ARKSCAN®

RFID/UHF READER (Model: U100)

User Manual

V 1.0

REVISIONS

Rev Number	Date	Description
01	January 05, 2018	Initial

Table of Content

1. Introduction

Arkscan U100 handheld UHF RFID wand is a high-performance RFID reader designed for asset and inventory management, and powered by easy-to-use UHF Tag manager software application. With its accurate reading capability, it allows user to manage large amount of item's UHF tags within seconds. Furthermore, comparing with traditional barcode system, the UHF Reader U100 may detect tags without LoS (Line of Sight) restriction which it is an ideal technology for practical operation in warehouse, retail, logistic and other industries. It has no doubt the UHF RFID is a better choice to save time and effort while you need an efficient way to manage assets and inventory's items.

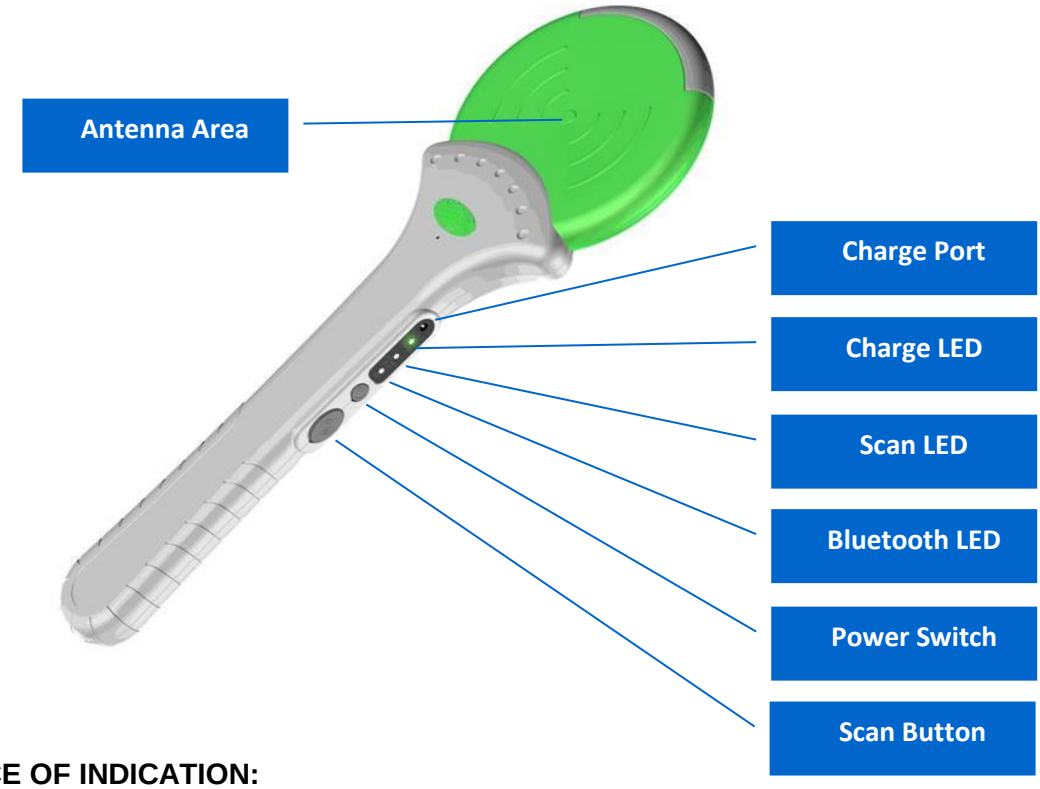
With Bluetooth communication, the user may perform tag reading without the restriction of location and distance from the host computer. The U100 UHF Reader can read tags up to 6 feet away, and user can operate the reader as far as 30 feet away from the host computer by sending tags data back to the host computer via the Bluetooth wirelessly.

It comes with an user-friendly UHF Tag manager is designed to create inventory item list or check list in one scan button away, and allows user easily to detect which items or asset are missed in a few seconds; the UFH Reader can be utilized as a detector to locate where a particular item tag is nearby, which it helps to locate an item much easier.

2. Hardware specification

CURRENT CONSUMPTION	Charge: 5 VDC. Battery: Li-Po 3.7 VDC/2500mAh.
RFID PROTOCOL SUPPORT	EPC Class 1 Gen 2, ISO18000-6C
SUPPORT EPC DRM	YES
FREQUENCY	840~960MHz band (26.5dBm)
RF POWER	10~27 dBm
TYPICAL MAXIMUM READ	Range 30~300 cm. (In ideal conditions depending on tag)
DEMODULATION	ASK or PR-ASK
DATA ENCODING	FM0 or Miller code
BACKSCATTERING LINK FREQUENCY	Supports uplink data rate of 40,160, 256,320, 640 Kbps
ANTENNA POLARIZATION	Circular Polarization
INDICATION	Internal LED, Audio and Vibration
INTERFACE	Bluetooth 2.0
DIMENSIONS	L415 x W140 x H31 mm
WEIGHT	< 420 gm
ENVIRONMENT	Operating Temp: -0℃ ~ +50℃
CIRTIFICATION	CE / FCC

3. Hardware overview



REFERENCE OF INDICATION:

STATUS	Vibrator	Beep	Bluetooth LED	SCAN LED	Charge LED
Power OFF	X	X	X	X	X
Power ON (Bluetooth Standby)	Vibrating	Beep twice	Flash every 2 seconds	Flash twice	X
Charging	X		Flash every 2 seconds	X	ON
Charge OK	X		Flash every 2 seconds	X	OFF
Bluetooth Link OK	X	X	Flash twice every second	X	X
Inventory Scan	X	X	Flashing	Flash every second	X
Search Scan	X	X	Flashing	Flash every second	X
Search Scan match	Vibrating	Beep ~ Beep	Flashing	ON	X
Battery Low	X	X	Flashing	Red LED Flash	X

4. System Requirements

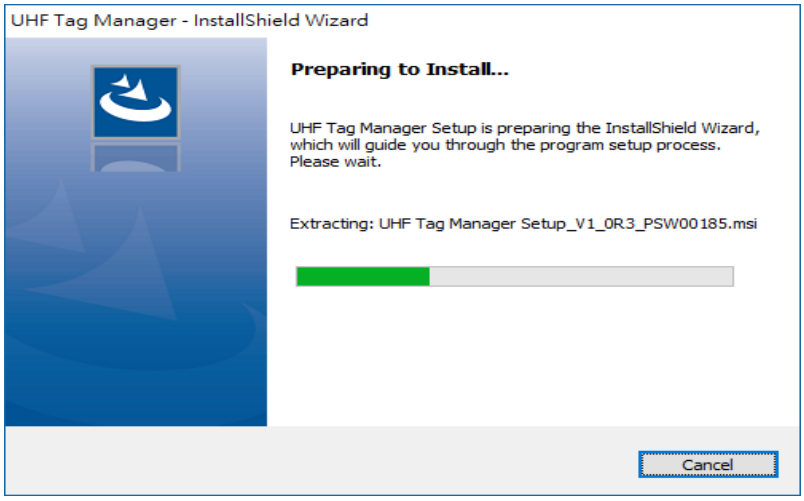
UHF Tag Manager is a Windows-based application, it requires the following:

- Windows 2000/XP/Vista/7/8/8.1/10
- 15 MB free space

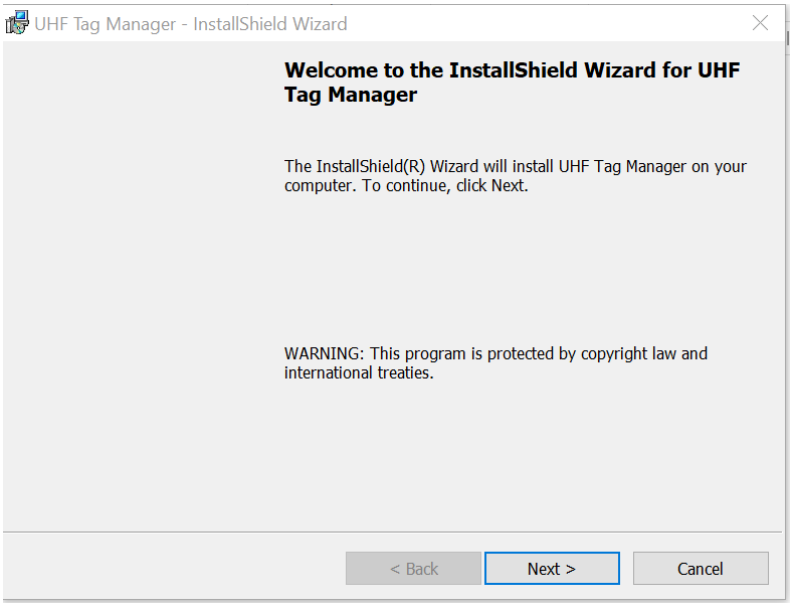
5. Installation

Install the UHF Tag Manager in Windows.

