POINT Mobile

UHF RFID For PM85

RF851

User Manual

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Instruction

RF851 is a UHF RFID reader for PM85. This manual provides information about basic features and using the RF851. Please read this manual carefully before using your UHF RFID reader to ensure safe and proper use.

Revision History

Revision	Date	Description
V01	18 Nov 2020	Initial release
V02	24 Nov 2020	Change menu string of RFID Control Configuration Tool
V03	21 Jan 2021	Removed minor description issue
V04	15 Jul 2021	Updated Battery safety information chapter Remove RF851-00RX-7 SKU Updated Apply Configuration, Firmware Update chapter
V05	29 Oct 2021	Added charging with cradle – 4SBC and handstrap chapter
V06	27 Mar 2023	Updated Related Document links Updated Battery Safety Information chapter

Related Document

- RFID Control User Guide – describes how to use the RFID Control and RFID Demo applications for PM85 and RF851. See this guide from Point Mobile Knowledge Base.
- RFID Control Configuration Tool User Guide – describes how to use the RFID Control Configuration Tool. See this guide from Point Mobile Knowledge Base.

RF851 SKUs

The contents of this manual can cover the following SKUs.

SKU	Part Number	RFID Module	Antenna	Location
SKU1	RF851-00RX-1	KCTM-2000F	H300U-K	US
SKU2	RF851-00RX-5			KR
SKU3	RF851-00RX-2	KCTM-2000E	H300U-E	EU, India

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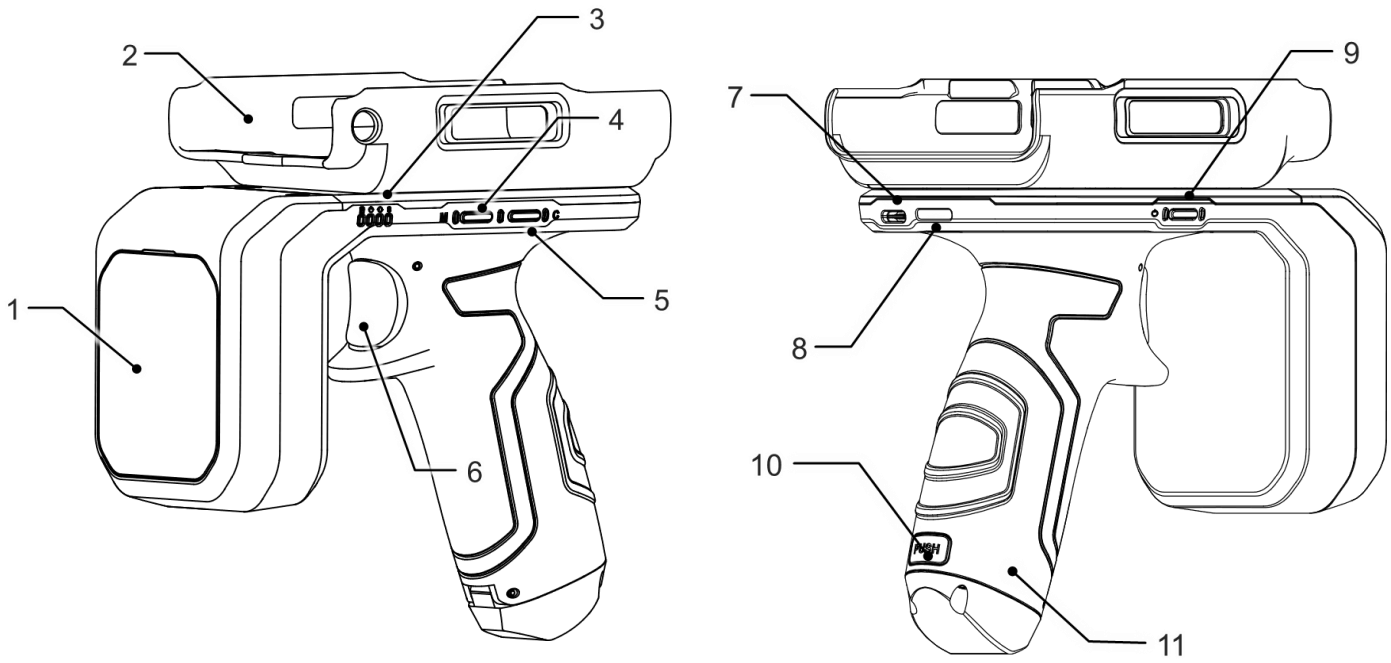
Getting Started

Device Parts

Figure 1 RF851 Views



No	Name	Description
1	UHF RIFD antenna	Read RFID tags
2	PM85 retention fixture	Install PM85 onto this part
3	LED Indicators	Indicate the status of power, battery charging, pairing, trigger mode. Find more details in LED Indicator
4	Trigger-mode change button	Press and hold to change trigger mode, barcode scanning or RFID tag reading
5	Connect-mode change button	Press and hold to change the connect mode
6	Trigger button	Read RFID tags or barcode by pressing
7	USB Connector	USB 2.0 Type C. Plug USB cable to charge the RF851
8	Hand strap install hole	Install the hand strap through the hole
9	Power button	Press and hold to turn on/off the RF851
10	Battery release button	Press to open battery cover and remove the battery
11	Battery slot	Open the slot cap by pressing battery release button

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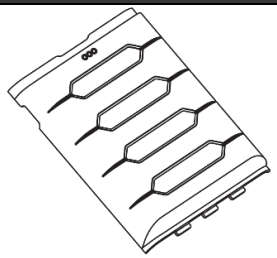
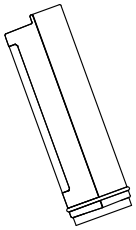
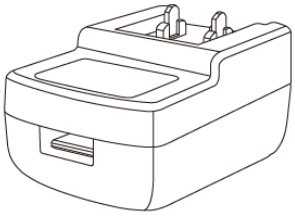
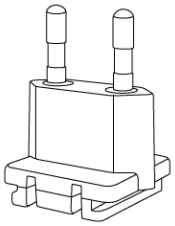
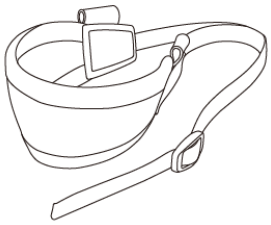
Getting Started

Product Standard Accessories

The following items are in the product box.

Accessory	Name
	PM85 Battery cover
	Battery pack (Battery may be assembled in the RF851)
	5V / 2A power supply
	Country plug (US / EU / KR plug)
	USB type C cable
	Hand Strap

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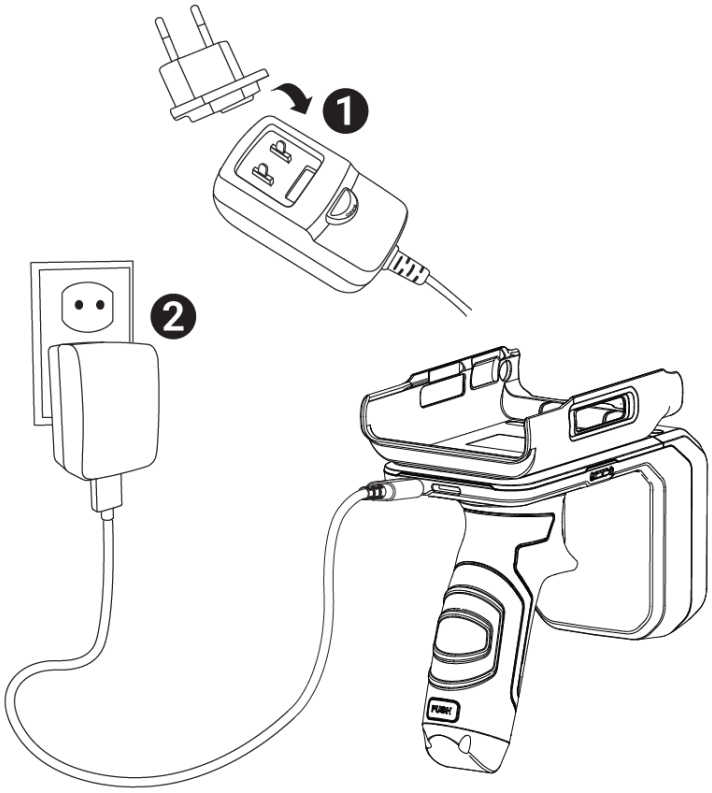
Getting Started

Charge the Device

Charge with AC/DC adaptor

1. Assemble the proper country plug and the AC/DC power supply. And plug USB type C cable to the AC/DC power supply
2. Connect the cable to RF851 and provide power by plugging the power supply to the wall socket

