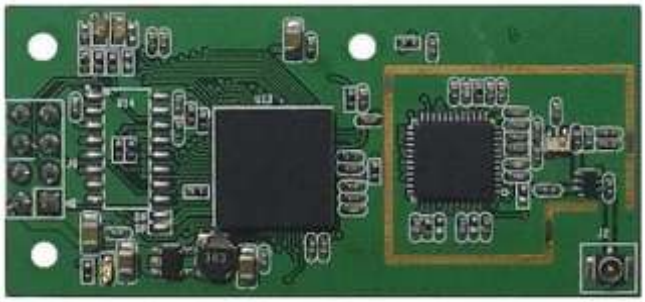

## summarize

TLG10UA03 is the new third-generation embedded Uart-Wifi modules studied by CEC Huada Electronic Design Co., Ltd.

Uart-Wif is an embedded module based on the Uart serial,according with the WiFi wireless WLAN standards, It accords with IEEE802.11 protocol stack and TCP / IP protocol stack， and it enables the data conversion between the user serial and the wireless network module. through the Uart-Wifi module, the traditional serial devices can easily access to the wireless network.

TLG10UA03 does a comprehensive hardware and software upgrades based on the products of the first two generations,now it's more functional and more Convenient to use,its main features include,

- ✧ Support transparent transmission of serial completely,and achieve a plug and play serial.
- ✧ Support new AT+instruction set,

## Characteristic

**Interface**

- ✧ 2*4 pins of Interface: HDR254M-2X4
- ✧ The range of baud rate: 1200~115200bps
- ✧ RTS / CTS Hardware flow control
- ✧ single 3.3V power supply

**Wireless**

- ✧ support IEEE802.11b/g wireless standards
- ✧ support the range of frequency: 2.412~2.484 GHz
- ✧ support two types of wireless networks:
  Ad hoc and Infrastructure
- ✧ support multiple security authentication mechanisms:
  WEP64/WEP128/ TKIP/CCMP(AES)
  WEP/WPA-PSK/WPA2-PSK
- ✧ support quick networking
- ✧ support wireless roam

**Others**

- ✧ support multiple network protocols:
  TCP/UDP/ICMP/DHCP/DNS/HTTP
- ✧ support two types of work modes:
  auto and command
- ✧ Support transparent transmission mode
- ✧ support AT+ instruction set


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Which is all based on ASCII format, it's simple to use and pellucid.

- ✧ Support more perfect TCP/IP protocol tack, support DHCP protocol for dynamicassignation of IP address and DNS domain name parsing.
- ✧ Embed WEB server, and achieve the long-range parameters configur-ation through wireless network with IE browser.
- ✧ Support more prefect transmission performance,the maximum sending rate can reach to 11KB/s.
- ✧ support a variety of parameters configuration methods:
  serial/WEB server/wireless conn-ection

## Application

- ✧ intelligent bus network, such as wireless credit card machine
- ✧ small financial payment network, such as wireless POS machine
- ✧ industrial equipment networking, such as wireless sensor
- ✧ things

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Q1: WHY CAN NOT THE MODULE SEARCH FOR THE SPECIFIED NETWORK? A: THE CHANNEL LIST USER SET DOESN'T CONTAIN THE CHANNEL WHICH THE SPECIFIED NETWORK WORK IN.错误！未定义书

Q2: WHY CAN NOT THE MODULE JOIN IN THE NETWORK? ..... 错误！未定义书签。

Q3: WHY DOES THE MODULE NEED ABOUT 10 SECONDS TO RESPONSE THE COMMAND OR CONNECT TO NETWORK AUTOMATICALLY, WHEN ENCRYPTION MODE IS SET TO WPA/WPA2? ..... 错误！未定义书签。

Q4: THE MODULE HAS CONNECTED TO THE NETWORK SUCCESSFULLY,WHY CAN'T IT SHOW "DESTINATION HOST UNREACHABLE" OR "REQUEST TIMED OUT" AFTER DOING THE OPERATION PING BETWEEN THE MODULE AND PC. ..... 错误！未定义书签。

Q5: IN AUTO-WORK MODE,THE ICMP CONNECTION SOMETIMES CONNECTS AND SOMETIMES DISCONNECTS AFTER THE MODULE HAS JOINED IN THE NETWORK,WHY? ..... 错误！未定义书签。

Q6: IN AUTO-WORK MODE,WHY DOES THE MODULE NOT CONNECT TO THE NETWORK AUTOMATICALLY AFTER RESETTING? ..... 错误！未定义书签。

Q7: IN AUTO-WORK MODE,DATA SENT TO THE MODULE THROUGH SERIAL WILL DELAY SOMETIME TO SEND TO THE NETWORK,WHY? ..... 错误！未定义书签。

Q8: IN AUTO-WORK MODE,WHY DOES THE MODULE NOT EXIT THE TRANSMISSION STATE, AFTER INPUTING THE ESCAPE CHARACTER? ..... 错误！未定义书签。

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Q12: WHEN USER SETS THE SERIAL TO THE PAUD RATE IT DOES NOT SUPPORT, THE MODULE CAN'T BE CONNECTED TO, THEN HOW TO CORRECT IT ? ..... 错误！未定义书签。

Q13： IN WIRELESS CONNECTION STATE,WHY CAN NOT THE SPECIFIED MODULE BE SEARCHED FOR?错误！未定义书签。

Q14: IN SOME ENVIRONMENT THE MODULE USED， WHY IS THE QUALITY OF WIRELESS CONNECTION ALWAYS BAD,AND HOW TO IMPROVE THE WIRELESS TRANSMISSION? ..... 错误！未定义书签。

APPENDIX B REVISION HISTORY OF THE DOCUMENT ..... 错误！未定义书签。

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# 1 Introduction

TLG10UA03 is the new third-generation embedded Uart-Wifi modules studied by CEC Huada Electronic Design Co., Ltd (here in after referred to as HED). Uart-Wif is an embedded module based on the Uart serial,according with the WiFi wireless WLAN standards, It accords with IEEE802.11 protocol stack and TCP / IP protocol stack，and it enables the data conversion between the user serial and the wireless network module. through the Uart-Wifi module, the traditional serial devices can easily access to the wireless network.

TLG10UA03 does a comprehensive hardware and software upgrades based on the products of the first two generations,now it's more functional and more Convenient to use,its main features include:

**Interface:**

- ✧ 2*4 pins of Interface: HDR254M-2X4
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- ✧ single 3.3V power supply

**Wireless**

- ✧ support IEEE802.11b / g wireless standards
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- ✧ support multiple security authentication mechanisms:
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- ✧ support quick networking
- ✧ support wireless roam

**Others**

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- ✧ support two types of work modes:
  auto and command
- ✧ Support the transparent transmission mode

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- ✧ support AT+ instruction set
- ✧ support a variety of parameters configuration methods:
  serial / WEB server / wireless configuration

## Application

- ✧ intelligent bus network, such as wireless credit card machine
- ✧ small financial payment network, such as wireless POS machine
- ✧ industrial equipment networking, such as wireless sensor
- ✧ Things

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# 2 Quick Start Wizard

## 2.1 Preparation

- Hardware
  - ✧ TLG10UA03 module
  - ✧ serial adapter board
  - ✧ serial cable

- Software
  - ✧ UART-WIFI configuration management program
  - ✧ serial debugging software,such as serial debugging assistant, serial master （

,

） and the like.
  - ✧ TCP/UDP debugging software, such as TCP/UDP test tool（

）and so on.

## 2.2 Setting parameters

1、 Run the UART-WIFI configuration management program.

2、 Connect TLG10UA03 module with Serial adapter board, and then turn the power on after the serial caple has been connected, as shown below:

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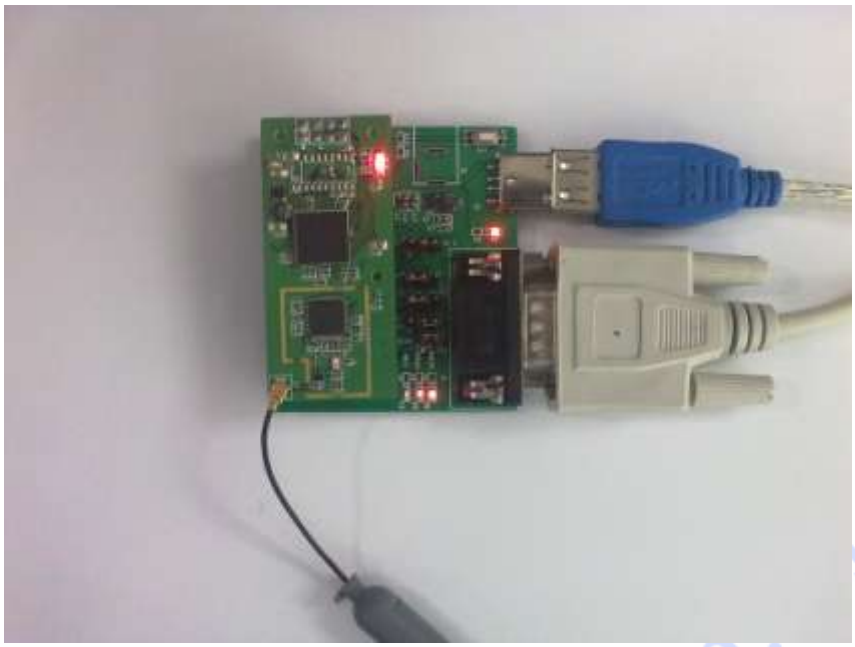

Figure 3-1 connection between with serial adapter board and UART-WIFI module

3、 click "search modules", as shown below:

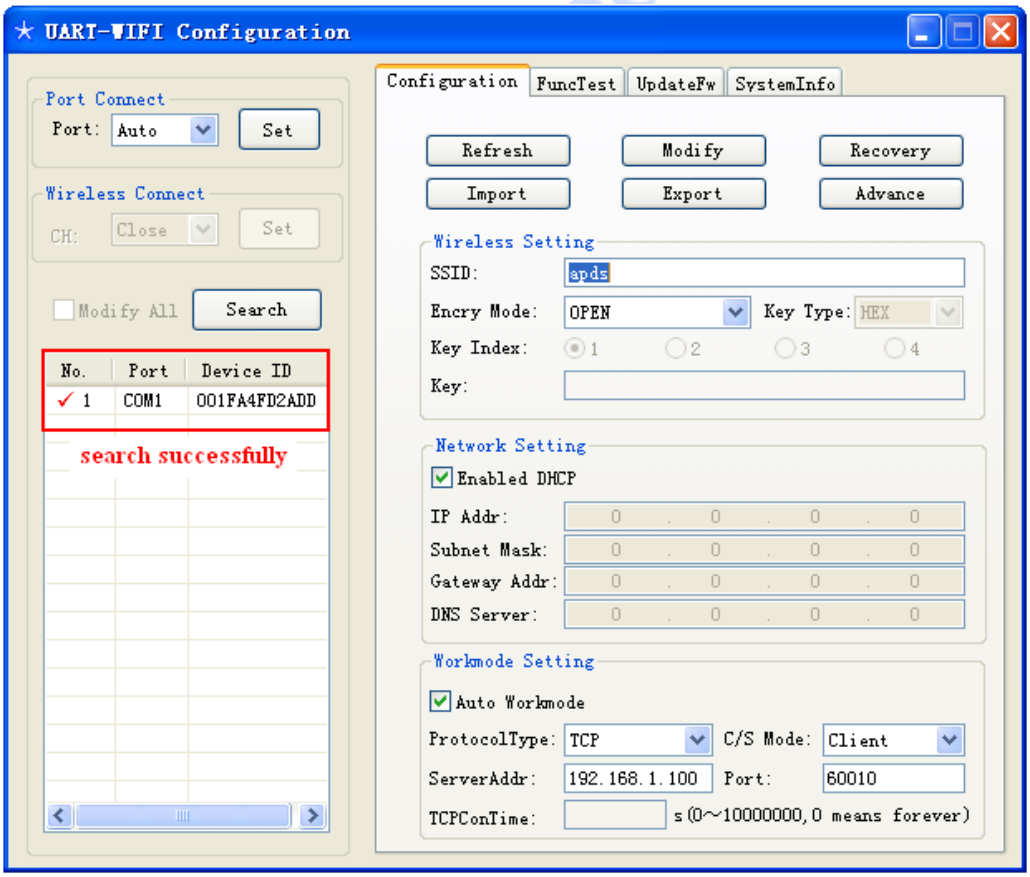


Figure 3-2 Search modules successfully


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4、According to the wireless router (AP) that you connect to, you can modify the parameters of wireless settings, including network name, encryption, keys and the IP address of network settings.