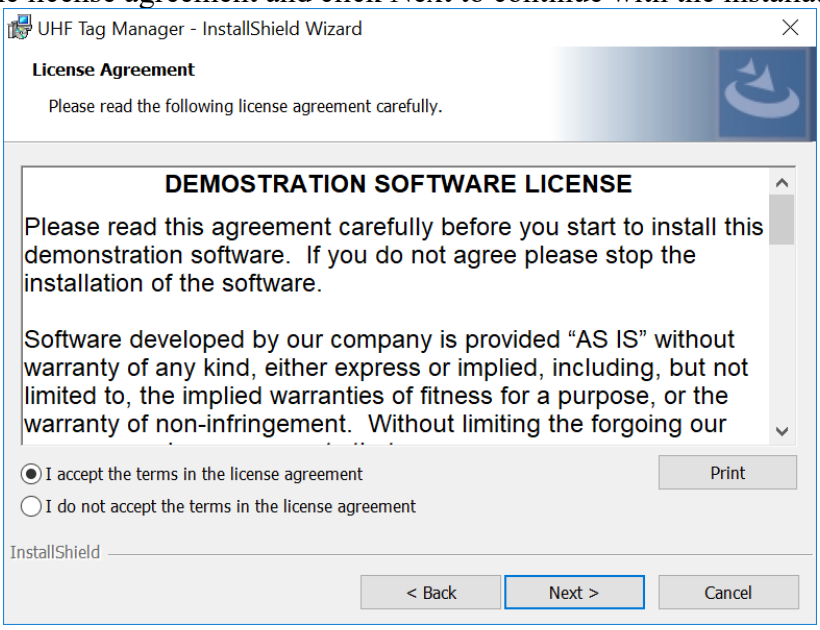
1. Locate the setup file UHF_Manager_Setup_U100.exe in CD that comes with the product package, or download it from Arkscan's website, www.arkscan.com, double click the setup file to execute the installation.



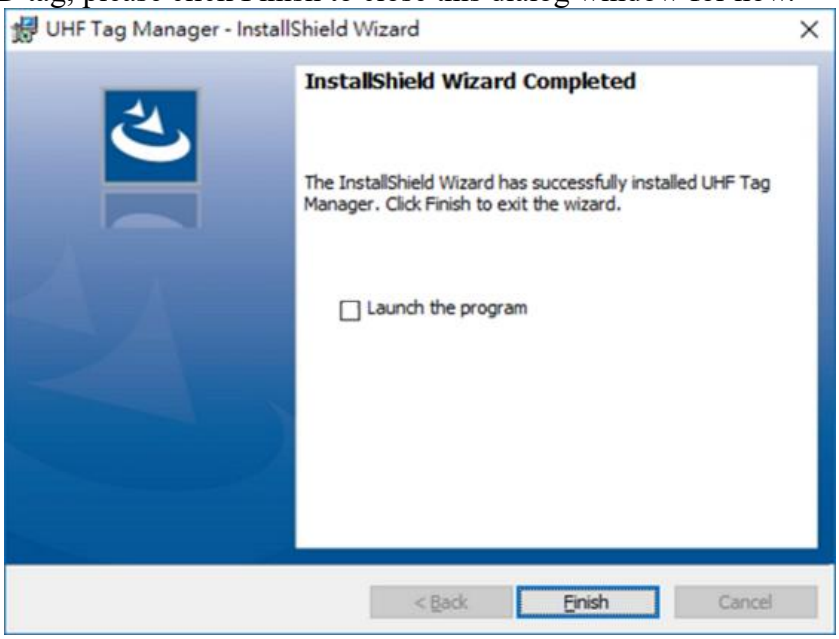
2. Click **Next** to continue.



3. Accept the license agreement and click Next to continue with the installation.



4. When installation is completed, uncheck the ‘Launch the program’ since the Bluetooth connection has to be paired between the UHF reader and this computer before we can scan any RFID tag; please click Finish to close this dialog window for now.

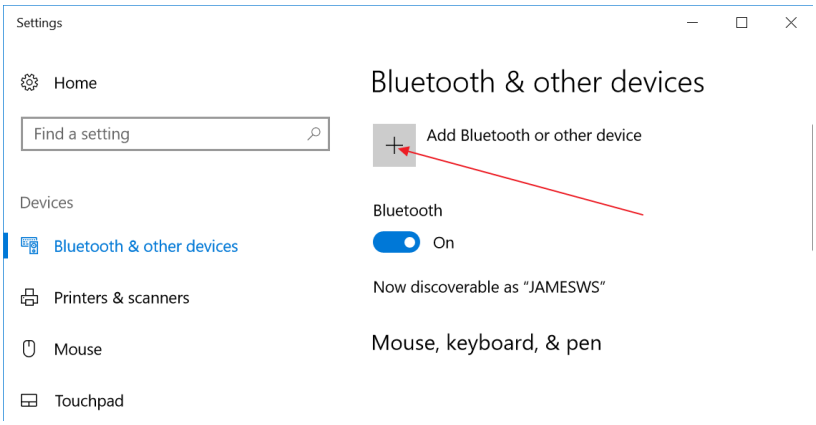


6. Connect UHF Reader with Computer (Bluetooth Pairing)

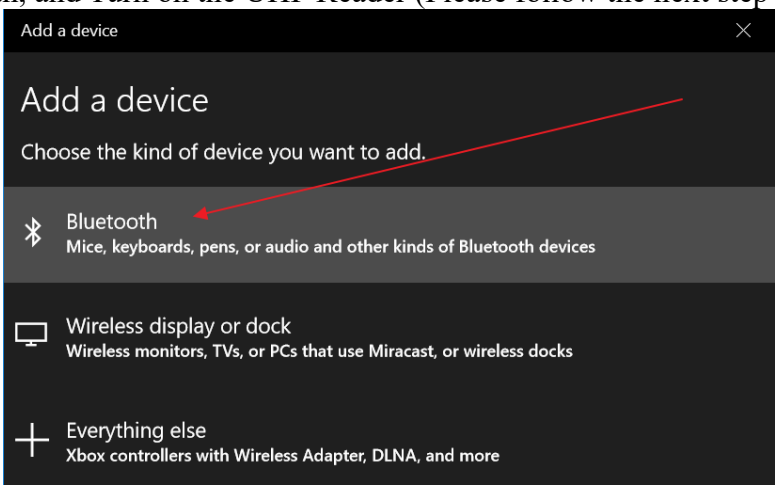
Before you can read RFID tags, you need to pair the UHF Reader with a computer via Bluetooth.
**You must charge the UHF Reader for at least two hours before you perform the pairing at the first time, just to make sure the connection won't be dropped due to lack of battery power.*

Here are the steps to pair the UHF Reader with Windows computer:

1. Go to your Bluetooth setting in Windows, and click + to add Bluetooth device:

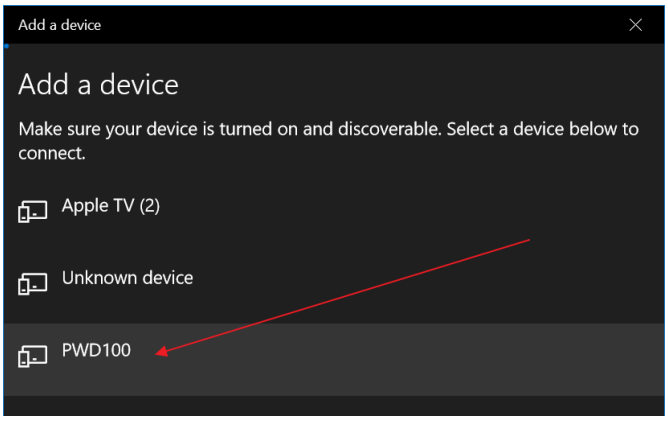


2. Then click Bluetooth, and Turn on the UHF Reader (Please follow the next step below).



3. Turn on the UHF Reader by press and hold the 'Power Switch' for about 2 seconds, you will hear two beeps and a vibrating signal to confirm the UHF reader is turned on; and another way to confirm if the UHF Reader is on, the 'Bluetooth LED' light on the UHF Reader should be flashed once every 2 seconds.

