UHF RFID Combined Reader Writer

Model: WS-RFIDALL-9

Version History

Version	Date	Changes
V1.01	08, August, 2017	1st Edition
V1.02	03, August, 2018	2st Edition

Wenshing

Technical Specifications

- Working Frequency: 902~928MHz
- Protocol: ISO18000-6C (EPC G2)
- Antenna: Built-in 9dBi
- Output Power: 20~33dBm
- Interface: RJ45、RS232、RS485、Wi-Fi、Weigand (Optional)
- Working Voltage: 12~24Vdc 2A
- Optional: 3 relay output controls and 1 input trigger
- Serial Communication Rate: Maximum Support up to 115200bps
- Working Temperature: -10°C ~ +60°C
- Size: 258x258x110mm

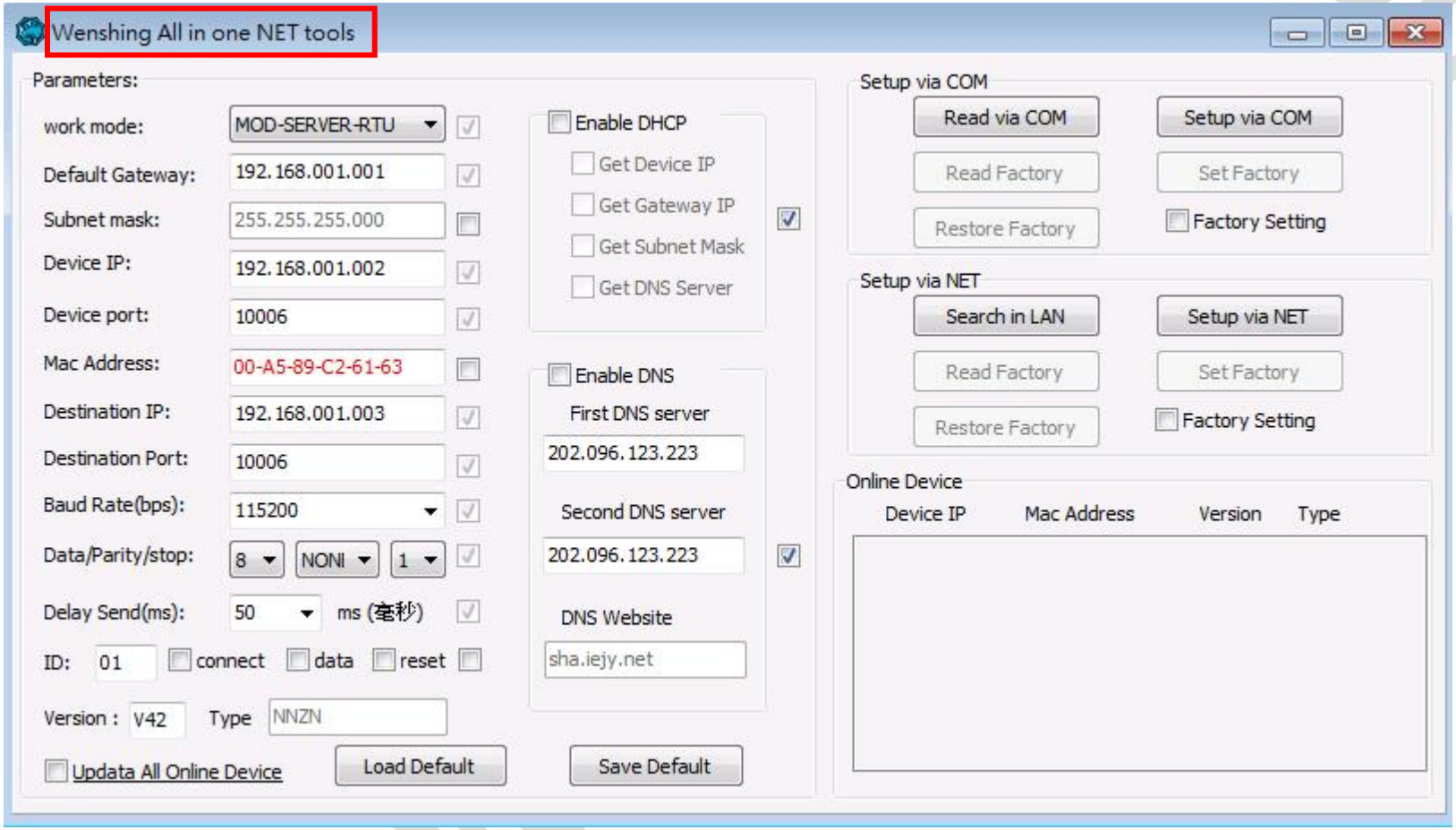
Network Initial Setting

- Default Gateway = 192.168.3.250
- Subnet Mask = 255.255.255.0
- Device IP = 192.168.3.88
- Device Port = 5000
- Destination IP = 192.168.3.100
- Destination Port = 5000
- Work Mode = TCP Client

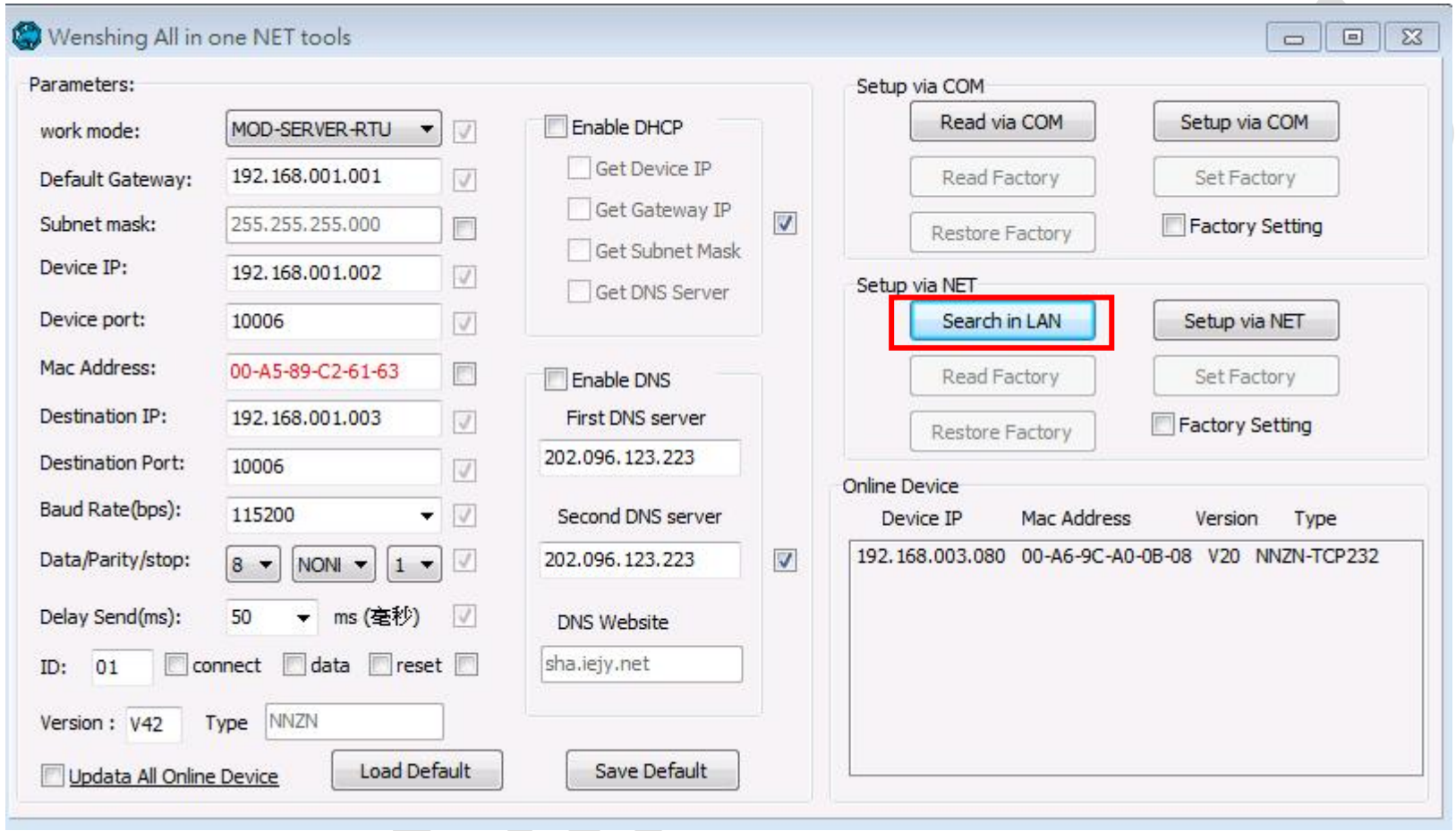
Wenshing

Network Configuration Mode

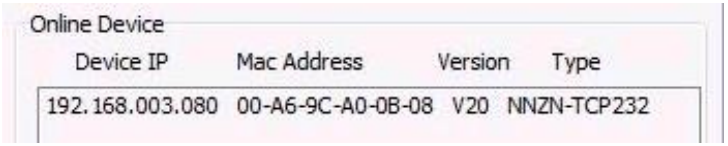
1. Please insert the WS-RFIDALL-9 network line and power line. (connect to computer or LAN)
2. Execute “Wenshing All in one NET tools” after you turned on it the screen is as following.