5、Modify the working mode settings, select the "enable auto-work mode" option and set the parameters according to what you want.

6、After modifying parameters as shown below, click "submit " and select "manually reset later" in the pop-up dialog box.

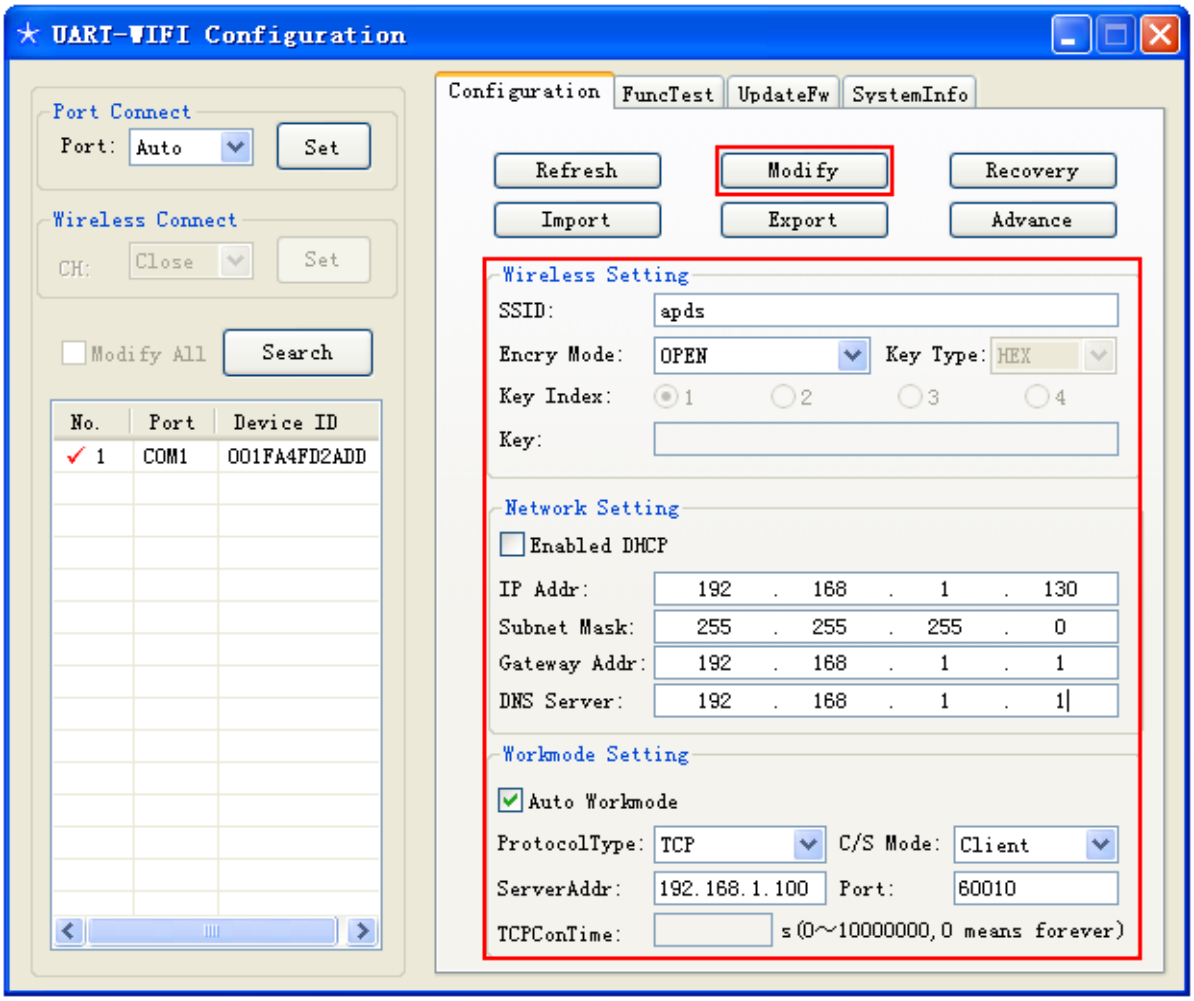


Figure3-3 Modify parameters of UART-WIFI module

## 2.3 Testing

1、Run TCP / UDP debugging software, create a TCP Server whose detecting port is


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60000.

2、 Run serial debugging software, such as RealTerm.exe in this case. Modify parameters.

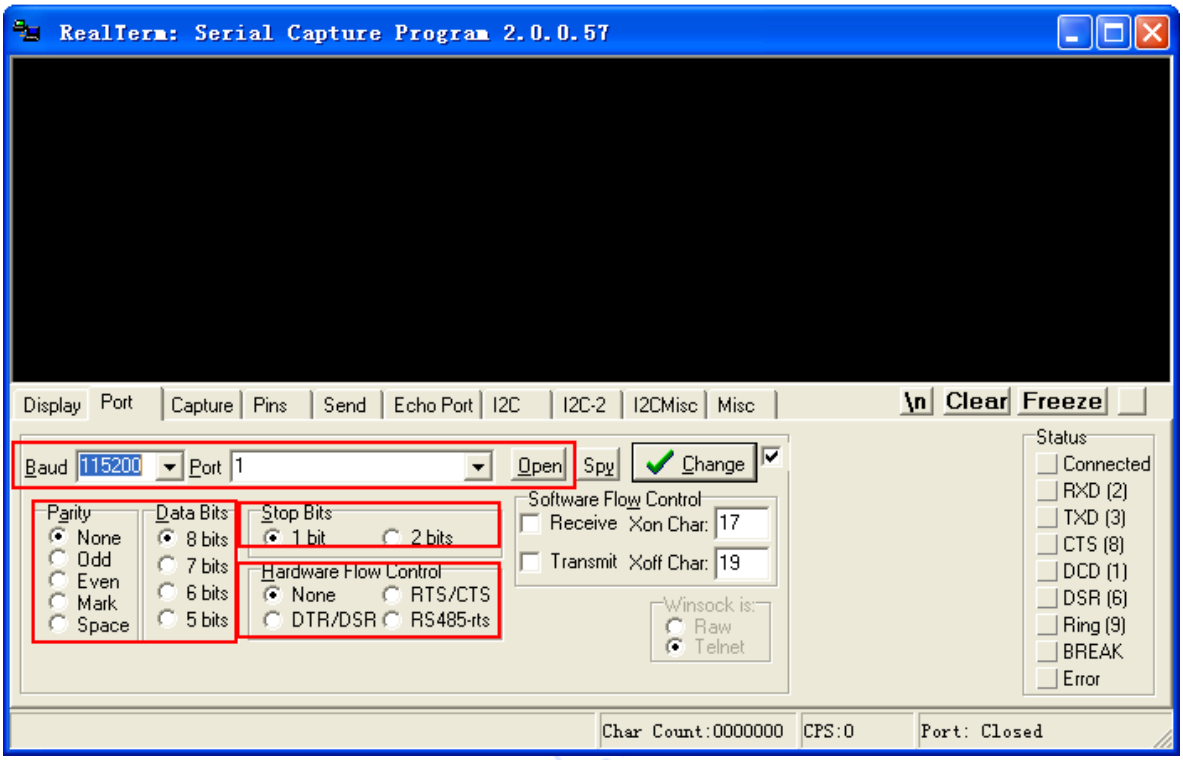


Figure3-5 modify the parameters of ComMaster

3、 Repower the serial adapter plate(or press the reset button), and the TLG10UA03 module will reset and automatically connect to the network and TCP server. Then you can begin your transmission test between ComMaster and the TCP/UDP test tools.


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# 3 Configuration management manual

## 3.1 Configuration through configuration management software

### 3.1.1 Introduction

We offer a configuration hypervisor that can manage TLG10UA03 module expediently，for configuration querying、config、function test etc，its main function includes,

- ✧ module management
  - ■ managemant through serial
  - ■ managemant through wireless connection
- ✧ parameter configuration
  - ■ modify/query module parameters
  - ■ import/export parameters
  - ■ modify parameters for a group of modules
  - ■ resume to default setting
- ✧ function test
  - ■ wireless network command test
  - ■ socket command test
  - ■ AT+ instruction test
- ✧ firmware upgrade
- ✧ system information query

### 3.1.2 Module management

#### 3.1.2.1 Management through serial connection

1、Connect the TLG10UA03 module to the serial adpater，then turn it power-on；

2、Open the UART-WIFI configuration hypervisor，select the port number of connection from port list，you can select ‘auto’ unless you make sure；

3、Click ‘search module’，if the connection port is selected to ‘auto’ and the computer has more than one serial，it maybe expend a long time for searching, The following sketch map will show after search completed：

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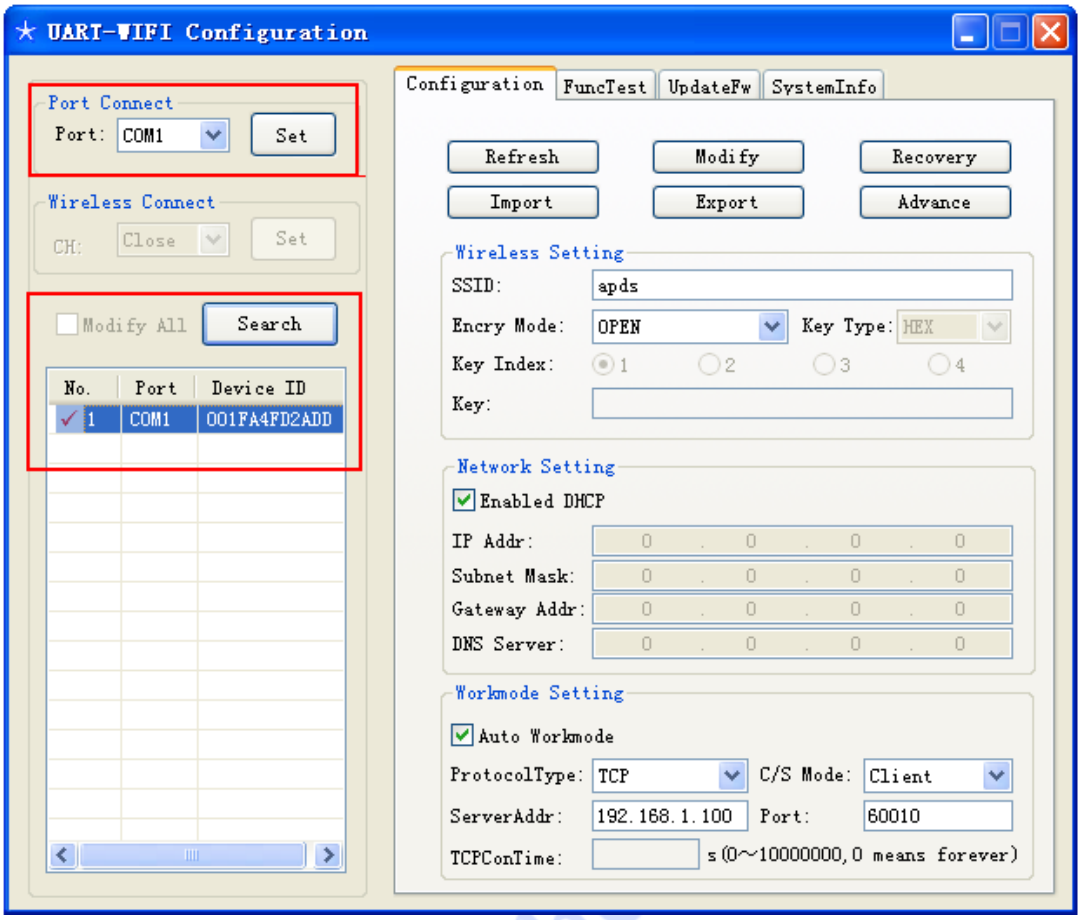


figure5-1 serial connection sketch map

3.1.2.2 Management through wireless connection

Note：Using this function needs to choose correct wireless adapter and install wireless driver correctly.