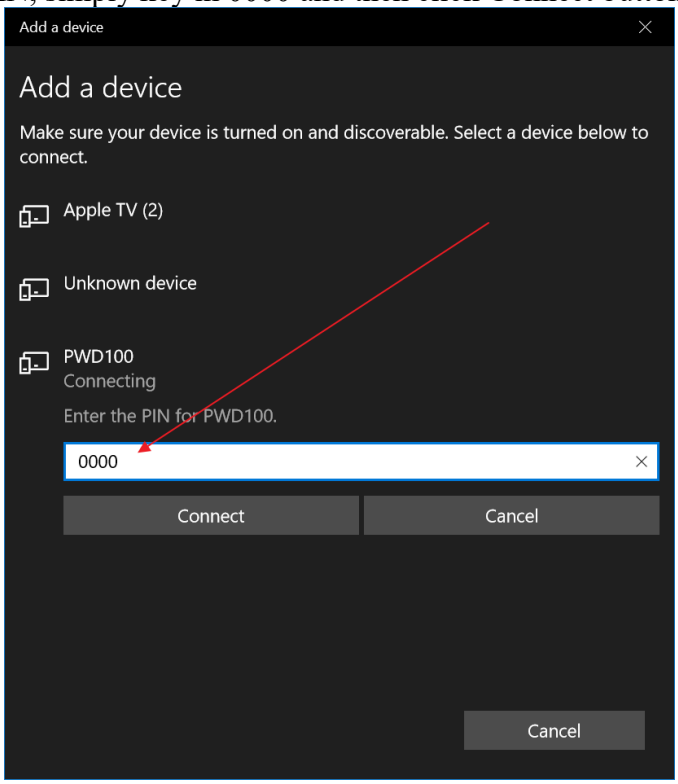
4. On Windows, you should expect to see 'PWD100' from the available device list. Click 'PWD100' to continue.



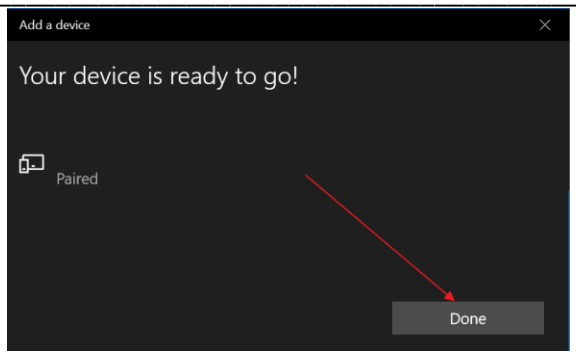
It sometimes may take a minute to two to see the UHF reader's device name PWD100 to be shown.

a. *Please check if the Bluetooth LED is flashing (it flashes once every 2 seconds when it's in pairing mode), if it doesn't, make sure the UHF device is turned on.*
b. *Please make sure your computer has the Bluetooth, and make sure the Bluetooth in your computer is turned on.*

5. It will prompt for the PIN, simply key in 0000 and then click Connect button to continue.

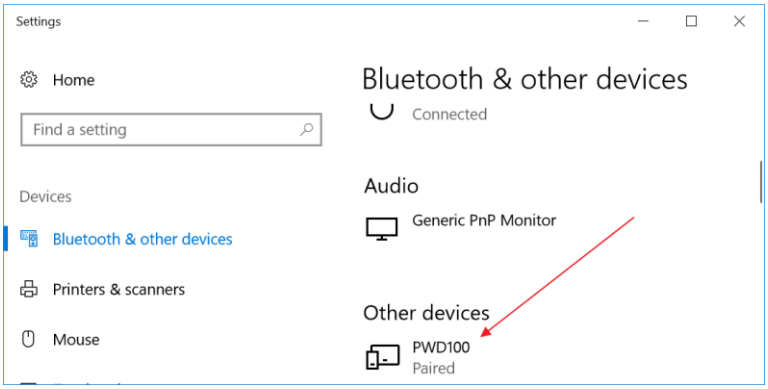


6. Click Done to complete the pairing.

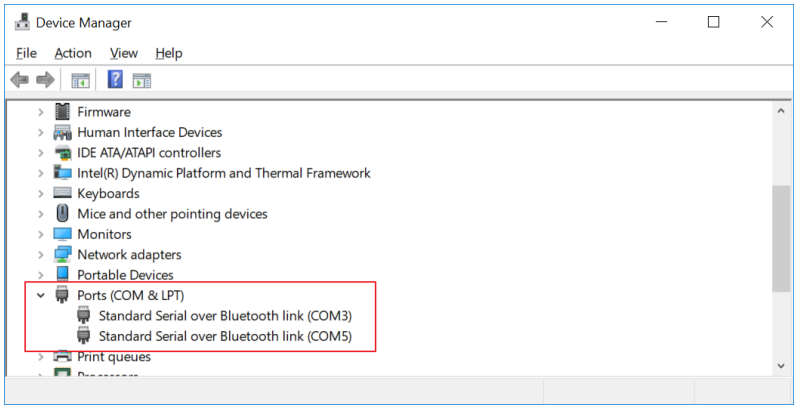


7. Two things you should verify before you move to the next step for setting UHF Tab Manager software. It expects to see the following:

a. PWD100 is shown under the Bluetooth setting, and has a 'Paired' status.



b. The COM ports should be shown under device manager, port numbers are might be different than 3 and 5.



If one or both of them are not shown as what we expect like above, you may want to restart the computer and check if they come up with the correct setting. If no, please repeat the Bluetooth pairing process again.

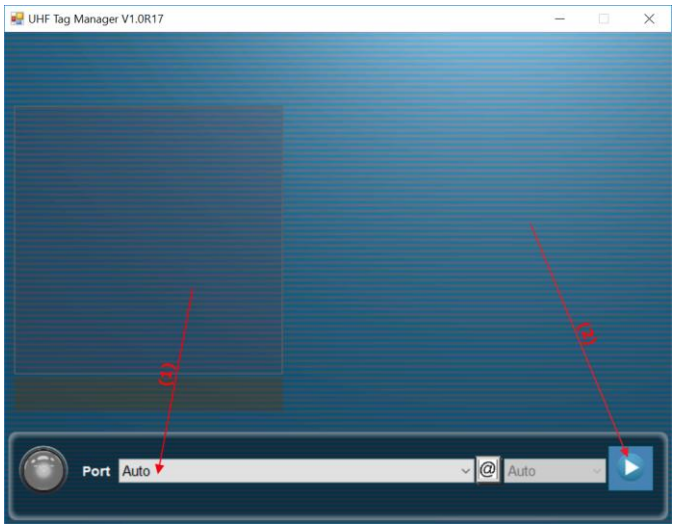
7. UHF Tag Manager & Reader Connectivity

The following steps will show how to use the UHF Tag Manager with the UHF Reader.

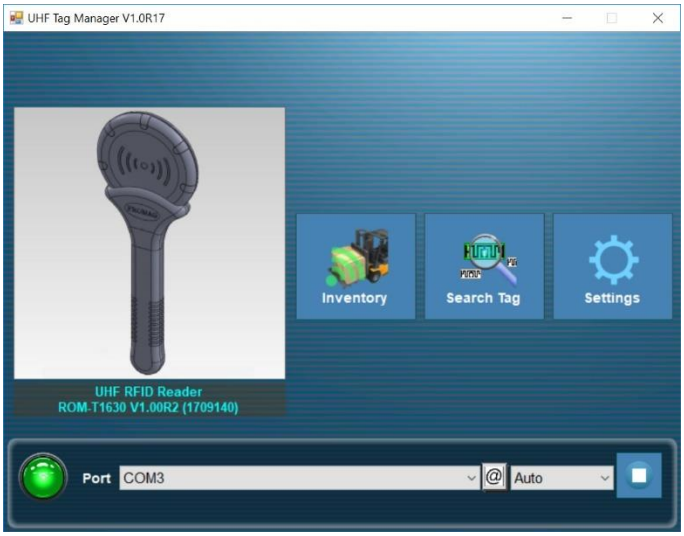
Before start running the UHF Tag Manager, please check if the Blueooth LED on the UHF Reader is flashing once every 2 seconds. If it doesn't, then the UHF Reader might be turned off, please turn it on.

