UHF RFID Robot Reader

AT Command

Model：WS-RFIDBY

Version History

Version	Date	Changes
V1.01	11, April, 2017	1st Edition
V1.02	21, August, 2018	2st Edition

Installation Direction (When Install on the Wall)
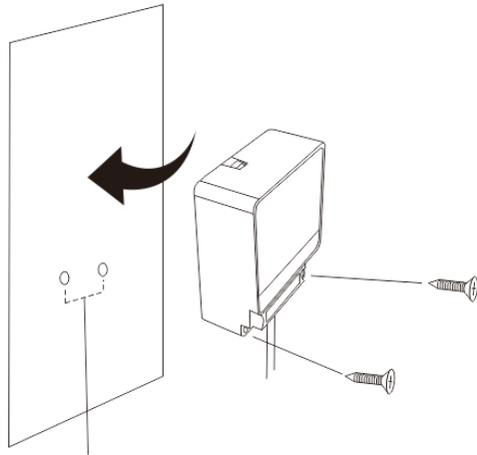
The distance between both screws are 47.5mm.
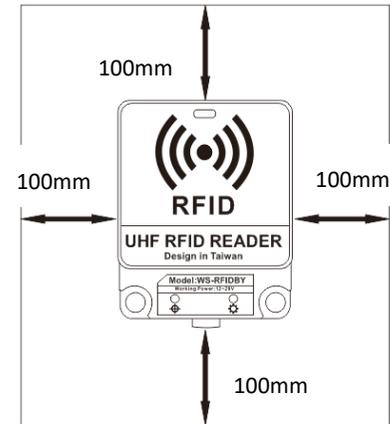
The minimum space room for WS-RFIDBY each side must be 100mm.

In order to keep the antenna efficiency well.

WS-RFIDBY-TCP (Network Cable Insertion, Power Insertion)

1. DC 12V 2A
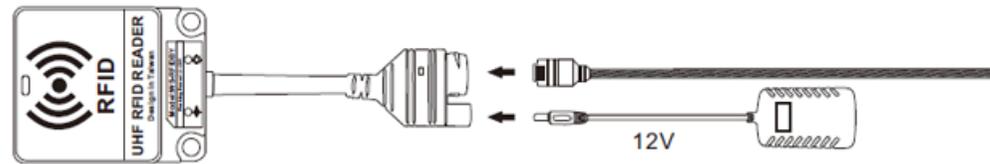
2. POE
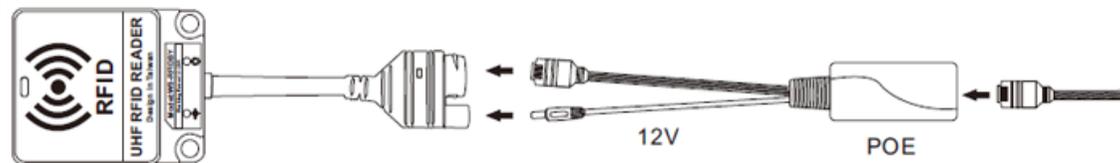
WS-RFIDBY-RS232

GND TX RX

1 3 6

RJ45

1:CD 2:RxD 3:TxD 4:DTR 5:GND

6:DSR 7:RTS 8:CTS 9:RI

RS-232

WS-RFIDBY-RS485

GND GND

485A 485B

1 2 3 6

RJ45

1 2 3 4
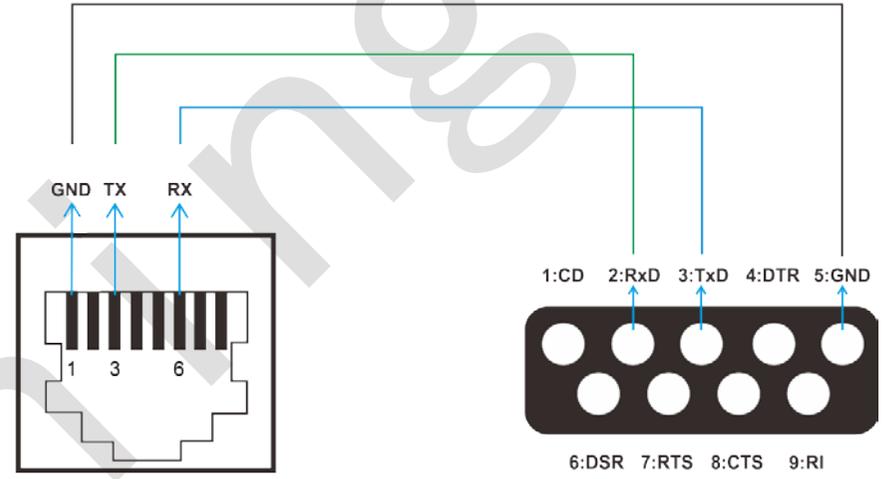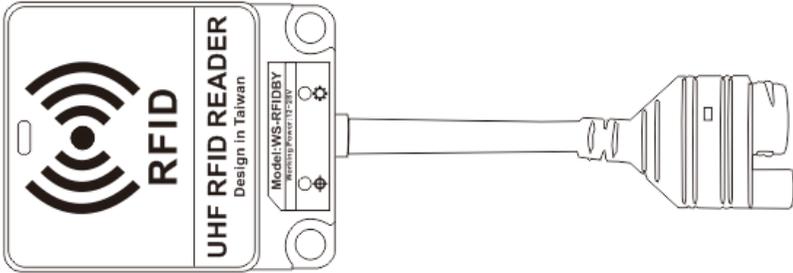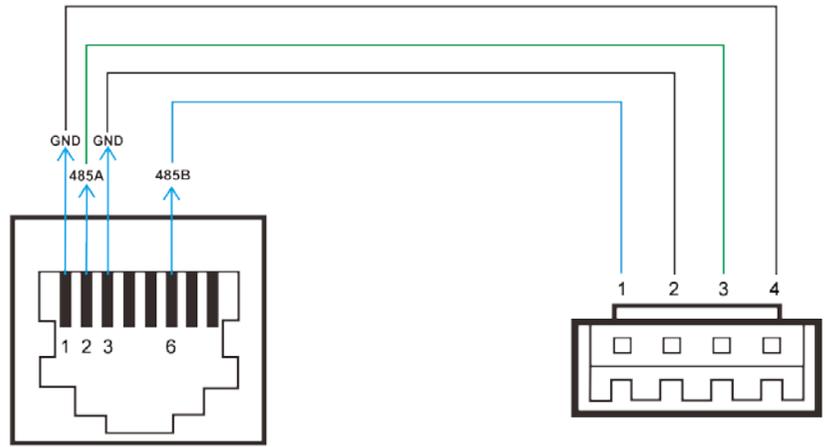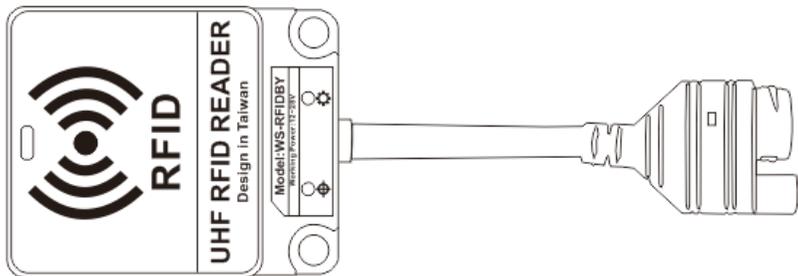
RS-485