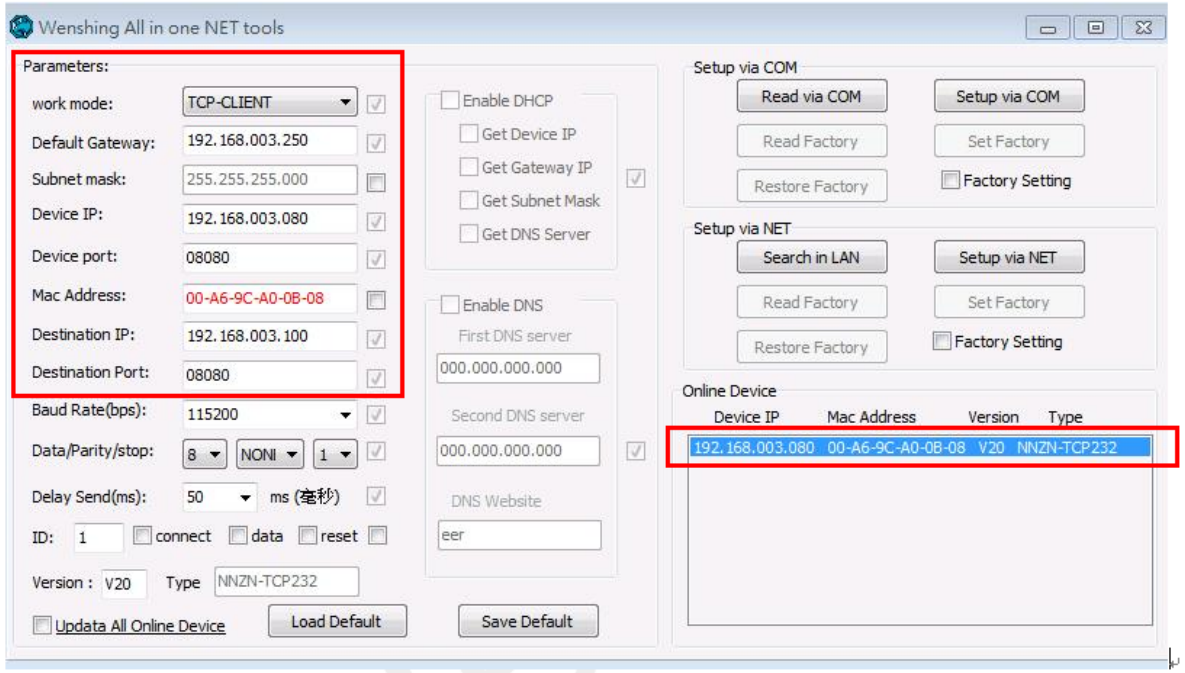
3. Search the equipment in the LAN, click “Search in LAN” button.



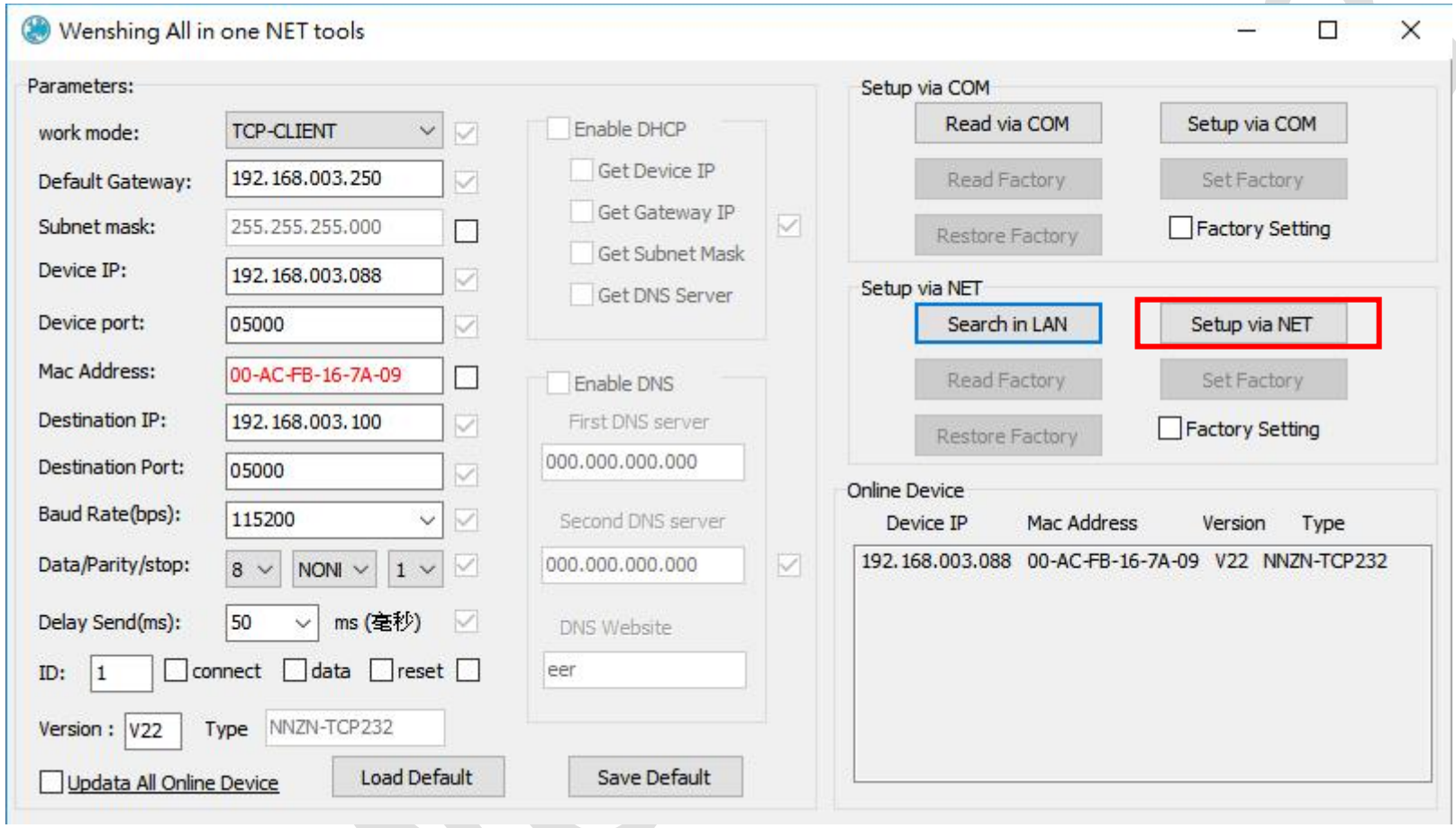
4. After the equipment was being found, the IP address will show up.



5. Read the network settings parameters, click twice to search for the device IP and automatically read the current settings. And display on the left "Parameters".