1.Start UHF Tag Manager with double clicking the shortcut UHF Tag Manager on desktop or in Windows' Start menu.

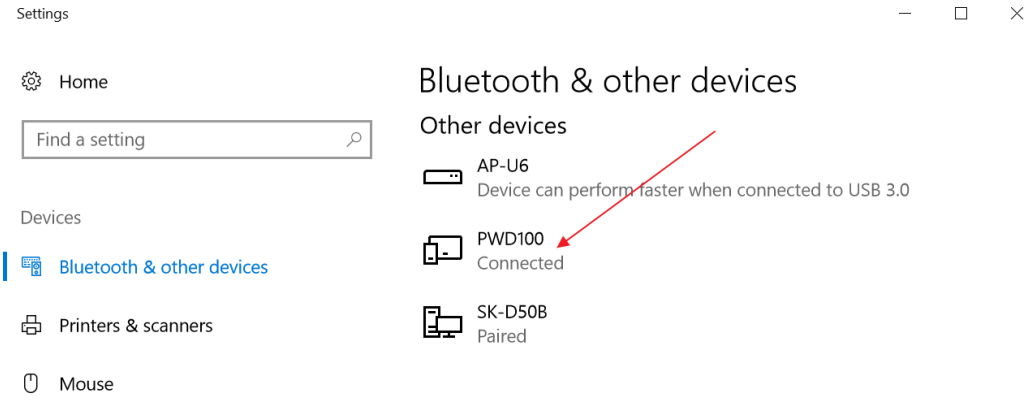
2. Choose 'Auto' for Port and then click **Start Arrow** to connect to the UHF Reader.



If it's connected successfully, it will automatically show the following window:

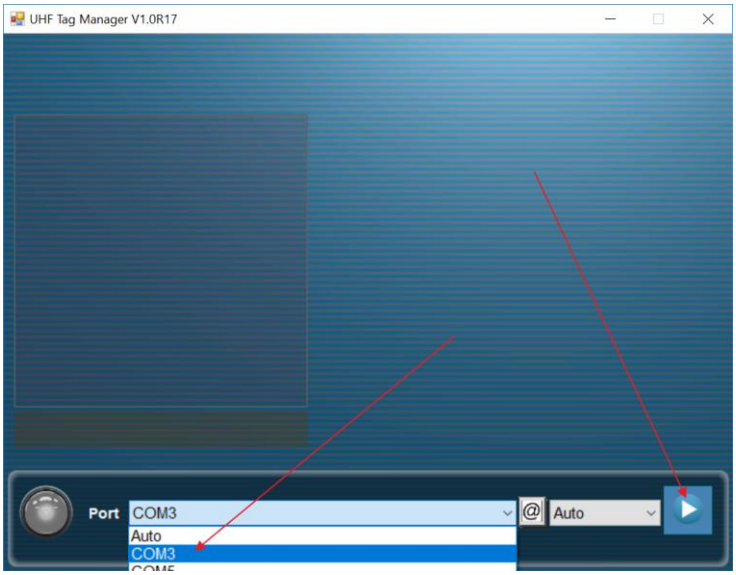


And the Bluetooth status will be changed to 'Connected' for its Bluetooth setting:



Now, it's ready to read some RFID tags to the UHF Tag Manager, please go to next section for how to operate the UHF Tag Manager.

If you have issue to connect the UHF Reader's COM Port with Auto setting, you may try to connect the UHF Reader's ports manually, please try to connect a port if one of the ports will work for you.



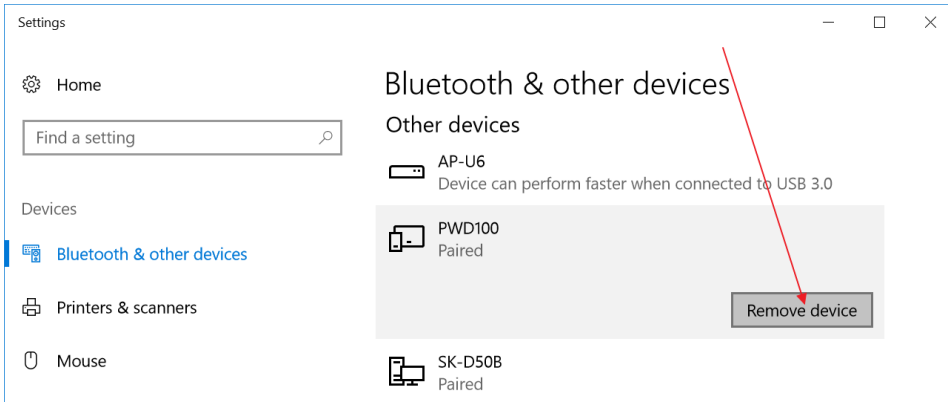
If you still have issue with it after few tries, here are some suggestions you may want to try:

- Make sure the UHF Reader has not been connected to another computer (if the reader shows two quick blinks in every second, then it's already connected with other computer rather than the one you are working on).

- Close the UHF Tag manager and reopen it again, and try to connect the COM ports again manually,

please always make sure the Bluetooth LED is flashing once every 2 seconds when you try to connect the UHF Reader and your computer.

- Remove the UHF Reader Bluetooth pairing from the computer, and restart the computer,

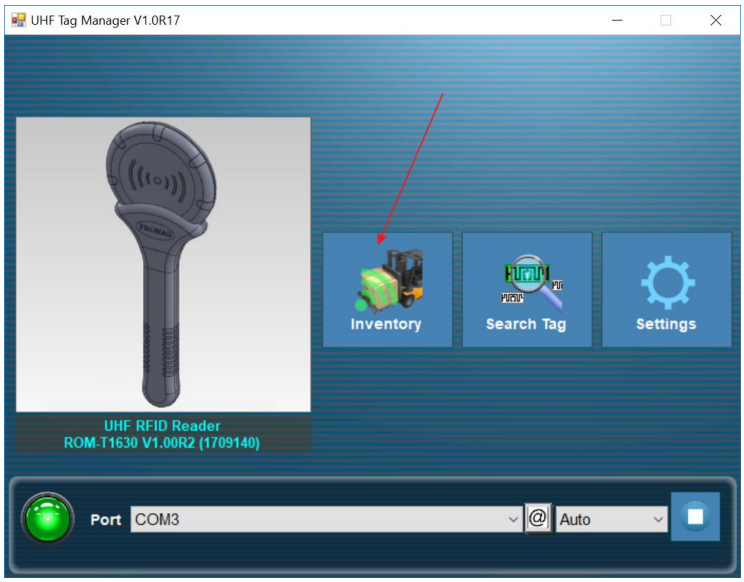


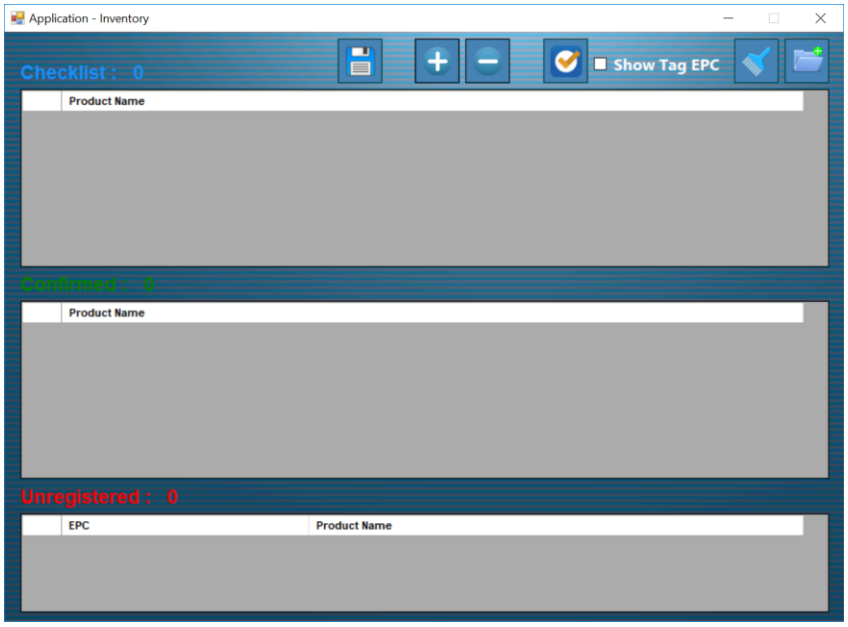
and then follow the same steps (mentioned in previous section) to pair the UHF Reader with the computer again, and follow the same steps to open the UHF Tag manager software, and try to connect the UHF Reader again.