Signal Indicating Instruction

Connection Indicator：Constant light when connected to network

Status indicator：Standby Mode = Green light bright permanency

Reading Tag = Blue light bright permanency 2seconds
Equipment Malfunction = Red Light bright permanency
Update Mode = Green light shine

Connection LED

Status Indicator
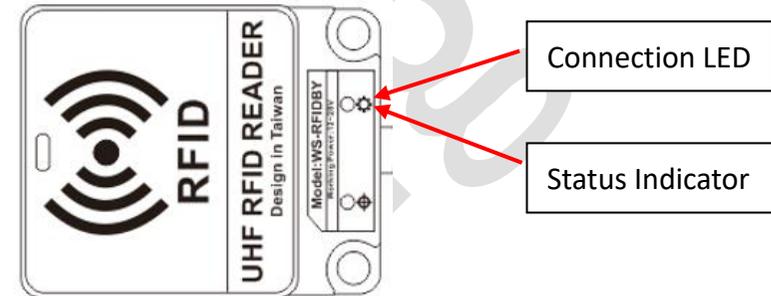
Setting of the Internet (WS-RFIDBY-TCP Only)

1. Please insert the WS-RFIDBY-TCP network line and power line. (connect to computer or LAN)

2. Execute "Wenshing All in one NET tools"，the screen is as follows.
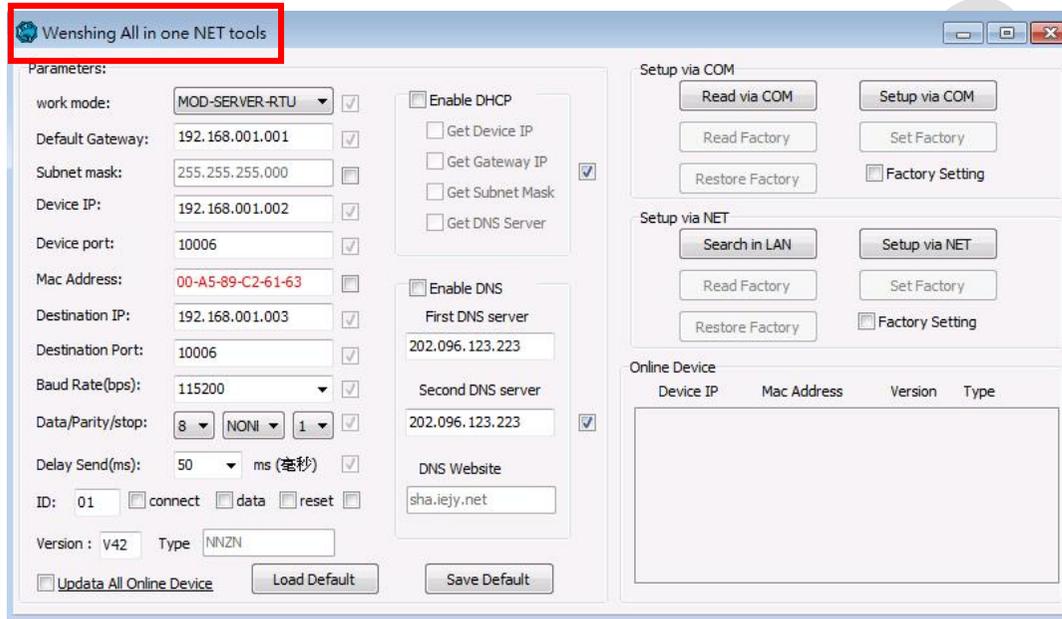
3. Search the equipment in the LAN, click "Search in LAN" button.

4. After the equipment was being found, the IP address will show up:

5. Read the network setting parameters. After clicked the searched device IP twice, the current settings will be automatically read and displayed on the left side of "Parameters".

6. Modify the setting parameter on internet. Find the suitable setting on the left and correct it. Click "Setup via NET" to modify it. (cannot use Port 5978).

