ATID CO., LTD

UHF Reader

AT388 User guide

AT388 Product User guide

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Revision History

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1 Before Beginning,

The objective of user guide is to pass the basic contents related with AT388`s maintenance and smooth uses.

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2 Product Overview

AT388 is both subminiature barcode and RFID reader which can grasp with just one hand. As the device that meets the basic function for industrial product such as IP65 in water & dust test and 1.2 m drop specification, it can take an active as data collector in the various kinds of part in medicine, stock and product management and logistics shipping/tracking, access control. 1D Barcode, UHF/HF RFID Tag information can be collected by just one AT388 and collected data can transfer to the HOST PC or Smart Phone by using Bluetooth or Wireless LAN through Remote process / real time process / batch process mode. This device is designed to handle the data by the equipment which has the Windows, Android as an operating system.

3 Strength of Product

AT388 is the smallest product among the existing RFID Barcode Scanner-Reader product

- Its device as durable industrial PDA meets IP65 standard for the dust & water proof and 1.2m drop to concrete.
- Apply Honeywell N3680 Barcode module, fast and accurate support for Barcode data collection.
- UHF RFID Tag can be read and written quickly since Impinj R2000 module is installed in the product
- In case of that HF RFID module is installed, Various HF RFID tag can be read and written.
- Mode of Remote Process and Batch Process and Real Time Process can work for device
- It device can be connected with PC and charged up itself through USB Cable.
- It can be charged up without exclusive adapter through normal smartphone charger
- Read data through LCD Display can be directly checked.
- Battery changes is easily available and its device can change the battery in case of battery shortage while using it.
- Exclusive charging package for only battery charging will be offered
  (Option: To be Offered in the near future)

4 H/W Specification

Performance Characteristics	
Processor	ARM7 Core
Support Operating System	Windows(WLAN/BT), Android(BT)
Memory	1Mbit (512Kbyte able to use)
Display	1.3inch LCD & LED Indicator
Weight	270g(without Battery 210g)
Operation Temperature	-20~40℃
Storage Temperature	-30~70℃
Humidity	95% non-condensing
Drop specification	1.2M Drop to concrete
Dust & Water Proof	IP65

Physical Characteristics	
Audio	Buzzer
Standard I/O Port	Bluetooth 4.0
Notification	LED, Buzzer, LCD, vibrator
Dimensions(L x W x H)	164 x 50 x 35(54)mm

Battery Supply	
Main Battery	3,200mAH Li-Ion Rechargeable Battery
Power Adapter	Battery Charger(Option) & DC5V, 2000mA

Network Characteristics	
Wireless LAN	802.11 b/g/n Wireless LAN, Key Emulator
Bluetooth	Bluetooth 4.1 HID/SPP

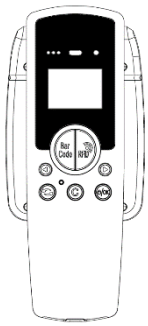
Barcode Data Processing Device	
Barcode Engine	1D Laser Scanner

UHF 900MHz RFID Reader/Writer (Option)	
Chips set	Impinj R2000
Frequency	refer to the test report (Support Global Frequency)
Reading Range	0M~3M(According to Tag & Environment)
Writing Range	0M~1.5M(According to Tag & Environment)
Protocol	EPC Gen2, ISO/IEC 18000-6C
Special Function	Anti-Collision

5 Product Composition

5.1 Product Composition

The basic package for AT388 is shown as below



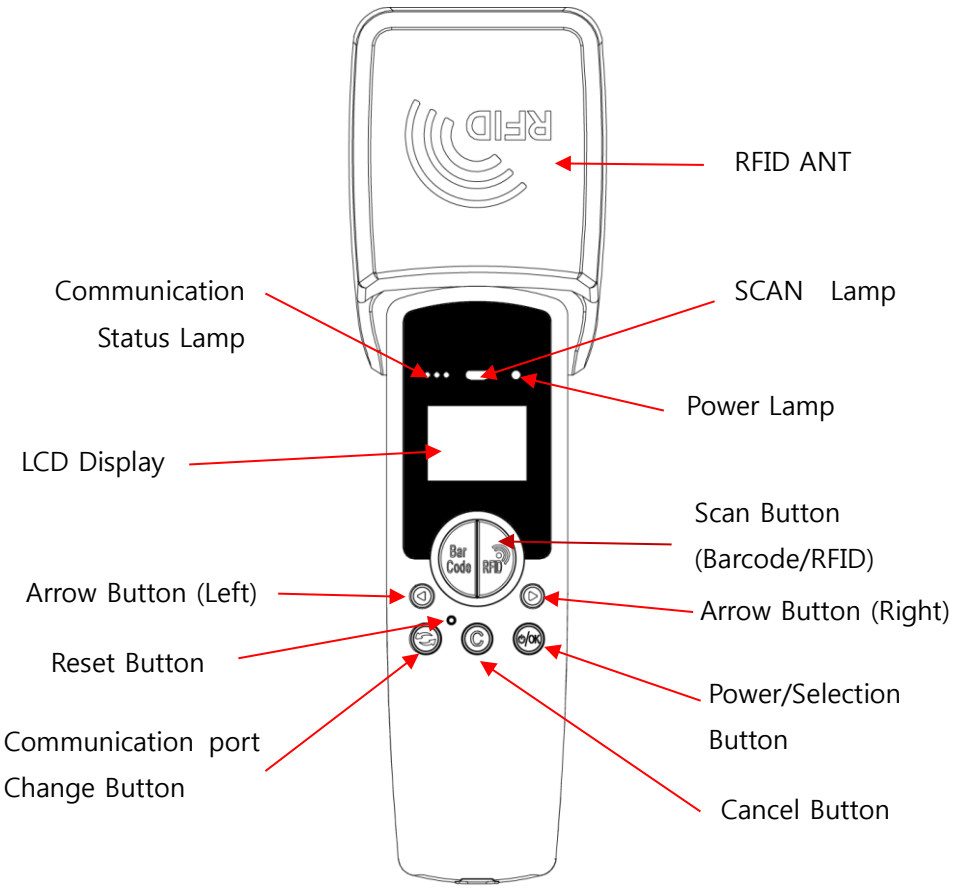
< Device Body >

< User Guide >

<Battery>

5.2 Composition of Each Product`s Part

i. Front Side



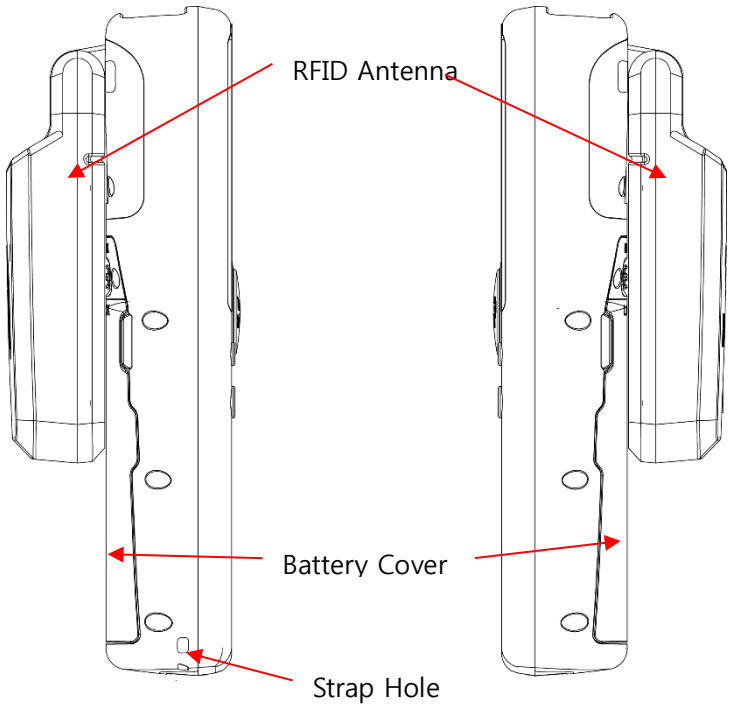
<Front Side>

- SCAN Lamp: blue lamp will be lit in case of reading the barcode and RFID Tag information
- Communication State Display Lamp: Show the connection state of Bluetooth, Wireless LAN
- Power Lamp: Show the state-of-charge (Charging : Red, Full Charge : Green)
- LCD Display: Show the collected data and current state of device
- Arrow Button(Left/Right): Movement of Operation Menu or Setting Menu
- Scan Button: Use its button in case of selecting the barcode and RFID Tag