Figure 2 Charge RF851



Caution: *Always use an original power supply from Point Mobile. Other chargers and cables may damage RF851. Also, make sure the connector, charger, cable is not wet.*

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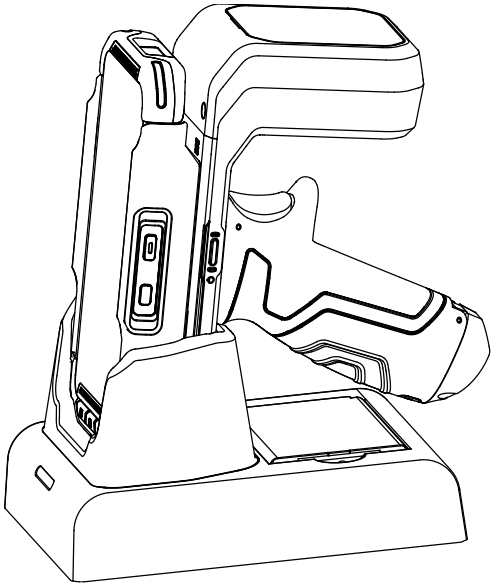
Getting Started

Charging with Cradle

SSC (Single Slot Cradle)

Figure 3 Charging with RF851 and PM85



Charge the RF851 with PM85 mounted through the cradle (Optional accessory: RF85-SSC0, RF85-SEC0). Place the device into the cradle, as shown in Figure 3.

Note: *If you use the cradle to charge, PM85 and RF851 will charge at the same time. Otherwise, PM85 and RF851 are charged individually.*

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Getting Started

4SBC (4 Slot Battery Cradle)

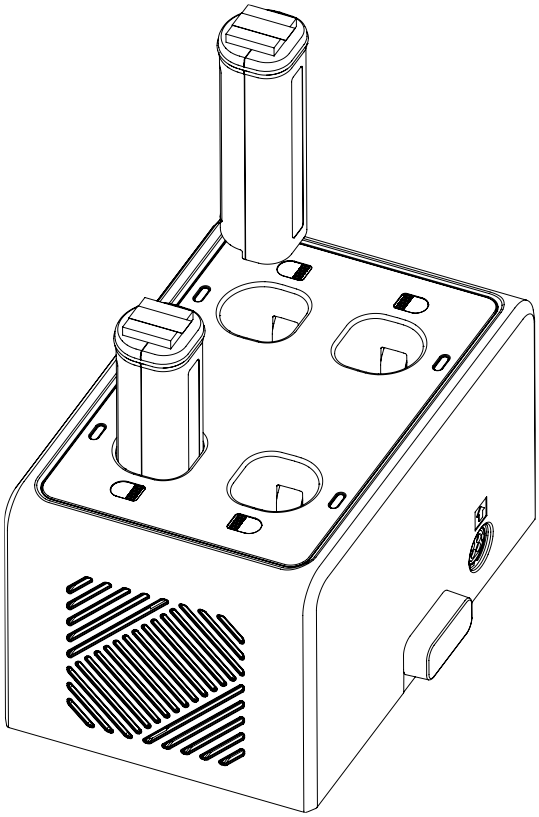
4SBC is a charging cradle for the battery of Point Mobile RFID sled models.

All RFID reader's replaceable batteries can be charged with 4SBC. And the cradle can charge up to 4 batteries at the same time.

Insert the battery into the slot with correct orientation. The LED indicator next to the slot will light up to confirm the charging. (Red – Charging / Green – Fully charged)

Find more detail in RF851 4SBC Quick Start Guide.

Figure 4 Charge battery with 4SBC



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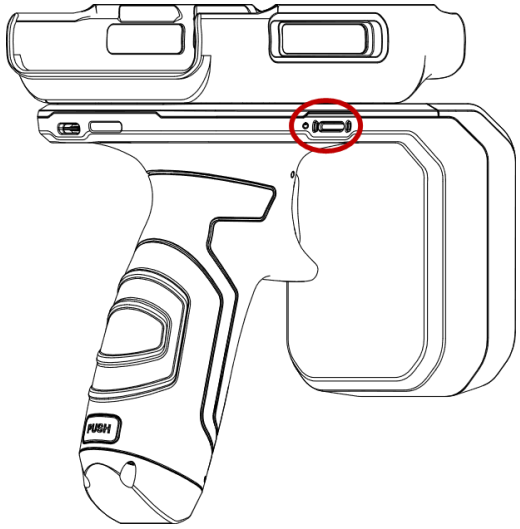
Getting Started

Turn on/off the Device

To turn on/off the RF851, press and hold the power button until the turning on/off notification sound rings and RF851's LED indicator lights on/off.

Figure 5 RF851 Power button



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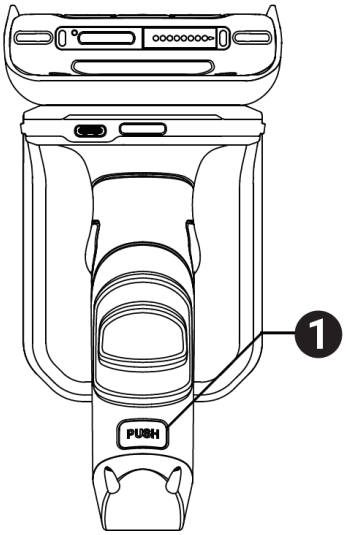
Getting Started

Replace the Battery

When the battery level is low, simply replace the battery with a charged one.

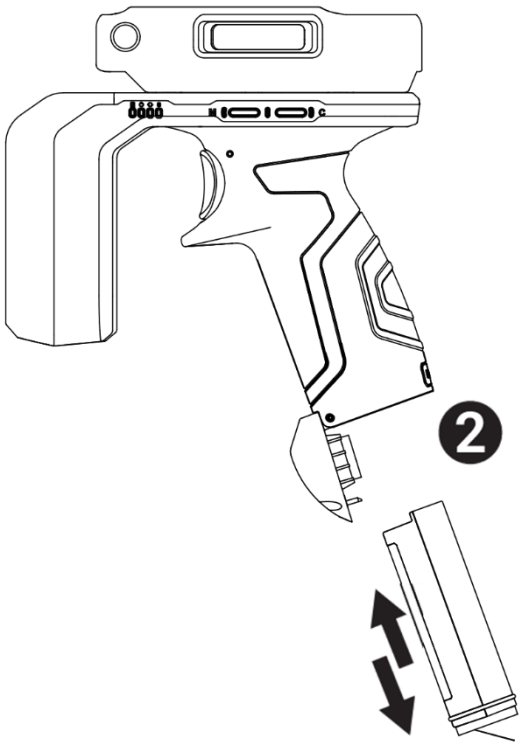
1. Press Battery release button on the back of the handle to open the battery cover

Figure 6 Battery release button



2. Remove the battery and replace it

Figure 7 Replace battery



3. Close the battery cover firmly until it clicks

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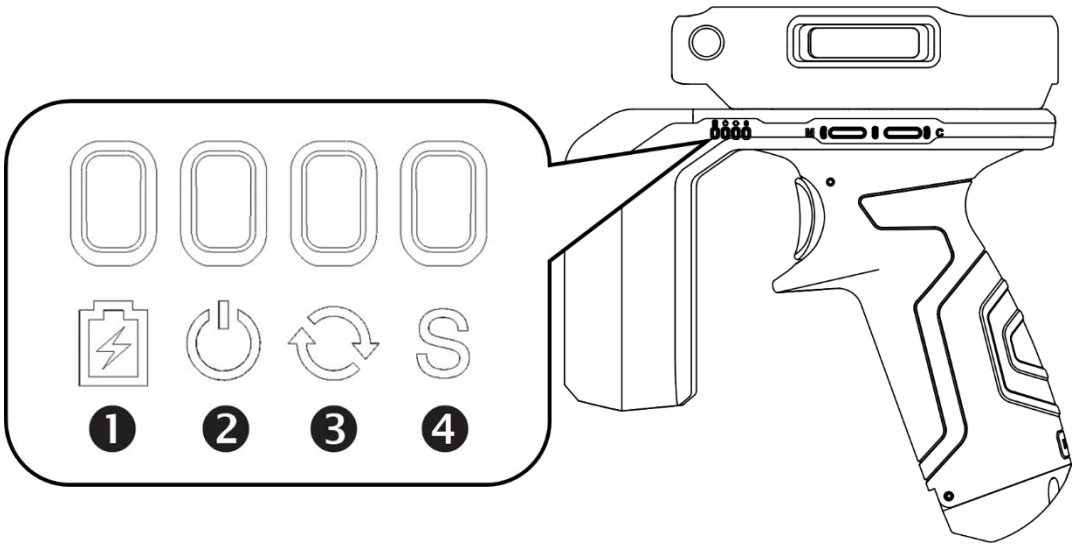
Getting Started

