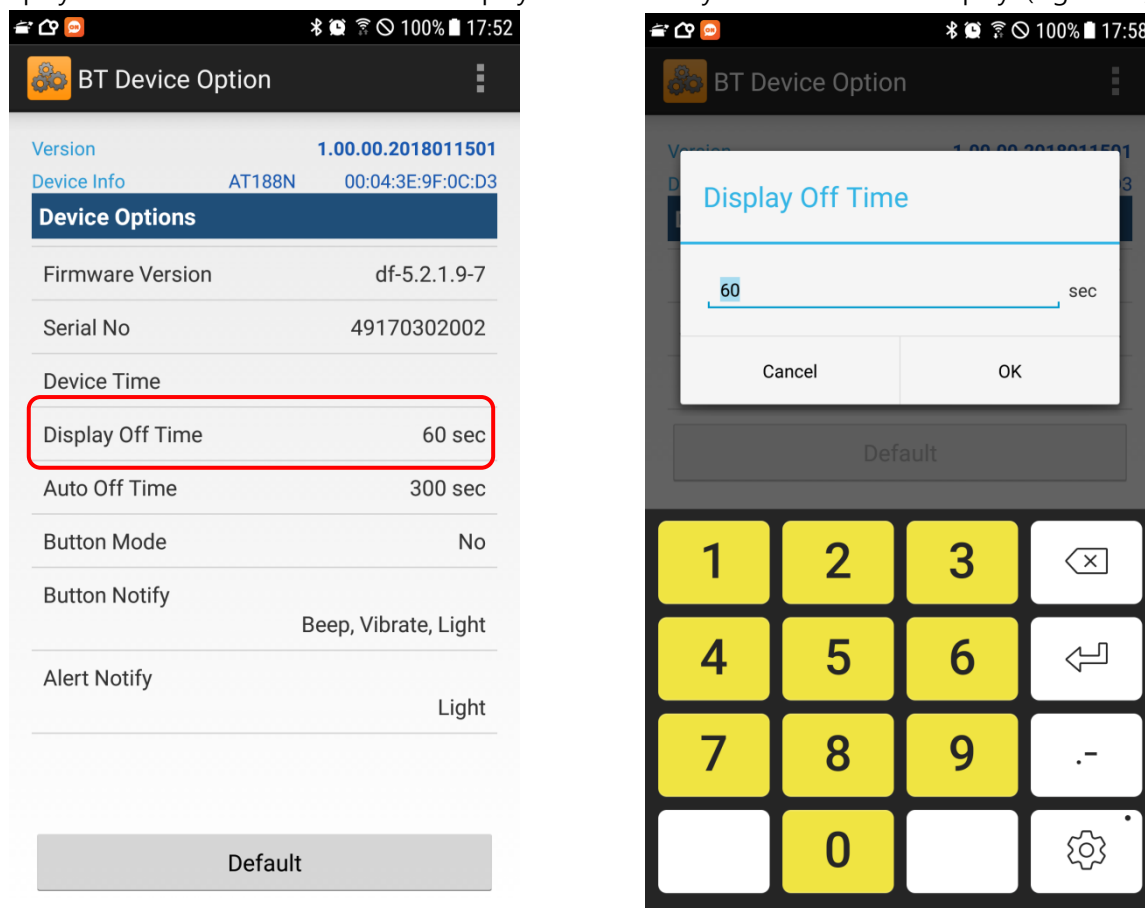
Touch Cancel button to cancel set time.

✖ This function is not supported in ATS100 and ATD100.

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3.10.2.4. Display Off Time

Display Off Time sets time to turn off display to save battery for a device with display (e.g.AT388, AT188N).




If Display Off Time has been set to 0sec, Display will not turn off automatically until power to a device is switched off.

Unit to set Display Off Time is second(sec).

In case of a device with display, if display is not used during Display Off Time, Display will turn off and after Display is off , if not used during Auto Off Time, a device will switch off.