7. If the modification is successful, the following prompt will be displayed.

8. Restarted, put off the power line and plug in again. Click the "Search in LAN" button twice and you can find the IP of the equipment. Ensure the internet setting is correct or not.
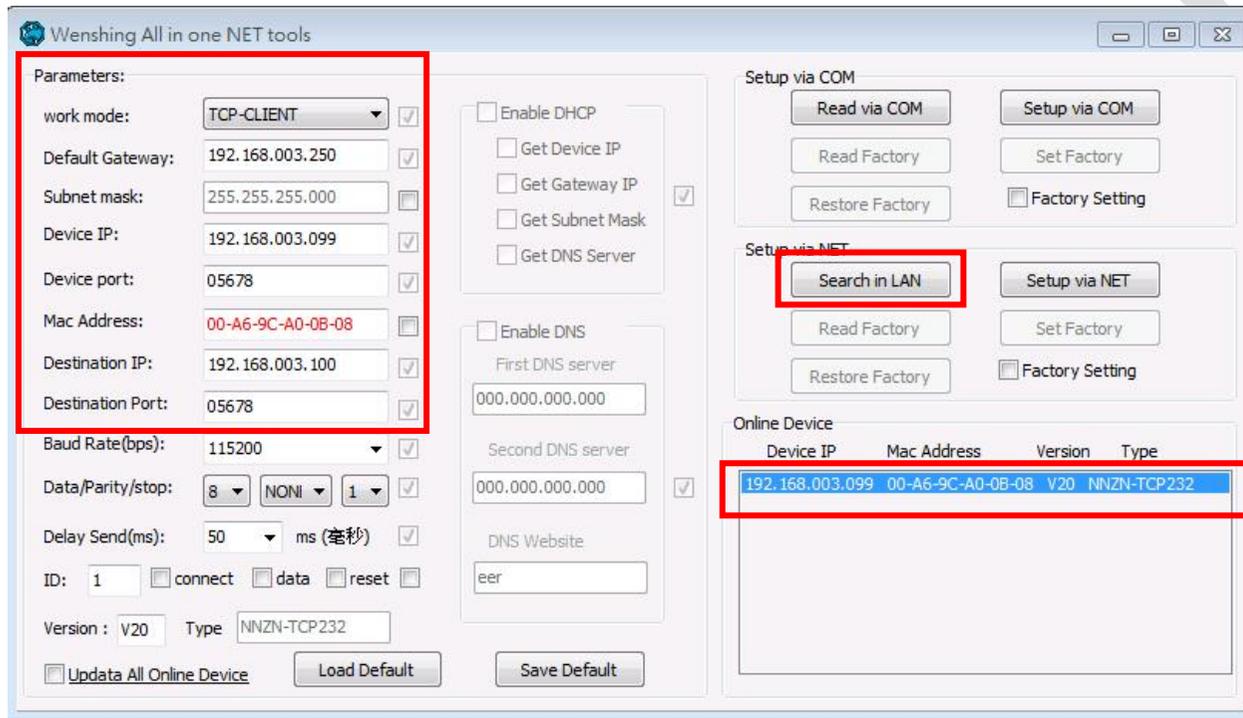
PC Wired Network Setting Method (WS-RFIDBY-TCP Only)