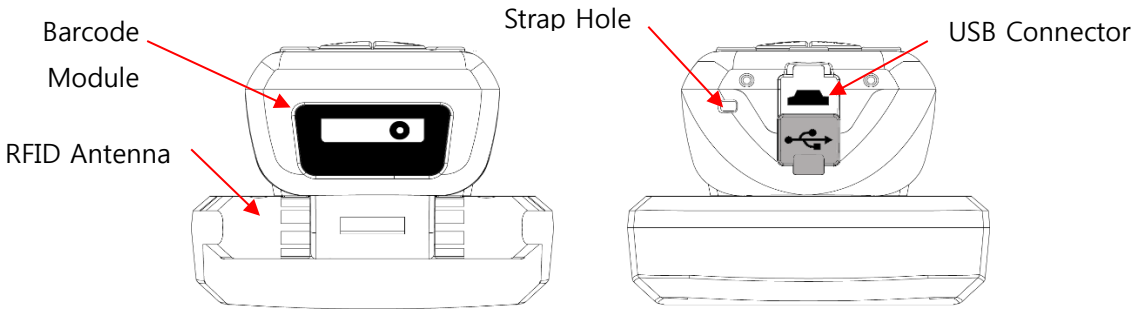
reading operation

- Reset Button: Restart the device by force.
- Communication port change Button: Change and selection the Bluetooth, WLAN Communication port
- Cancel Button: Exit the Barcode or RFID Scan operation or Movement of previous Menu
- Power/Selection Button: Power On/Off or Selection of Menu operation

i. Right and Left Side of Device



< Left Side > < Right Side >



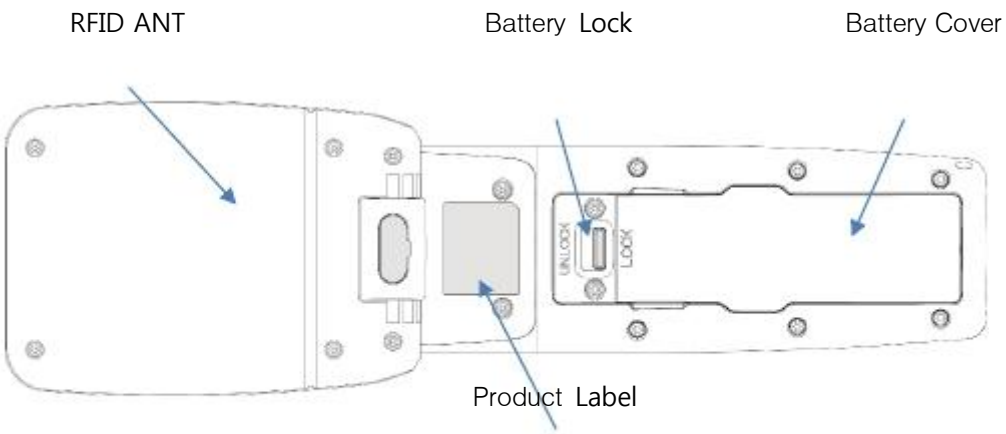
< Top Side > < Bottom Side >

- RFID Antenna: HF or UHF RFID Antenna are built in the device and, the radio is emitted through RFID Antenna when reading the Tag
- Battery Cover: Battery can be changed after getting rid of cover
- Strap Hole: Fix the Neck strap or Hand strap enclosed with the product

ii. Top and Bottom Side of Device

- RFID Antenna: HF or UHF RFID Antenna are built in the device and, the radio is emitted through RFID Antenna when reading the Tag
- Barcode Module: Barcode scanner is built in the device and 1D barcode module will be selectively applied. Please note that it should be careful to use since it is one of the most important part to read the barcode
- USB Connector & Waterproof Cover: If the Waterproof Cover opens up, Micro USB connector is located in it. User can charge the device through
- Cable Please do lock the cover in case of keeping or using the device.
- Strap Hole: The portability of device can be improved by connecting the Hand Strap or Neck strap with strap hole

iii. Back Side of Device



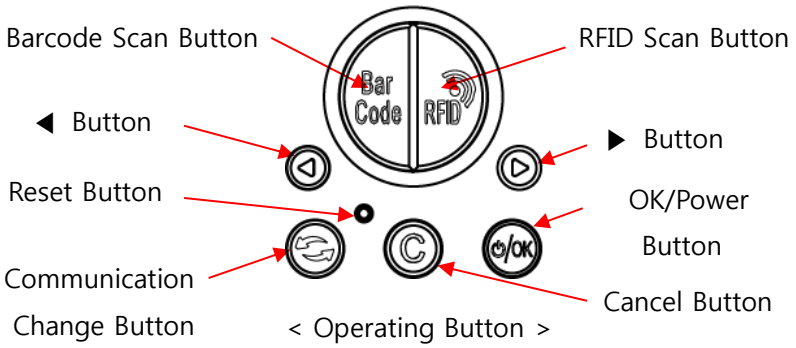
< Back Side >

- Battery cover: Remove the cover and attach the battery.
- Battery Lock: Move the battery lock to the UNLOCK position and the battery

cover will open.

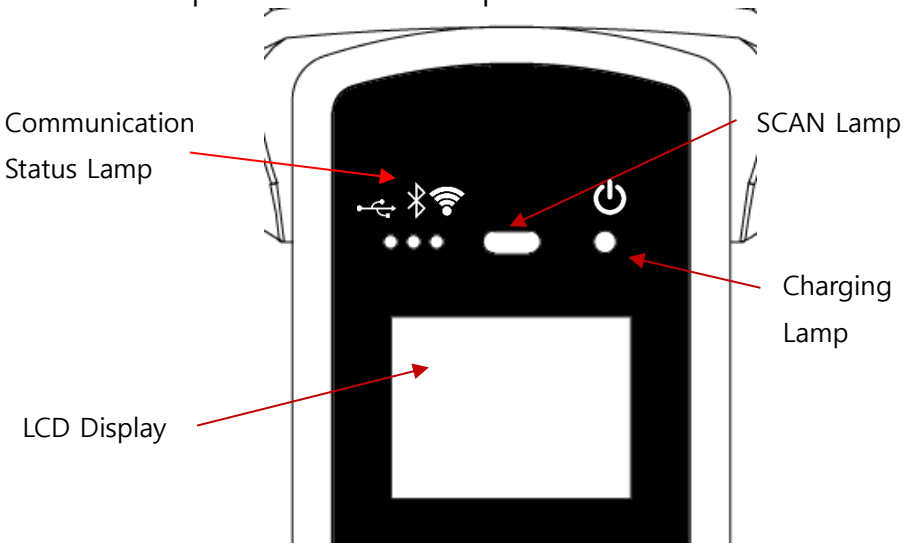
- Product Label: This product is labeled with the input voltage and other device information and the serial number of the product.