8. Use UHF Tag Manager Software Application

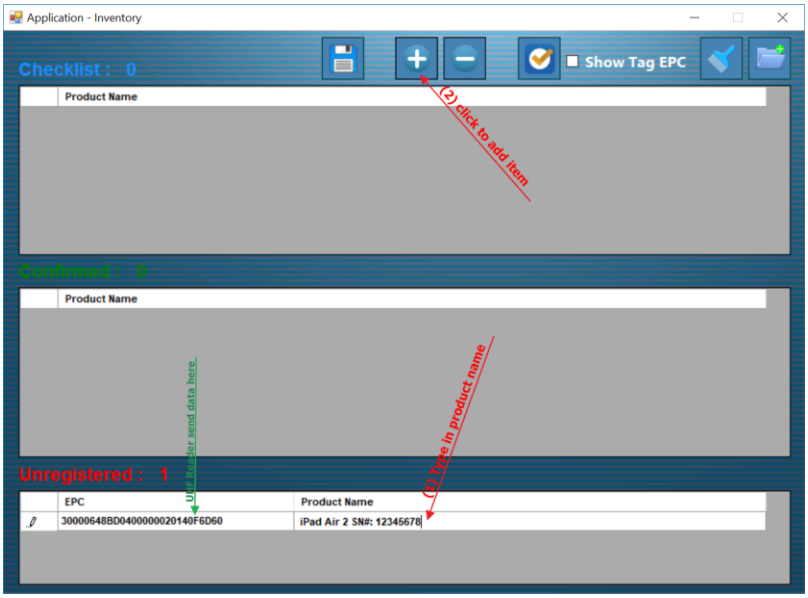
8.1 Create a check list for assets or inventory items (pre-defined a check list)

a. Click Inventory to open the data spreadsheet. If you don't' see this Window, the Bluetooth connection and COM port connection are not setup properly yet, please see previous sections on how to setup them.

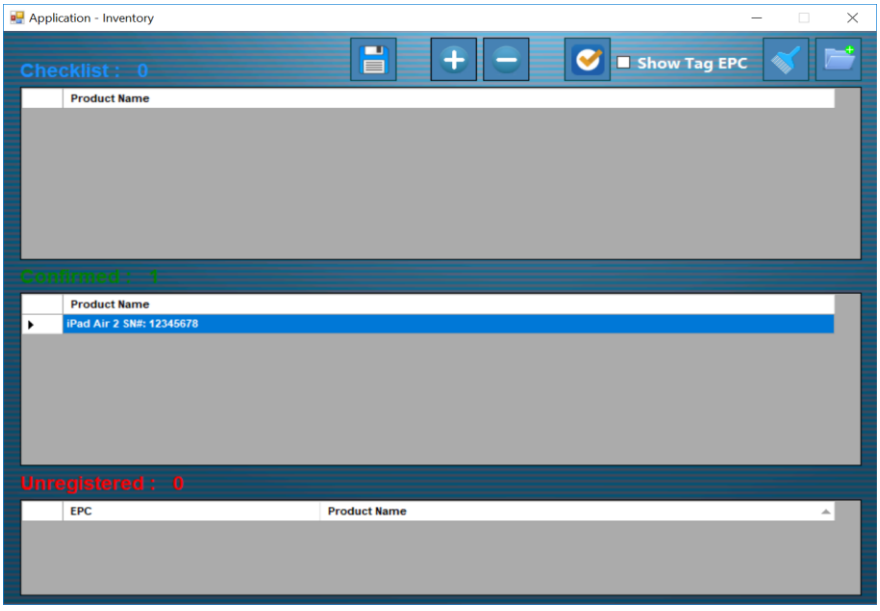




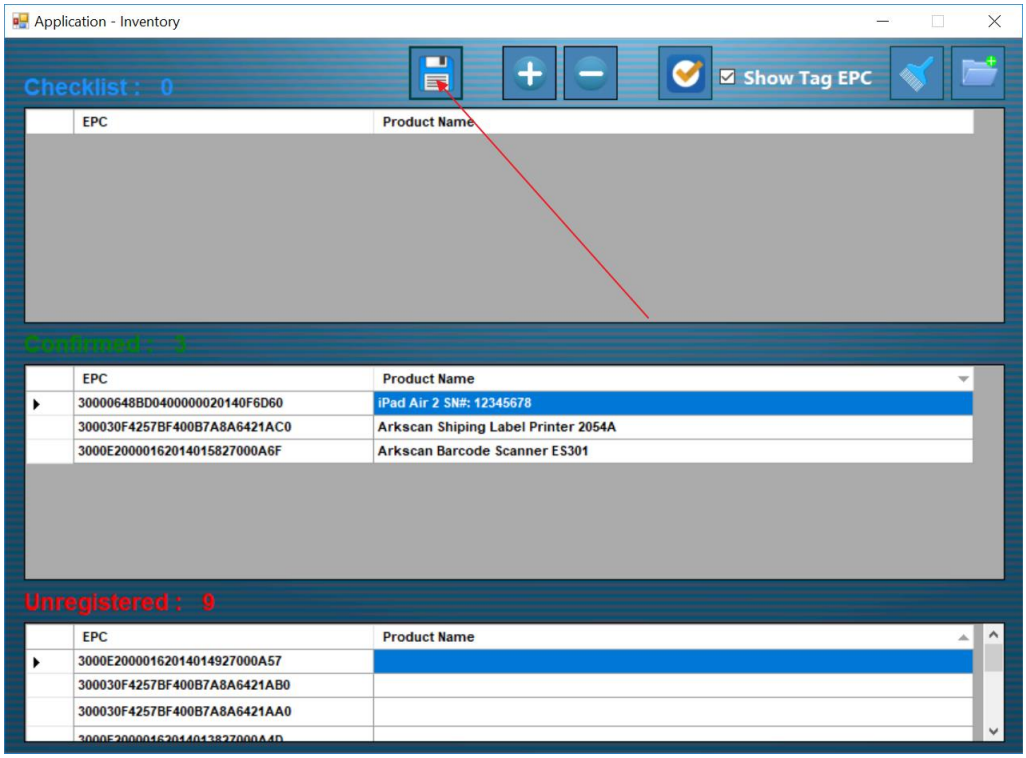
b. Press the 'Scan Button' with the 'Antenna Area' point to one of your RFID tags, the EPC number of the scanned tag should be shown under the 'Unregistered' table; then type in your product name for this associated EPC.
※ Make sure the Bluetooth LED flashes twice in every second, it's an indication that the UHF reader is still connected to the computer; otherwise, it needs to connect again. Please check 'The Most Common Issue' section below for additional helps if you still have issue to operate the UHF Reader!



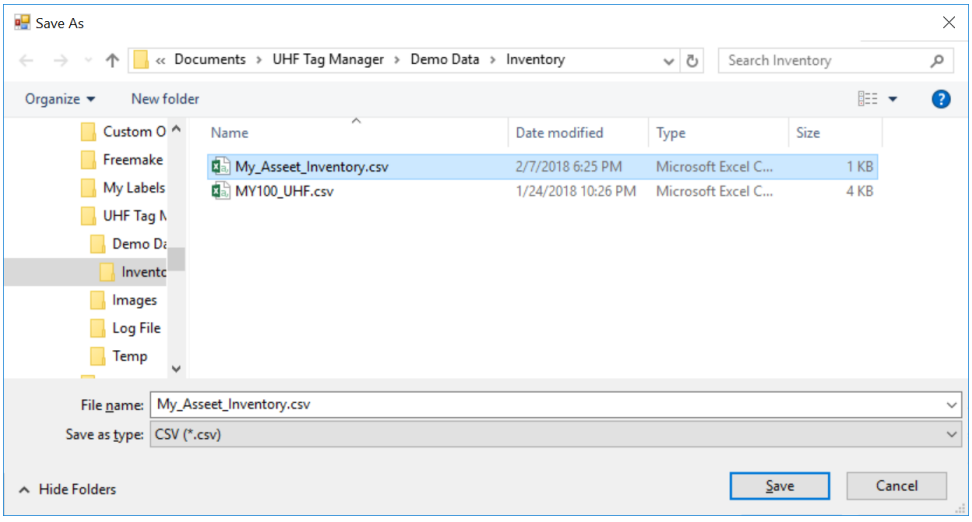
c. Then highlight a new entry in the Unregistered table, and click + to add the item to Confirmed table.