1. Setting the PC internet parameter. Modify the settings corresponding to the PC according to the set parameters.
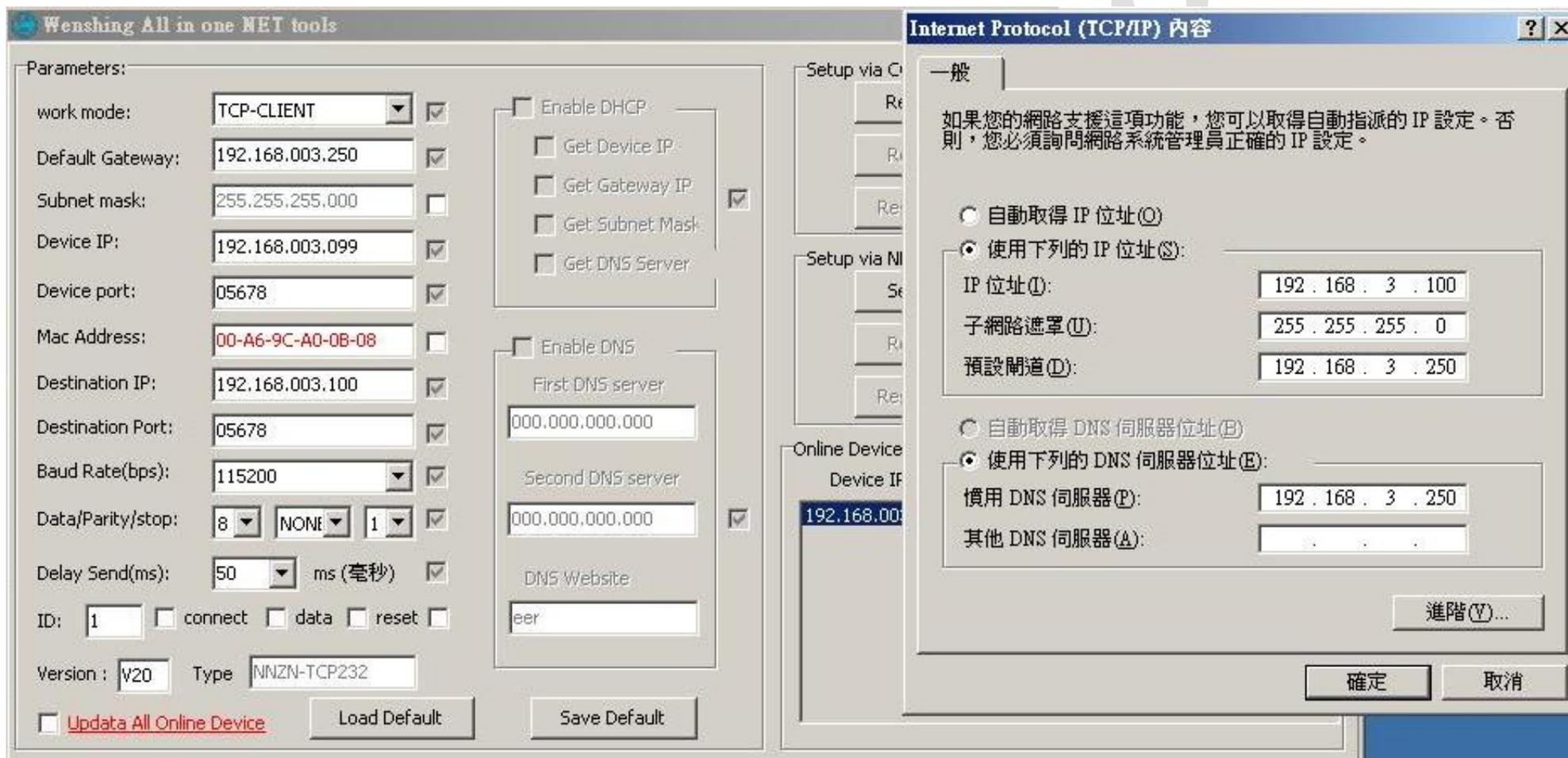
2. Test on the communication, PC execute "TCP Server" software and set the appropriate port. Send the AT command to test the communication is correct or not. (cannot use Port 5978).
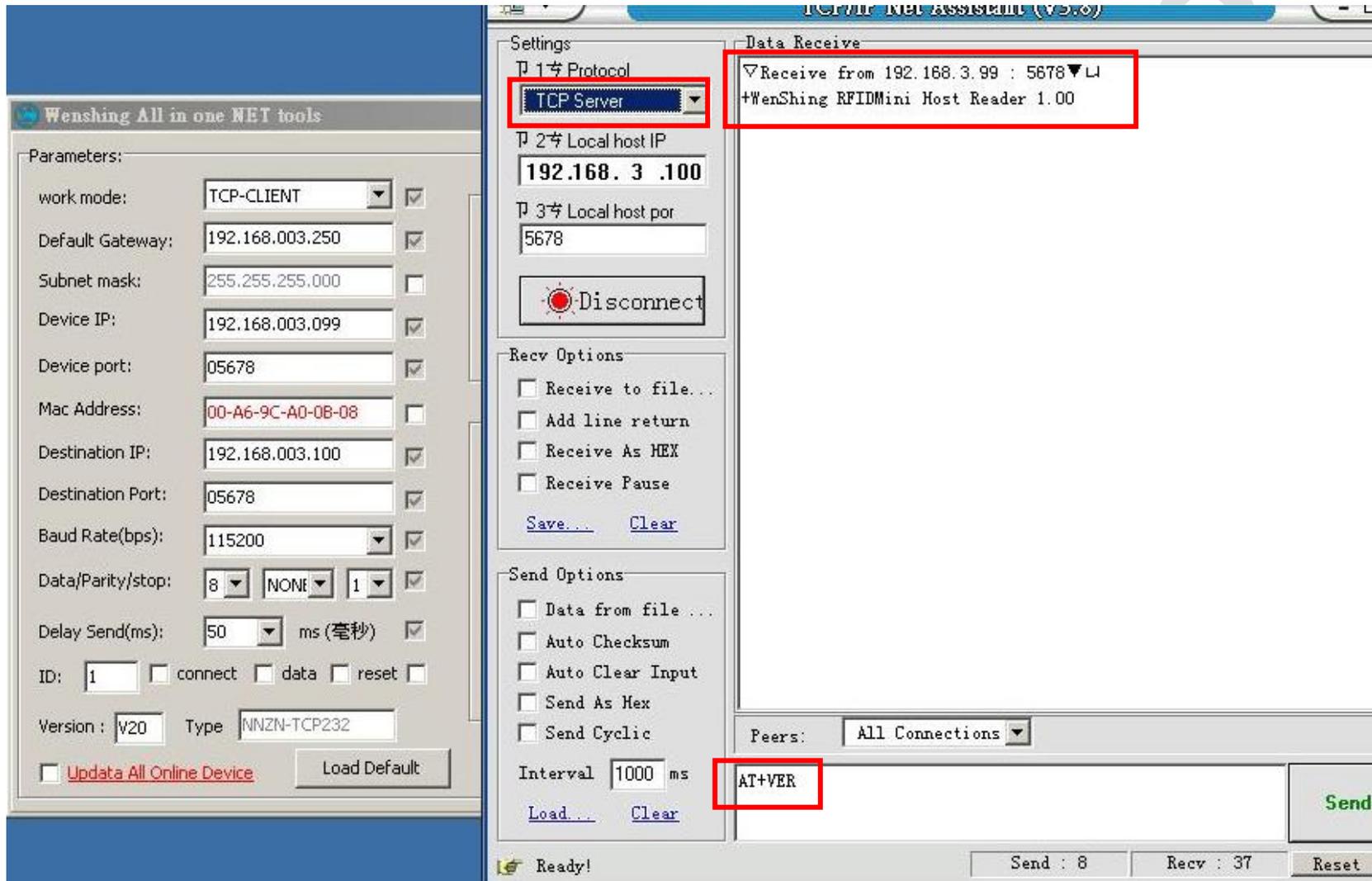
Output Data Format

Byte1 = 0x53 Suggesting output data is TAG TID；Data format reference as below：

Byte 0	Byte 1	Byte 2	Byte 3~N	Byte N+1
0x02	0x53	Length of data being read	Tag TID	0x03