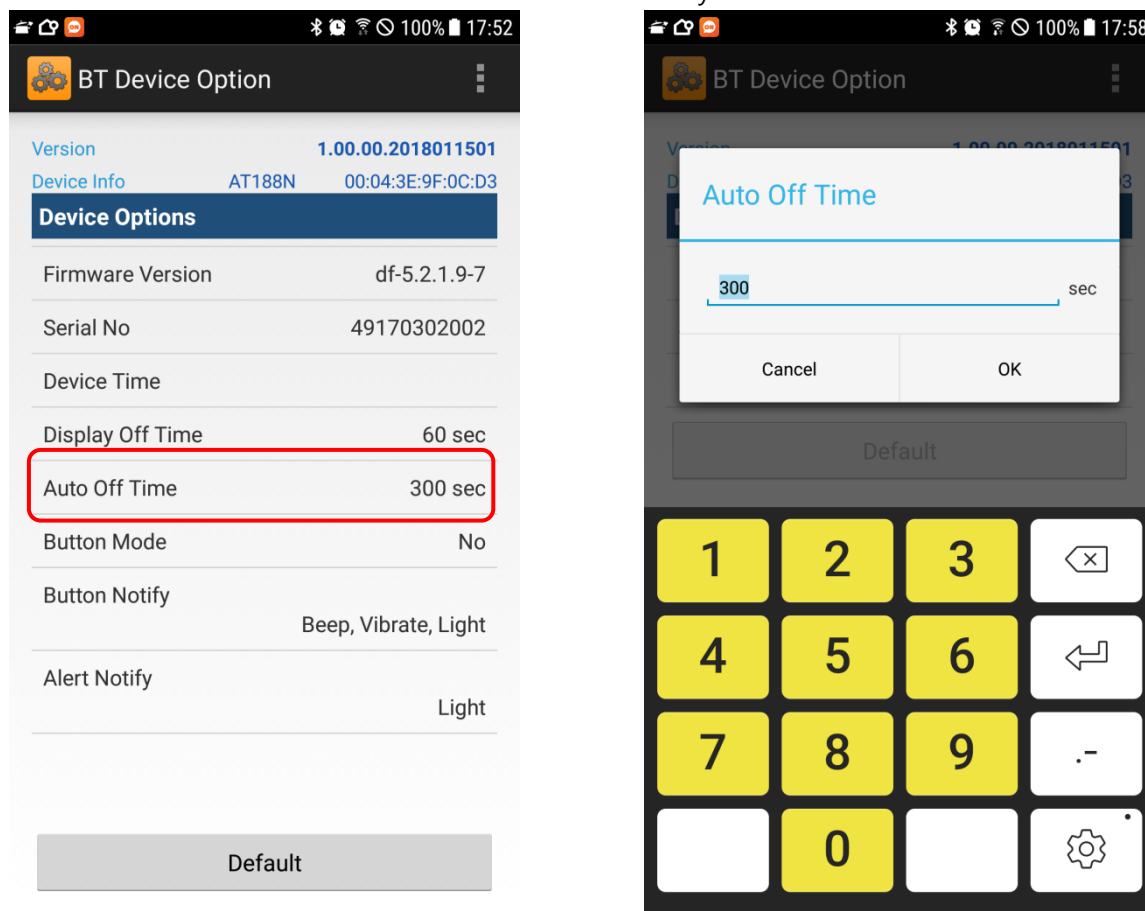
If Display Off Time has been set to 0, Display will not switch off and thus Auto Off Time gets useless.

✖ This function is not supported in ATS100 and ATD100

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3.10.2.5. Auto Off Time

Auto Off Time sets time for a device to turn off automatically.



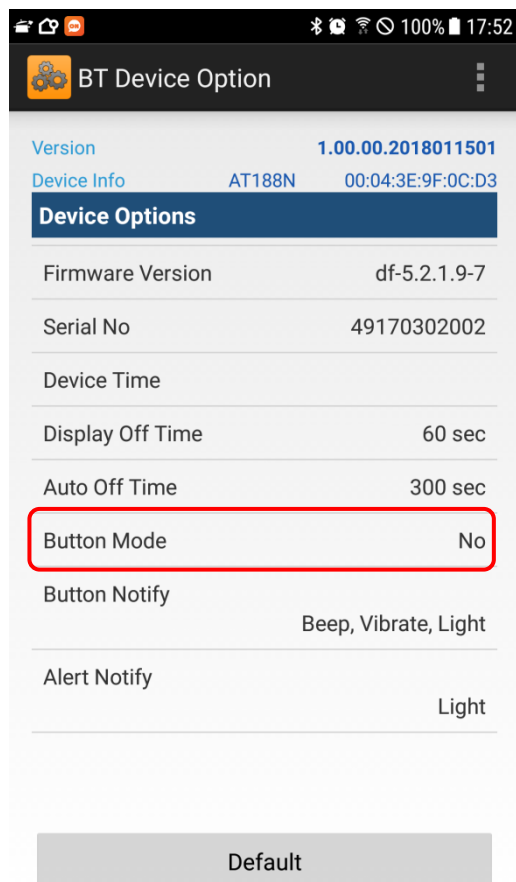
If Auto Off Time has been set to 0sec, a device will not turn off automatically.

Unit to set Auto Off Time is second (sec).