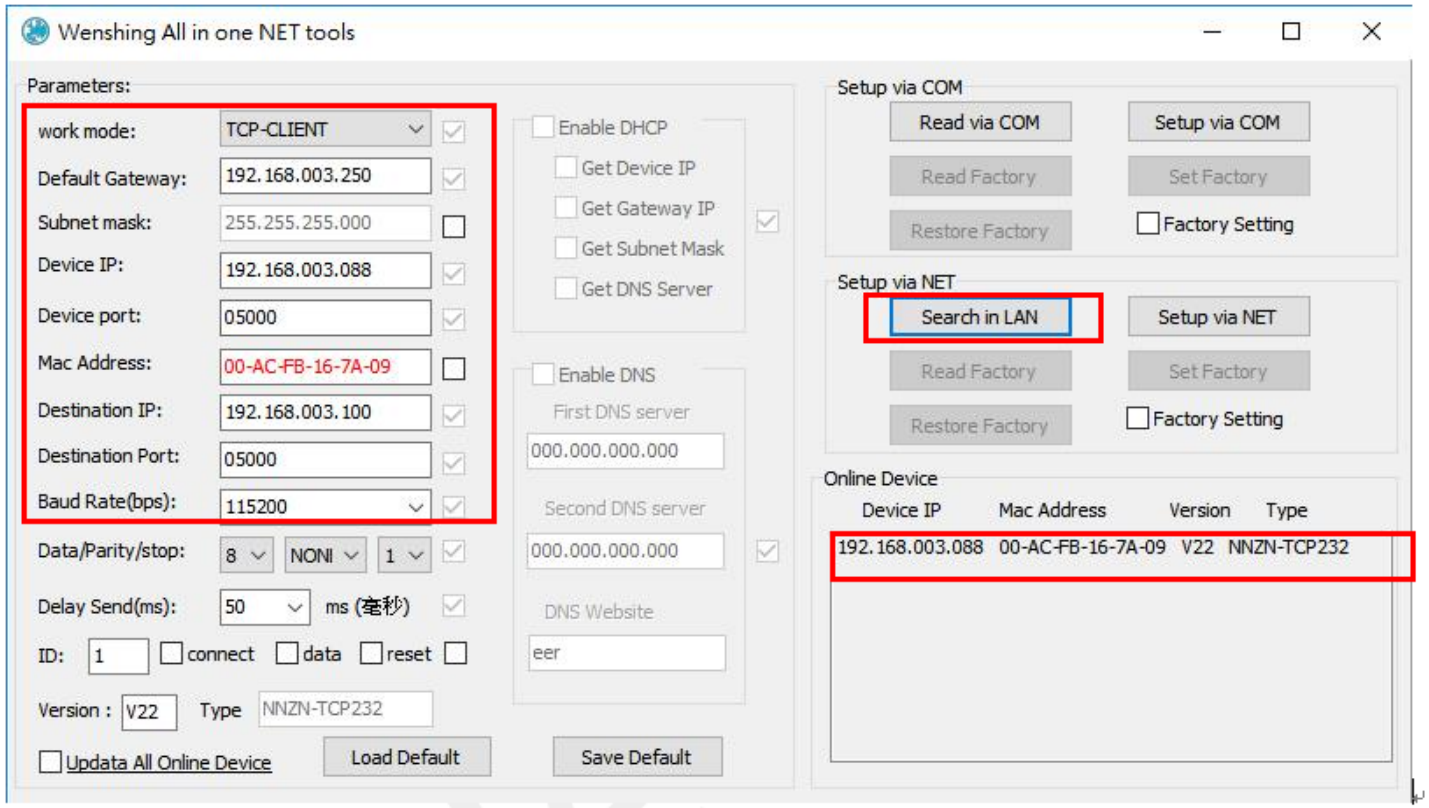


6. Modify the setting parameter on internet. Find the suitable setting on the left and correct it. Click “Setup via NET” to modify it.
(Device Port、Destination Port cannot set to 5978. This Port is for online update only.)



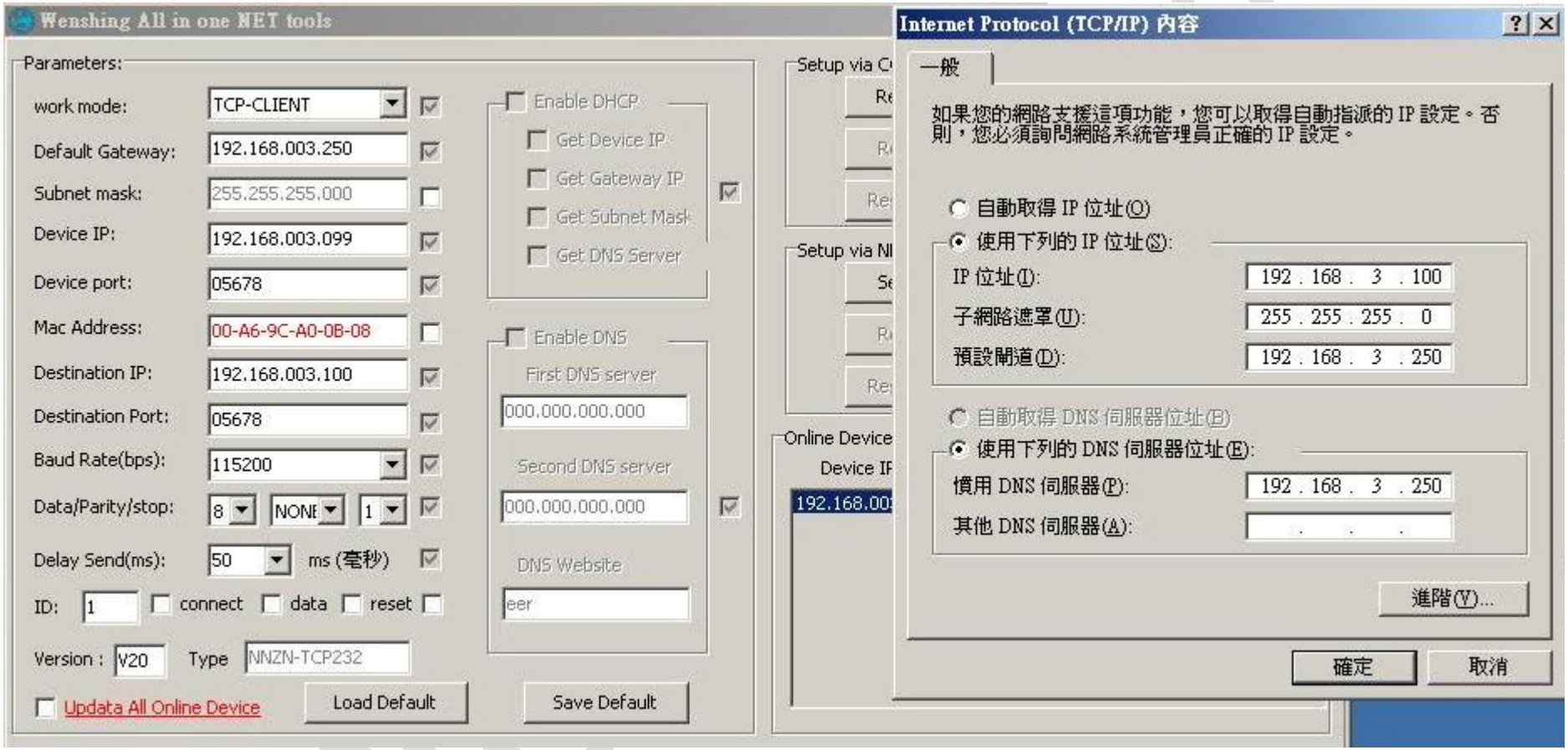
7. If the modification is successful, the following prompt will be displayed.

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.