Byte1 =0x54 Suggesting output data is TAG EPC；Data format reference as below：

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4~6	Byte 7	Byte 8~9	Byte 10~N	Byte N+1
0x02	0x54	Length of data being read	RSSI value being received	Frequency being received and Antenna port	PC+EPC Length	PC (Tag assortment)	Tag EPC	0x03

Byte 4 is frequency low byte

Byte 5 is frequency middle byte

Byte 6 is frequency high byte and antenna port

When bit 7=1 the frequency value is 0E, bit 7=0 the frequency value is 0D

Bit 0~5 is received antenna port , antenna 1=0 0000、antenna 2=0 0001、antenna 3=0 0010、antenna 4=0 0011

AT Command

" Newline" for each command (Attention: You must stop the scan before sending all instructions.)
In the command, 0001 represents the ID address of the device. The ID can be used to set the data of the specified device or specify the device to return the data. The parameters range from 0001 to 9999.

	AT COMMAND	RFID Reader Return	Function Explanation
1	AT+0000-FindDeviceID		Search all of the device's ID address in LAN.
		+0000-FindDeviceID:0001	0001 represents the ID address.
2	AT+0001-DeviceID:0002		Modify the ID address of device.
		+0001-DeviceID:0002	Command successful.
3	AT+0001-Scan:0		Setting the model status: 1 =scan, 0= stop scanning. Default = 1
		+0001-Scan:0	Instruction successful.
4	AT+0001-VER		Read the version of device.
		+WenShing RFIDBY4 Reader 0.01	Device name and firmware version
5	AT+0001-BuzzTime:3		Buzz sound number control. Buzz sounds 3 times when this command is given. If it is to be sounded twice, the command is "AT+0001-BuzzTime: 2". Parameter 1 range is 1~9
		+0001-BuzzTime:3	Command successful. Buzzer will ring for three times.
6	AT+0001-BuzzONOFF:0		Set the buzzer switch when Buzz reads the tag. =0 – turn off the notification of sound. =1 – turn on the notification of sound.
		+0001-BuzzONOFF:0	Command successful.

7	AT+0001-Reset		Reset the system.
		+0001-Reset	Command successful.
8	AT+0001-SetPower:30dBm		Set the output power, range is from 19dbm to 30dbm.
		+0001-SetPower:30dBm	Command successful.
9	AT+0001-Mode:S0		S0: Scan multiple Tags, as long as the RFID scans to the Tag and it will respond. (Usually, it be used on test environment.) S1: Scan multiple Tags, after scanning the TAG, the Tag will take about 1 second to respond again. Usually, it be used a lot in inventory, lane, and logistics. S2: Scan multiple Tags, after the Tags are scanned. The Tags need to leave the receiving range for a period of time and return within the range then Tags will be responding. Usually, it be used a lot in racing and logistics. S3: Scan multiple Tags, after the Tags are scanned. The Tags need to leave the receiving range for a period of time and return within the range then Tags will be responding. Usually, it be used a lot in racing and logistics. Default = S1
		+0001-Mode:S0	Command successful.
10	AT+0001-SetQuery:SL=0,SS=0,TG=0,Q4		Parameter SL: 0 Parameter SS: 0=S0 1=S1 2=S2 3=S3 S0: Scan multiple Tags, as long as the RFID scans to the Tag and it will respond. (Usually, it be used on test environment.) S1: Scan multiple Tags, after scanning the TAG, the Tag will take about 1 second to respond again. Usually, it be used a lot in inventory, lane, and logistics. S2: Scan multiple Tags, after the Tags are scanned. The Tags need to leave the receiving range for a period of time and return within the range then Tags will be responding. Usually, it be used a lot in racing and logistics. S3: Scan multiple Tags, after the Tags are scanned. The Tags need to leave the receiving range for a period of time and return within the range then

			Tags will be responding. Usually, it be used a lot in racing and logistics. Default = S1. Parameter TG: 0. Parameter Q: Range is from Q0~Q7, you need to set it bigger. When scan multiple Tags simultaneously.
		+0001-SetQuery:SL=0,SS=0,TG=0,Q4	Command successful.
11	AT+0001-ReadDeviceMessage		Read the setting of parameter.
		+0001-ReadDeviceMessage	Command successful.
		+Sel=0	Default = 0
		+Session=1	Default = 1
		~~+Target=A~~	~~Default = A~~
		+Qbegin=4	Default = 4
		~~+WorkingArea=2~~	~~working frequency=2~~
12	AT+0001-Read:1,00,00000000,08,201309248 726030001020022		Read the information of specific Tags. parameter1: =0 – Read Tag's coding area. =1 – Read Tag's EPC area. (Parameter 2 needs to use 02). =2 – Read Tag's TID area (Read Only) =3 – Read Tag's user area. Parameter 2: Reads the number of characters filled in Parameter 4 starting at address 00(1Word=2byte). Range is form 00~FF. parameter 3: 00000000: Access password parameter. parameter 4: 08 for reading how many words (unit is Hex). parameter 5: EPC number.