1、 Plug the wireless adapter in computer，it's shown as the figure 2-5；

2、 Install wireless driver，the successful result is shown as the following sketch map；

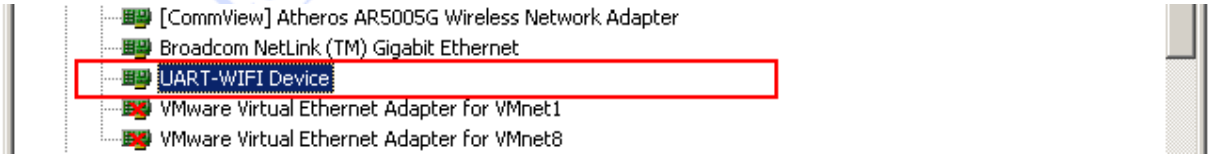


Figure5-2 Install wireless driver

3、 Open the UART-WIFI configuration hypervisor，if the driver is installed successfully，setting frame of wireless connection will be in activation status；

4、 Click 'setting' button，input system password（only the module of which the system password matchs with the setting can be scanned）；


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5、 Select scan channel from channel list. It will scan all channels from 1 to 14 ,if 'auto' is selected;

6、 Click 'search module', if channel is selected to 'auto', it will expend a long time to search, the completed result is shown as the following sketch map:

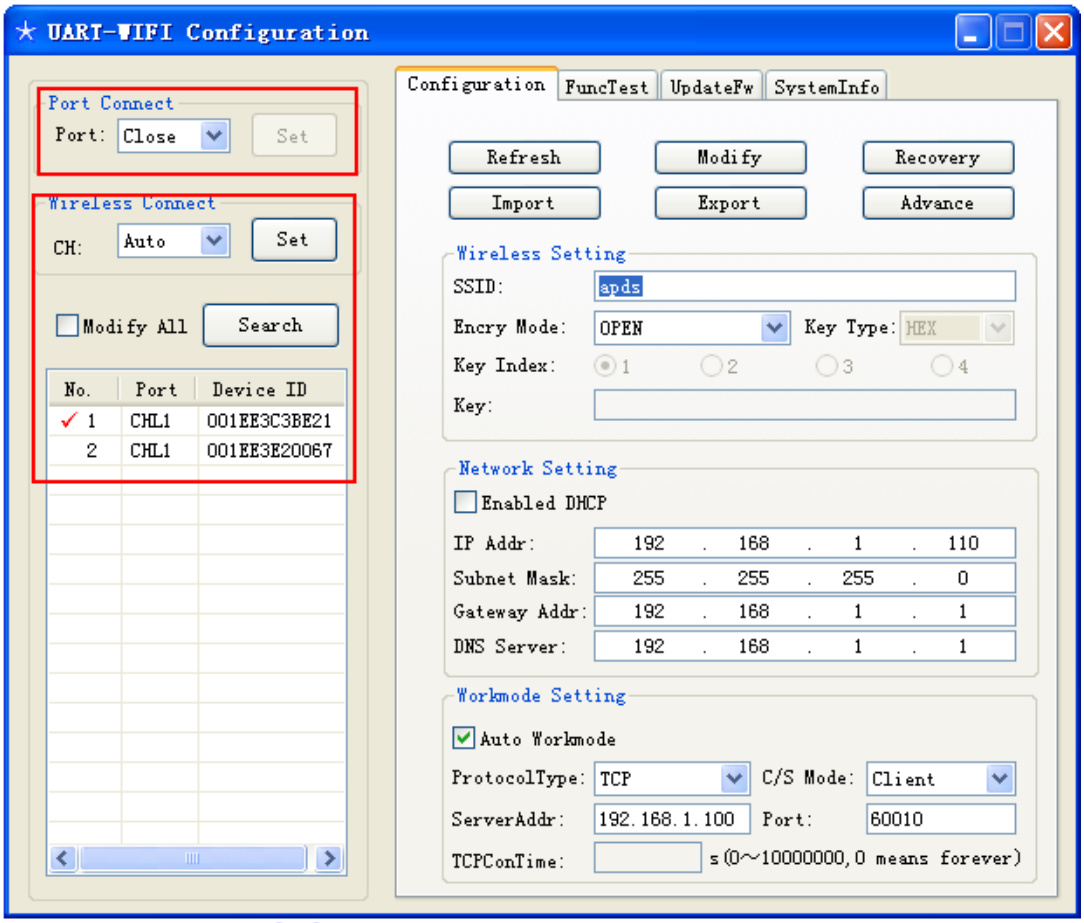


Figure5-3 sketch map of wireless connection

### 3.1.3 Configuring parameter

This section offers the function of fast querying/modifying configuration parameter of module for user.


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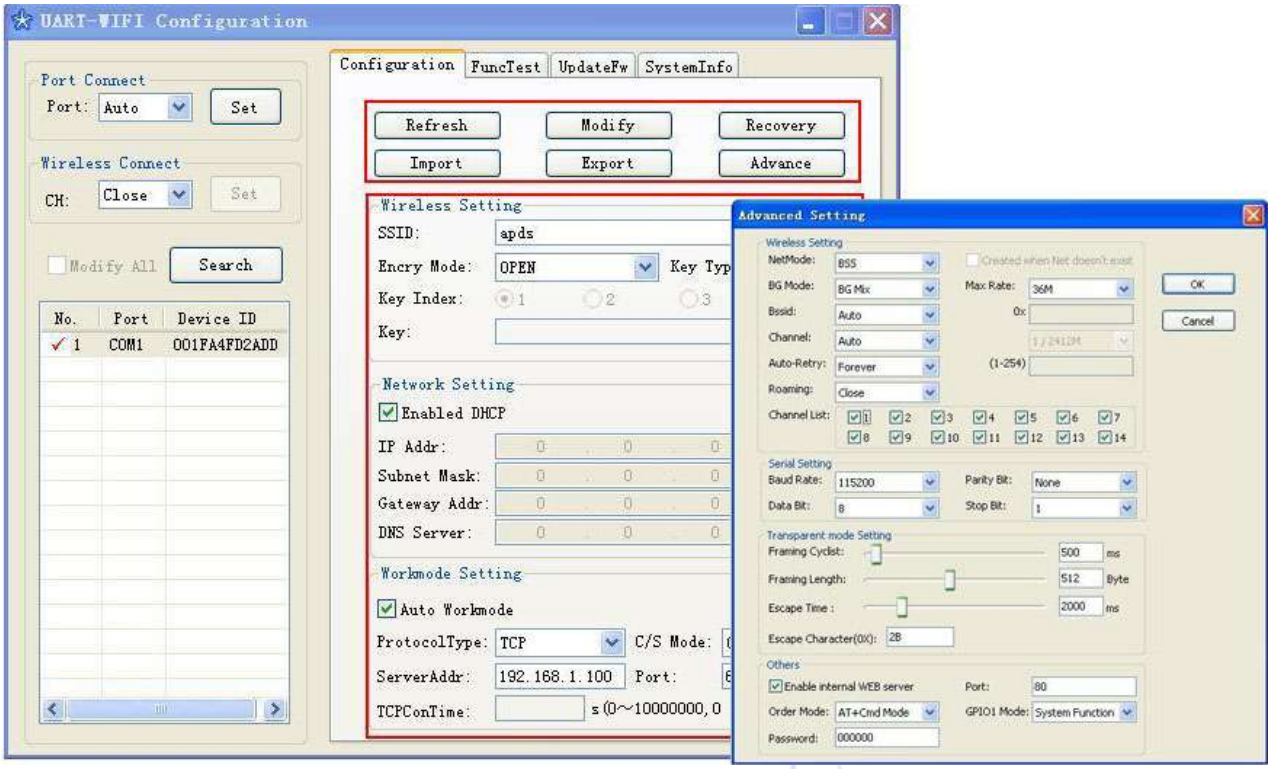


figure5-4 configure parameters

### 3.1.3.1 Refresh parameter

User can refresh the configuration parameter from wireless module and show in the display interface through clicking the ‘refresh parameter’button.

### 3.1.3.2 Submit modification

User can click ‘submit modification’ button after modifying configuration parameter（including parameter in advanced setting）in the display interface to save the parameters into wireless module. New parameters will become effective until wireless module has been reset,user can select to reset at once or manually reset later in pop-up dialog box after modifying，it’s shown as the following sketch map,


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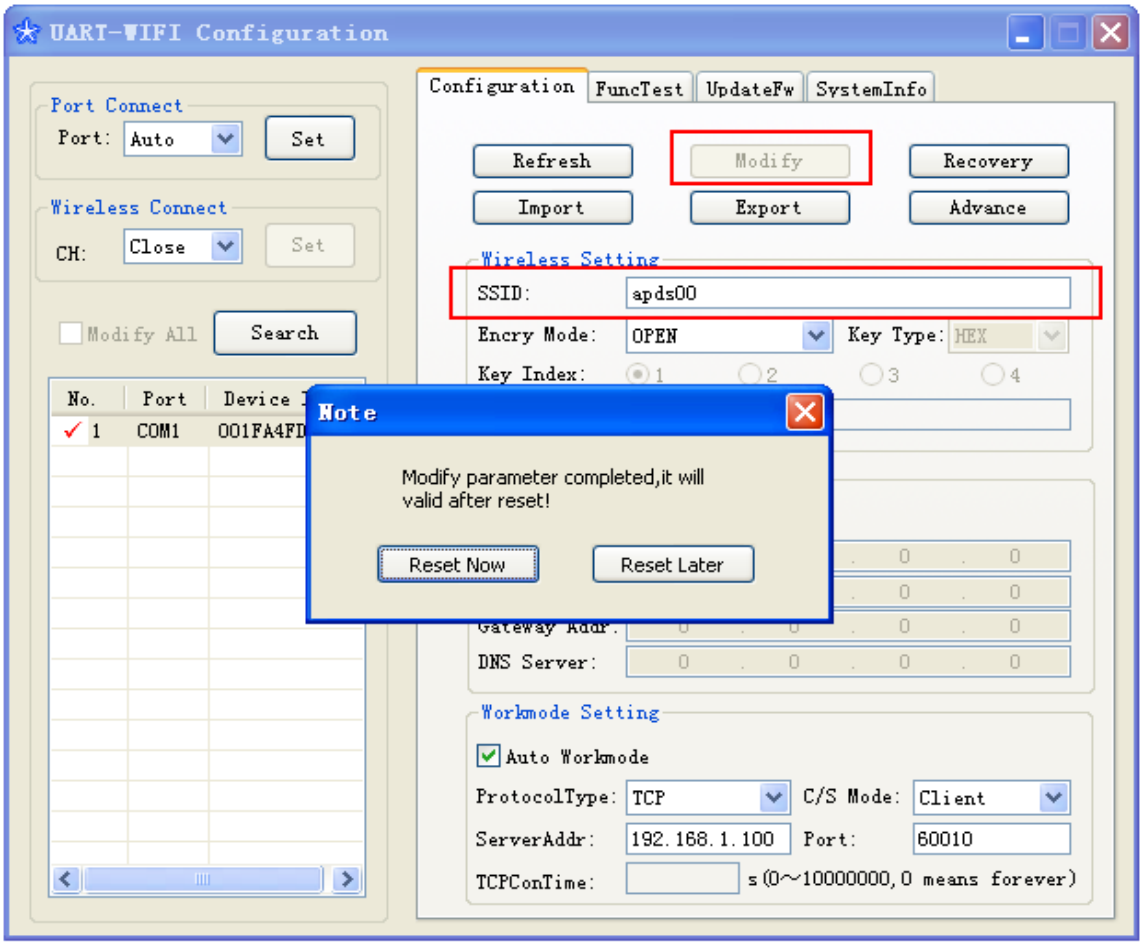


figure5-5 sketch map of submitting modification

### 3.1.3.3 Restore to factory setting

User clicks ‘’ button to restore the configuration parameters of the wireless module into factory status. After restoring，the factory setting becomes effect until the module has been reset.