5.3 Function of Each Button



- Barcode scan button: Scans the barcode data.
- RFID Scan Button: Scan RFID data.
- ◀ Button: Scroll the screen upward or select the previous item. If user press and hold, the setting menu is displayed.
- ▶ Button: Scroll the screen downward or select the next item.
- Reset Button: Restart the device.
- Communication change Button( ): Switch the communication function of Bluetooth, WLAN whenever you press it.
- Cancel Button( ): In the Settings menu, cancel the current selection and return to the previous step.
- OK/Power Button( ): Select a specific item or press and hold for more than two second to turn the power on and off.

5.4 Configuration and operation of the Lamp



< Display screen and Lamp >

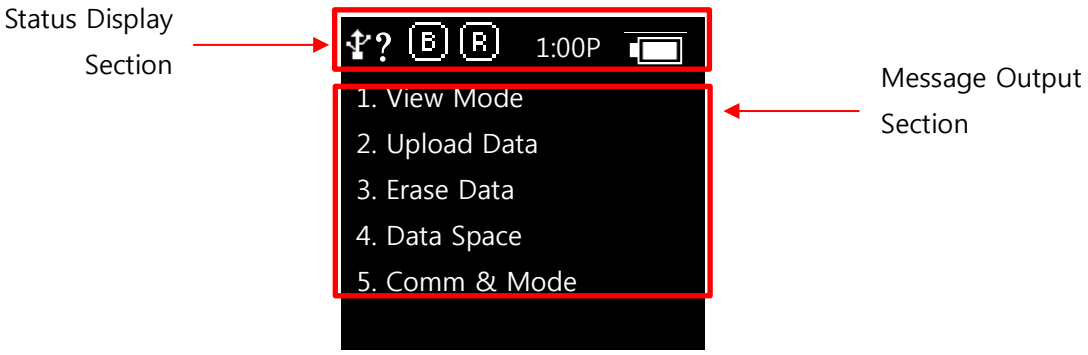
- Communication Status Lamp: Displays the communication method currently in use. Each time the communication switch button is pressed, the three modes of Bluetooth ( ) and WiFi ( ) are switched, and the lamp of each position lights up.
  Fast blinking: Indicates that it is waiting for connection with host device.
  Slow blinking: Indicates that the host device is connected to the current communication mode.
- SCAN Lamp: According to the setting, the blue lamp lights up when recognizing the barcode or RFID information, and when the data is recognized, the blue lamp also lights up to indicate that normal data has been read.
- Charging lamp: The red lamp lights up when the unit starts charging.

Conversely, when the battery is low and needs to be recharged, it blinks. When charging is completed, the blue lamp lights up.

5.5 Screen Composition

AT388 shows the various kinds of item through compact LCD such as the current state of device and read data

The screen is separated as state display section and message display section



5.5.1 State Display Section

Its section shows the present time, battery remains and operating set-up state.

- , Indication of connection mode: Show the Bluetooth connection mode (), Wireless Lan connection mode( ).
- ?, H, S, T : Show the connection state with the Host.
  Disconnection State(?), HID Mode(H), Serial Mode(S), WLAN (T)
- , : Show the Scanner Mode and show the activated state of Barcode ()and RFID ()through the ICON.
  (Bright Condition: ON, Dark Condition: OFF)
- 10:00P: Show the set time. (There is a possibility to be different with the present time) It can be reset up at the system configuration menu.
- Battery State: Show the battery remains as a four level

5.5.2 Message Output Section

Its section shows the read barcode and RFID Tag information.

6 Basic Function of Device

AT388 supports the reading function for basic barcode and RFID without host after turning on the device. Please acquire the basic function in accordance with the below step.

6.1 Basic Function of Device

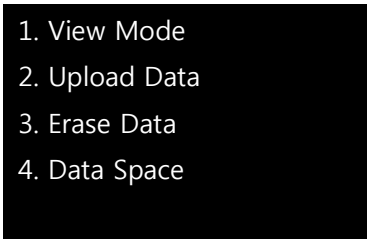
AT388 is basically worked as three kinds of different mode

6.1.1 Scan Mode

This is the screen shown at the first when turning on the device and It acts a role in collecting the barcode and RFID data

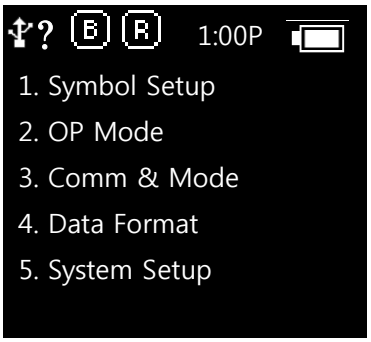
6.1.2 Scan configuration Menu

User can adjust the basic setting of device through this menu such as confirmation of read data, memory management, communication mode and setting the time to turn off the device



6.1.3 System Configuration

User can adjust the relation settings with whole function of device, barcode symbol settings, Barcode/RFID operation and communication



6.2 Power ON and OFF

6.2.1 Power ON

① Press the Power/Section button for 2 seconds.

② After "Booting…" message is come out at the screen, please move the hand from scan in case of that "Wait…" message is come out.

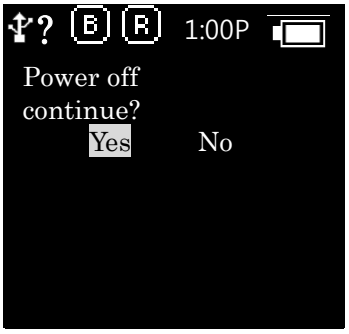
③ If the "Scan Ready" message is come out as below, device can read the Barcode or RFID Tag data.

6.2.2 Power OFF

① Press the Power/Selection button for 2 seconds in the Scan Ready

② Select the "Yes" through either ◀button or ▶button and then, turn off the power by pressing the Power/Selection button

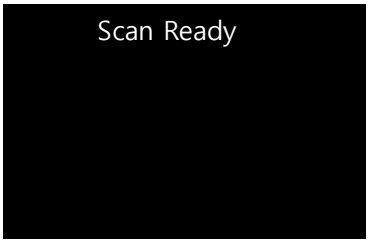
③ If "No" is selected, user can return back to the scan mode



6.3 Barcode Data Reading(Barcode Scan)

① Press the Barcode scan button in the Scan Ready

② User can read the barcode after "Scan Ready" message.



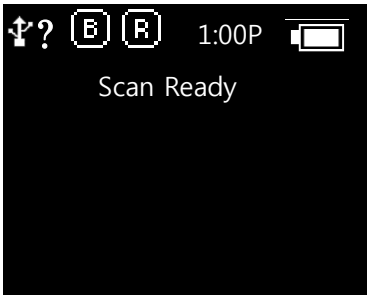
< Scan Ready >

< After Barcode reading >

6.4 RFID Tag Data Reading(RFID Scan)

① Press the RFID scan button in the Scan Ready

② User can read the RFID tag after "Scan Ready" message.



< Scan Ready >

< After RFID Reading >

6.5 Scan Configuration

Contents for reading history & operation of Barcode/RFID Tag, Auto Power Off might be changed by the scan configuration

Entry for Scan Menu

Please refer to the chapter 5. Settings & Changes in regard to detailed information on scan menu.

① Turn on the device

② The scan menu will be shown up after pressing the ◀button for a second

③ Select the preferred item by using either ◀button or ▶button and then, press the Scan button to check the detailed information on selected item

④ Press the "Cancel Button" for returning back to Scan mode

6.6 System Configuration

It has to be controlled in the system configuration menu for changing the operating direction of device, settings for communication function, settings of barcode symbol and scan mode

6.6.1 Entry for System Configuration

① Turn on the device

② Show the system configuration menu if user press the ◀button and Power button for several seconds.