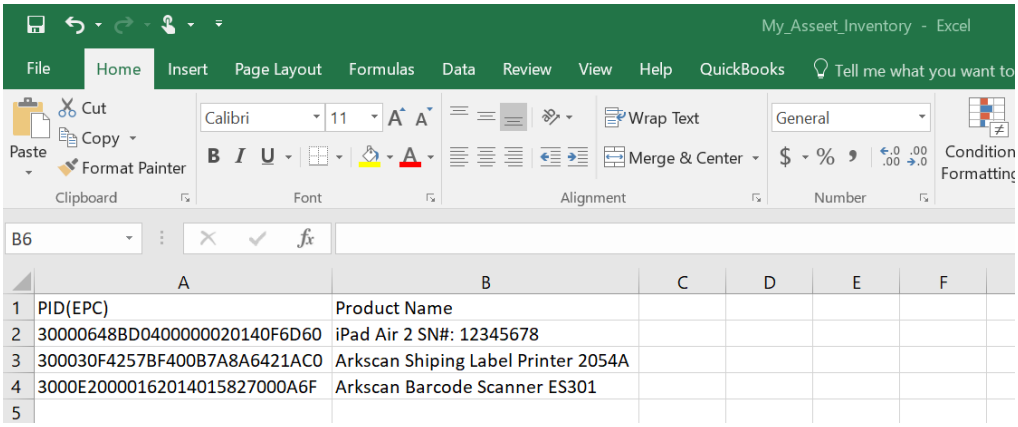
d. After adding all the Tag/Items to the Confirmed table, then save the confirmed list (it only save the list under the Confirm table here, Checklist's and Unregistered's won't be saved). You may click the check box 'Show Tag EPC' to see each product's tag ID.



Assign a file name and save the confirmed list to a file, you already make a check list for all the items you want to compare with their presence when you scan your RFID tags later on.

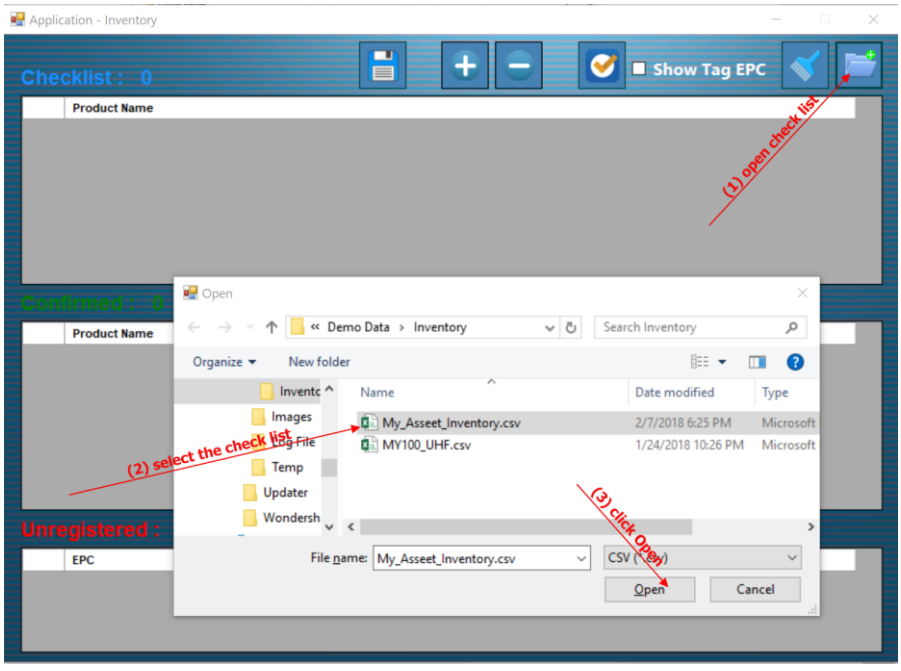


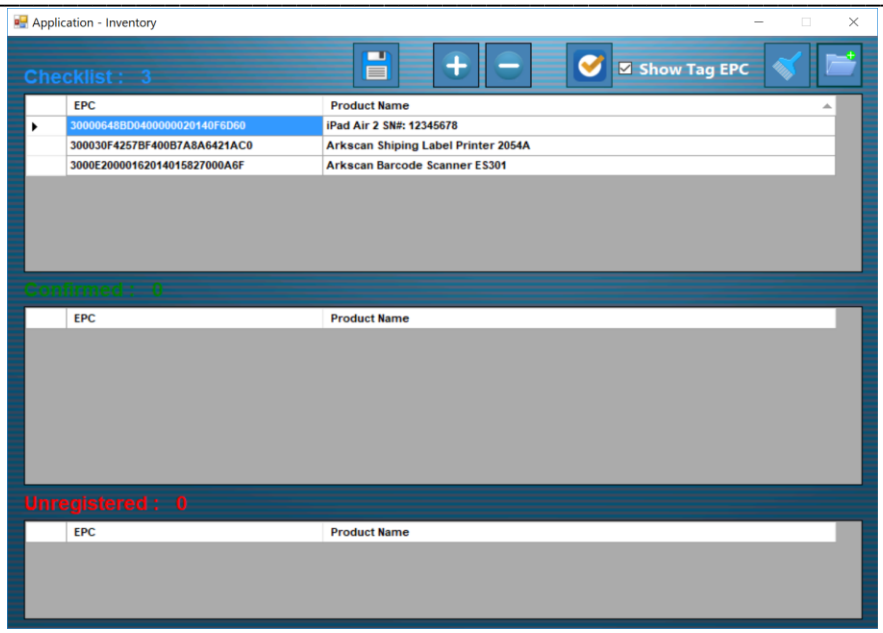
The file you save from the Confirmed list is the CSV format by default, you may manually open the CSV file in the Microsoft Excel to update the content as you wish, and save it as the original CSV format; it's not recommended to make any change on the PID(EPC) column.



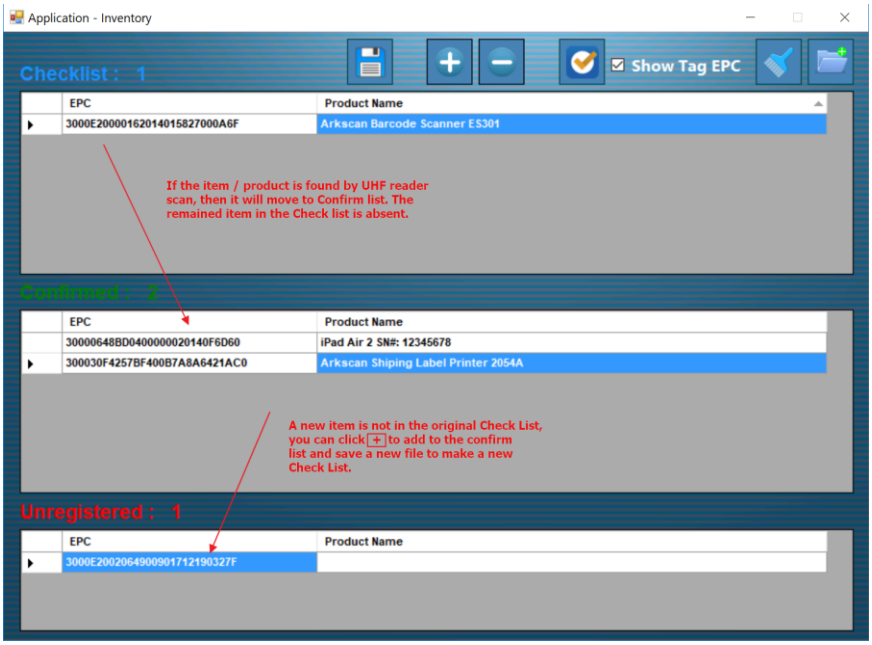
8.2 Check which tags are missing from pre-defined check list.