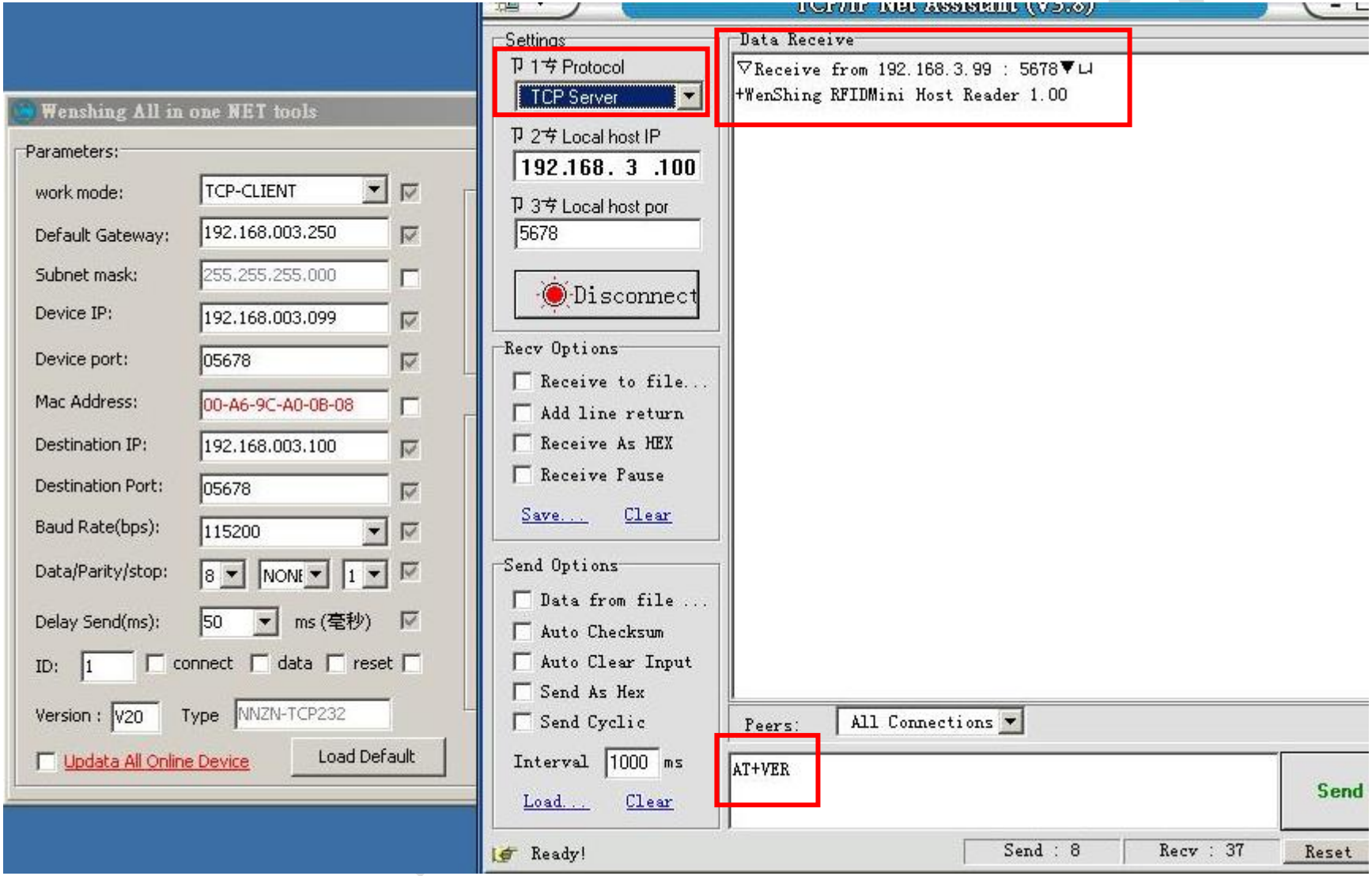


The Way of Setting Wired Network for PC

9. Setting the PC internet parameter. Modify the settings corresponding to the PC according to the set parameters.



10. 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.



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

Wenshing

AT Command

"Newline" for each command (Attention: Before you send all of the command, you should stop scanning.)

	AT COMMAND	RFID Reader Return	Function Explanation
1	AT+0001-Linking		Heartbeat pack. If the device side does not receive any instructions from the remote end or heartbeat pack for more than 10 seconds, it will determine that the network anomaly. 0001 represents the device ID number and this ID number specifies that the device returns data.
		+0001-Linking_0	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Parameter 1: 0 represents that there is no entry or exit record on the device side. 1 represents that there is an incoming and outgoing record on the device side.
2	AT+0001-Reset		Reset Device 0001 represents the device ID number and this ID number specifies that the device returns data.
		+0001-Reset	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
3	AT+0001-ReadVer		Read the version number of the device. 0001 represents the device ID number and this ID number specifies that the device returns data.
		+WenShing Allinone Reader H0.03_V0.01	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Device name and firmware version.
4	AT+0001-MainCtrl:1		Setting data output format 0001 represents the device ID number and this ID number specifies that the device returns data. 0: The received EPC number is uploaded to the remote end in character format： +EPC:0001-00000000000000:EPC:000000 1: The received EPC number is uploaded to the remote end as HEX：0254…EPC03 (Refers Output data format) 2:Wiegand 26：Not supported for the time being 3:Wiegand 34：Not supported for the time being

		+0001-MainCtrl:1	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
5	AT+0001-Scan:0		Setting up the working mode of RFID 0001 represents the device ID number and this ID number specifies that the device returns data. Parameter 1: 0- Stop scan. In the connected state. Scan: 1 instruction must be given to continue scanning (Refers AT Command Instruction1) Under the state of broken line. More than 20 seconds without AT instruction, it will be automatically scanned. 1- Start scanning (Device from disconnected to connected, it will not automatically be scanned. It must be scanned from the terminal.) 2- Point scanning (Upload in Hex format and does not distinguish between black and white lists. Also, does not control relays. The buzzer is mainly set by instruction 30. If the terminal has no AT command for more than 20seconds, the scan will be stopped automatically. During scanning, the "AT 0001-linking" command can be used to recount the 20-second delay) 3- Reservations
		+0001-Scan:0	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
6	AT+0001-Mode:S0		0001 represents the device ID number and this ID number specifies that the device returns data. S0: with the RFID technology, you can get response after the scanning of Tag. most use in testing environment. S1: Scan many Tags, you can get the response after one second. it is used in counting, lane, logistic. S2: Scan many Tag s, you can get the response after you left the area for a while and return. most of these were used in racing, logistic S3: Same with S2. Note: When switch among with S0/S1/S2/S3. Must stop scanning before making order and also Q cannot equal to ZERO.
		+0001-Mode:S0	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
7	AT+0001-Read:0,00,00000000,00,EPC		0001 represents the device ID number and this ID number specifies that the device returns data. Read the information for the specified Tag

			Parameter 1： =0 - Read the password area for the specified Tag. (start from 00) =1 - Read the EPC area for the specified Tag. (start from 02) =2 - Read the TID number area for the specified Tag. (Read-only, start from 02) =3 - Read the user area for the specified Tag. Parameter 2：00 –Read all subsequent data from address 00(in word units (2Byte)), range 00 to FF Parameter 3: 00000000：Access password parameter Parameter 4: Read how many word (Word=2Byte) Parameter 5: EPC Number
	AT+0001-Read:1,02,00000000,06,2013 11248725010001020023	+0001-Read:1,02,00000000,06,201311 248725010001020023<00> ->20131124872501000102023	0001 represent device ID number. This ID number can be used to determine which device sent back the data. <00>: Represent read correct and others represent read error. (Refer to the Error Code table) <09>: Represent label are no longer. <A3>: Represent that parameter 4 exceeds the size of the storage area.
8	AT+0001-Write:0,00,00000000,EPC,Strin g		0001 represents the device ID number and this ID number specifies that the device returns data. Write information for specified Tag Parameter 1: –Writes the String to the password area of the specified Tag. (String will be written in Hex format) =0 – Write the password area for the specified Tag (start from 00) =1 – Write the EPC area for the specified Tag (start from 02) =3 –Write the user area for the specified Tag. Parameter 2: 00 –Write from address 00 Parameter 3: 00000000：Access password Parameter 4: EPC number String: Its length must be a multiple of 4, otherwise it will be completed with 0.
	AT+0001-Write:3,00,00000000,201311 248725010001020023,098765432109 87654321	+0001-Write:3,00,00000000,20131124 8725010001020023,09876543210987 654321<00>	0001 represents the device ID number and this ID number specifies that the device returns data. <00>: Represent write correct and others represent write error. (Refer to the “Error Code” table) <10>: Represent Tag are no longer or EPC number is incorrect.
9	AT+0001-SetQuery:SL=0,SS=0,TG=0,Q4		0001 represents the device ID number and this ID number specifies that the device returns data. Parameter 1: SL=0/1(Sel=ALL)，SL=2(~SL)，SL=3(SL) Parameter 2: SS=0(S0)，SS=1(S1)，SS=2(S2)，SS=3(S3) Parameter 3: TG=0(Target=A)，TG=1(Target=B)，Fixed to 0 Parameter 4: Q4(range Q0~Q9)
		+0001-SetQuery:SL=0,SS=0,TG=0,Q4	0001 represents the device ID number and this ID number can be used to determine which device sent back the data.