③ Select the menu by using either ◀button or ▶button and then, enter the configuration menu through scan button

④ User can check the detailed information on selected item through the OK button after selecting the preferred item with either ◀button or ▶ button in the system configuration menu.

⑤ For restarting it to scan mode after completing the whole settings and storing the contents, user has to select the "Save & Exit" after selecting the "8. Exit". If user selects the "No Save & Exit", it will be restarted to scan mode without storage of adjusted contents.

7 Settings & Changes

7.1 Scan Configuration

Please refer to the chapter "7. Settings & Changes in regard to detailed information on system configuration menu

7.1.1 "1. View data"

View Data shows the stored data located in the internal memory, in case of Batch Process Mode. Check the next or previous item through either ◀button or ▶ button

7.1.2 "2. Upload data"

Stored data in the internal memory are transferred to Host`s Bluetooth or WLAN Data of memory will be remained after transferring.

7.1.3 "3. Erase data"

Stored data in the internal memory can be wholly deleted

If user wants to erase the data, please select "Yes"

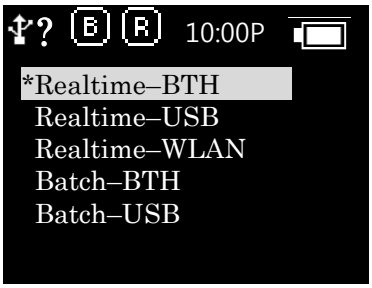
7.1.4 "4. Data space"

Show the amount of used internal memory

7.1.5 "5. Comm & Mode"

Comm & Mode is set up the communication measures and data transferring way between device and host.

"*" is marked at the present settings.



① Realtime-BTH: Transfer the read data to device connected with Bluetooth in real time.

② Batch-BTH: Transfer the read data to equipment connected with Bluetooth in a lump (Batch Process mode)

③ Remote-BTH: Link with application program. (BTH_SPP only)

7.1.6 "6. Poweroff Time"

The time to automatically turn off the device can be selected as 1 minute, 2 minutes, 5 minutes, 10 minutes, 30 minutes, 60 minutes, 120 minutes, None. The device will be automatically turned off itself after designated time. "*" is marked at the present Settings.

7.1.7 "7.Network Setup"

The menus are organized as follows.

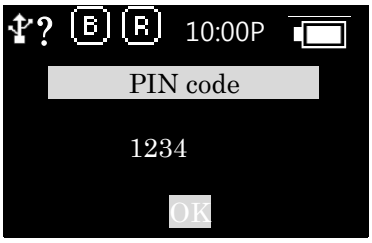
7.1.7.1 "1. Show Info"

Information (SSID, Password) and MAC Address related to WiFi connection set up in this product are displayed. For detailed WiFi connection information setting, please use the special setting tool provided separately.

7.1.7.2 "2. Host Pairing"

When the connection mode is used as Bluetooth or WLAN, it provides a function for pairing with the parent device.

① "1. PIN Code": Check pin code necessary for pairing.

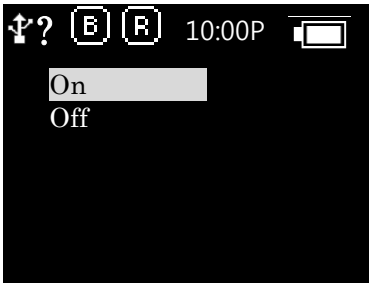


② "2. WLAN Pairing": Waiting for pairing with host device (HOST) via WiFi, and waits for connection at the host device.

③ "3. BTH Pairing": Waiting for pairing with host device (HOST) via Bluetooth, and waits for connection at the host device.

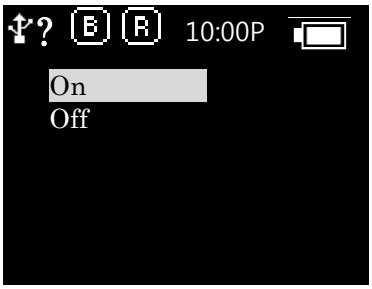
The device identification name required for pairing is displayed together.

7.1.7.3 "3. DHCP Mode"



- On: Enable DHCP mode to automatically obtain IP.
- Off: Disable DHCP Mode and set IP on the device separately.

7.1.7.4 "4. Paired Mode"



- On: Do not pair with any device other than the last device that was currently paired.
- Off: Allow any device to pair.

7.1.7.5 "5. Manual Setup"

Switch to the mode to receive wireless LAN connection information and IP information from the PC's dedicated setting program.

Please refer to the separately distributed manual for setting program for PC.

7.2 System Configuration

7.2.1 "1. Symbol Setup"

User can choose to read the barcode symbol or not. The item that can be set will be changed in accordance with the type and supportive function of module. The "*" is marked at the Enable item.

7.2.2 "2. OP Mode"

Set up the operating mode of RFID and Barcode Reader and basic function of RFID Module

- "1. READER": Set up the barcode and RFID operating mode

"BARCODE": Set up the exclusive barcode mode and, read the only barcode when user pushes the scan button

"UHF RFID": Set up the exclusive RFID mode, read the only UHF RFID Tag when user pushes the scan button.

"BARCORDE–RFID": Set up either barcode mode or RFID mode at the scan ready.

"BARCORDE+RFID": Set up the both barcode mode and RFID mode

- "2. Report Mode":

Set up the tag Reading Mode of RFID among Multi Tag / Single Tag / Multi Repeat

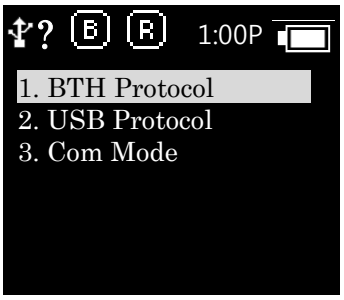
"MULTI": Set up Multi Tag Reading mode to read all the nearby tags.

"SINGLE": Set up Single Tag mode to read only one Tag data.

"Multi Repeat": Set up Multi Repeat mode to read all the tags nearby but does not read same tags twice.

7.2.3 "3. Comm & Mode"

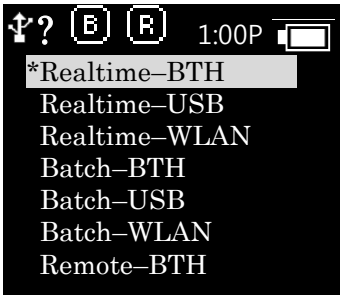
AT388 can connect with host through Bluetooth and WLAN. Bluetooth supports the different kinds of protocol



- 1. BTH Protocol: Select the communication protocol to be used when connecting with Bluetooth
  - **BTH HID**: It will connect through Human Interface Device and the data to be transferred will be inputted in accordance with the contents typed through Keyboard at the place where the cursor is located. User has to require more attention for using this mode since between the data where the cursor is located and actual reading data can be differently shown up with the keyboard language settings of host.
  - **BTH SPP**: It will connect through serial port profile and the data to be transferred will be transferred to serial port (COM port) of host. The host has to make the separate program for utilizing the transferred data.

- 3. Com Mode

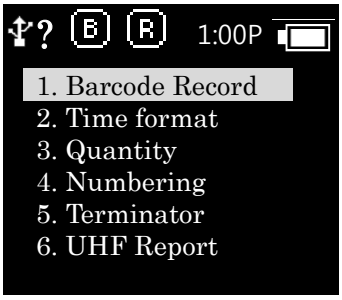
  Set up the data transferring mode and communication protocol between AT388 and host. "*" is marked in selected item.