LED Indicator

Figure 8 RF851 LED Indicator



No	Indicator	Status	Indication
1	Charging LED	Solid red	Battery is charging
		Solid green	Battery is fully charged
		Alternately blinking green & red	Battery fault
2	State LED	Solid red	Power on
		Blinking red	Low battery
		Solid green	Bluetooth is connected
		Alternately blinking green & amber	Bluetooth is connected and battery is low
3	Connect-Mode LED	Turned off	SPP communication
		Solid Red	UART communication
4	Trigger-Mode LED	Turned off	UHF RFID ready
		Solid Red	Barcode scan ready

Note: *When RF851 enters sleep mode (10 minutes after last operation), all LED indicators will turn off.*

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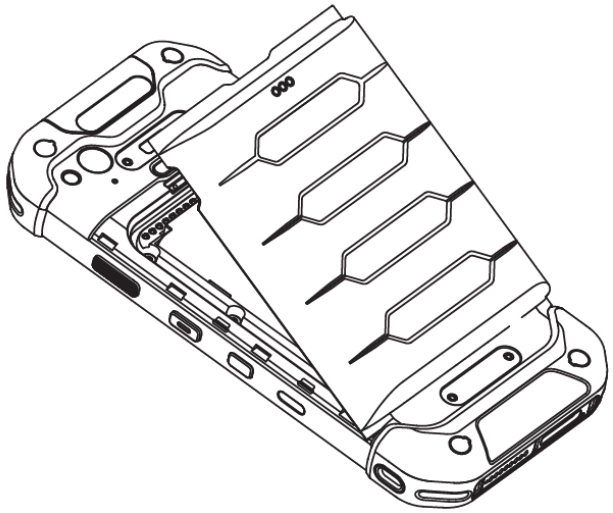
Getting Started

Install PM85

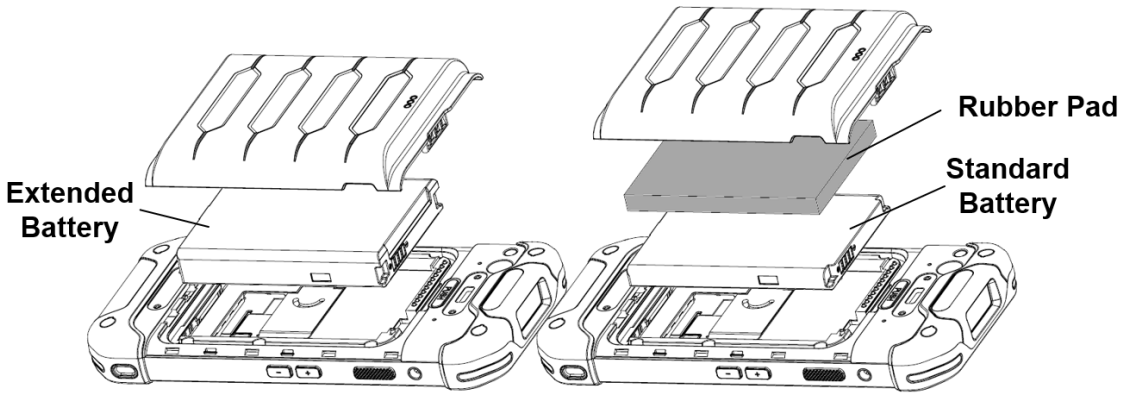
1. Remove and replace the PM85 battery cover with the RF851 exclusive battery cover

Figure 9 Installing RF851 battery cover



Caution: *If you are using PM85 with extended battery, remove the rubber pad before installing the RF851 exclusive battery cover. The rubber pad is for supporting the space between the battery cover and standard battery.*

Figure 10 Battery cover and rubber pad



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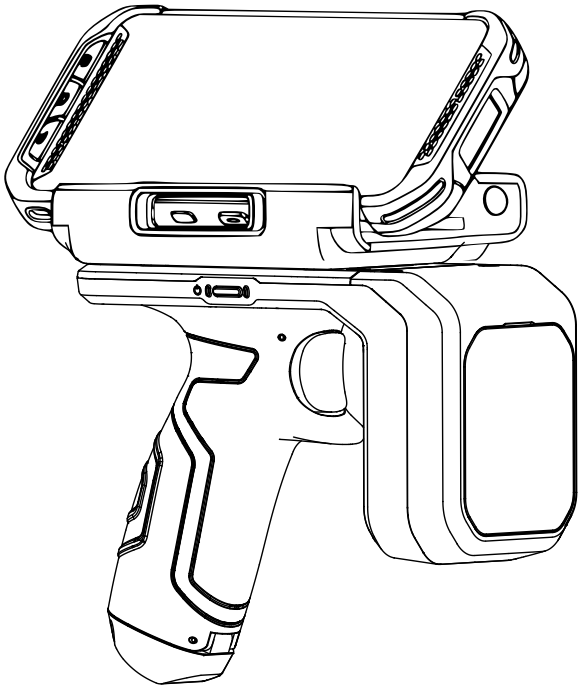
Getting Started

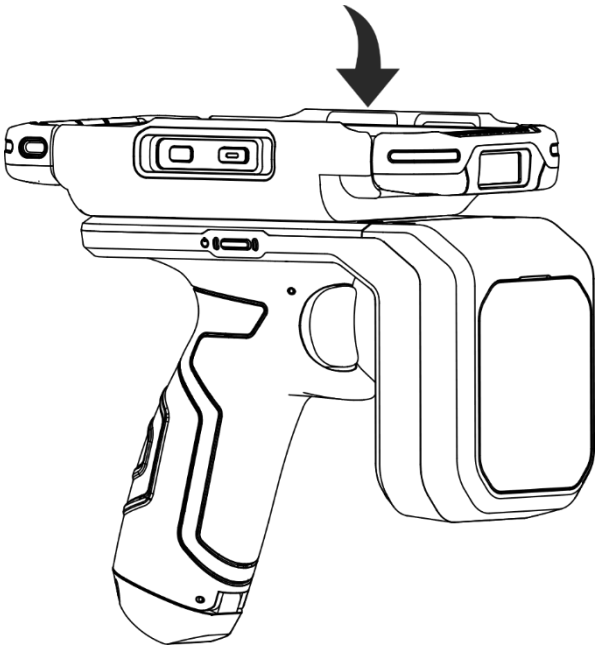
2. Place the left or right side of the PM85 on the retention fixture first

Figure 11 Installing PM85_1



3. Push down the other side firmly

Figure 12 Installing PM85_2



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Bluetooth Connection

Install the RFID Control App

Connect your PM85 and RF851, and set up the configuration of the RF851 with **RFID Control** application. **RFID Control** can be downloaded from Point Mobile Service Portal website.

This guide only describes a few basic features of **RFID Control**, so please find more detail information in RFID Control User Guide.

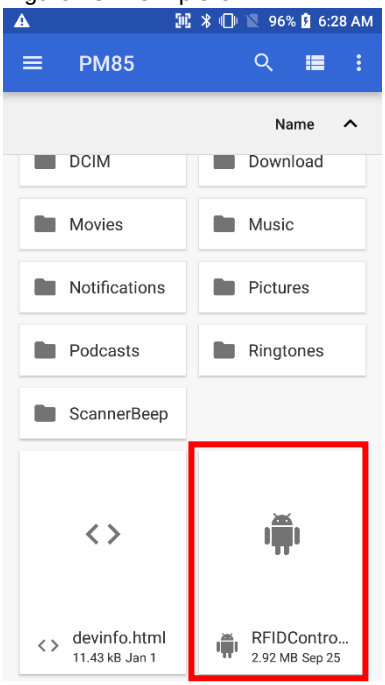
To install RFID Control,

1. Access to Service Portal and log in

   Note: *If you don't have the login account, please contact your local reseller. If you are a business partner of Point Mobile but didn't get the account, please contact Point Mobile.*

2. Go to the **Download** board and find a post titled as **RFID Control Apps & Document**
3. Download the **RFID Control** application
4. Copy the apk file to PM85
5. Go to **FileExplorer** from PM85 App drawer, and install the app

Figure 13 FileExplorer



6. To run the app, tap **RFID Control** from App drawer or **EmKit**

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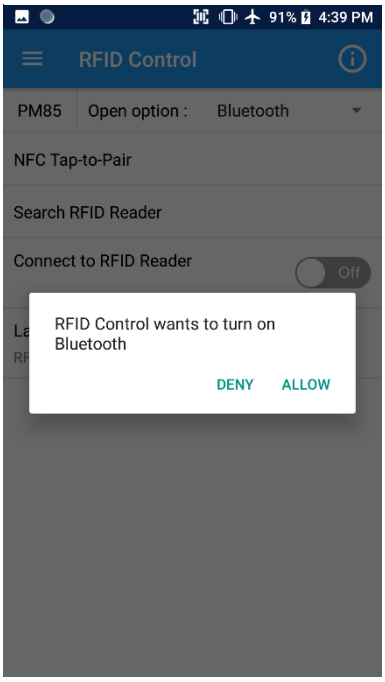
Bluetooth Connection

Bluetooth Pairing with PM85

RF851 and PM85 can be connected through Bluetooth. Bluetooth connection will establish by **RFID Control**. If the Bluetooth is turned off when the **RFID Control** is launched, the app tries to turn on the Bluetooth automatically.