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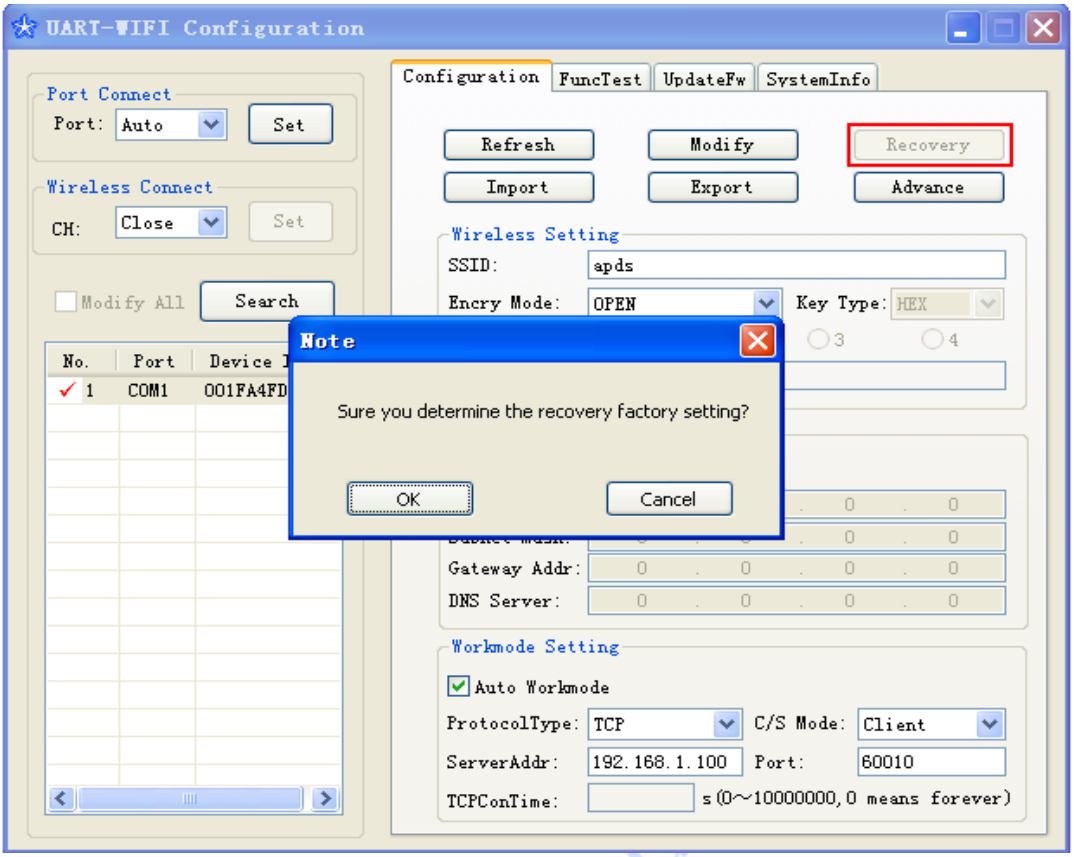


figure5-6 sketch map of restoring to factory setting

### 3.1.3.4 Import/export parameters

User can save all configuration parameters in display interface to the specified configuration file through clicking the ‘export parameters’ button, and apply all parameter which are saved in configuration file through clicking ‘import parameter’ button. What should be noted is that, using import parameter function only imports parameters to the display interface，the imported parameters can be wrote in wireless module actually until clicking the ‘submit modification’.


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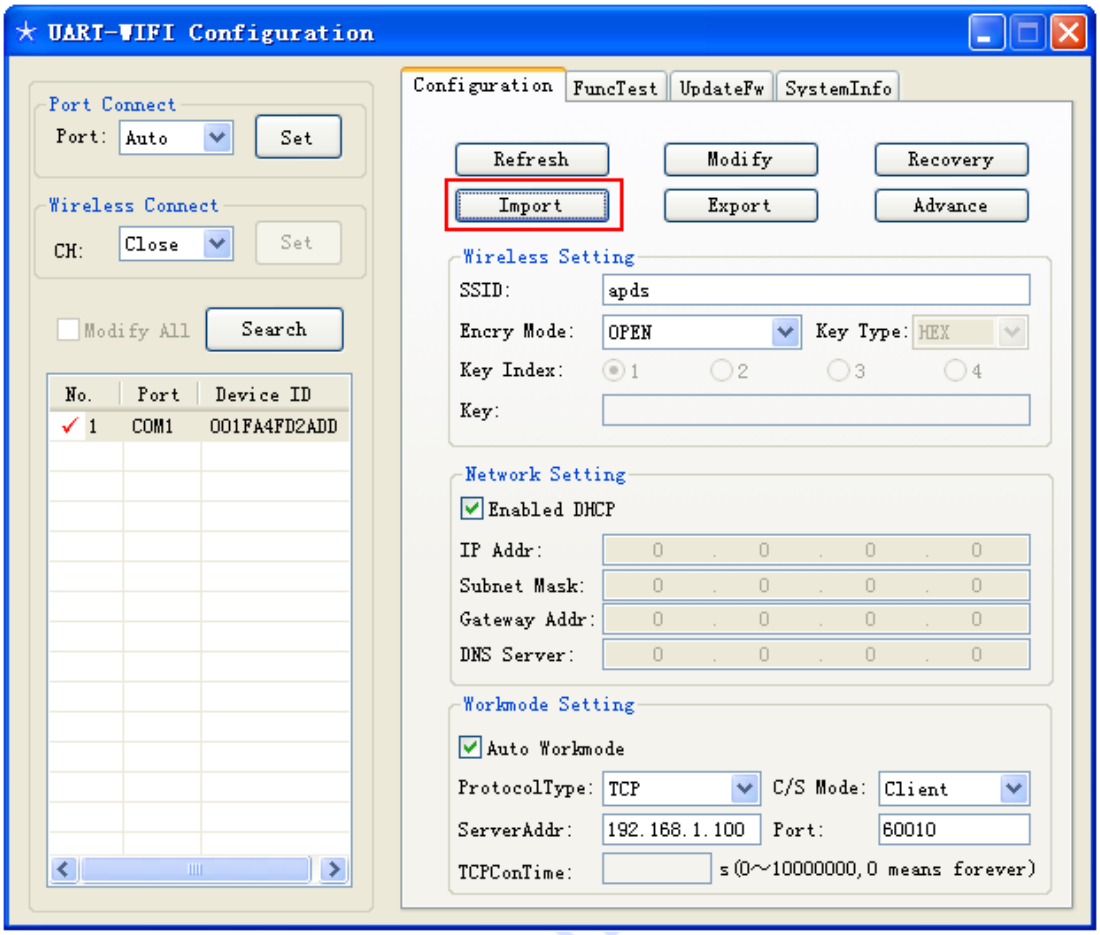


figure5-7 sketch map of Importing parameters

3.1.3.5 Group modification

Group modificatio will be activated when configuration hypervisor has searched for more than one wireless module. If user selects the function， the modified parameters will be applied to all of the wireless modules automatically through clicking ‘modify all’. This function can predigest operation steps and enhance work efficiency when a lot of modules need to be restored to the default configuration.

### 3.1.4 Function test

This section offers the function of fast testing AT+ instruction for user，the user can jump over this section when using auto-work mode. Additionally，this function can not work while the module is configured through wireless connection.

User can send command through shortcut button of usual instruction or inputting AT+ instruction directly，it is shown as the following sketch map,


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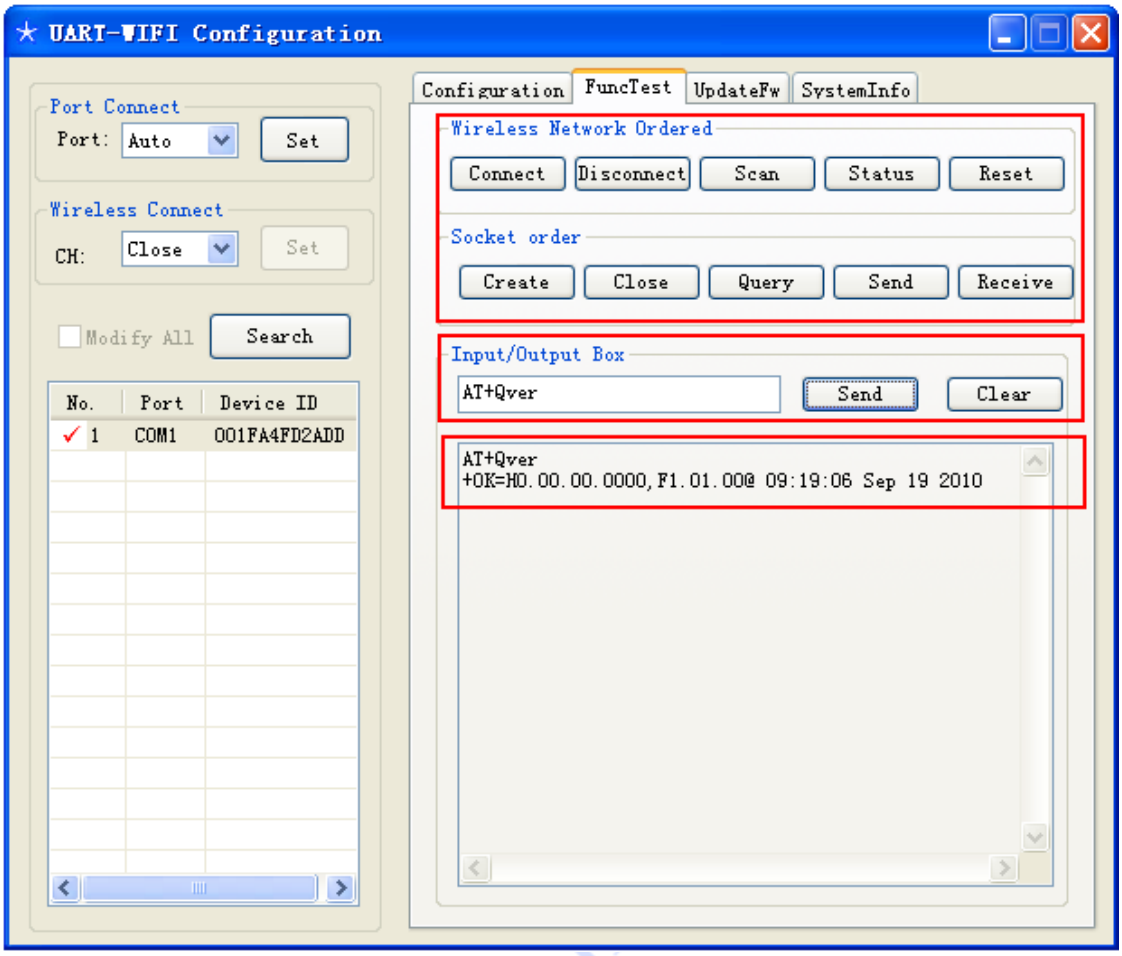


figure5-8 function test page

### 3.1.4.1 Network scanning

User can click ‘scan’ button to scan network as the following sketch map. Scan result will show in the following display frame，such as network type、encryption、network MAC、channel、signal strength etc.