  - Realtime-BTH: The read data will be transferred to the equipment that connects with its device through Bluetooth in real time
  - Batch-BTH: The read data will be transferred to the equipment that connects with its device through Bluetooth (Batch Process mode)
  - Remote-BTH: Link with application program. (BTH_SPP only)

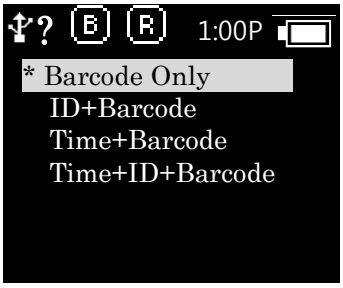
7.2.4 "4. Data Format"

The contents of this menu are explained on the basis of a situation that device can read the barcode. The operation can be different when reading the RFID Tag



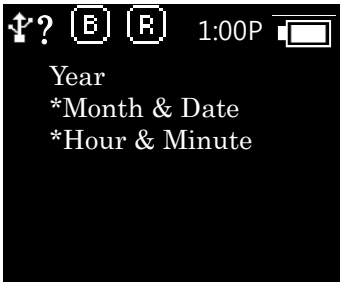
- "1. Barcode Record": After reading the barcode, user can decide to use the barcode

type ID or time to be appended when storing or transferring the data
"*" is marked in selected item.



- Barcode Only: The only reads barcode data will be stored or transferred
- ID+Barcode: ID of barcode and read barcode data will be stored or transferred
- Time+Barcode: Time data and read barcode will be stored or transferred
- Time+ID+BarcodeMode: Time data, ID of barcode and read barcode data will be stored or transferred.

- "2. Time format": In case of that the time will be stored or transferred with the read barcode, user can set up the time format
- "*" is marked in selected item



- **Year**: Choose to use the year data or not at the time data (YYYY)
- **Month & Date**: Choose to use Month & Date or not at the time data(MMDD)

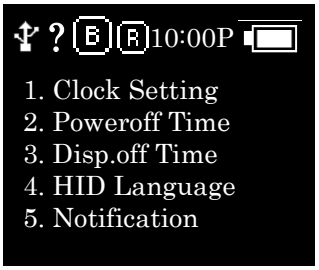
- **Hour & Minute**: Choose to use Hour & Minute or not at the time data(HHMM)

- "3. Quantity": Choose to input tag quantity. Quantity settings can be operated in the only barcode mode and its settings might be possible after reading the barcode tag. User can get AT388 to input quantity from 1 to 9999 and it cannot read another tag before inputting applicable tag quantity. "*" is marked in default settings
- "4. Numbering": Store or transfer the data index when reading the barcode and RFID tag. If the memory is vacated, it will be started from 1
- "5. Terminator": Select which letter will be attached at the end of data among LF, CR, CR&LF, Tab, Space, Semicolon when transferring the data via host

- "6. UHF Report" **(UHF Only)**: Select whether only EPC data is sent or both the EPC data and PC data is sent when transferring the UHF RFID Tag Data

7.2.5 "5. System Setup"

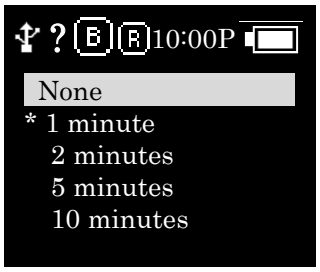
Set up to use the time, sound, vibrator, LCD and etc are needed or not



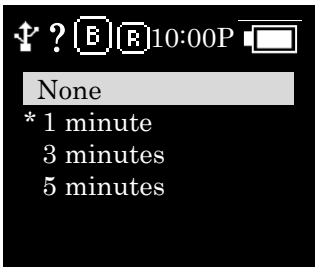
- "1. Clock Setting": Set up the current time. Designated time can be used with RFID tag information and barcode.
  ★ Please do set up the time in regularly since time error can be occurred

- "2. Poweroff Time": Select the time to automatically turn off the power when not in use. User can select the time among 1 minute, 2 minutes, 5 minutes, 10 minutes,

30 minutes, 60 minutes, 120 minutes and None. The device will be automatically turned off the its power after the designated time from LCD power off. "*" is marked in default settings



- "3. Disp,off Time": Set up the time to turn off the LCD for saving battery and LCD will be automatically turned off in accordance with the designated time



- "4. HID Language": Set up the language type in case of HID mode. User can select the preferred one among the UNIVER-SAL, FRENCH, UK, US

- "5. Notification": Set up the operation when pressing the button or placing the Alert situation
  - 1. Button notify
    Set up whether beep, vibrate, light is being operated when pressing the button.
  - 2. Alert notify
    Set up whether beep, vibrate, light is being operated when placing the Alert situation such as connection success/failure with remote or booting up. The time to operate can be different in accordance with situation
  - 3. Button mode
    Select the holding time of Button notify among None, Short, Long. In case of

None settings, there is no reaction, but in case of Short settings, it will operate for 0.3 seconds. In case of Long settings, it will operate until user detaches the button

- "6. BT HID Mode": Set up the Bluetooth HID data speed to High or Low speed.
  - High Speed
    Set up the Bluetooth HID data speed to High speed.
  - Low Speed
    Set up the Bluetooth HID data speed to Low speed.

- "7. F/W Version": Show the installed firmware version. User cannot change the firmware for changing the basic function and improvement of device. Please make an inquiry on the firmware to manufacturer or distributor.

7.2.6 "6. Factory Reset"

Return all settings to default

7.2.7 "7. Exit"

Terminate the system configuration and saving operation.

8 Bluetooth Connection setting

To transmit / receive data using this product with Bluetooth, you need a PC with built-in Bluetooth function or a dedicated Bluetooth dongle.

※ Please check with your PC vendor or product installer for details on Bluetooth function.

※ This chapter assumes that the Bluetooth driver is installed normally.

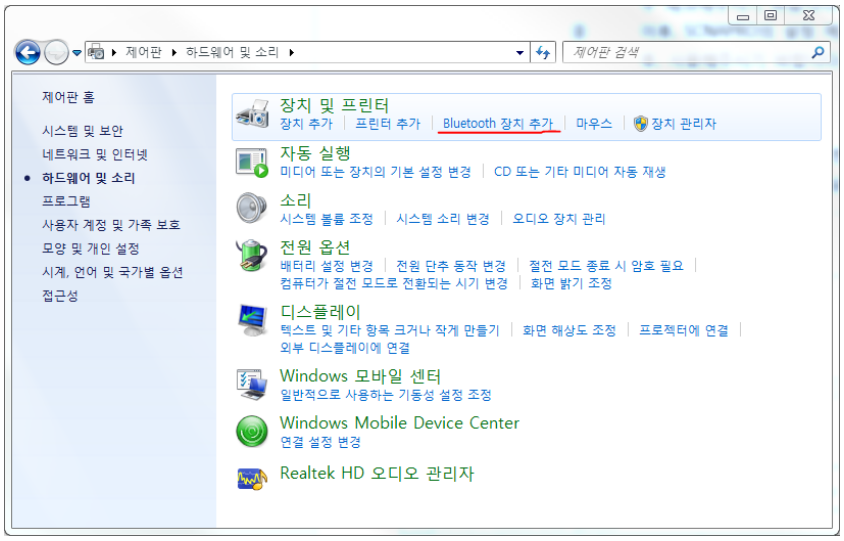
※ Please contact the distributor or the manufacturer who purchased the product for any problems during use or installation.

※ If the Bluetooth driver does not install properly, or if you use a special driver that is supported separately by Windows 7 and 8 or 10 OS, this manual and the contents may not match.