		+0001- Read:1,00,00000000,08,2013092487 26030001020022<00> →2DF1351720130924872603000010 20022 or +0001- Read:1,00,00000000,08,2013092487 26030001020022<09>	<00>: Tag is correct. <09>: Tag is no longer exist. <A3>: Parameter 4 is out of storage zone.
13	AT+0001- Write:3,00,00000000,20130924872 6030001020022,098765432109876 54321		Write in the information of specific Tags. Parameter 1: 3– Write in the user's area of Tag. =0 – Write in password's area of Tag. =1 – Write in EPC area of Tag. (Parameter 2 needs to use 02 when the EPC length is not changed.) =2 – TID area is read-only. Written is unavailable. =3 – write access to Tag area from the user part. To modify the length of the EPC, parameter 2 must be written from 01. When modified to 12 bits, location of 01 will be filled into 3400. When modified to 14 bits, location of 01 will be filled into 3800. When modified to 16 bits, location of 01 will be filled into 4000. The following example are modified from 12 bits to 16 bits. AT+0001- Write:1,01,00000000,201311248725010001 02000A,4000AA13112487250 1000102BBBB01020304 +0001- Write:1,01,00000000,201311248725010001 02000A,4000AA13112487250 1000102BBBB01020304<00> The following example are modified from 16 bits to 12 bits. AT+0001- Write:1,01,00000000,AA131124872501000102BBBB01020304,300020131 1248725010001 02000A +0001-

		Write:1,01,00000000,AA131124872501000102BBBB01020304,300020131124872501000102000A<00> Parameter 2: 00- Writes from address 00 and all data is in words. Parameter 3: 00000000: Access password. Parameter 4: EPC number. Parameter 5: The data to be written must be the multiple of 2 Bytes.
	AT+0001- Write:3,00,00000000,201309248726030001020022,09876543210987654321<00>	<00>: Represent the writing is correct. <10>: Represent the Tag is no longer exist or EPC number is not corrected.

1. Execute "Wenshing All in one NET tools", the screen is as follows.

2. Search for devices in the LAN and click the button of "Search in LAN."
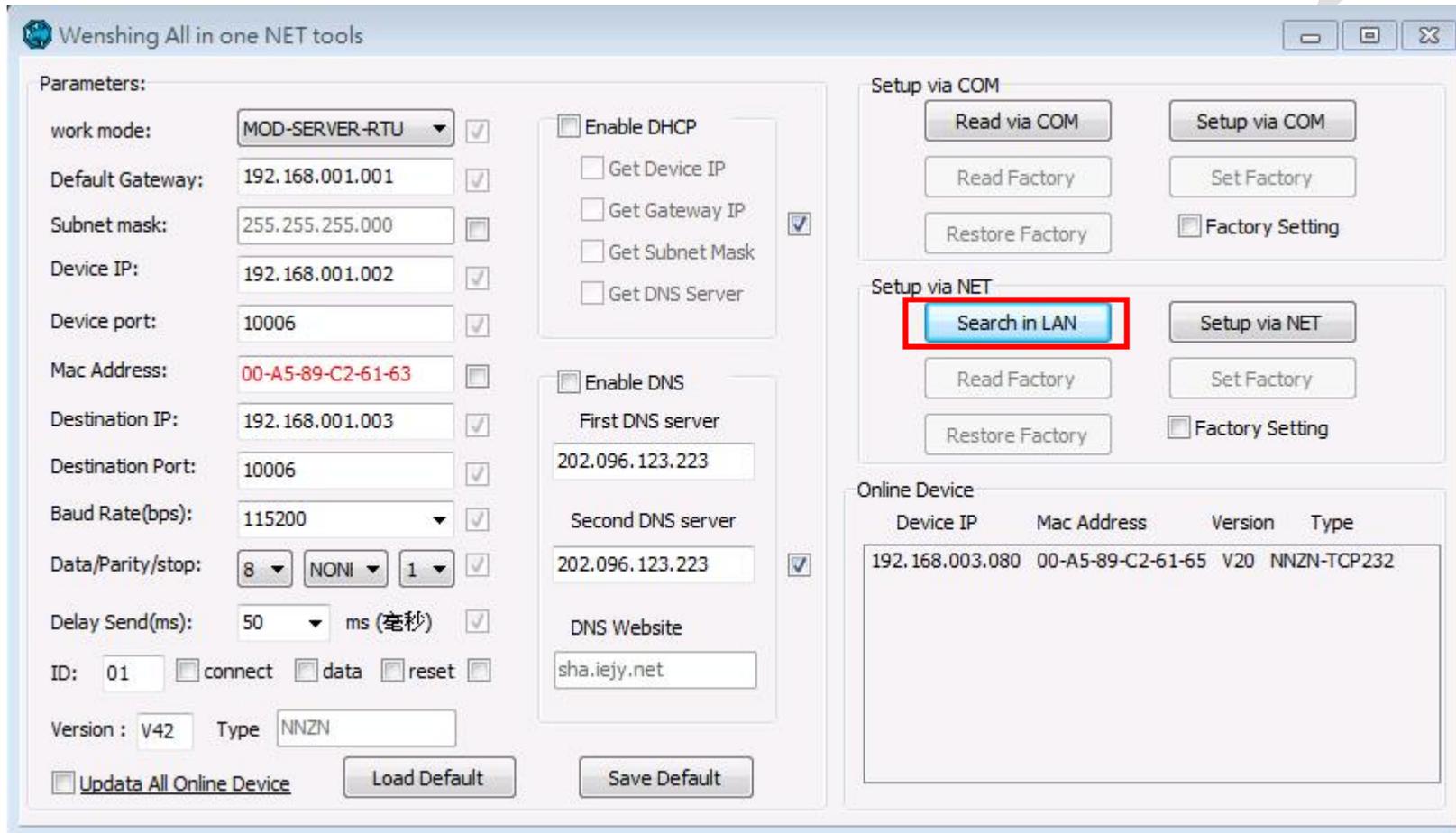
3. After searching for the device and the IP address of the device will be displayed below.