			Command successful.
10	AT+0001-ReadDeviceMessage		0001 represents the device ID number and this ID number specifies that the device returns data.
		+0001-ReadDeviceMessage +Sel=0 +Session=0 +Target=A +Qbegin=0 +WorkingArea=2	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
11	AT+0001-Sensitivity:4,6,0120		Set the reception sensitivity of the RFID module. 0001 represents the device ID number and this ID number specifies that the device returns data. 0001 represents the device ID and this ID specifies that the device returns data. 4：Mixer Gain(0-0dBm；1-3dBm；2-6dBm；3-9dBm；4-12dBm；5-15dBm；6-16dBm) Default is 4 6：IF Amp Gain(0-12dBm；1-18dBm；2-21dBm；3-24dBm；4-27dBm；5-30dBm；6-36dBm；7-40dBm；) Default is 6 0120：Reception sensitivity (this value is in Hex format，00F0)，Default is 0080
		+0001-Sensitivity:4,6,0120	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
12	AT+0001-SetPower:30dBm		Set/query the power of the UHF Reader: range is 19-30 0001 represents the device ID number and this ID number specifies that the device returns data. If wants to classify equipment power roughly: AT+0001- SetPower:30 dBm (range of value: 23 to 30) If wants to classify equipment power exactly: AT+0001- SetPower:31-23 (range of value: 13 to 48. 31 is fixed.)
		+0001-SetPower:30dBm	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
13	AT+0001-SetFreq:902~928		Set up the working frequency band of RFID Reader 0001 represents the device ID number and this ID number specifies that the device returns data.
		+0001-SetFreq:902~928	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
14	AT+0001-ReadReflectedPower:?		Impedance matching for scanning the entire frequency band. 0001 represents the device ID number and this ID number specifies that the device returns data.

		+0001-ReadReflectedPower:	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
15	AT+0001-Antenna:1		Set/query the mode in which the UHF Reader antenna works: 0001 represents the device ID number and this ID number specifies that the device returns data. (if device ID is 0000 that means broadcast order) Parameter 1 – Right antenna = main antenna 2 – Left antenna = secondary antenna 3 – Mode of double antenna ? – Query
		+0001-Antenna:1	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
16	AT+0001-BuzzTime:5		The Buzz is controlled by the sound number. And sound 5 times when give the commend. 0001 represents the device ID number, which specifies the device action. Parameter 1 range is 1 to 9.
		+0001-BuzzTime:5	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
17	AT+0001-ONOFFRelay1:L,3	(Optional) Scanning the Tag number stored in the Flash will opens the door (The seconds of absorbed is the time set by set relay1 plus one second)	Control the door lock operation. When the far end receiving the EPC number must be returned within 3 seconds to open or not. Otherwise the device will open the door according to the EPC number which is stored in the device. 0001 represents the device ID number, which specifies the device action. Parameter 1 represents the way of action. H is open door; L is close door Parameter 2 represents the duration of the action. In seconds, ranging from 1 to 9.
		+0001-ONOFFRelay1:L,3	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
18	AT+0001-ONOFFRelay2:L,3	(Optional) Automatically close the door in 10 seconds after open the door. (The seconds of absorbed is the time set by set relay2 plus two seconds)	Control the door lock operation. When the far end receiving the EPC number must be returned within 3 seconds to open or not. Otherwise the device will open the door according to the EPC number which is stored in the device. 0001 represents the device ID number, which specifies the device action. Parameter 1 represents the way of action. H is open door; L is close door Parameter 2 represents the duration of the action. In seconds, ranging from 1 to 9.

		+0001-ONOFFRelay2:L,3	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
19	AT+0001-ONOFFRelay3:L,3	(Optional)	Control the door lock operation. When the far end receiving the EPC number must be returned within 3 seconds to open or not. Otherwise the device will open the door according to the EPC number which is stored in the device. 0001 represents the device ID number, which specifies the device action. Parameter 1 represents the way of action. H is open door; L is close door Parameter 2 represents the duration of the action. In seconds, ranging from 1 to 9.
		+0001-ONOFFRelay3:L,3	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
20	AT+0001-SetRelay1:L,3	(Optional)	Setting whether the relay is NC or NO. 0001 represents the device ID number, which specifies the device action. Parameter 1 represents the way of action. L is NC; H is NO Parameter 2 represents the duration of the action after reading the correct Tag. Range from 1 to 8.
		+0001-SetRelay1:L,3	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
21	AT+0001-SetRelay2:L,3	(Optional)	Setting whether the relay is NC or NO. 0001 represents the device ID number, which specifies the device action. Parameter 1 represents the way of action. L is NC; H is NO Parameter 2 represents the duration of the action after reading the correct Tag. Range from 1 to 8.
		+0001-SetRelay2:L,3	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
22	AT+0001-SetRelay3:L,3	(Optional)	Setting whether the relay is NC or NO. 0001 represents the device ID number, which specifies the device action. Parameter 1 represents the way of action. L is NC; H is NO Parameter 2 represents the duration of the action after reading the correct Tag. Range from 1 to 8.

		+0001-SetRelay3:L,3	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
23	AT+0001-InputState1?	(Optional)	Query Input by click current status 0001 represents the device ID number, which can query the status of the device.
		+0001-InputState1:0	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful. Parameter1 when the optocoupler input point is not triggered which it is 1. And when it is triggered which it is 0.
24	AT+0001-Input1Buzz:1	Presently, it's not working. When the fixed coupling triggers 4 rings and the interval is 0.5 seconds. Then the 4 rings will not stop until no break.	Setting the sound cue' switch for optocoupler detection. 0001 represents the device ID number and this ID number specifies that the device returns data. =0 – Turn off sound cues =1 – Prompt 1 sound when input triggers =2 – Prompt 2 sounds when input triggers
		+0001-Input1Buzz:1	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
25	AT+0000-FindDeviceID		Query the ID Address of all devices in the LAN. 0001 represents the device ID number and this ID number specifies that the device returns data.
		+0000-FindDeviceID:0001	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
26	AT+0001-DeviceID:0002		Set device ID 0001 represents the device ID number, which sets the device. Parameter1 ranges are from 0001 to 9999.
		+0001-SetDeviceID:0002	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful. This device ID from 0001 change to 0002.

27	AT+0001-NoMatchEPC:0		Prompt sound that does not match Flash memory EPC. 0001 represents the device ID number and this ID number specifies that the device returns data.
		+0001-NoMatchEPC:0	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful. Range of parameter is 0 to 2. 0 No prompt 1 Prompt one sound 2 Prompt two sounds
28	AT+0001-MatchEPC:1		A sound that conforms to the Flash memory EPC. 0001 represents the device ID number and this ID number specifies that the device returns data.
		+0001-MatchEPC:1	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful. Range of parameter is 0 to 2. 0 No prompt 1 Prompt one sound 2 Prompt two sounds
29	AT+0001-ReadEPCList		Read the EPC list of device memory. 0001 represents equipment ID, and the ID number can be querying the device.
		+0001-ReadEPCList File Size is 156Byte 20130924872603000101C0C4 2013092487260300010200 22 20130924872603000102AAA7 20130924872603000102AAE8 32324100000000000000000 E2002019770402251691 7268	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful. Each EPC number has 24 bytes, plus a newline character is 26 bytes totally. The sample on the left-hand side has 6 EPC number totally. And file size is 156 bytes.
30	AT+0001-UpdataEPCList		Update the EPC list of device memory. 0001 represents the device ID number and this ID number specifies that the device returns data.
		+0001-UpdataEPCList	0001 represents the device ID number and this ID number can be used to determine which device

			sent back the data. Command successful.
	2013092487260300010 1C0C4 2013092487260300010 20022 2013092487260300010 2AAA7 2013092487260300010 2AAE8 323241000000000000000000 E2002019770402251691726 8		The EPC list must be sorted from small to large. Each behavior is 24 bytes followed by line break characters. Maximum transmitting is list of 16 lines every time. For Example: A total of 109 EPC numbers need to be updated Send 16 lines for the first time and return once OK is received. Send 16 lines for the second time and return once OK is received. Send 16 lines for the third time and return once OK is received. Send 13 lines for the seventh time and return once OK is received.
		OK	
	AT+UpdataEPCList End		Completed updating EPC list
		+UpdataEPCList End	
31	Read the information returned by Tag		Read the information returned by Tag
		+EPC+0001-00000000000000:20130924872603000102 0022:00000 或 0254130000000 00E3000E2003028630 C0245175064AB03	The data are the device ID number, the time of entry and exit (fill in 0 for saving), EPC number、and the statistics of entry and exit. (fill in 0 for saving) +EPC+0001-00000000000000:20130924872603000102 0022:00000 or 0254130000000 00E3000E2003028630C0245175064AB03 Information returned from above. Green color represents which antenna output. 0=Right antenna=Main antenna=AT+0001-Antenna:1 1=Left antenna=Secondary antenna=AT+0001-Antenna:2
32	AT+0001-CloseCount:030		Setting the reciprocal delay time for closing the door. 0001 represents the device ID number and this ID number specifies that the device returns data. Range is from 001 to 240. Maximum 4 minutes in seconds
		+0001-CloseCount:030	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
33	AT+0001-SetNoTagSen:040,050		Set sensitivity for mobile detection. Only Scan:1 has this function. Parameter1 represents the sensitivity of the secondary antenna. Parameter2 represents the sensitivity of the main antenna. The setting range is from 000 to 255. (The greater the numerical value, the lower the sensitivity.)