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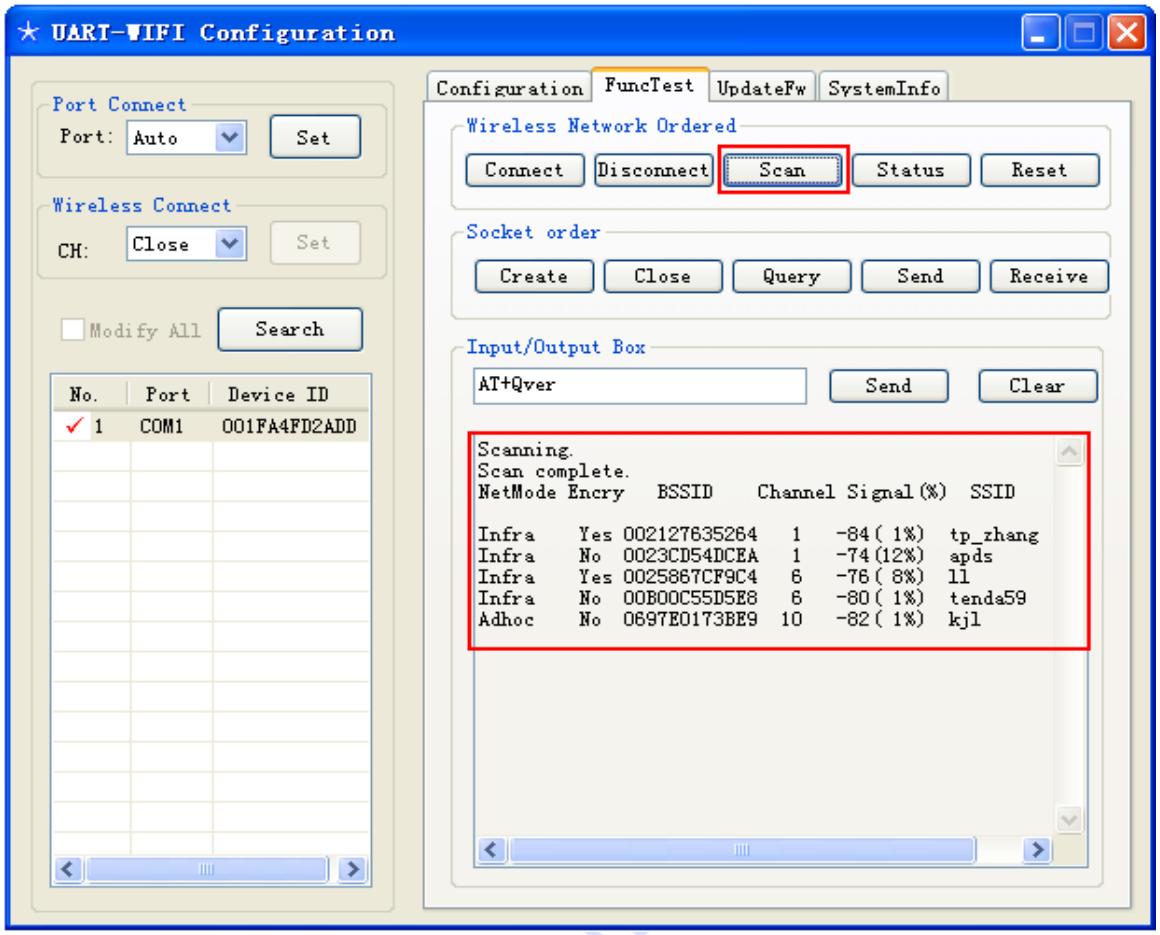


figure5-9 network scanning

### 3.1.4.2 Join/Disconnect network

User can click the ‘’ button to join or disconnect the wireless network as the following sketch map, the result will show in the following display frame.


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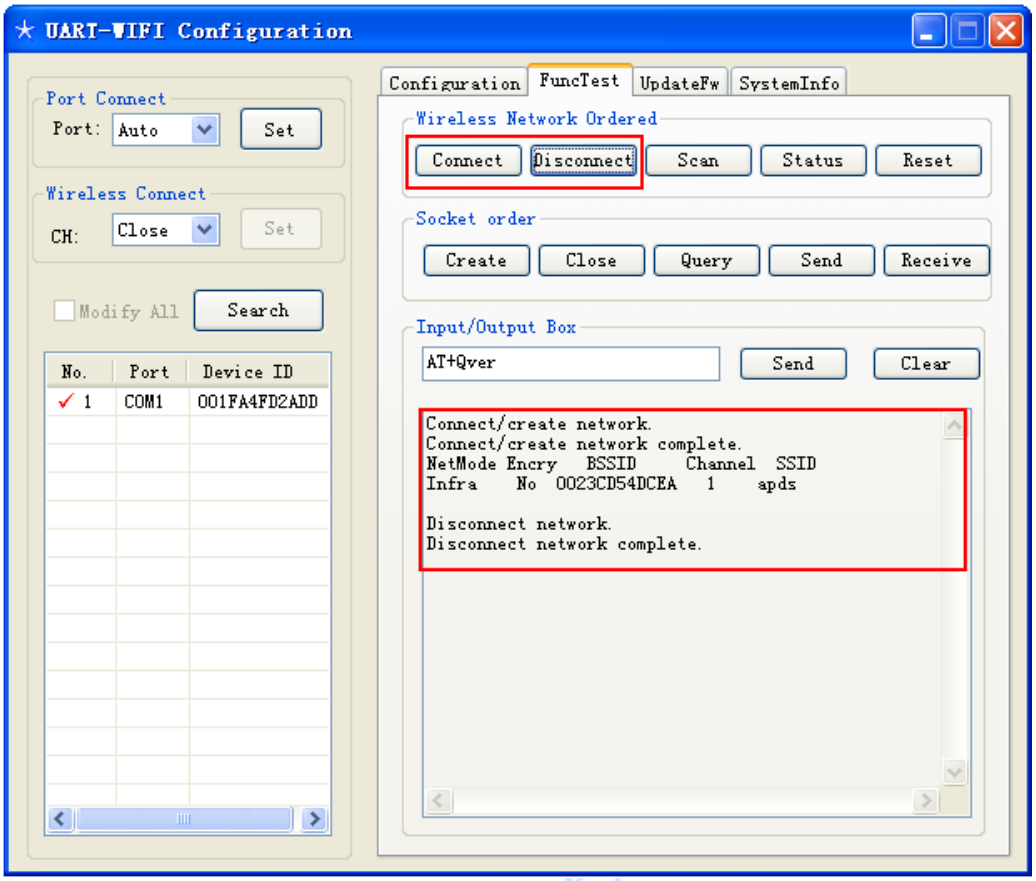


figure5-10 join/disconnect network

### 3.1.4.3 Query network status

User can click the ‘state’ button to query network connection status as following sketch map, the result will show in the following display frame.

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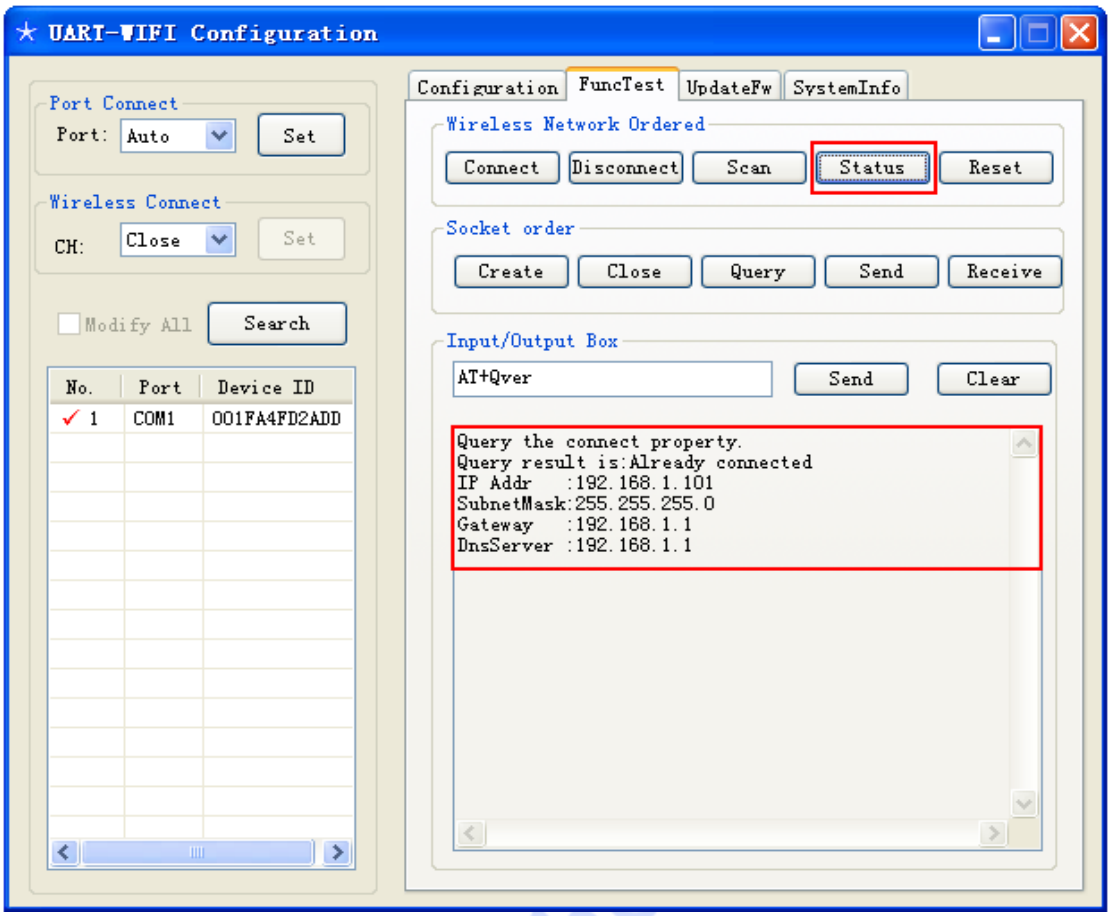


figure5-11 query network status

### 3.1.4.4 Create socket

User can click ‘create’ button to create socket as the following sketch map. Click the ‘Yes’ button after hasing configured each parameter.It will return a socket number after creating successfully.

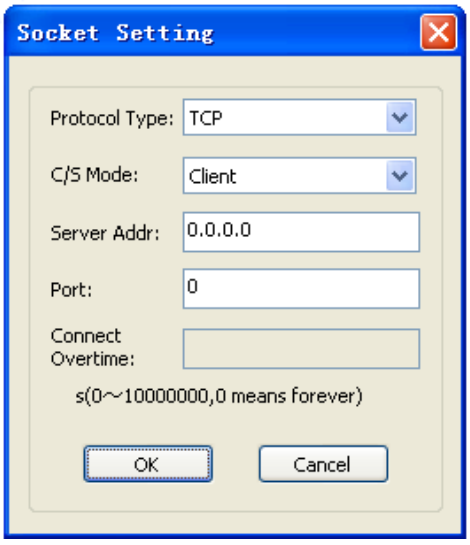


figure5-12 interface of creating socket


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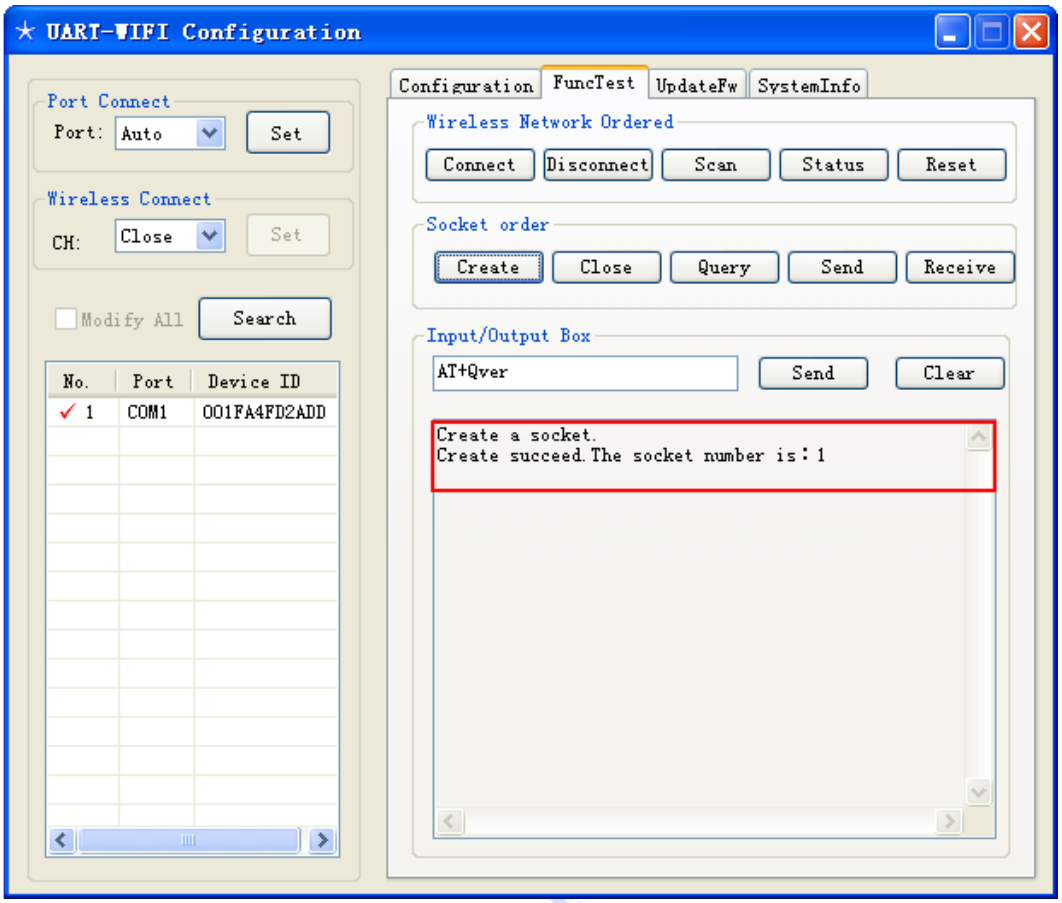


figure5-13 interface of the result of creating socket

3.1.4.5 close socket

User can delete the socket connection through clicking ‘close’ button and inputing the socket number which is expected to close.