Figure 14 Bluetooth turn on dialog



Tap **ALLOW** to turn on the Bluetooth. Or tap **DENY** to disagree with turning on Bluetooth. But if you deny to turn on Bluetooth, **RIFD Control** will be closed. If the Bluetooth is already turned on, the dialog will not be shown.

There are two ways for connecting RF851 with PM85, Tap-to-Pair and Searching RFID reader. Choose more comfortable method.

Note: NFC Tap-to-Pair or Search RFID reader

- ***NFC Tap-to-Pair****: Easy automatic pairing and connection process with a single tap*
- ***Search RFID reader****: Normal pairing and connection process with manual steps*

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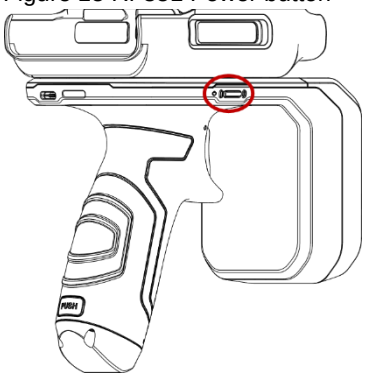
Bluetooth Connection

Tap-to-Pair

RF851 has NFC tag for supporting Tap-to-Pair. To connect the RF851 with PM85,

1. Press and hold the Power button to turn on RF851

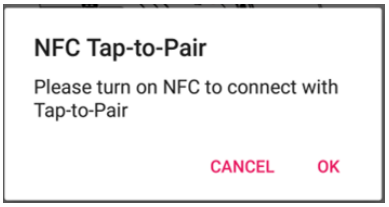
Figure 15 RF851 Power button



2. Tap NFC Tap-to-Pair on the main screen of **RFID Control**

Note: *NFC is enabled by default. But if NFC is turned off, app will ask to turn on NFC. Tap* ***OK*** *and tap NFC toggle switch to enable NFC.*

Figure 16 NFC turn on dialog



Or before access to Tap-to-Pair screen, enable NFC with one of below ways.

- ***Settings*** *>* ***Connected devices*** *> NFC toggle switch*
- *Open Quick setting panel > Enable NFC*

Figure 17 NFC_Settings

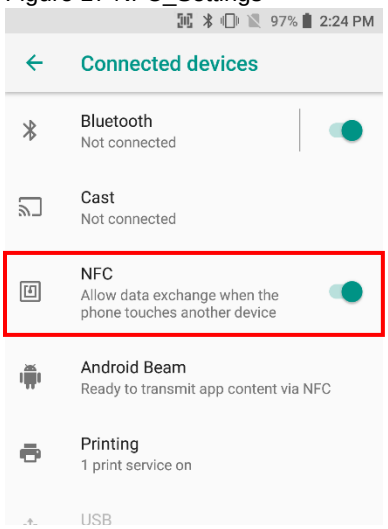
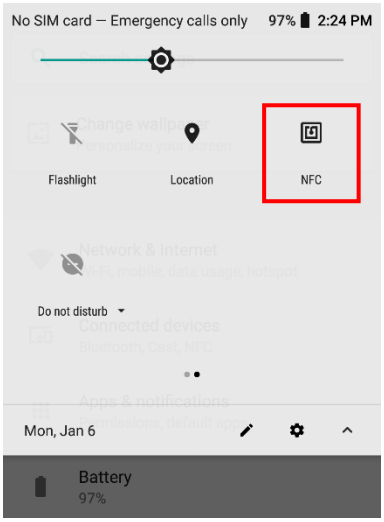


Figure 18 NFC_Quick setting panel



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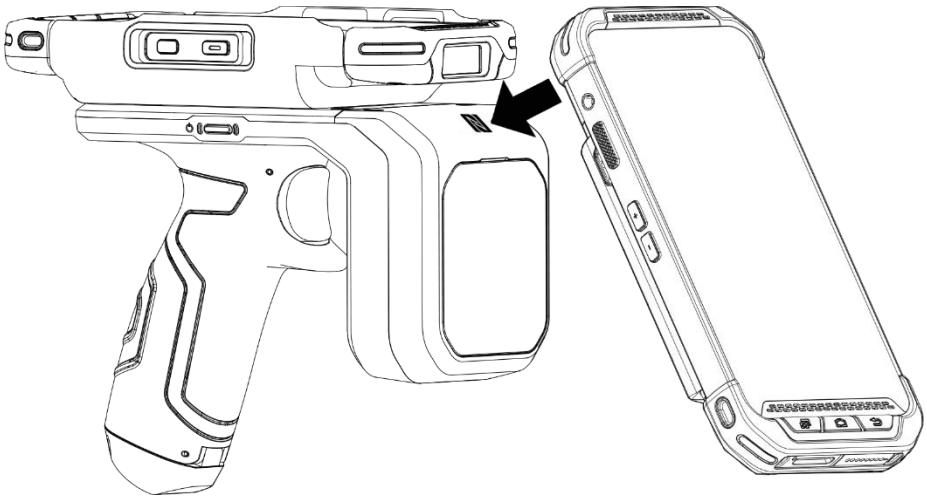
Bluetooth Connection

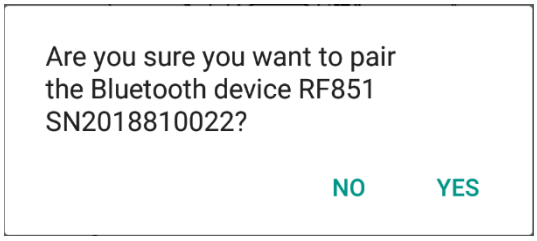
3. Align NFC logo of RF851 with NFC antenna of PM85, and bring RF851 close to PM85 as the picture on the screen

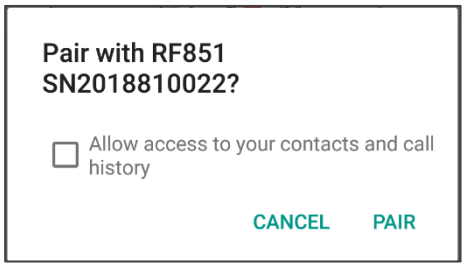
Figure 19 Tap-to-Pair



4. Tap **YES** and then tap **PAIR** on the dialogs for Bluetooth pairing

Figure 20 Bluetooth pairing dialog





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Bluetooth Connection

5. Check the device and reader are connected properly
   - Enabled **Connect to RFID Reader** toggle switch and connected RF851's name is displayed
   - An icon indicating the RF851's battery level is shown on the status bar
   - RF851's status LED flashes green