a. Load the pre-defined check list





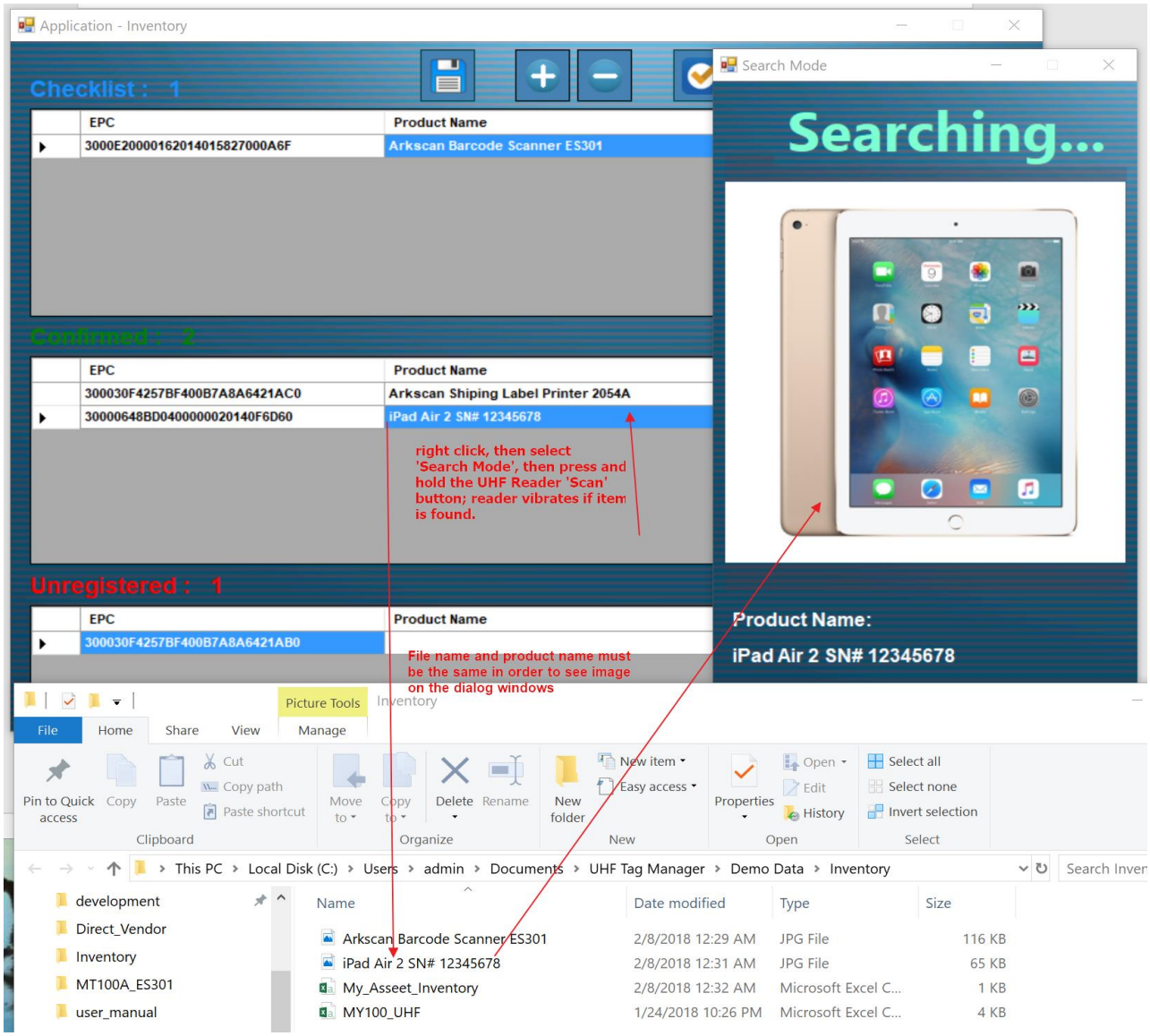
b. Scan your inventory item or asset by the UHF Reader.
※ Make sure the Bluetooth LED flashes twice in every second, it's an indication that the UHF reader is still connected to the computer; otherwise, it needs to connect again.



If the items in the Checklist table are found through the UHF Reader's scan, the items will be moved from Check list to Confirmed table automatically. The remained items in Check list are missed or absent tags. The items in the Unregistered list are new items, which you can click  to add the new items to Confirmed list, then save to a file to make a new Check list.

8.3 Search an item

You have many items, sometimes it's hard to locate where an item is located; the Search mode will be really helpful here. You may right click on any item from any one of the tables (Checklist, Confirmed & Unregistered tables), then select 'Search Mode' to open the Searching dialog window, and press and hold the UHF Reader's scan button to read RFID tags. It will be buzzed and vibrated when the targeted tag is nearby.



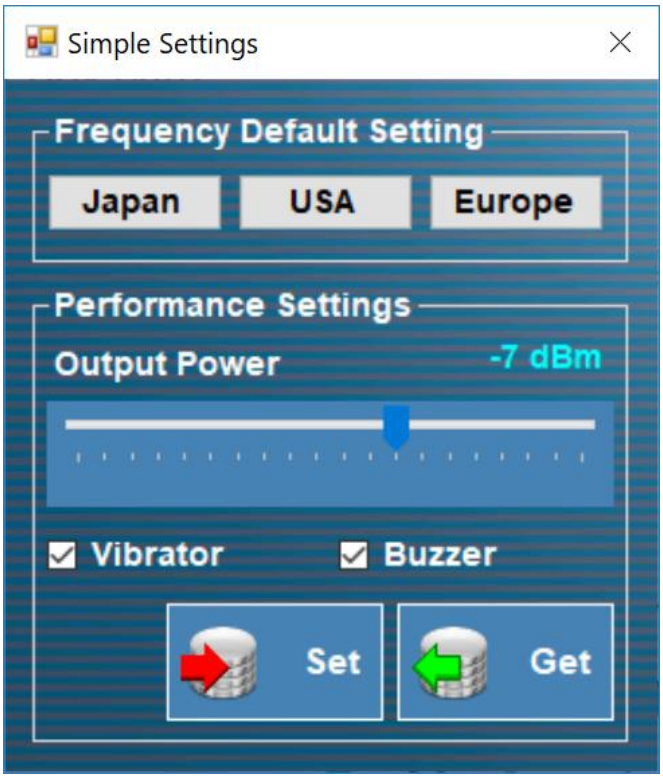
※ To show product's image:

1. Image file name should be the same as product name and must be .jpg file type.
2. Image file path:
   C:\Users\UserName\Documents\UHF Tag Manager\Demo Data\Inventory

9. Settings

Frequency Default Setting:

Click Japan, USA, or Europe button to reset frequency to defaults.



Performance Settings:

1. Output power: value range is from -19 to 0.

2. Vibrator: if this item is checked, UHF Reader will vibrate in **Search** mode when it finds the target.

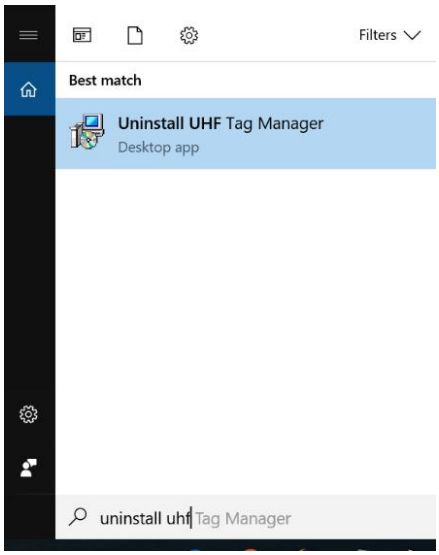
3. Buzzer: if this item is checked, UHF Reader will buzz in **Search** mode when it finds the target.

4. Set button: after you change the **performance settings**, you need to click the **Set** button to complete your settings to UHF Reader.

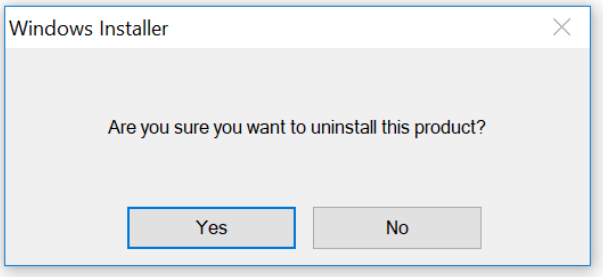
5. Get button: the program gets the settings automatically when **Settings** window is opened. If it gets the settings failed, you can click Get button to get settings manually.

10. Re-install UHF Tag Manager

1. Uninstall **UHF Tag Manager**:
Perform a Windows search by typing in **uninstall uhf**, the program **Uninstall UHF Tag Manger** should show up, just click Uninstall UHF Tag Manger to remove the application from Windows.