3.1.4.6 query socket status

User can query socket status through clicking ‘query’ button and inputing the socket number which is wanted, the state of socket will return in the display frame after clicking ‘yes’ button.


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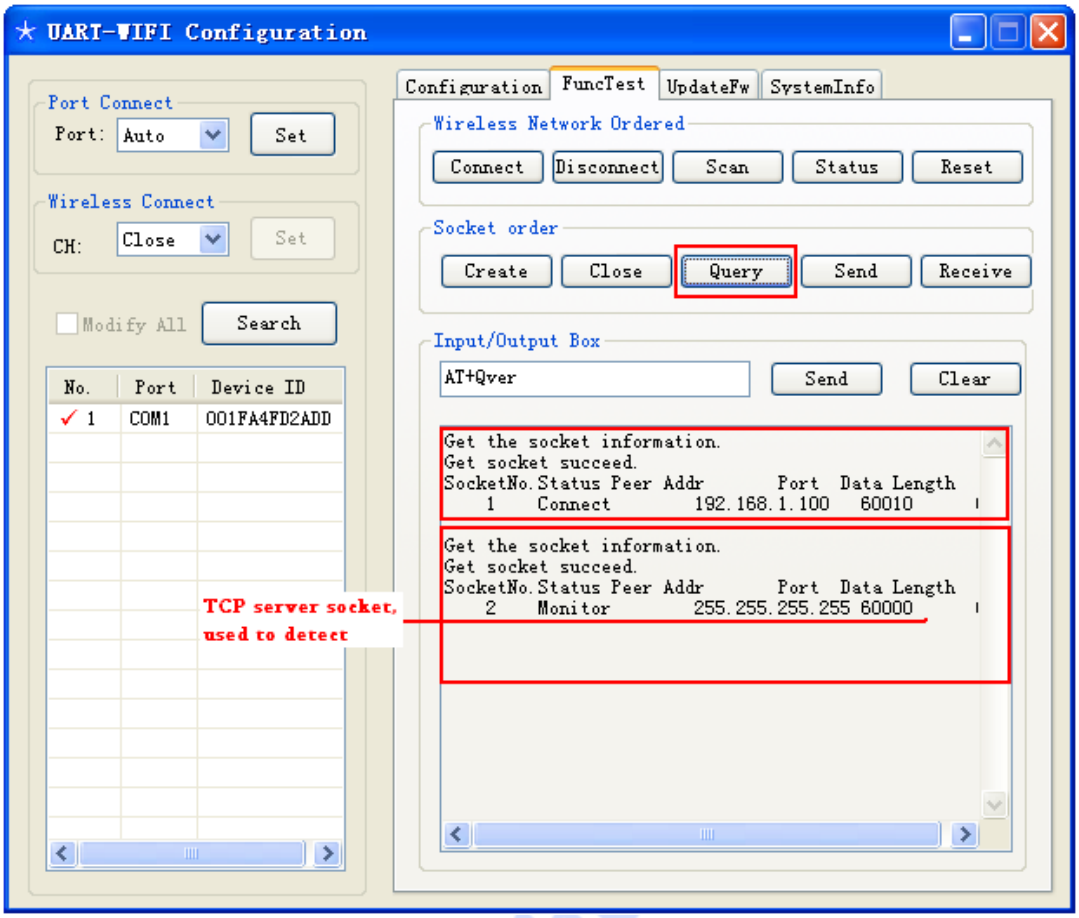


figure5-14 socket status querying

Description,

1、 As shown above, the querying results return from two sockets are different. Because the second socket type is TCP server, which is in monitor state after creating successfully, its result does not only contain itself state，but also includes the connection information of Clients which are connecting to the server(these sockets are created by system automatically)，as socket3 and socket4 shown in sketch map.

### 3.1.4.7 Socket sending

User can send data through socket by clicking ‘send’ button and inputing socket number（the socket of TCP server can’t be used to send or receive data directly，what is input should be the socket number of the conection between clients and the server）and data that need to send，the sending accomplishment information will return in the display frame after clicking ‘yes’ button.


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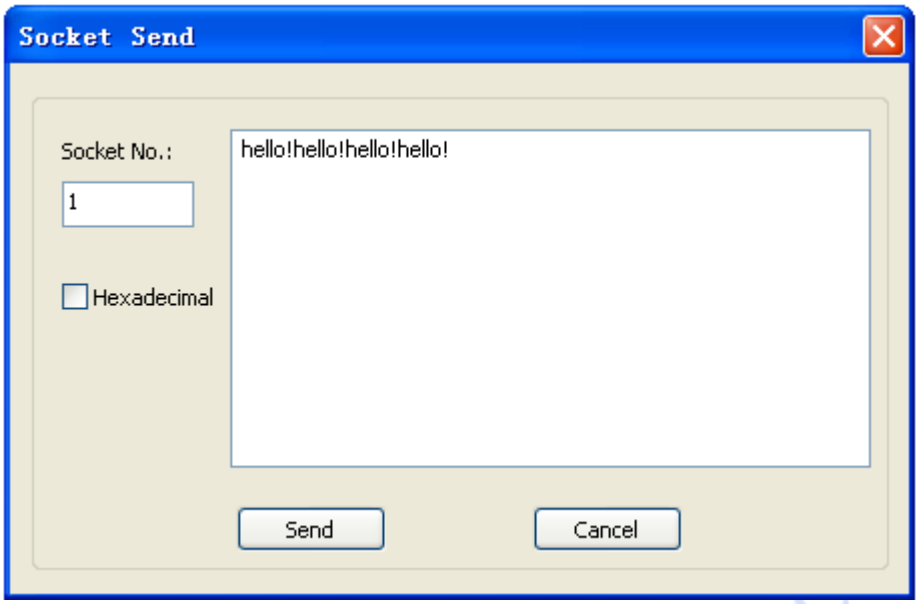


figure5-15 send data through socket

3.1.4.8 Socket receiving

User can receive data through socket by clicking ‘receive’ button and inputing socket number（the socket of TCP server can’t be used to send or receive data directly，what is input should be the socket number of the conection between clients and the server）and data size that expected to receive in pop-up dialog box，the data will show in the receive frame after clicking ‘receive’ button shown as figure5-18.

Before receiving data，please use ‘query’ command to confirm whether the socket receiver buffer has saved data in it at first.

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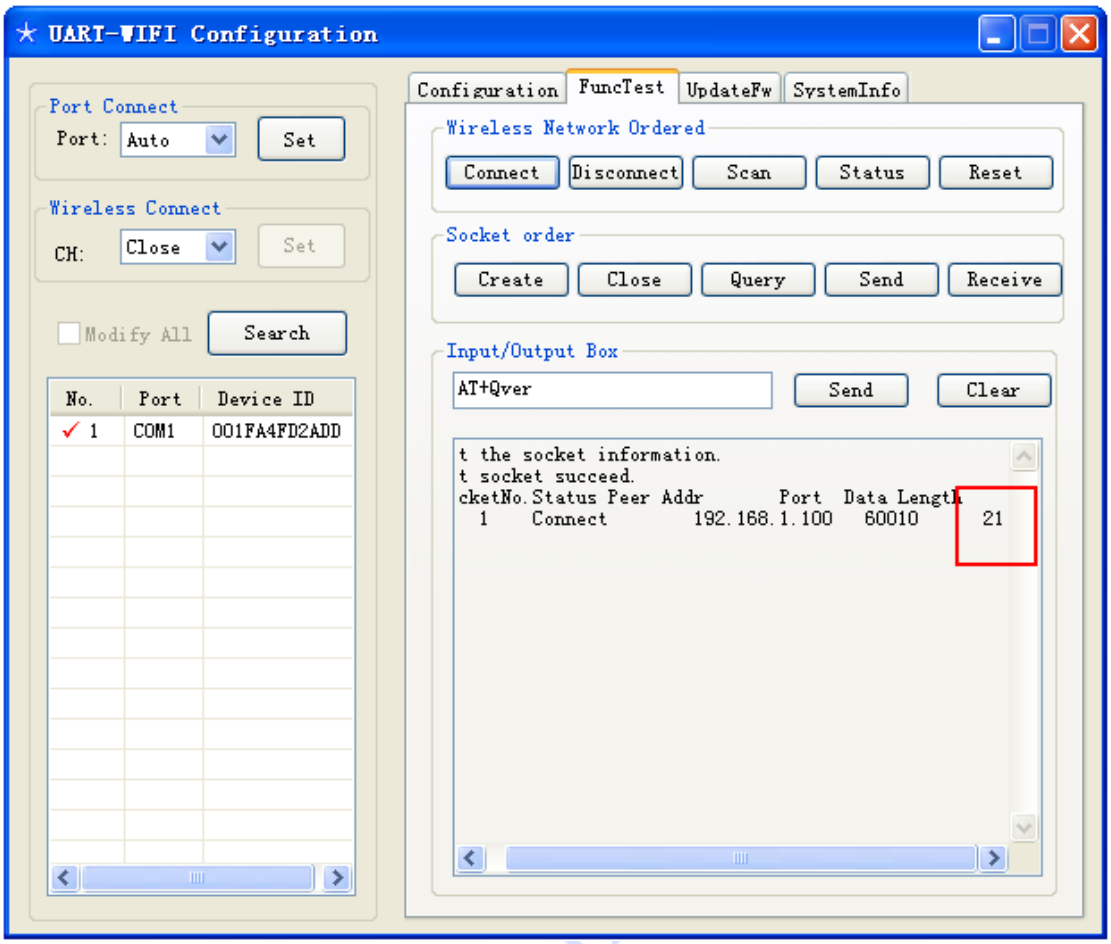


figure5-16 query the receiver buffer

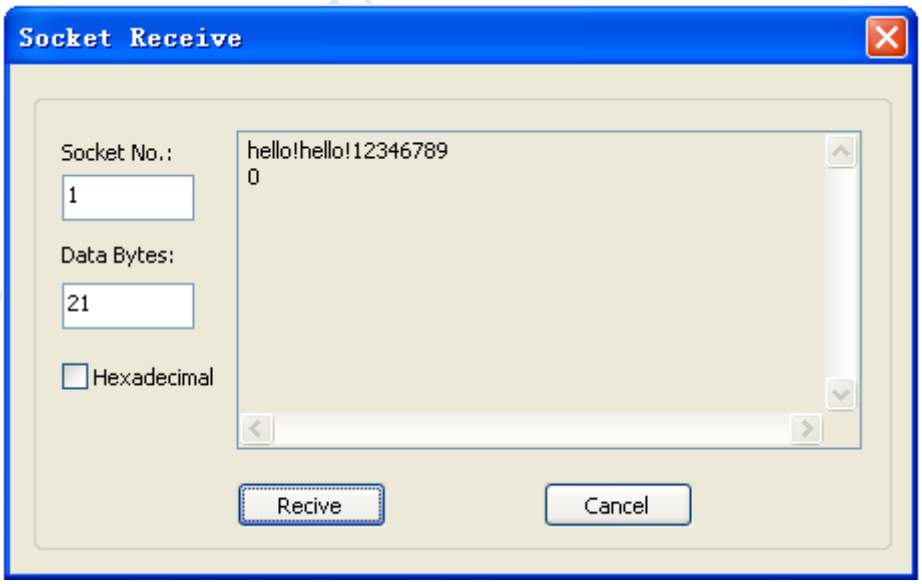


figure5-17 socket receiving


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### 3.1.5 System information

User can query MAC address、hardware version information and firmware version information of the module in this section, the following sketch map is the show.