Figure 21 Bluetooth connected screen

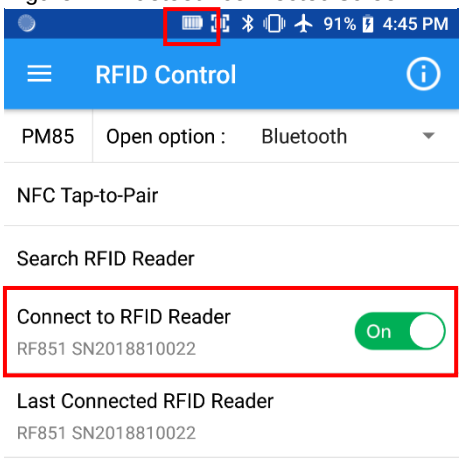
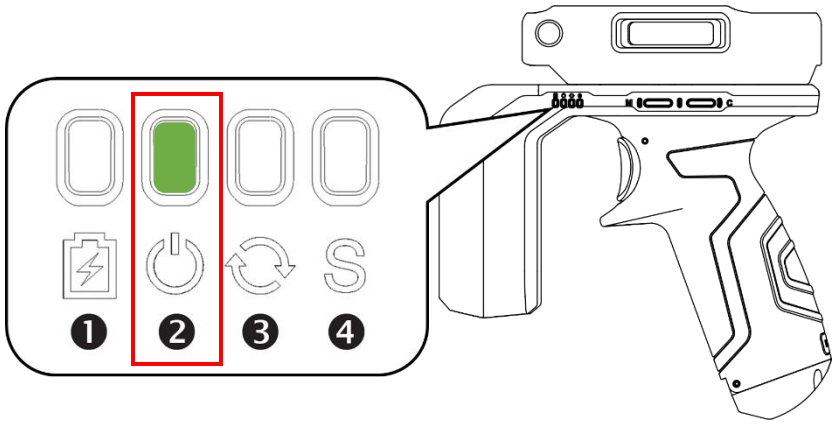


Figure 22 RF851 status LED_Bluetooth connected



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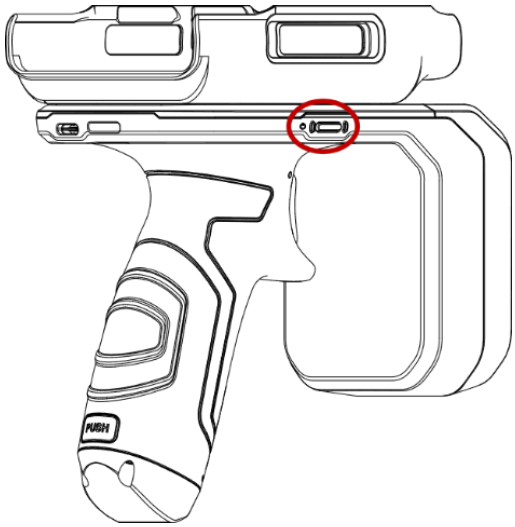
Bluetooth Connection

Search RFID Reader

Second method for connecting RF851 with PM85 is searching nearby RFID readers.

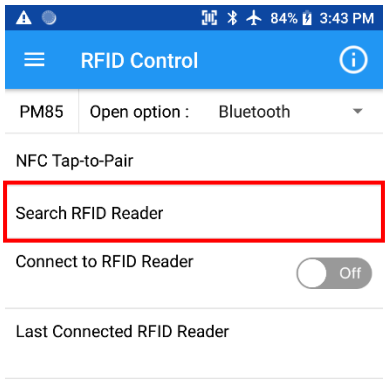
1. Press and hold the Power button to turn on RF851

Figure 23 RF851 Power button



2. Run **RFID Control** and tap **Search Reader** to search nearby RFID readers

Figure 24 Search RFID Reader



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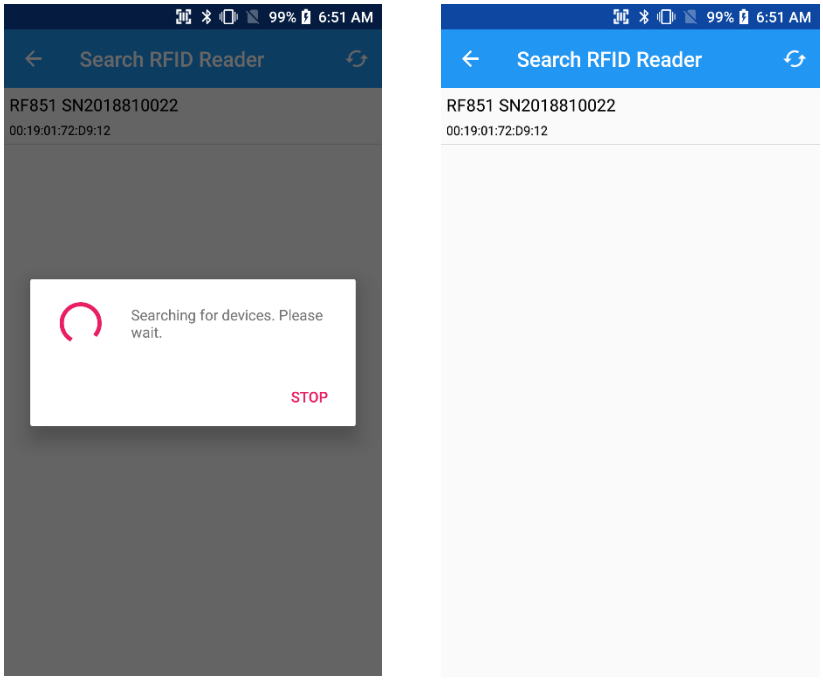
Bluetooth Connection

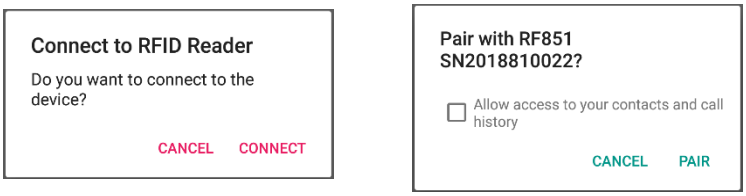
3. When desired RF851 name appears, stop searching by tapping **STOP** and select the name

Figure 25 Searching RFID reader



4. Tap **CONNECT**, and then tap **PAIR** on the dialogs

Figure 26 Connect dialogs



5. Check below items to confirm that RF851 is connected properly (Refer to **Figure 21, 22**)
   - Enabled **Connect to RFID Reader** toggle switch and connected RF851's name is displayed
   - An icon indicating the RF851's battery level is shown on the status bar
   - RF851's status LED lights on green

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Bluetooth Connection

Disconnect

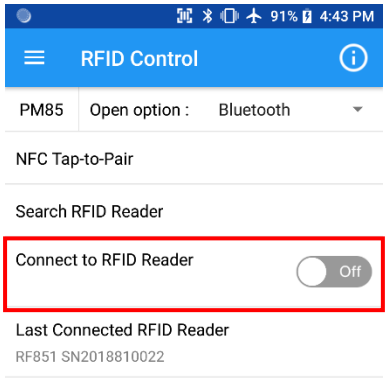
To close the Bluetooth connection,

- Turn off the RF851
- Tap **Connect to RFID Reader** toggle switch until it turns to **Off**

Reconnect

To reconnect to the last connected RFID reader, tap **Connect to RFID Reader** toggle switch and wait until the connection is established.

Figure 27 Connect to RFID Reader



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Configuration Settings

RF851 configuration contains below settings.

- Beep Volume
- Radio Power
- Tx Data Format
- Filter
- Tag Focus
- Continuous Read
- Auto read interval
- Reset RFID Setting
- Vibrator
- Tx Cycle
- Filter duplicate tags
- Inventory Config
- Fast ID
- Auto Read
- Save Log

Apply Configuration

To adjust configuration, use RFID Control app or importing JSON file.

Apply via RFID Control

After completed pairing, you can access to Configuration. Tap ☰ to open the side menu bar and select **Configuration**. And then, adjust desired configuration.

Figure 28 Side menu bar - Configuration

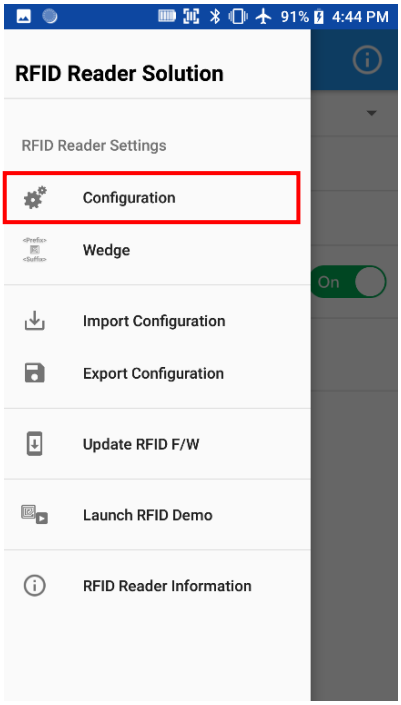
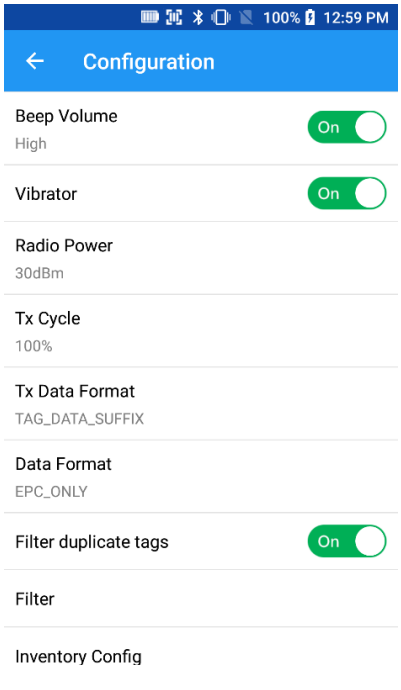


Figure 29 Configuration



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Configuration Settings

Apply via JSON file

You can also apply the configuration by importing the JSON file which contains configuration.