4. Read the network setting parameters and click on the searched device IP twice to automatically read the current settings. Then it will display the "Parameters" on the left side.
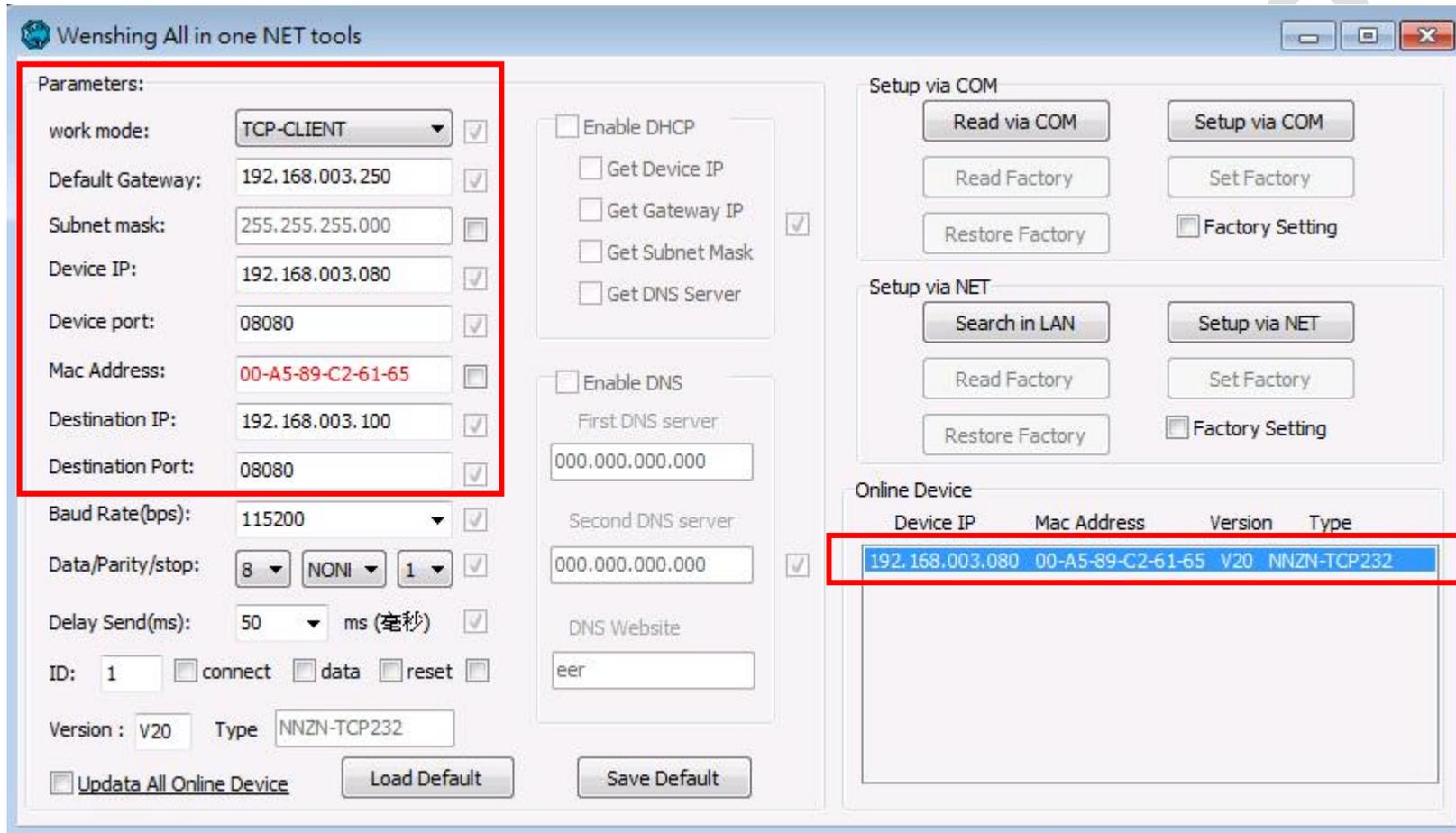
5. Modify the working mode, IP location, Device port of the update host, and modify it by using "Setup via NET."
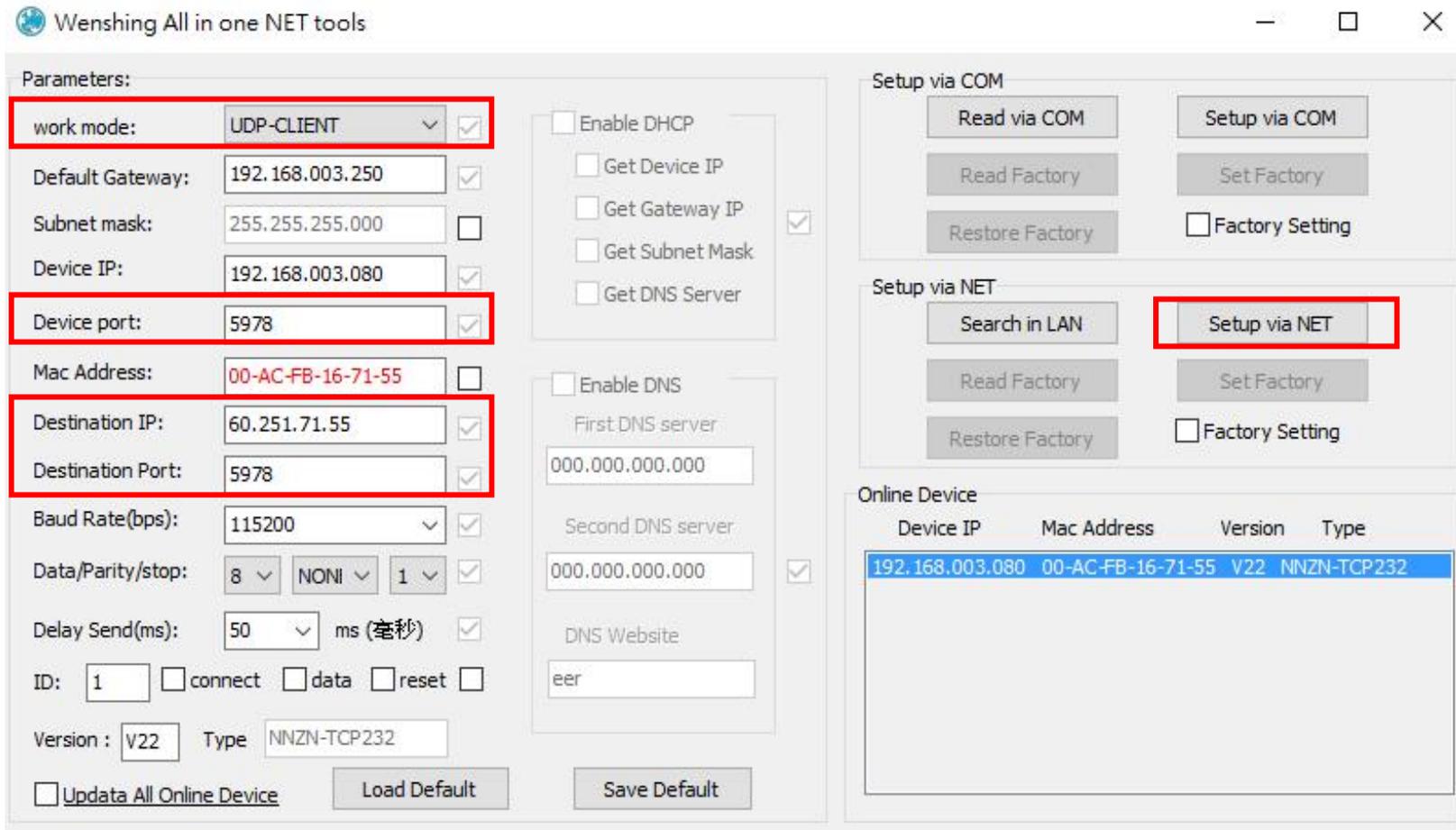
6. If the modification is successful, the following prompt will be displayed.
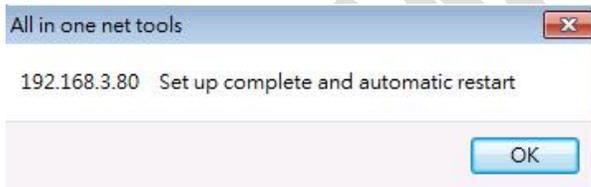
7. Restart, remove the WS-RFIDBY device and plug it in again. When the update begins, the lights are alternately changed by green, red and blue, and there is an audible prompt. After the update is successful, it will restart and enter the standby state.