A dialog box is shown to confirm, and continue by clicking **Yes** to start the removing process.



2. Follow the installation instruction and install the **UHF Tag Manager** again.

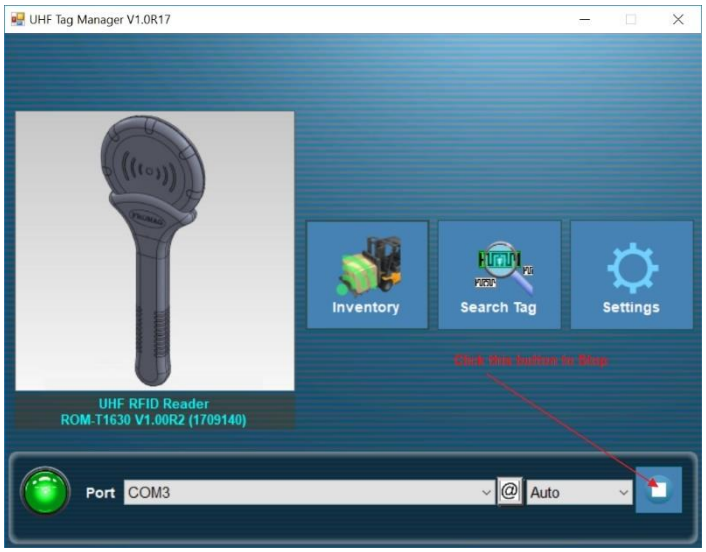
11. The Common Issues

11.2 Timeout Issue

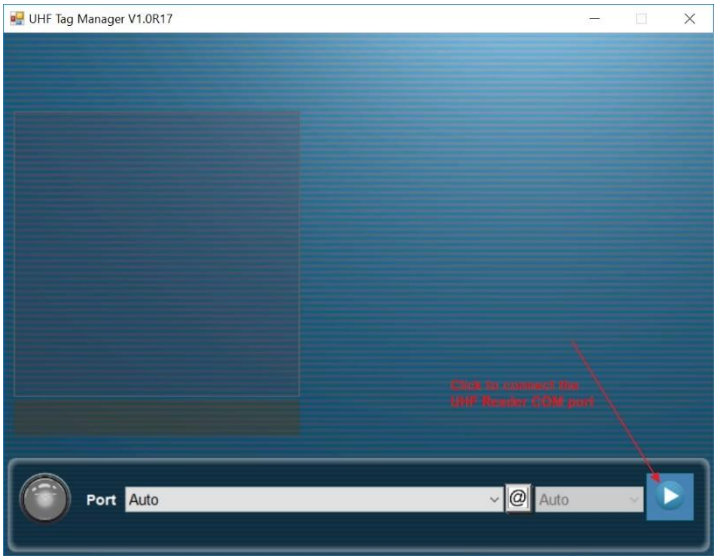
If the UHF Reader had been working fine, and suddenly stop working, most likely the reader is lost the wireless connection with the computer due to the power off timeout. The fundamental rule is, If the Bluetooth LED is NOT emitting 2 quick blinking lights, then it is the confirmation of losing connection.

※When power off timeout happens, connect is lost, and power up the UHF Reader will NOT lead to automatically reconnect the device, you have to connect the COM port again.

The UHF Reader is enabled a 30-minutes power off timeout by default, the reader will be automatically turn itself off after 30 minutes of inactivity; it was made it this way to save battery life. If power off timeout happens, you must reconnect the COM port of the UHF Reader from the UHF Tag Manager software in order to use the reader again. You have to go back to the main windows like below, and click  to reset the connection,

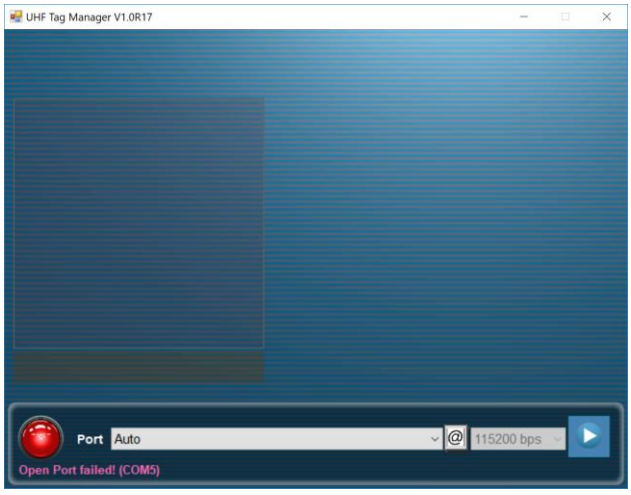


Then **turn on** the UHF Reader and make sure the Bluetooth LED is flashing (emit one light) once every 2 seconds, and then click  to connect the COM port again. Use Auto port and try manually assign port if Auto port doesn't work.



11.2 Open Port failed

If you see 'Open Port failed!' message when you try to connect the COM port, here are the common possible issues:



1. The UHF Reader is power off, 9 out 10 the issue is caused by this. To fix it, you need to turn on the UHF Reader and connect the COM port again.

2. The UHF Reader's COM ports are not working properly. To fix it, check if the ports are still in the device manager. You may try to disable the COM ports, and then enabled them, and try to connect it again. If it still

doesn’t work, you may want to remove the Bluetooth paring of the UHF Reader from the computer and start it all over again.

11.3 Tags Compatibility

Please make sure the tags you scan with are one of the following RFID types, the UHF Reader only supports them for now:

EPC Class 1 Gen 2

ISO18000-6C

SAFETY CERTIFICATION

Test standard: FCC rules Part 15 subpart C 15.247 (2011 - 10)

Test Result: No deviations from the technical specification(s) were ascertained in the course of the tests performed.

Test standard: FCC rules Part 15 subpart B

Test Result: Radiated Emission. FCC Part 15. 109 Class B. Test passed.

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

End Product Labeling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in visible area with the FCC ID.

End Product Manual Information

The user manual for end users must include the following information in a prominent location “IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter.” This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) This device may not cause harmful interference and (2) This device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or collocation with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization. This device is intended only for OEM integrators under the following conditions: The antenna must be installed such that 20 cm is maintained between the antenna and users. As long as a condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

LIMITED WARRANTY

ARKSCAN, LLC warrants that the products sold pursuant to this Agreement will perform in accordance with ARKSCAN, LLC's published specifications. This warranty shall be provided only for a period of **one year** from the date of the shipment of the product from ARKSCAN, LLC (the "Warranty Period"). This warranty shall apply only to the "Buyer" (the original purchaser, unless that entity resells the product as authorized by ARKSCAN, LLC, in which event this warranty shall apply only to the first re-purchaser).

During the Warranty Period, should this product fail to conform to ARKSCAN, LLC's specifications, ARKSCAN, LLC will, at its option, repair or replace this product at no additional charge except as set forth below. Repair parts and replacement products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of ARKSCAN, LLC. This limited warranty does not include service to repair damage to the product resulting from accident, disaster, unreasonable use, misuse, abuse, negligence, or modification of the product not authorized by ARKSCAN, LLC. ARKSCAN, LLC reserves the right to examine the alleged defective goods to determine whether the warranty is applicable.

Without limiting the generality of the foregoing, ARKSCAN, LLC specifically disclaims any liability or warranty for goods resold in other than ARKSCAN, LLC's original packages, and for goods modified, altered, or treated without authorization by ARKSCAN, LLC.

Service may be obtained by delivering the product during the warranty period to ARKSCAN, LLC (420 W 42nd Street, Suite 11C, New York, NY 10036 USA). If this product is delivered by mail or by an equivalent shipping carrier, the customer agrees to insure the product or assume the risk of loss or damage in transit, to prepay shipping charges to the warranty service location, and to use the original shipping container or equivalent. ARKSCAN, LLC will return the product, prepaid, via a three (3) day shipping service. A Return Material Authorization ("RMA") number must accompany all returns. Buyers may obtain an RMA number by contacting with support@arkscan.com.

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ARKSCAN, LLC'S SOLE LIABILITY AND BUYER'S EXCLUSIVE REMEDIES ARE STATED IN THIS SECTION AND IN THE SECTION RELATING TO ARKSCAN, LLC'S LIMITED WARRANTY.

BATTERY CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with same or equivalent type recommended by the manufacturer.

Do not discard used batteries in to regular trash.

These batteries need to be recycled according to the manufacturer's instructions.