The JSON file for configuration update can be made by RFID Control Configuration Tool. And it must be named as **Configuration.json** and copy it to **RFIDControl/RFIDJsons** folder of host device's internal storage.

***Note**: Must follow the file name and path. Otherwise, RFID Control cannot find the file.*

You can perform configuration update automatically or manually. Refer to below table to identify the differences and choose more suitable on your working environments.

Methods	Description
Auto Update	• Set auto update settings in JSON file • Importing configuration every time the RFID reader is connected while RFID Control is running
Manual Update	• Perform regardless the auto update is enabled or disabled. • Perform update immediately

Auto Update

RFID Control app reads the **Configuration.json** file when the app is launched without any connection with RF851 and detect whether Auto Update is determined in the file. If Auto Update is set, importing configuration is performed automatically every time RF851 is connected while RFID Control is running.

To set Auto Update by JSON file,

1. Using RFID Control Configuration Tool, save a **Configuration.json** file containing the enabled configuration auto update setting.
2. Save the JSON file and copy it to the **RFIDControl/RFIDJsons** folder of host device.
3. Launch RFID Control without any connection with RF851.

***Note**: The JSON file must be named **Configuration.json,** and the file location must be **RFIDControl/RFIDJsons** folder.*

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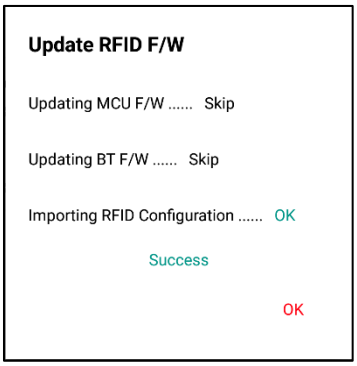
Configuration Settings

When you set up Auto Update,

- Auto Update will be performed every time the RF851 is connected while RFIDControl is running

Figure 30 RFIDControl - Auto Update Configuration dialog



- Auto Update setting value will be maintained until next reading Configuration.json file
  (The file is read when RFIDControl is launched without any connection with RF851)

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Configuration Settings

Manual Apply

To apply the configuration immediately using the JSON file you want, perform update manually.

1. Copy the **Configuration.json** file to the specified folder of internal storage.
2. Tap ☰ to open the side menu bar and select **Import Configuration.**
3. Tap **IMPORT** and wait until the process is done.
   (No need to select JSON file manually because the app will automatically find and use it in the specified folder.)

Figure 31 RFID Control - Import Configuration

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Wedge Settings

Wedge contains the below values.

- Result Type
- Terminator
- Prefix
- Suffix

Apply Wedge

To adjust wedge setting, use RFID Control app or importing JSON file.

Apply via RFID Control

After completed pairing, you can access **Wedge**. Tap ☰ to open the side menu bar and select **Wedge**. And then, adjust desired configuration.

Figure 32 Side menu bar - Wedge

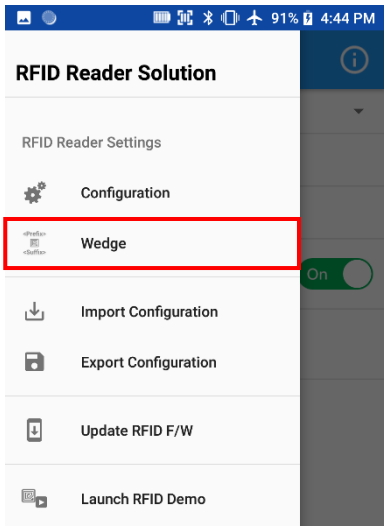
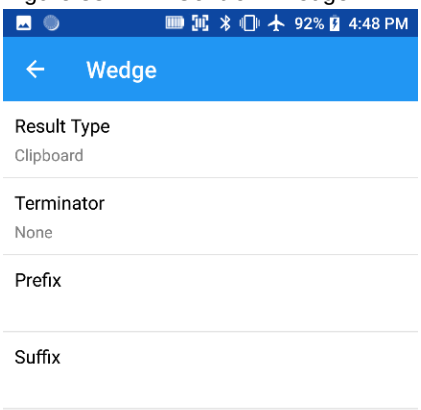


Figure 33 RFID Control - Wedge



Apply via JSON file

See Apply via JSON file in Configuration Settings. If the JSON file contains wedge setting values, Wedge settings are applied at the same time when you apply the configuration settings via the JSON file.

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Firmware Update

To improve the performance of RF851, Point Mobile provides up-to-date firmware. The firmware files are provided by RFU file format, and it contains Bluetooth firmware and MCU firmware.

Note: *Before start,*

- *Download RFU file from Point Mobile Service Portal*
- *Copy the RFU file to* ***RFIDControl/RFIDRFUs*** *folder of host device internal storage.*
- *Firmware update is only available when the current firmware is 93.03 (Oct 30 2020) and higher.*

You can perform update automatically or manually. Refer to below table to identify the difference between the two update processes.

Methods	Description
Auto Update	• Set auto update settings and firmware file name in JSON file • Update Firmware every time the RFID reader is connected while RFID Control is running
Manual Update	• Select firmware file manually in RFID control • Perform update immediately

Auto Update

To set up the firmware auto update,

1. Save **Configuration.json** file containing the enabled firmware auto update setting.
   - Find detail in RFID Control Configuration Tool User Guide.
2. Copy the JSON file into the **RFIDControl/RFIDJsons** folder of host device.
3. Launch RFID Control without any connection with RFID reader.
   - Then, the app reads the JSON file and detects whether auto update is enabled or not in the file.
4. Connect an RFID reader.

Note*: The JSON file is same file as the one used for configuration update. Must follow the file name and path.*

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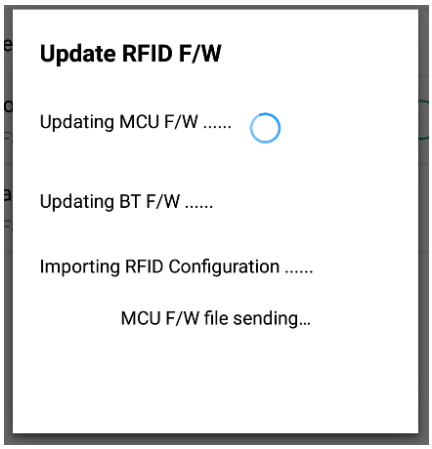
Firmware Update

When you set up Auto Update,

- Auto Update will be performed every time the RF851 is connected while RFID Control is running
- Auto Update setting value will be maintained until next reading JSON file
  (JSON file is read when RFID Control is launched without any connection with RF851)

Figure 34 RFID Control - Auto Update via JSON



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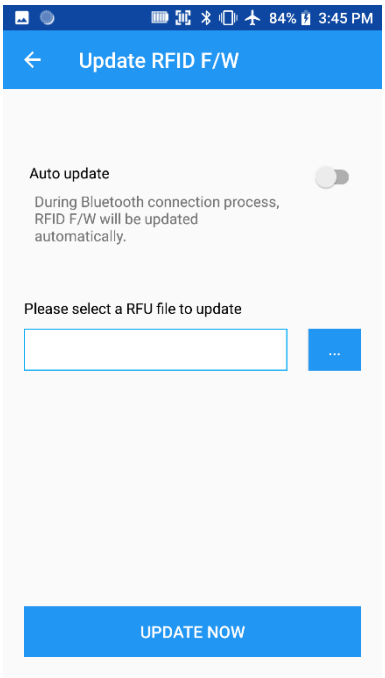
Firmware Update

Manual Update

To update the firmware of RF851 manually,

1. Execute RFID Control and connect RF851 to host device with Bluetooth
2. Tap ☰ and select **Update RFID F/W**
3. Tap ... to browse the RFU file you prepared