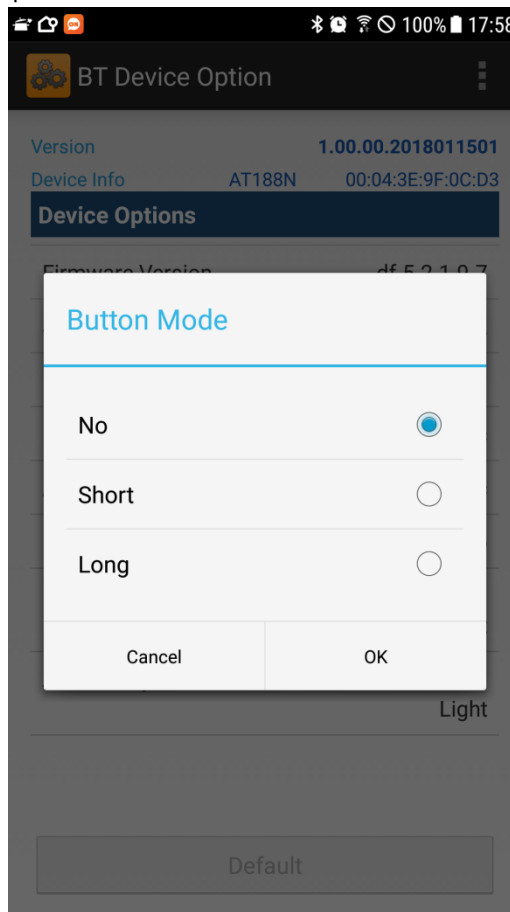
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3.10.2.6. Button Mode

Button Mode sets device button sound or duration of operation.




The screenshot shows the 'BT Device Option' screen. At the top, it displays 'Version 1.00.00.2018011501' and 'Device Info AT188N 00:04:3E:9F:0C:D3'. Below this is a 'Device Options' section. The 'Button Mode' is currently set to 'No' and is highlighted with a red rectangular box. Other settings visible include 'Firmware Version df-5.2.1.9-7', 'Serial No 49170302002', 'Device Time', 'Display Off Time 60 sec', 'Auto Off Time 300 sec', 'Button Notify Beep, Vibrate, Light', and 'Alert Notify Light'. A 'Default' button is at the bottom.



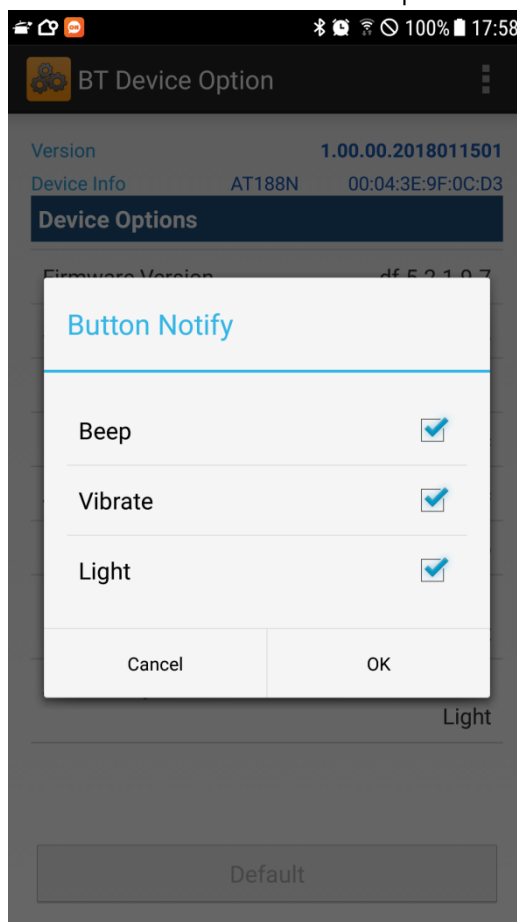
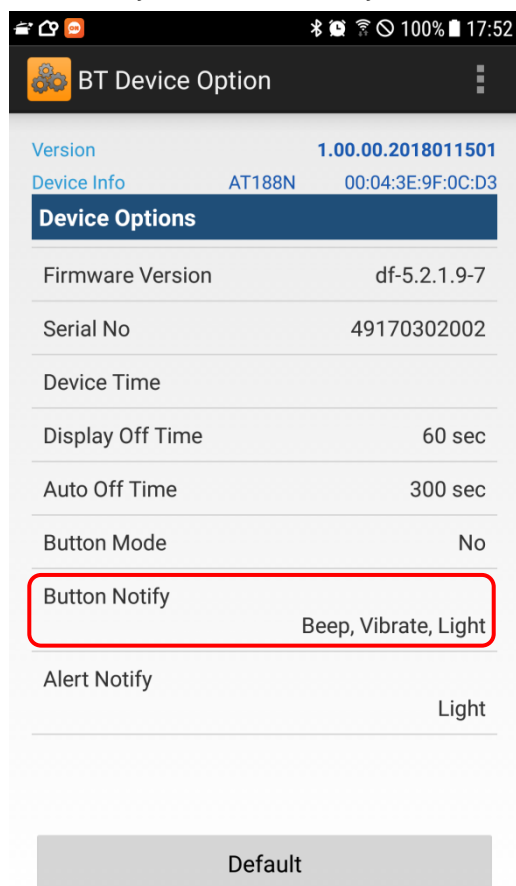
The screenshot shows a 'Button Mode' dialog box overlaid on the BT Device Option screen. The dialog has three radio button options: 'No' (which is selected), 'Short', and 'Long'. At the bottom of the dialog are 'Cancel' and 'OK' buttons. The background screen is dimmed.