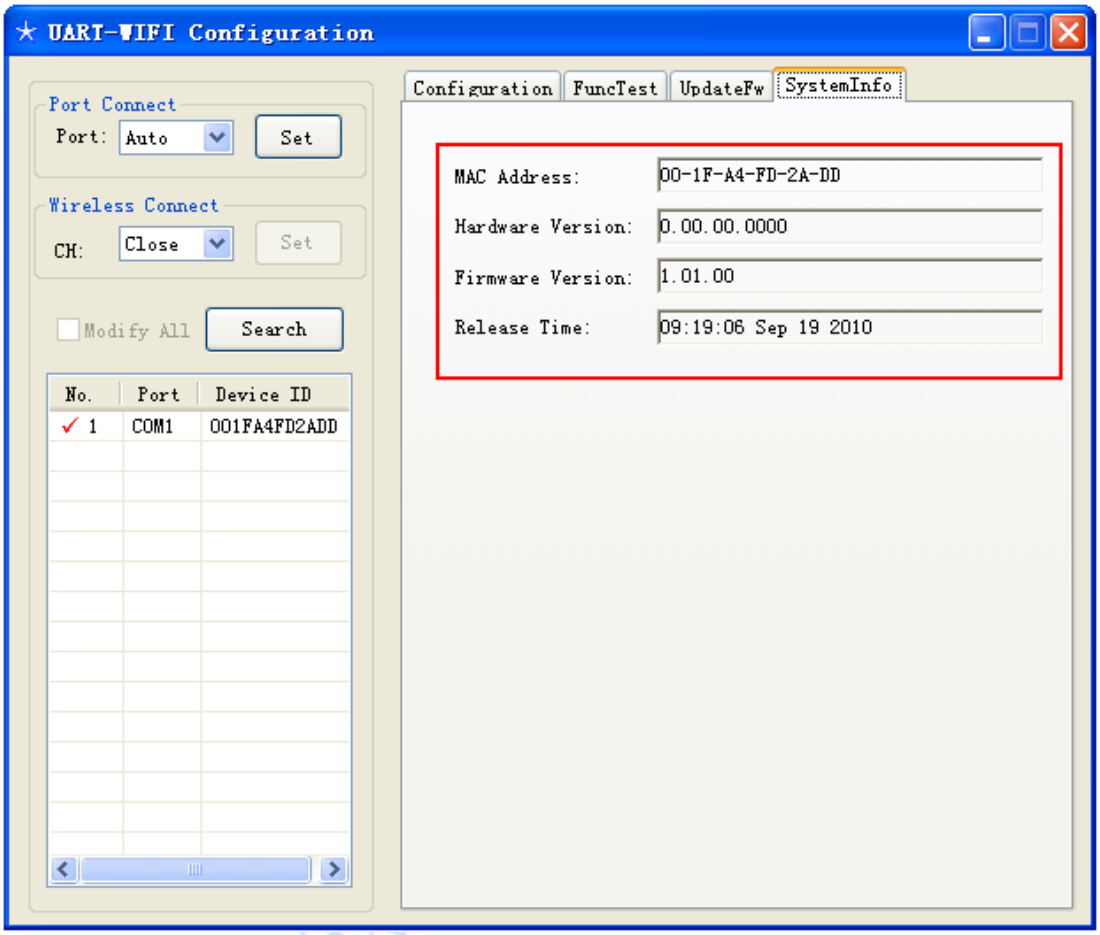


figure5-18 system information

### 3.1.6 Firmware upgrade

This function will be activate when the module has connected to the wireless network.

User can acquire the function of module firmware upgrade in this section, as the following sketch map shows（what should be noted is that, please read the notice carefully before upgrading, otherwise, failure will make the module destroyed）.


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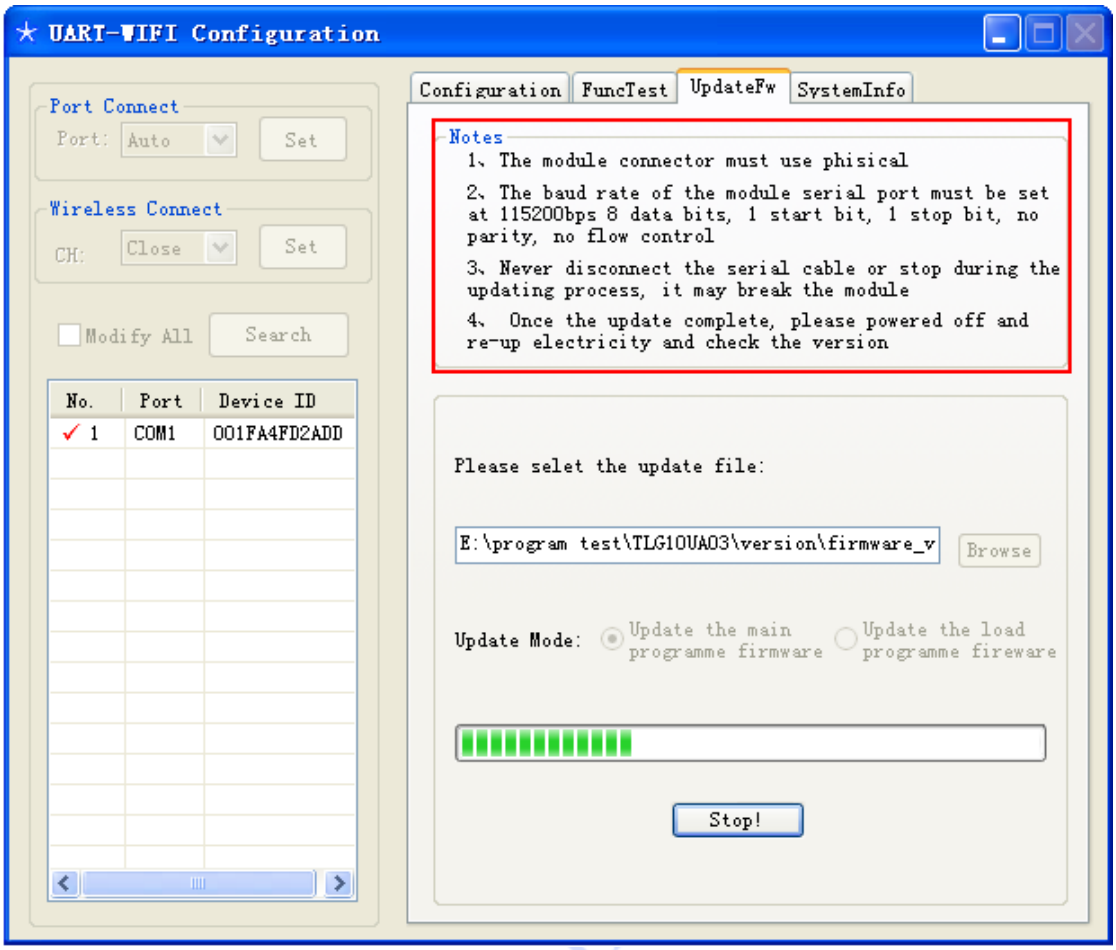


figure5-19 firmware upgrade

## 3.2 Configuration through WEB server

WEB server has been embedded in this product, it can support the function of parameters configuration with IE browser, the method is as follow,

Notices,

1、 Make sure the module has connected to the network successfully before using web page configuration;

2、 The default port number of the WEB server is 80，so it only needs to input address in address column of browser，if user has modified the web server port，user must input port number，otherwise the net can not be opened, for example when the port number is set to 8080，the access address of the web server is http://192.168.1.20:8080;

3、 Please use Windows IE browser to access the server as well as you can;


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### 3.2.1 Query/set configuration parameter

1、 Open IE browser，connect after inputting IP address(and the port number sometimes) of wireless module in address column，the login interface will appear, input user name ‘admin’ and login password of module（default password is 000000）;

2、 The configuration web page is shown as the following sketch map，if user want to modify configuration parameters of wireless module，you need to click ‘save‘ button to submit the modification;

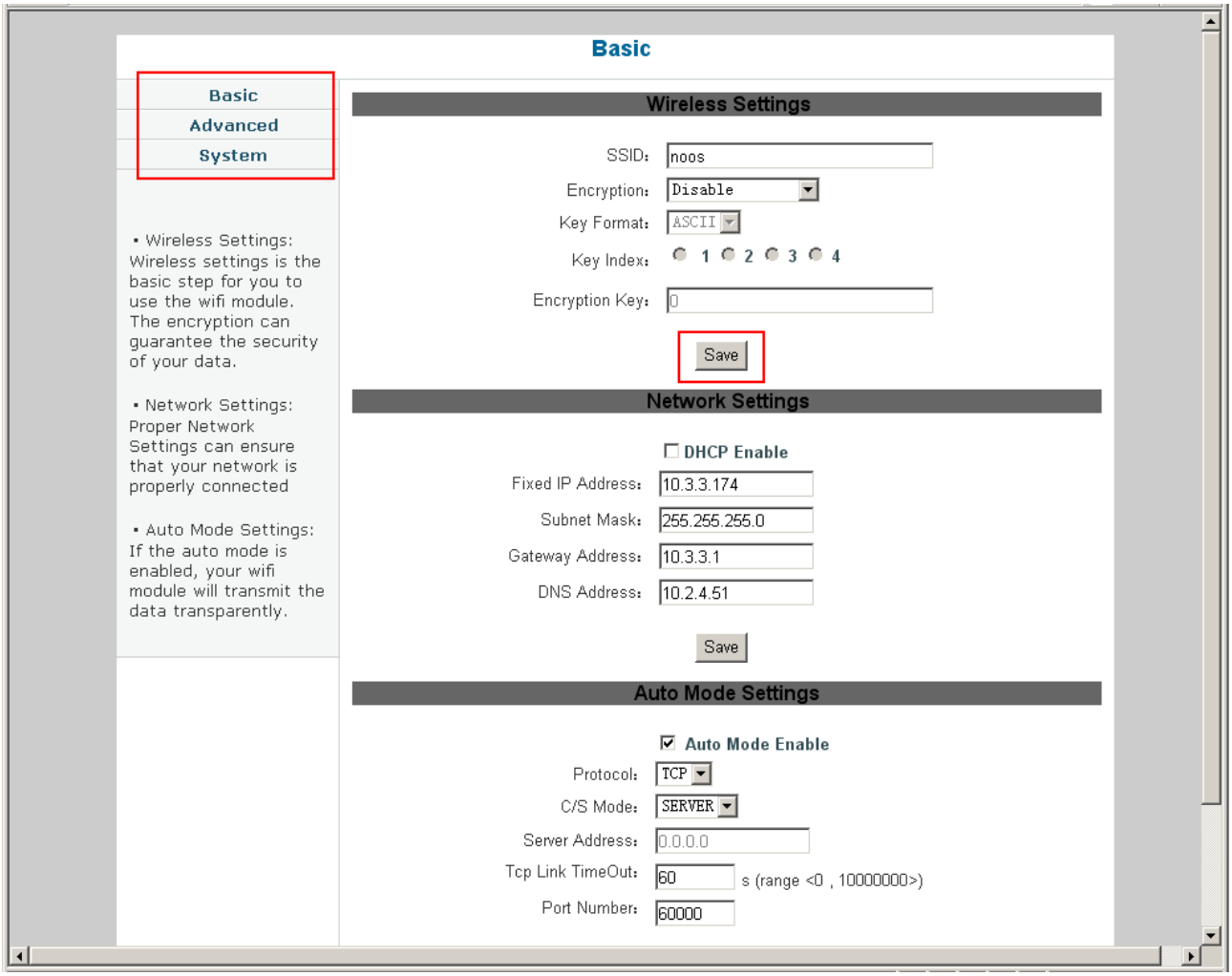


figure5-20 web page of parameter modification

3、 After completing the submission, the wireless module will restart automatically，the web page will be also refreshed in ten seconds.