Figure 35 RFID Control - Update RFID F/W



4. Select the RFU file and Tap **UPDATE NOW**
5. Wait until the update process is done

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Read RFID Tag

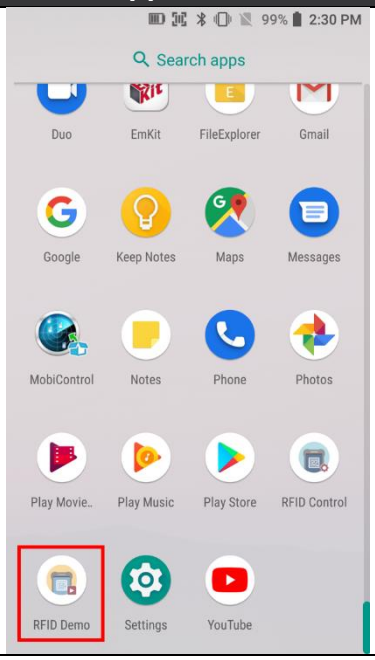
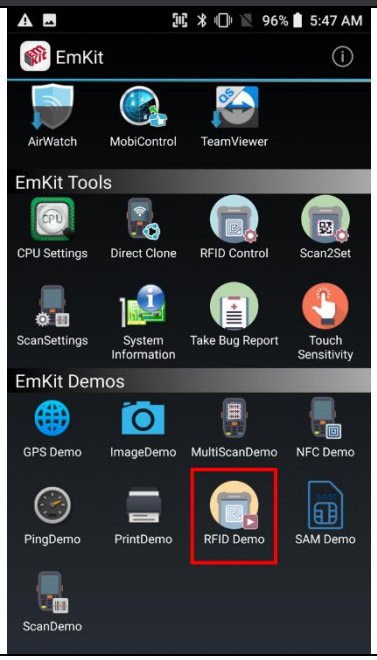
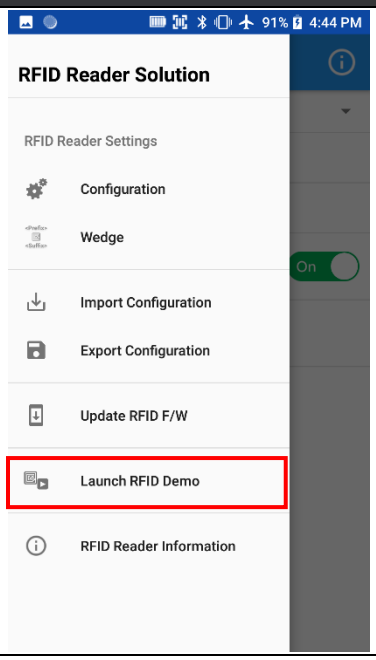
RFID Demo

You can demonstrate the function of reading an RFID tag with **RFID Demo**. **RFID Demo** will be installed together with **RFID Control**.

***Note: RFID Demo** is compatible with PM85 running **85.05 and above**. Please update your PM85 if the OS version is lower.*

There are two ways to launch **RFID Demo**,

- Tap **RFID Demo** from App drawer or **EmKit**
- Open the side menu bar on the **RFID Control** and tap **Launch RFID Demo**

App drawer	EmKit	RFID Control
		

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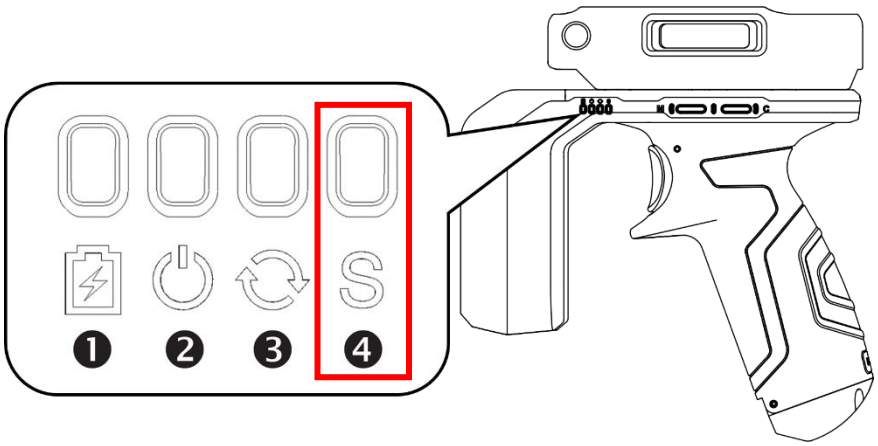
Read RFID Tag

Read the RFID Tag

Before read RFID tag, make sure that the Trigger-Mode LED lights off. Turned off Trigger-Mode LED means that RF851 is in UHF RFID mode. If the LED lights on red, press and hold the Trigger-mode change button until the LED turns off because red Trigger-Mode LED means RF851 is in barcode scan mode.

Figure 36 RF851 Trigger-Mode LED



Read RFID tags after pairing the RF851 to your PM85. To read RFID tags, aim the tag and then press the trigger button of RF851 or tap the **Read RFID Tag** button on the screen.

Figure 37 Reading RFID tag

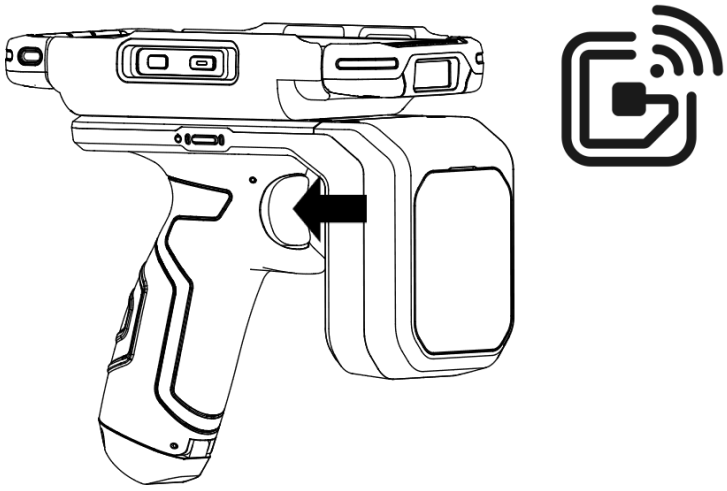
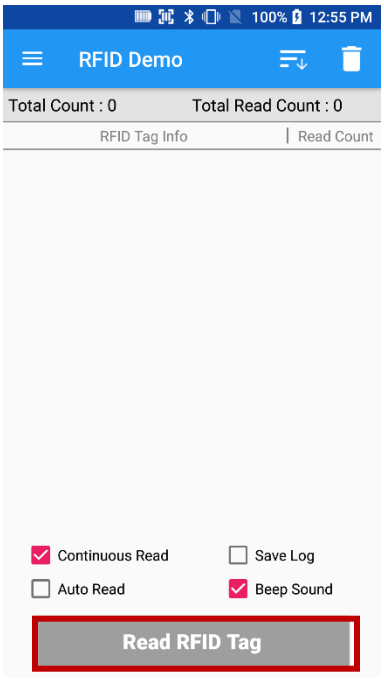


Figure 38 RFID Demo - Read tag



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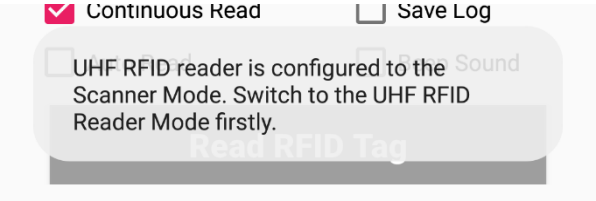
Read RFID Tag

Note: *If you perform trigger action (press trigger button on RF851 or Read RFID Tag) while the RFID Demo is running and RF851 is in barcode scan mode, a toast message pop up on the screen.*

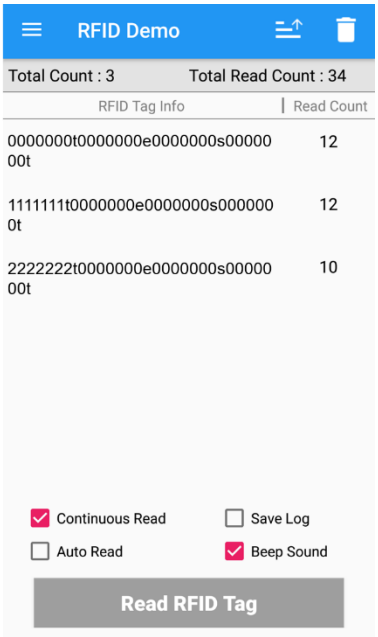
Figure 39 RFID Demo - Barcode scan mode message



RFID Demo cannot get barcode data. For demonstrating barcode scan function, use Scan Demo application.