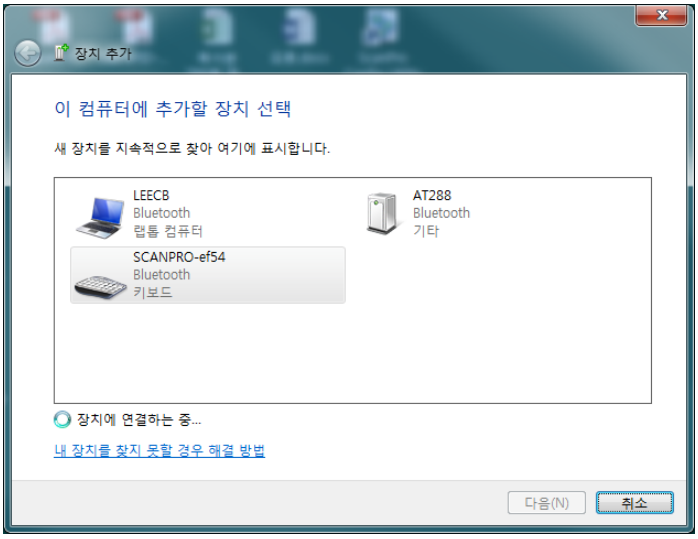
8.1 Windows 7 Environment

① Turn on the AT388 and set it to 7. Network Setup -> 2. Host Paring -> 3. BTH Pairing.

② In Windows, select Start -> Control Panel -> Hardware and Sound -> Devices and Printers -> "Add Bluetooth Device".

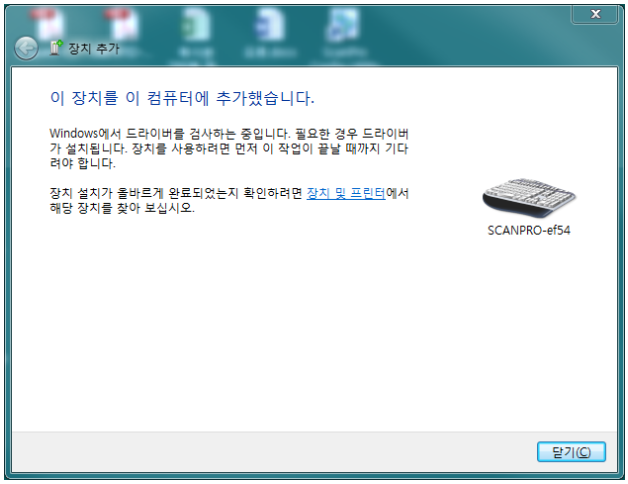


③ The Bluetooth device will be detected automatically, select the AT388 you want to connect to, then press N (Next) to proceed with device addition.

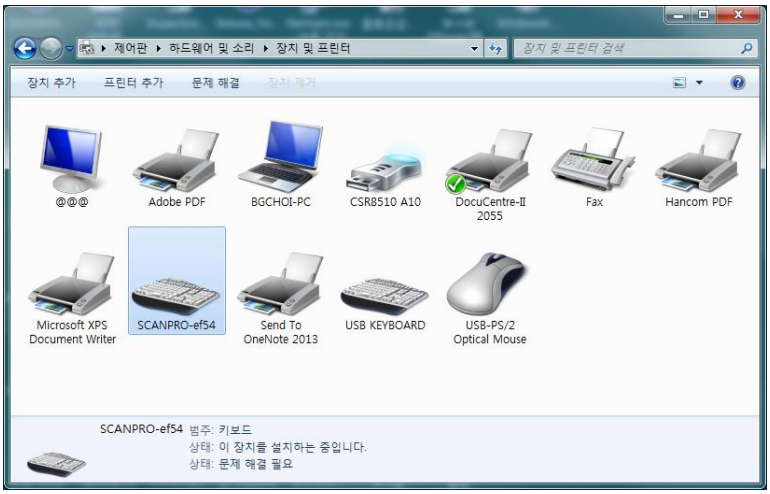


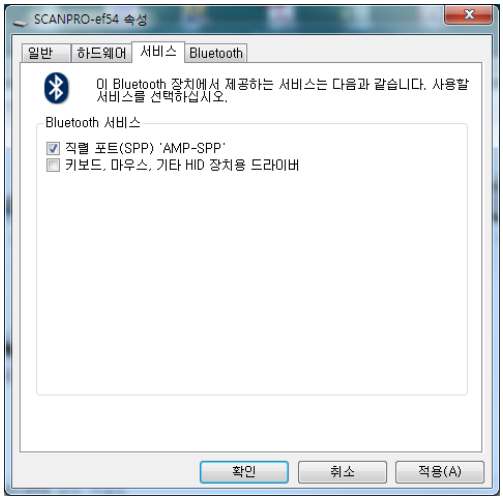
④ When the confirmation window for the connection code is displayed, press N to continue. The connection code does not need to be changed specially.

⑤ After a while, Windows7 will automatically detect the driver and proceed with the installation, and the screen will display the message Completion of device addition.

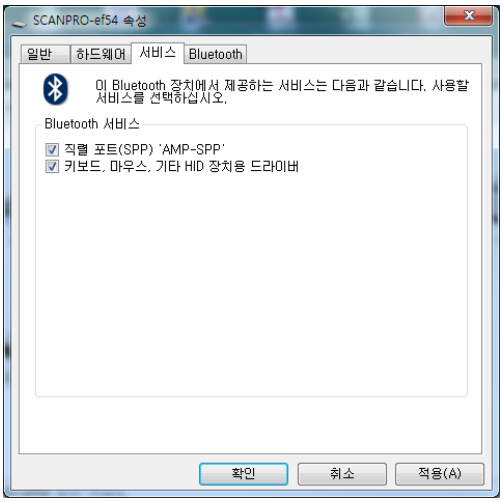


⑥ Double-click on the newly added AT388 in Control Panel -> Devices and Printers to display its properties, then go to the "Services" tab.





⑦ After checking all the two services that appear in the Bluetooth service, click the OK button to finish adding the service and adding the Bluetooth device.



⑧ After that, exit the setting menu of AT388 and set it to the desired operation mode.

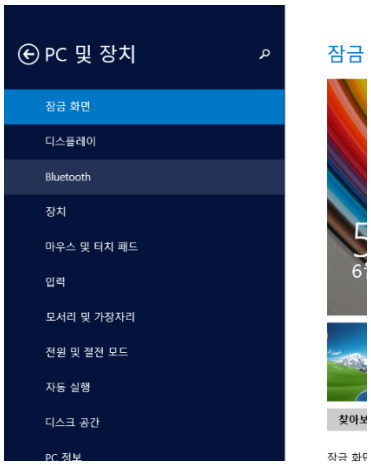
8.2 Windows 8 or Windows 10 Environment

Windows 8 and Windows 10 are similar to the basic user interface, so the contents are based on Windows 8.

① Turn on the AT388 and set it to 7. Network Setup -> 2. Host Paring -> 3. BTH Pairing.

② In Windows, select Start -> PC Settings -> PC and Devices -> Bluetooth.