Button Mode	Description	Note
No	Do not use button notify function.	
Short	Button notify sounds short .	
Long	Button notify sounds long.	

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3.10.2.7. Button Notify

Button Notify sets how to notify when an alarm sounds when a button to a device is pressed.



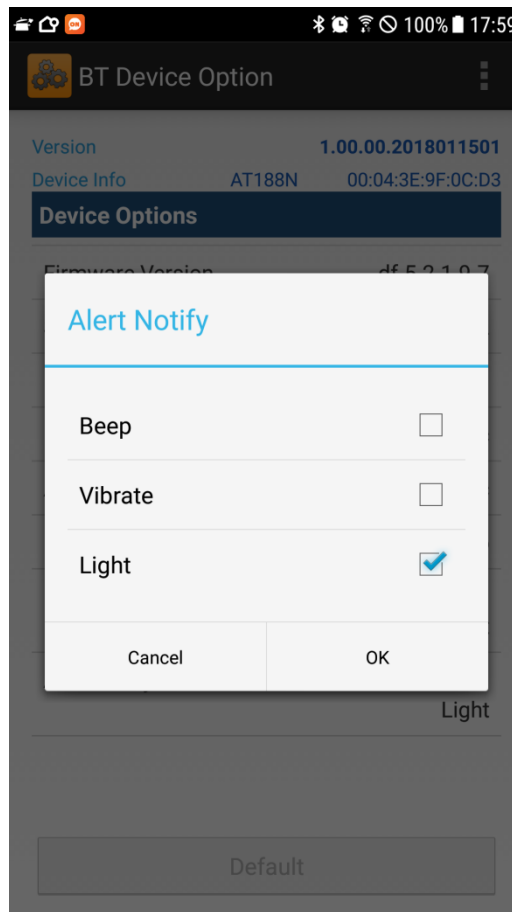
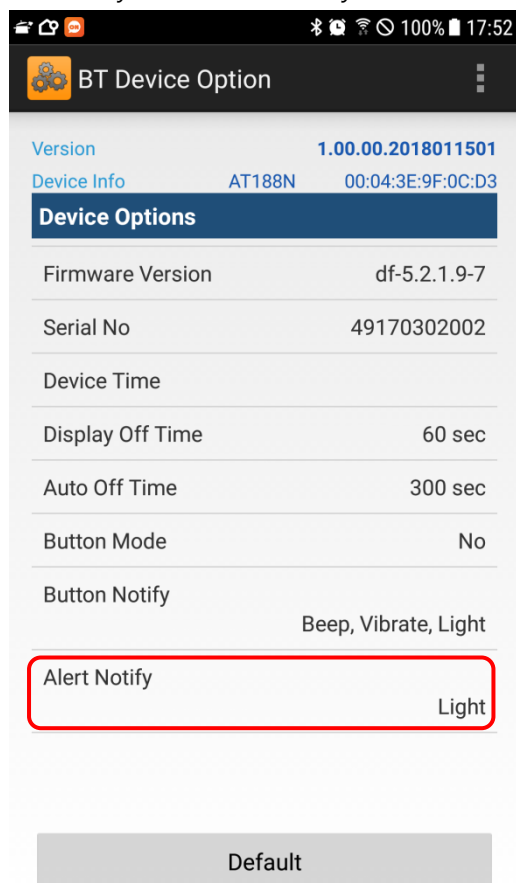
Button Notify	Description	Note
Beep	If you press a button to a device, beep will sound.	
Vibrate	If you press a button to a device, vibrate will generate.	
Light	If you press a button to a device, LED will flicker.	

- ※ For ATS100 , Light function is not supported.
- ※ For ATD100, Vibrate function is not supported.

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3.10.2.8. Alert Notify

Alert Notify sets how to notify when an event occurs in a device.



AlertNotify	Description	Note
Beep	If an event occurs in a device, beep will sound.	
Vibrate	If an event occurs in a device, vibrate will generate.	
Light	If an event occurs in a device, LED will flicker.	

※ For ATS100 , Light function is not supported.

※ For ATD100, Vibrate function is not supported.