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### 3.2.2 Firmware upgrade on line

The product supports firmware upgrade online through web page, it's shown as following sketch map,

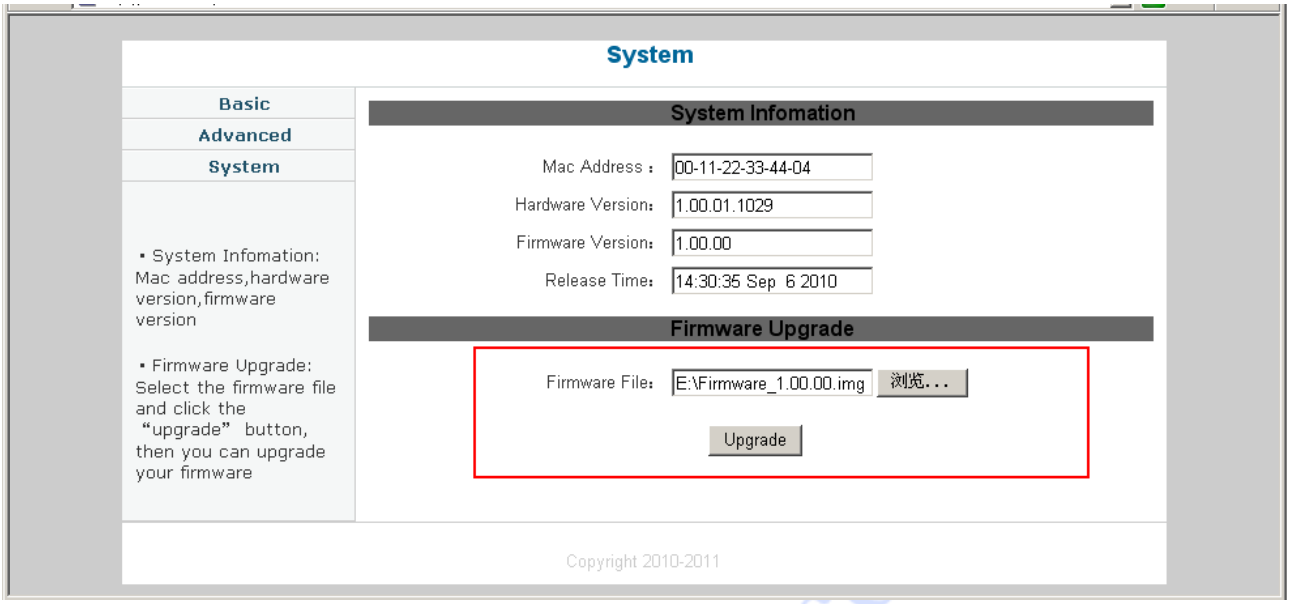


figure5-21 online upgrade of firmware

## 3.3 Configuration through super terminal program

User can ignore the section if only using the wireless module in auto-work mode.

For the user who hopes to test the function of AT+instruction, Windows Super Terminal which is embedded in Windows operation system can be used to input AT+ instruction directly for parameter configuration of wireless module and function test. What should be descripted is that, the serial debugging softwares（serial genius、serial master，etc）that refered in preamble all can be used for AT+instruction test，this section just takes super terminal program as an example.

1、Open super terminal program（Windowsstart—program—accessories—communication—super terminal program），input connection name and icon，select serial number and parameters（the same as the wireless module），what should be descripted is that the option of flow control must be set to none in command mode，the setting is shown as following sketch map,


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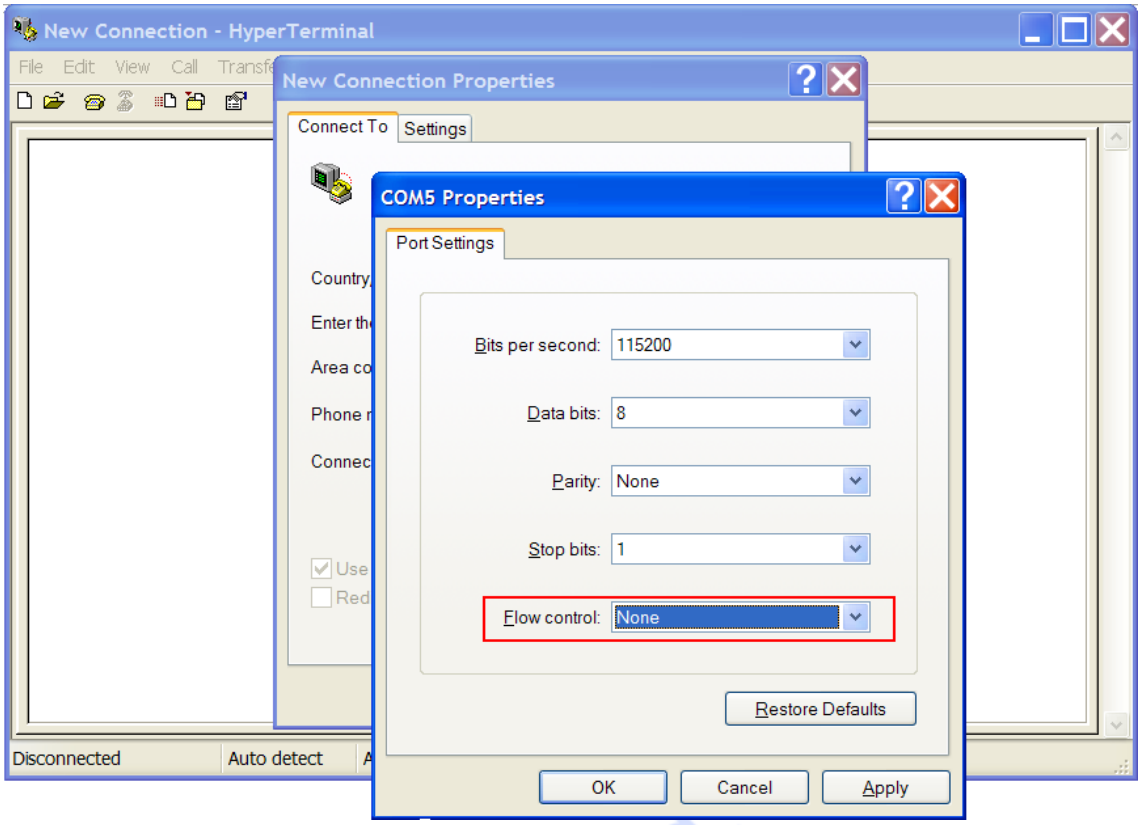


figure5-22 the configuration of super terminal

2、 If the wireless module has started configuration mode（see the 4.2.1 section）or the work mode is set to command mode，please jump to step 5 directly，otherwise，it needs to make the module exiting the transparent transmission mode according to following approachs at first（refer to section 4.2.2.4）;

3、 Open a notepad to edit escape character string（the default escape character is'+' ）and save.

4、 Wait for the time specified by the parameter of escape time（its default setting is 2 second），select 'send text file' in the 'transmit' menu，send escape character string file，the module return '+OK' information if success;

5、 Input 'AT+E' instruction to open input return display（before it, the character that user input can not be display in the super terminal interface）;

6、 Thus，user can use super terminal program to test the most of AT+ instruction set，for example, the command of network scan can be insteaded of inputtig 'AT+WSCAN', it's shown as the following sketch map.


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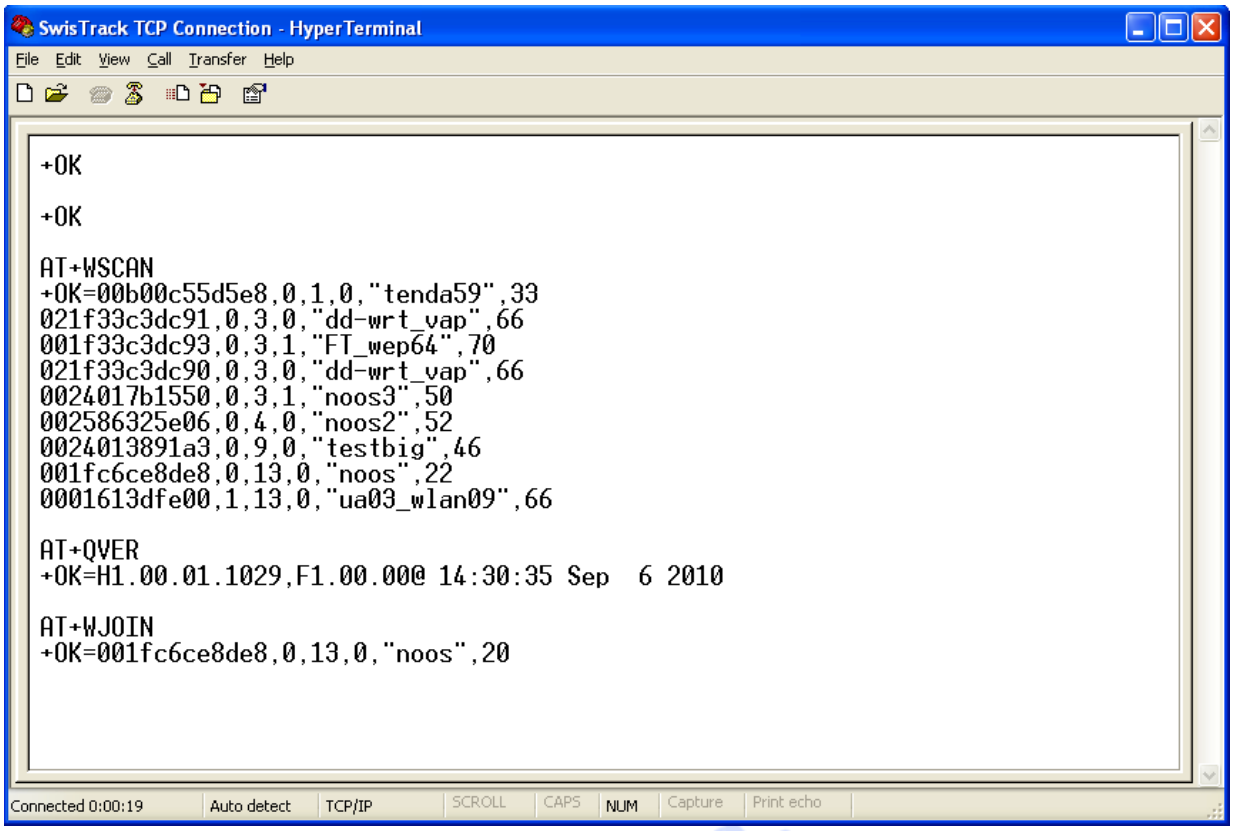


figure5-23 instruction test

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1 This device must not be co-located or operating in conjunction with any other antenna or transmitter

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

**Federal Communications Commission (FCC) Requirements, Part 15**

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 or more 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.

2 Regulatory information / Disclaimers

Installation and use of this Wireless LAN device must be in strict accordance with the instructions included in the user documentation provided with the product. Any changes or modifications (including the antennas) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the

equipment. The manufacturer is not responsible for any radio or television interference caused by unauthorized modification of this device, or the substitution of the connecting cables and equipment other than manufacturer specified. It is the responsibility of the user to correct any interference caused by such unauthorized modification, substitution or attachment. Manufacturer and its authorized resellers or distributors will assume no liability for any damage or violation of government

**CAUTION: To maintain compliance with FCC's RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use on the supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.**


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**MPE Statement (Safety Information)**

Your device contains a low power transmitter. When device is transmitted it sends out Radio Frequency (RF) signal.

3 Safety Information

In order to maintain compliance with the FCC RF exposure guidelines, this equipment should be installed and operated with minimum distance 20cm between the radiator and your body. Use only with supplied antenna. Unauthorized antenna, modification, or attachments could damage the transmitter and may violate FCC regulations.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

IEEE 802.11b/g operation of this product in the U.S.A. is firmware -limited to channels 1 through 11.

## 3.1 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, and

The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are 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.).

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