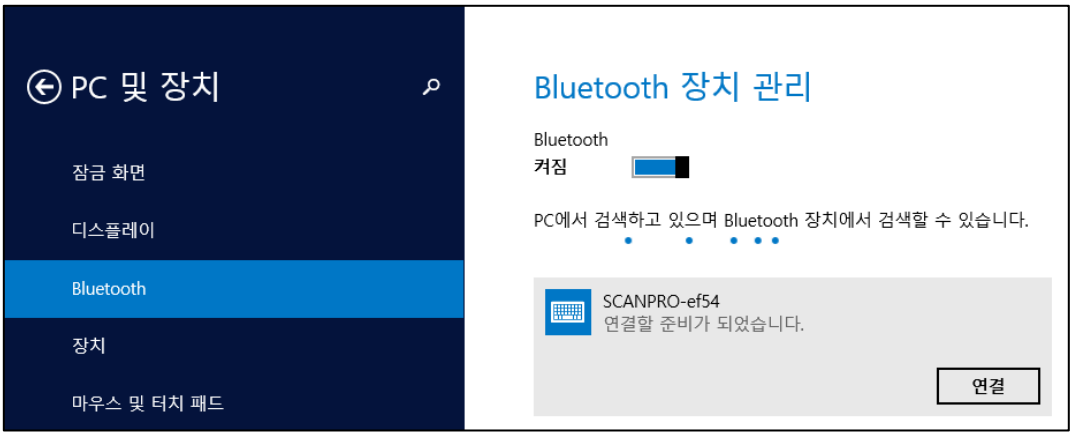
->



< Select settings at Start> < Select Bluetooth on your PC and device>

③ If Bluetooth is off, if you change Bluetooth to on, the AT388 is automatically detected and displayed.

※ The AT388 name may take a while to appear.

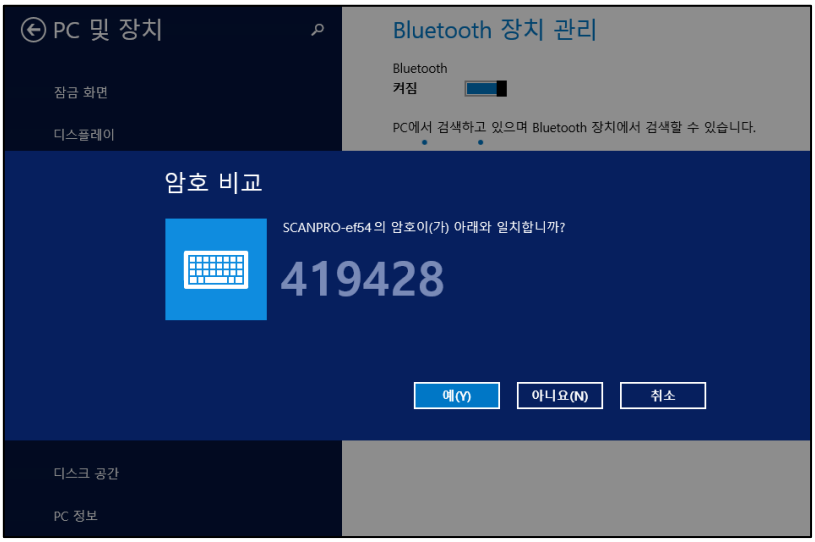


④ After confirming that the displayed contents of the AT388 matches the

AT388's LCD screen, click the "Connect" button on the corresponding device.

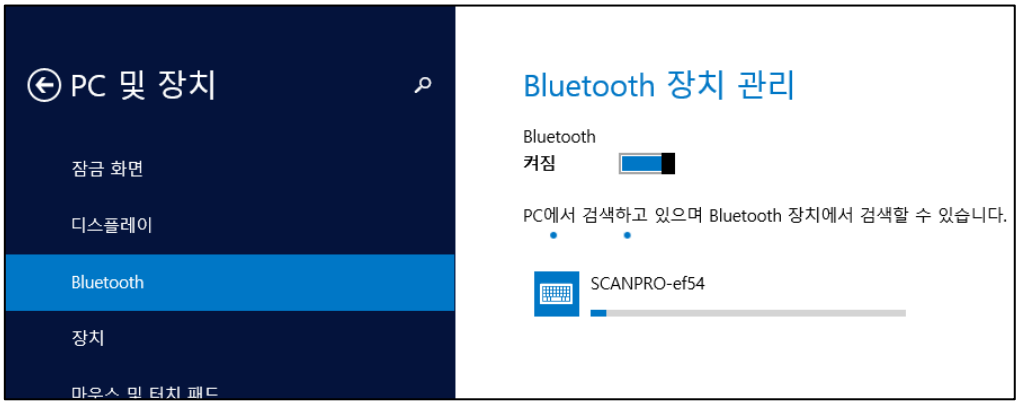
⑤ When the device connection is established for the first time, the password (PIN code) with AT388 will be set automatically, and if confirmation screen is displayed, click "Yes".

※ The password is set automatically, so there is no need to change it.



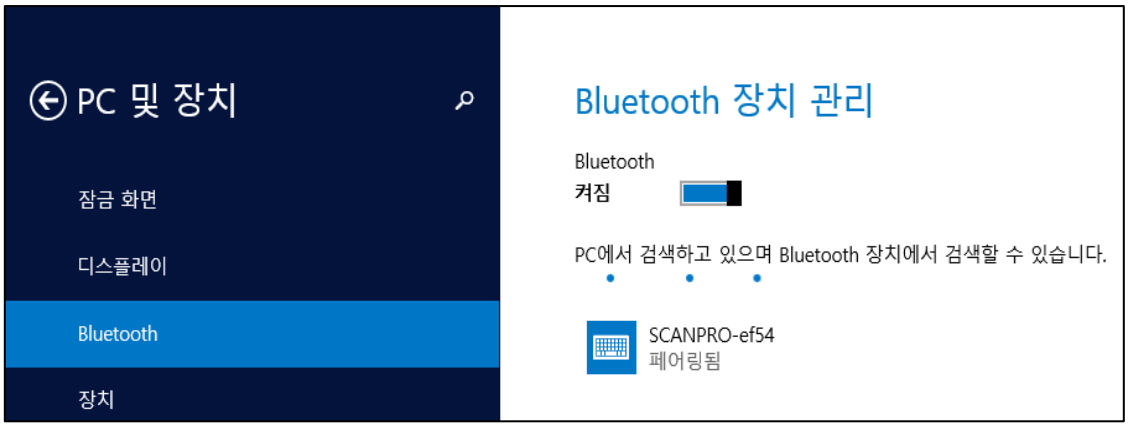
⑥ The driver will be installed automatically when "Connect" is done.

※ It may take a few minutes to install the driver.



⑦ After the driver installation is complete, the message "Paired" is

displayed when the device is successfully added.



⑧ After that, exit the setting menu of AT388 and set it to the desired operation mode, then use it.

9 Firmware Update

Firmware for AT388 can be updated for improvement of its device. If user does not have a proper knowledge on software and hardware, please ask distributor or manufacturer to handle the issue since the recovery of device cannot be possible, in case of that the problem comes up in doing update.

9.1 Preparation for Firmware

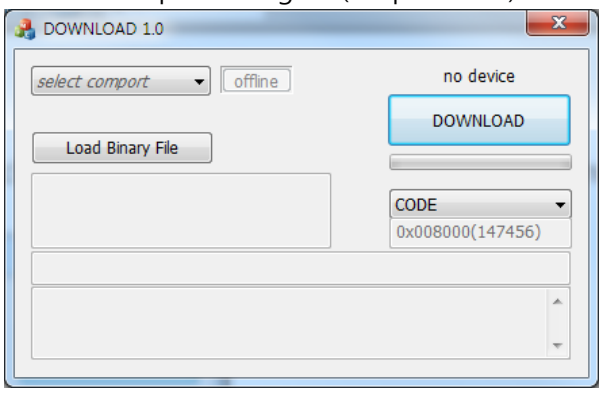
- Computer with over Windows 7 OS
- 1 piece of USB 2.0 Port
- AT388 product
- Micro USB Cable (with Device sold)
- Firmware File(.bin)
- Firmware Updater Application
  (SetupUpdater.msi, it will be supplied from manufacturer or distributor)