8. Use "Wenshing All in one NET tools" to modify the appropriate network settings, refer to PC wired network settings.

Table 1：Read/Write Error Code

#	Type	Code	Description
1	Command Error	0x17	Command code error in command frame.
2	FHSS Fail	0x20	The frequency-hopping searches the channel overtime, all channels all are taken during this period of time.
3	Inventory Fail	0x15	Polling operation failed. Tag does not return data or return CRC checking error.
4	Access Fail	0x16	Access Tag failed. It is possible that the Access password is incorrect.
5	Read Fail	0x09	Failed to read Tag data storage area. Tag does not return data or return CRC checking error.
6	Read Error	0xA0 | Error Code	Read Tag data storage error. The returned code is obtained by 0xA0 and Table 3 Error Code. The Error Code information is shown in the table below.
7	Write Fail	0x10	Failed to write Tag data storage area. Tag does not return data or return CRC checking error.
8	Write Error	0xB0 | Error Code	Read Tag data storage error. The returned code is obtained by 0xA0 and Table 3 Error Code. The Error Code information is shown in the table below.
9	Lock Fail	0x13	Locking the Tag data storage area failed. Tag does not return data or return CRC checking error.

10	Lock Error	0xC0 | Error Code	Lock Tag data storage error. The returned code is obtained by 0xA0 and Table 3 Error Code. The Error Code information is shown in the table below.
11	Kill Fail	0x12	Kill Tag failed. Tag does not return data or return CRC checking error.
12	Kill Error	0xD0 | Error Code	Kill Tag failed. The returned code is obtained by 0xA0 and Table 3 Error Code. The Error Code information is shown in the table below.

For example: Error Code Return<B3>, representatives' item 8 of Table 1 and item 2 of Table 3. Write Error writing Tag data storage error. The specified Tag data storage area does not exist or the Tag does not support EPC of the specified length, such as XPC.

Table 2：NXP G2X Specific-Instruction of Tag Error Code

#	Type	Code	Description
1	ReadProtect Fail	0x2A	ReadProtect command failed. Tag does not return data or return CRC checking error.
2	Reset ReadProtect Fail	0x2B	Reset ReadProtect command failed. Tag does not return data or return CRC checking error.
3	Change EAS Fail	0x1B	Change EAS command failed. Tag does not return data or return CRC checking error.
4	NXP Error Code returned by the unique instruction Tag	0xE0 | Error Code	NXP Error Code returned by the unique instruction Tag. The Error Code is obtained by 0xE0 and Table 3 Error Code.

Table 3：EPC Gen2 Tag In Agreement Returns an Error Code

#	Type	Code	Description
1	Error-specific	0	All other errors.
2		3	The specified Tag data storage area does not exist or the Tag does not support EPC of the specified length, such as XPC.
3		4	The specified Tag data storage is locked and/or for permanently. And also, the lock status is not writable or unreadable.
4		B	Tag does not receive enough power to write.
5	Non-specific	F	Tag does not support Error Code return.