		+0001-SetNoTagSen:040,050	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. Command successful.
34			Output prompt string when Tag is not scanned and someone is detected moving within range.
		+0001-Warning Internal Antenna +0001-Warning External Antenna	0001 represents the device ID number and this ID number can be used to determine which device sent back the data. +0001-Warning Internal Antenna: Explains main antenna triggering +0001-Warning External Antenna: Explains secondary antenna triggering

Wenshing

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>, representative 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

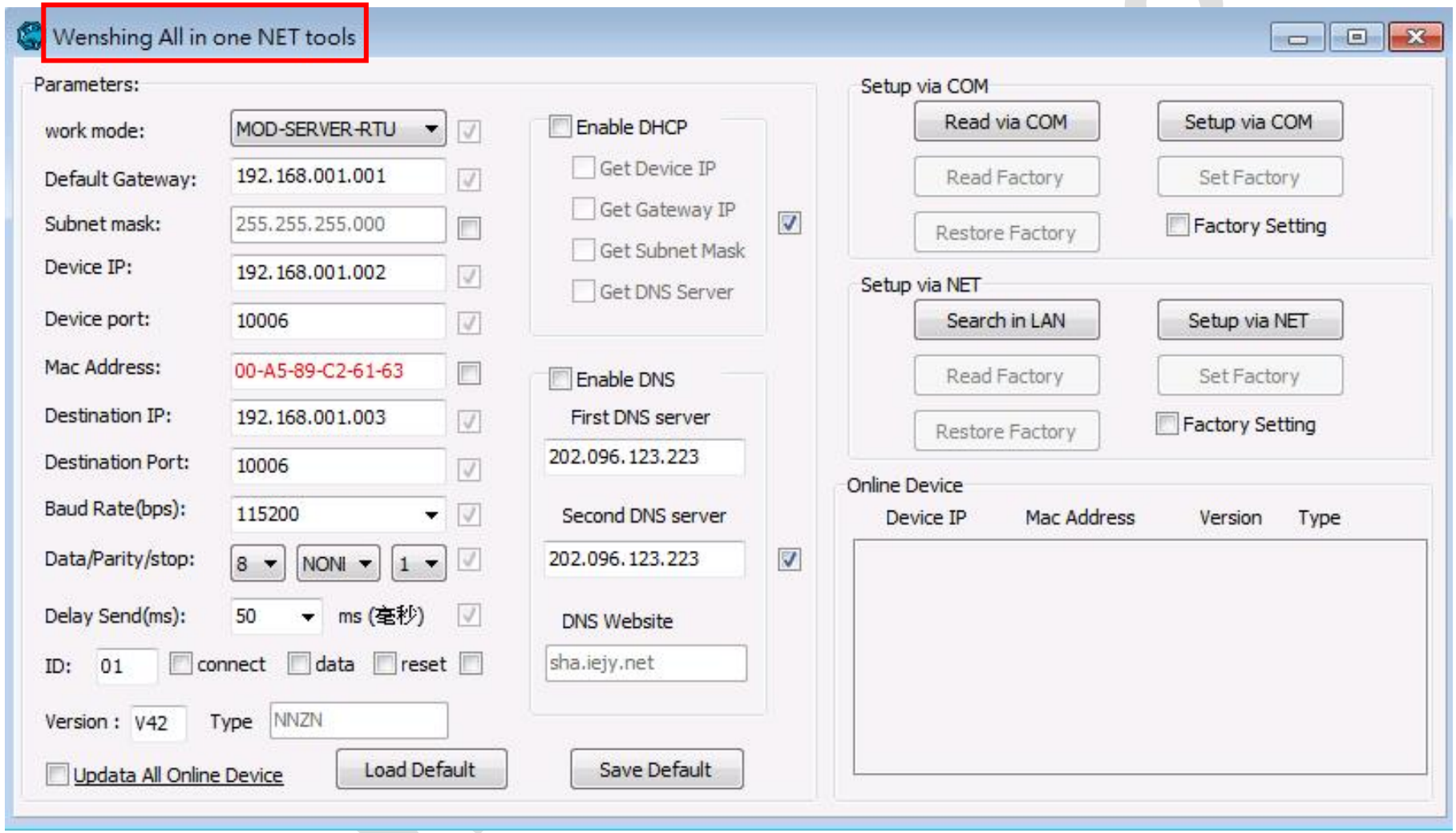
#	Type	Code	Description
1	ReadProtect Fail	0x2A	ReadProtect command failed. Tag does not return data or return CRC checking error.
2	Reset ReadProtect Fail	0x2B	Reset ReadProtect command failed. Tag does not return data or return CRC checking error.
3	Change EAS Fail	0x1B	Change EAS command failed. Tag 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

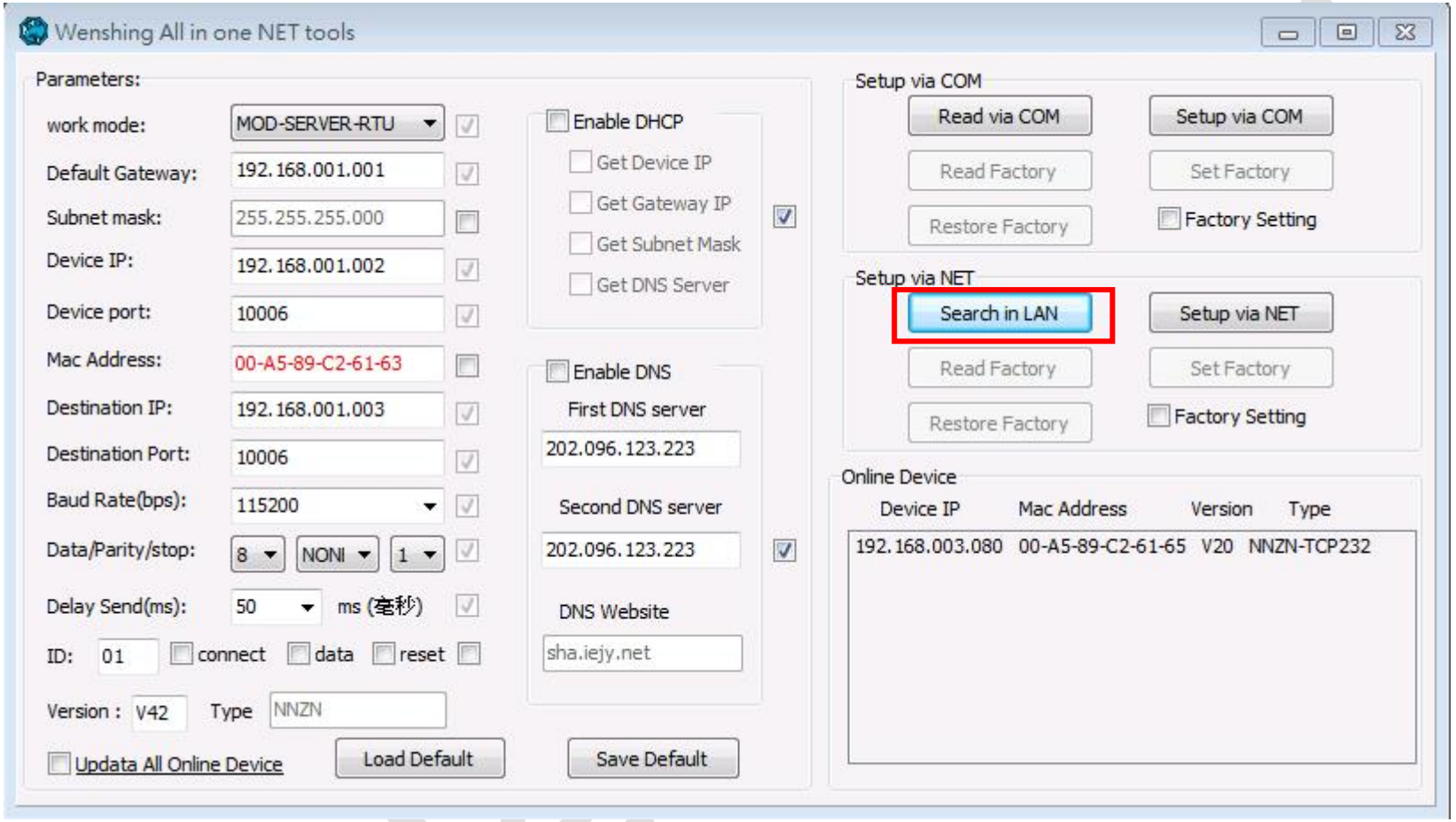
#	Type	Code	Description
1	Error-specific	0	All other errors.
2		3	The specified Tag data storage area does not exist or the Tag does not support EPC of the specified length, such as XPC.
3		4	The specified Tag data storage is locked and/or for permanently. And also, the lock status is not writable or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