9.2 Firmware Update Start

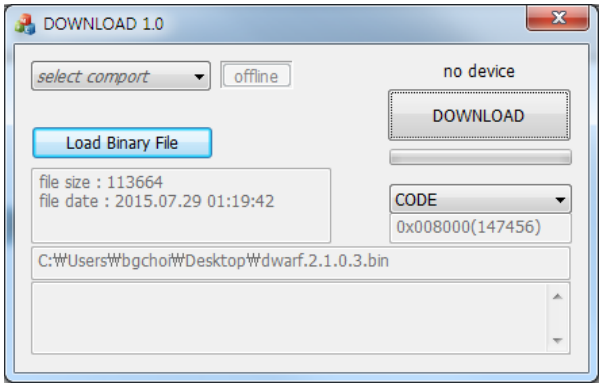
① Install the SetupUpdater.msi into the PC (With Double-click)

② Save the Firmware File to specific folder

③ Execute the Firmware Update Program(fwupdate.exe)

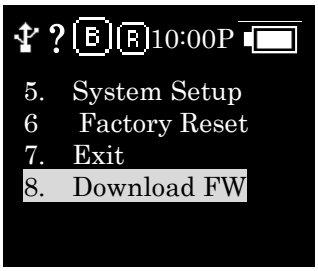


④ Click the "Load Binary File" button and then, select the stored Firmware File in the specific folder

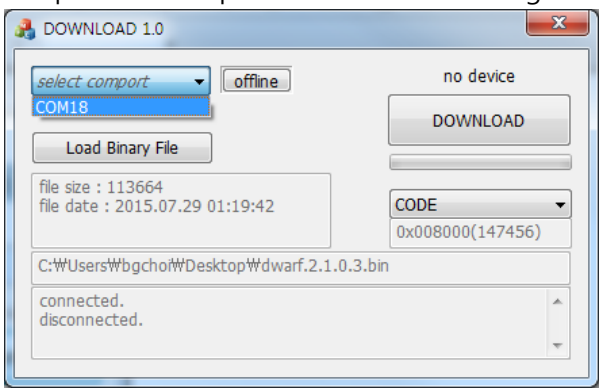


⑤ Connect AT388 with PC through USB cable

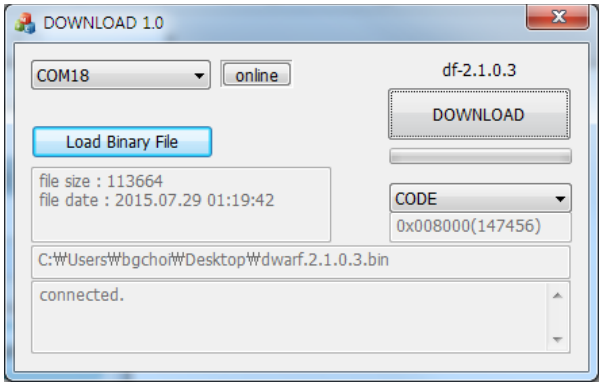
⑥ Enter the the Firmware Download Mode in AT388`s configuration menu.



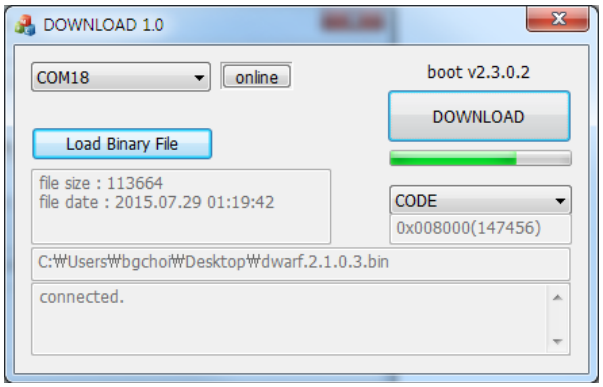
⑦ Click "select comport" in the Updater and select the assigned COM port



⑧ "Online" will be appeared when clicking "off line" and Firmware version will be displayed as well.



⑨ Start the download for Firmware by clicking the download button



⑩ After completion of download, new firmware will be automatically restarted

10 Warranty and Technical Supports

All of ATID products have one-year warranty from date of manufacture

However, there is a principle in ATID that the customer will be charged for the repairs, in case of the damage caused by customer even if it is under warranty period

We recommend requesting the warranty and technical support for AT388 through distributor.

ATID Co., Ltd.
#1211 Byuksan/Gyungin Digitial Valley II, #481-10 Gasan-Dong Gumchon-Gu, Seoul, Korea
TEL: +82-2-544-1436
FAX: +82-2-2113-0040
Homepage: http://www.atid1.com
E-mail: atid@atid1.com , webmaster@atid1.com
English: +82-70-8677-8589
Chinese: +82-70-8677-8669
Japanese: +82-70-8677-8594
Korean: +82-70-8677-8594

Caution:

Use the Product in the environment with the temperature

Between -20℃ and 40℃; Otherwise, it may damage your product. It can be Operating under 2000m。

For the following equipment:

Product Name: UHF Reader

Model: AT388 Brand Name: ATID

ATID CO., LTD E-mail: djlee@atid1.com

hereby declares that this [Name: UHF Reader, Model: AT388] is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU.

CE

CAUTION
RISK OF EXPLOSION IF BATTERY IS REPLACED
BY AN INCORRECT TYPE.
DISPOSE OF USED BATTERIES ACCORDING
TO THE INSTRUCTIONS

The product shall only be connected to a USB interface of version USB2.0 or higher, and that the connection to a power USB is allowed.

Adapter shall be installed near the equipment and shall be easily accessible.

Only can use deceive with Output: 5.0V⎓2A which comply with CE for charging

The RF distance between body and Mobile Phone is 0mm

This product is intended for sale and application in a business environment.

RED Article 10

2

Manufacturers shall ensure that radio equipment shall be so constructed that it can be operated in at least one Member State without infringing applicable requirements on the use of radio spectrum.

-This product can be used across EU member states

10

In cases of restrictions on putting into service or of requirements for authorisation of use, information available on the packaging shall allow the identification of the Member States or the geographical area within a Member State where restrictions on putting into service or requirements for authorisation of use exist. Such information shall be completed in the instructions accompanying the radio equipment. The Commission may adopt implementing acts specifying how to present that information. Those implementing acts shall be adopted in accordance with the advisory procedure referred to in Article 45(2).

-The product is class 1 product, No restrictions

Technical Characteristics of EUT	
Bluetooth Version:	Bluetooth V4.1 (Only EDR)
Frequency Range:	2402-2480MHz
RF Output Power:	9.42dBm (EIRP)
Type of Modulation:	GFSK, Pi/4 DQPSK, 8DPSK
Data Rate:	1Mbps, 2Mbps, 3Mbps
Quantity of Channels:	79
Channel Separation:	1MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	0dBi
Wi-Fi	
Support Standards:	802.11b, 802.11g, 802.11n-HT20
Frequency Range:	2412-2472MHz for 802.11b/g/n(HT20)
Max.RF Output Power:	9.81dBm (EIRP)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Quantity of Channels	13 for 802.11b/g/n(HT20)
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	2.2dBi
RFID	
Frequency Range:	865.7-867.5MHz
RF Output Power:	26.47dBm (ERP)
Modulation:	ASK
Quantity of Channels:	4
Channel Separation:	600kHz
Antenna Type:	Integral Antenna
Antenna Gain:	1dBi

FCC RF Exposure Information and Statement

The SAR limit of USA (FCC) is 1.6 W/kg averaged over one gram of tissue. This device has also been tested against this SAR limit. SAR information on this and other pad can be viewed on - line at http://www.fcc.gov/oet/ea/fccid/. Please use the device FCC ID number for search. This device was tested simulation typical 0mm wear on hand.

FCC Warning

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.

NOTE 1: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.