Tap to sort the delivered tag data in order and tap to clear the tag data.

Figure 40 RFID Demo - Read tags



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Scan a Barcode

If you want to scan a barcode instead of RFID tag, change the trigger mode of RF851. Trigger button will activate the barcode scan action.

1. Press and hold the Trigger-mode change button until the Trigger-Mode LED turn on red

Figure 41 RF851 Trigger-mode change button

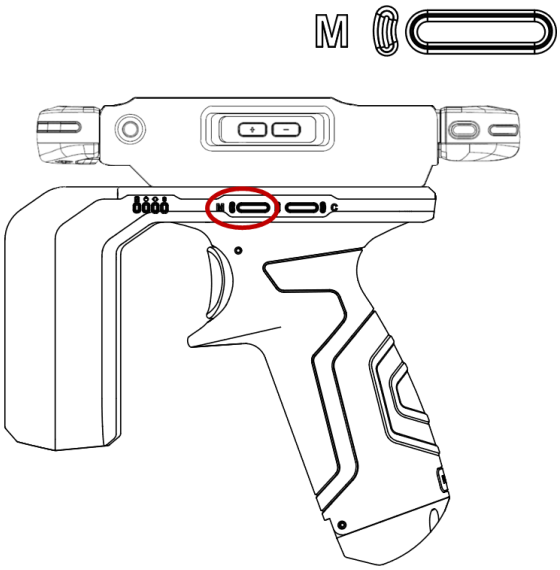
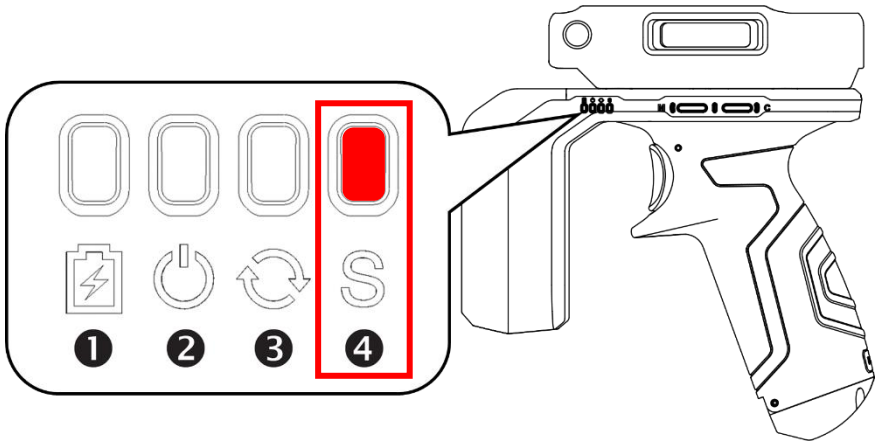


Figure 42 RF851 Trigger-Mode LED



2. Execute **Scan Demo** or scanner application, and then scan a barcode by pressing the trigger button of RF851
3. Check the barcode information displayed on the app

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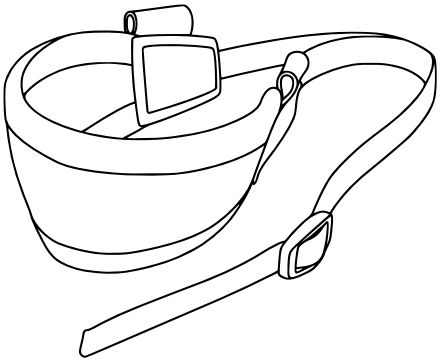
Accessory

A hand strap is enclosed in the RF851 package. Attach the strap and carry the reader more comfortably.

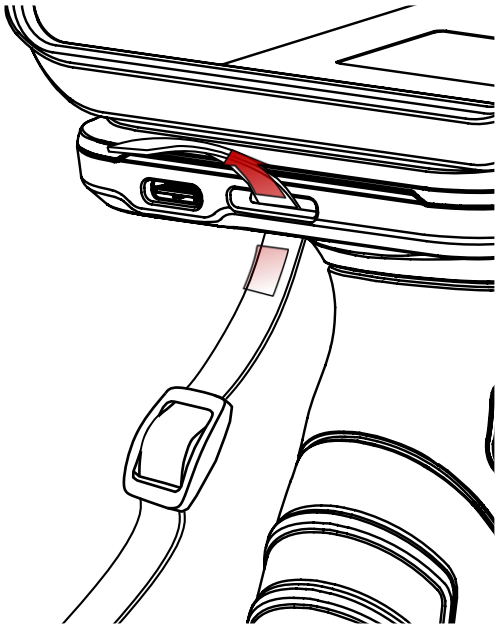
Figure 43 Hand strap



To attach the hand strap,

1. Thread the strap through the hand strap hole next to the USB connector.

Figure 44 Attach hand strap_1



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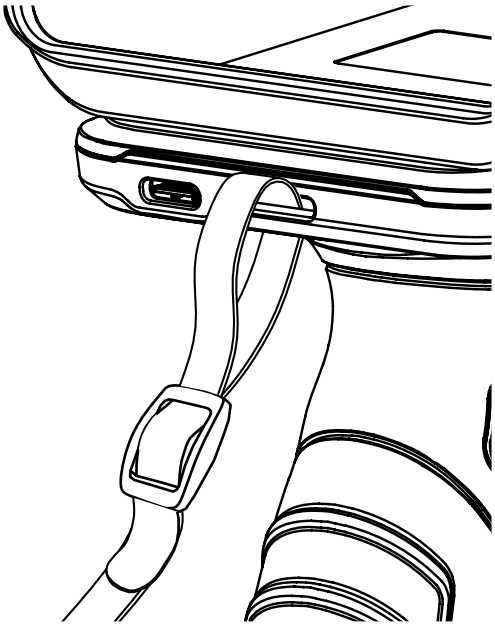
Accessory

2. Slide the strap through the buckle at the appropriate length.

Figure 45 Attach hand strap_2



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Safety Information

Battery Safety Information

Follow the battery safety guidelines for safe usage, storage, and disposal of Li-ion batteries. Improper battery use may result in a fire, explosion, or other critical hazards.

Battery Safety Guidelines

- Use only Point Mobile approved batteries and charging accessories. Other batteries and chargers may damage the device or result in a fire, leakage, or other hazards.
- Do not expose the battery to excessive heat or cold.
- Do not use or store the battery in or near areas that might get very hot, such as in a parked vehicle, near a heat duct or close to other heat sources.
- Do not allow objects that may cause a short circuit, such as metal objects, corrosive substances, or liquids like water, to contact the battery.
- Do not disassemble, crush, bend, shred, press, or other actions that may damage or deform the battery.
- Do not use or replace the battery on the go or from a high location. Dropping may result in an explosion or fire.
- Do not put any labels, stickers, tags, etc. on the device or battery. Performance of the device or battery, such as sealing, drop, or tumble, could be affected.
- Close supervision is necessary when used near children to avoid the risk of injury.
- If battery leakage is observed, avoid any contact with the skin or eyes and properly dispose of the battery. If contact has been made, wash the affected area with water for 15 minutes and seek medical advice.
- If you notice any type of damage to the battery, such as swelling, dents, and leaks, stop using it immediately and contact Point Mobile.

Battery Charging Guidelines

- Charge the battery in a clean, cool, dry, and ventilated environment.
- Separate the charger from the battery as soon as possible when the battery is fully charged.
- Battery performance can degrade due to the stress of daily charging and discharging. Batteries typically need to be replaced after 300 to 500 charging cycles (full charge-discharge cycles) or when the battery capacity has been reduced to 70 ~ 80% of its original capacity. The actual number of charging cycles varies based on usage patterns, temperature, age, and other factors.

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Safety Information

Battery Storage / Disposal Guidelines

- Store the batteries in a clean, dry and ventilated environment within ambient temperature ranges of 20±5℃.
- For safety regulations, batteries are charged to below 20~30% of full capacity during production.
- When not using batteries for a long period, charge the battery for 30 minutes to 1 hour at least once every 6 months to prevent full discharge and keep the performance.
- Batteries should be stored separately when storing for long periods. Disconnect from any device, charger, or cradle.
- Dispose of used batteries promptly according to local disposal regulations.
- Do not dispose of the battery in fire. It may cause explosion.

Notice: The battery is consumable. Point Mobile provides a warranty for the battery for 12 months after purchase.

If you suspect the battery swelling, change the battery immediately and contact Point Mobile.

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