Internet Update

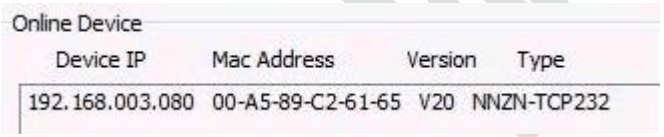
1. Execute “Wenshing All in one NET tools”, the screen is as follows.



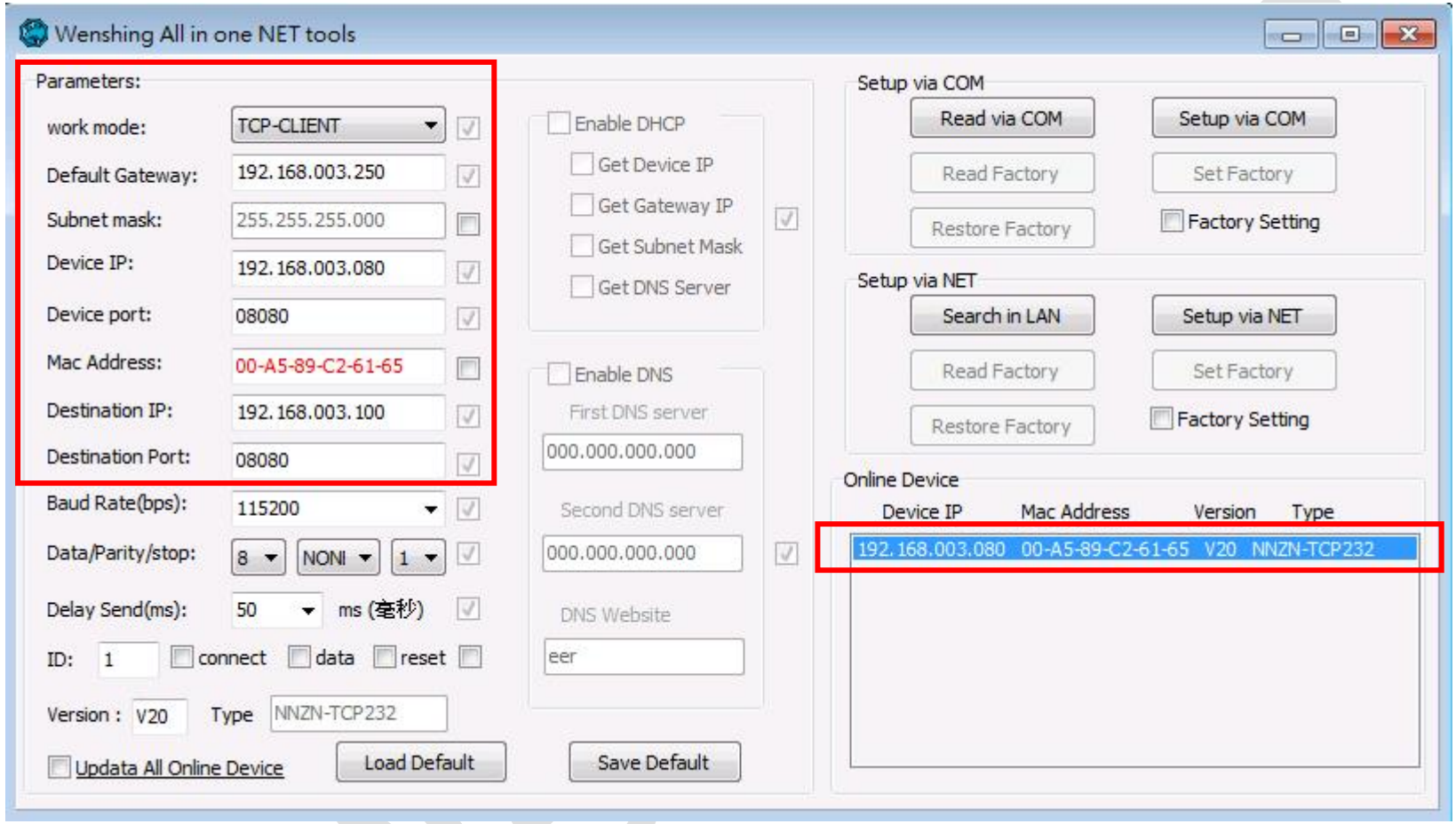
2. Search for devices in the LAN and click the button of “Search in LAN”.



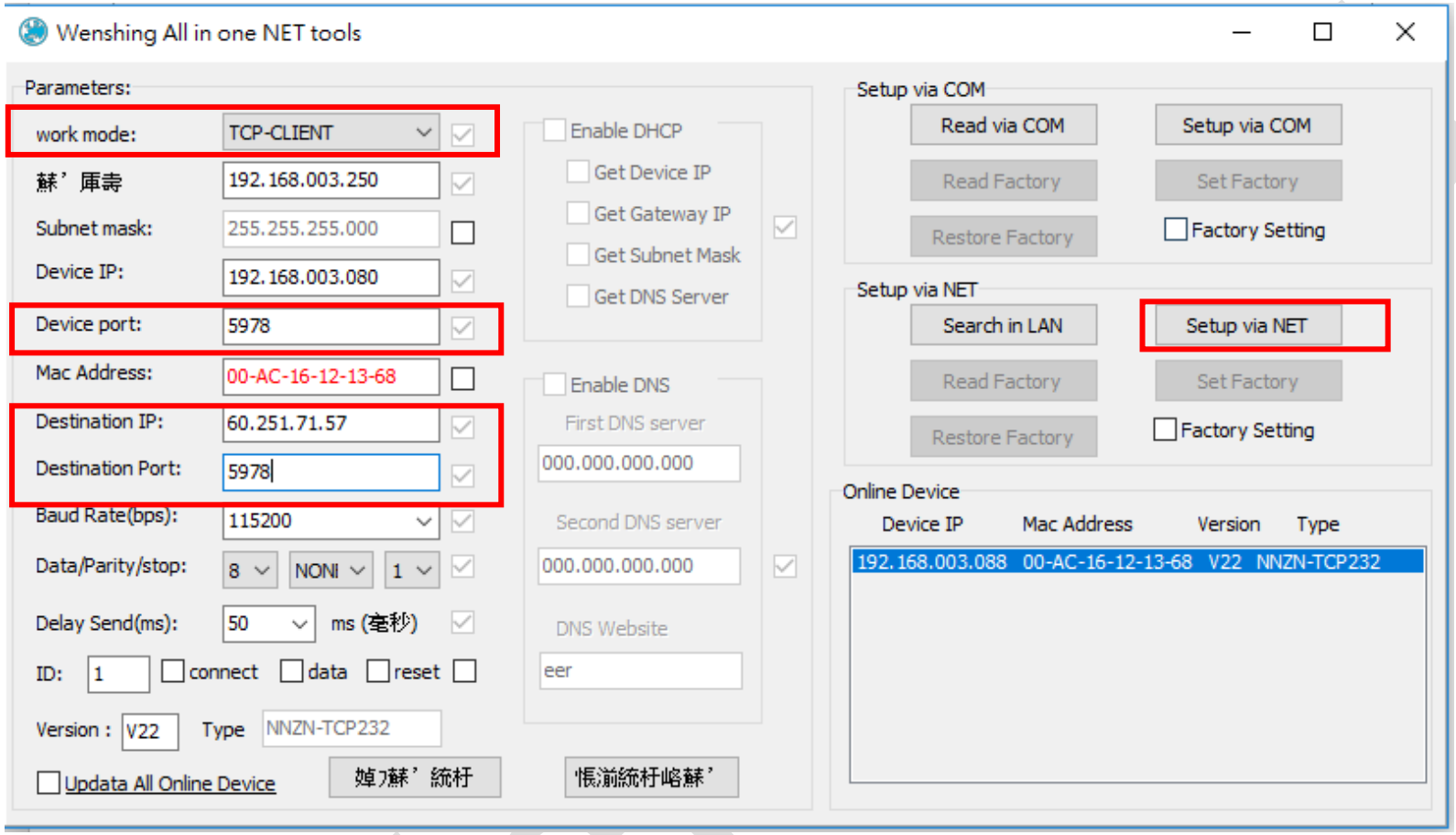
3. After searching for the device and the IP address of the device will be displayed below.



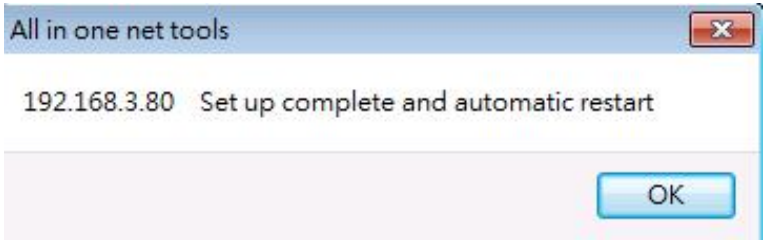
4. Read the network setting parameters and click on the searched device IP twice to automatically read the current settings. Then it will display the "Parameters" on the left side.



5. Modify the updated Host working mode, IP location, Device port of the updated host. And click “Setup via NET” to do it

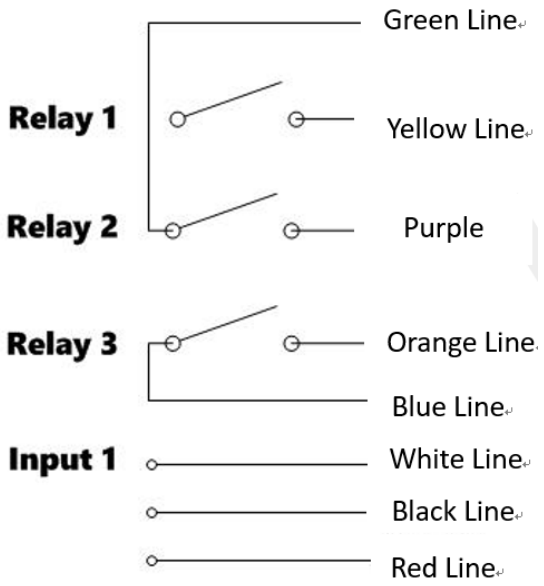


6. If the modification is successful, the following prompt will be displayed.

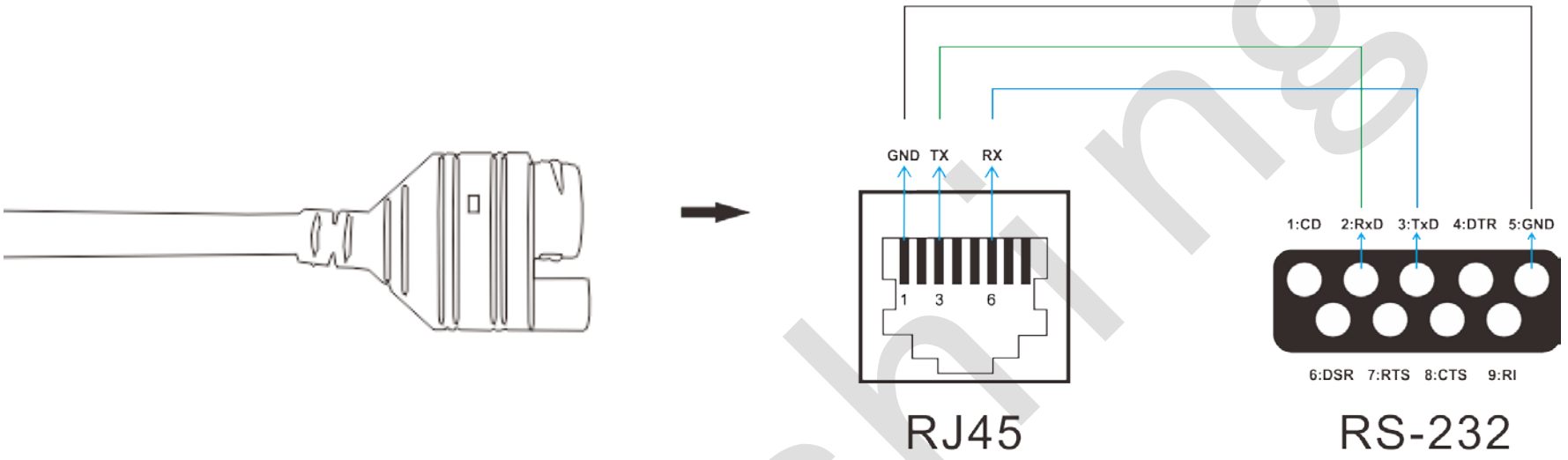


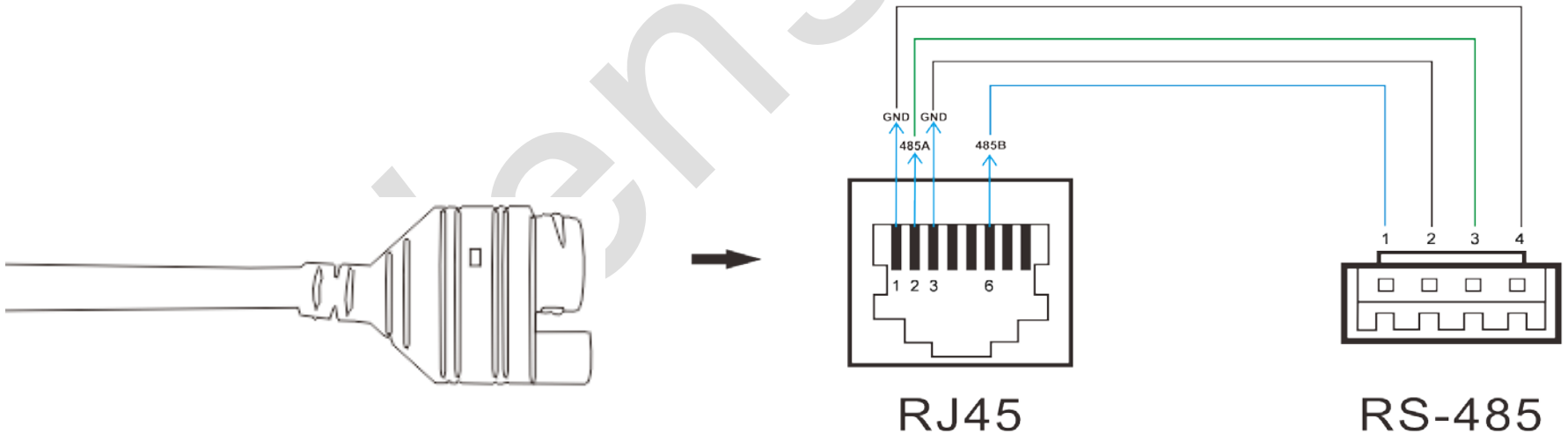
7. Unplug the power of WS-RFIDALL-9 device and then plug it in again. When the update is starting, there will be audible prompt. After the update is successful, a long “Beep” sound will be showed-up for notification. At this time, please unplug the power and plug it in once again. After the power is turned on, there will be a “Beep” sound prompt. When it enters the update mode, it will show up a “Beep” prompt. After the update is successful, there will be a long “Beep” prompt and two short “Beep” prompts closely.
8. Use “All in one NET tools“ to modify the appropriate network settings according to step 2 and refer to the network setting method in page 3.

Wiring



RS-232 and RS-485 Wiring





Wenshing