TGD-210x

802.11 b/g/n WIFI Module

User Manual

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TGD-210x is a WiFi module which is lower energy consuming, compact designed size, stronger signal, quick start reading, higher reliability, higher cost-efficiency. This module integrates the MCU, RF transceiver, TCP / IP protocol stack and application software. Users only need provide 3.3v power supply to the module. TGD-210x Wi-Fi module is equipped with a variety of standard interfaces, including UART, GPIO, I2C, SPI, etc., and also provides a Command Line Interface Configuration, AT Instruction Set , SDK kit etc.. User could easily integrate into their products , accelerate product development, shorten time to market. It provides users a low-cost & reliable wireless solutions.

Product features：

➢ Support 802.11b/g/n

➢ Support 1 second quick start-up

➢ Low energy consumption, support sleep mode, optionally powered by battery

➢ Support AP/ STA/ADHOC/ WiFi Direct modes etc.

➢ Support all WiFi Encryption Protocal, applicable for all types of routers; can connect to Iphone and Adroid mobile phone

➢ Support UART/SPI/GPIO/I2C interfaces

➢ Support PCB antenna or external antenna IPEX Interface

➢ Support command line configuration interface, compatible with the AT instruction

➢ Support TCP / UDP / DNS / HTTP 支持 TCP/UDP/DNS/HTTP

➢ Supports various parameter configuration interfaces, including serial configuration / web Configuration / Network Configuration

➢ Support Smart Config

➢ Support App Server application server, users can remotely control domestic appliance through a mobile phone

➢ Provide SDK kit and Demo apk software to support secondary development

➢ FCC/ CE certificated

➢ Alternative choice available between stamp holes and pin holes types

Suitable for :

➢ Intelligent home system, small appliances, intelligent home appliances, light.

➢ Wearable, handheld devices, health/medical care equipment.

➢ Toys, automotive electronics, all types of industrial control products.

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MODEL 1: TGD-210D

Main characteristics:

➢ PCB Size: 15 X 29MM, double-side, 7 PIN 2.0 pin pitch, pcb antenna available

➢ 3.3 V power voltage, 1 URAT and 3 GPIO connections;   up to 5 GPIO without UART
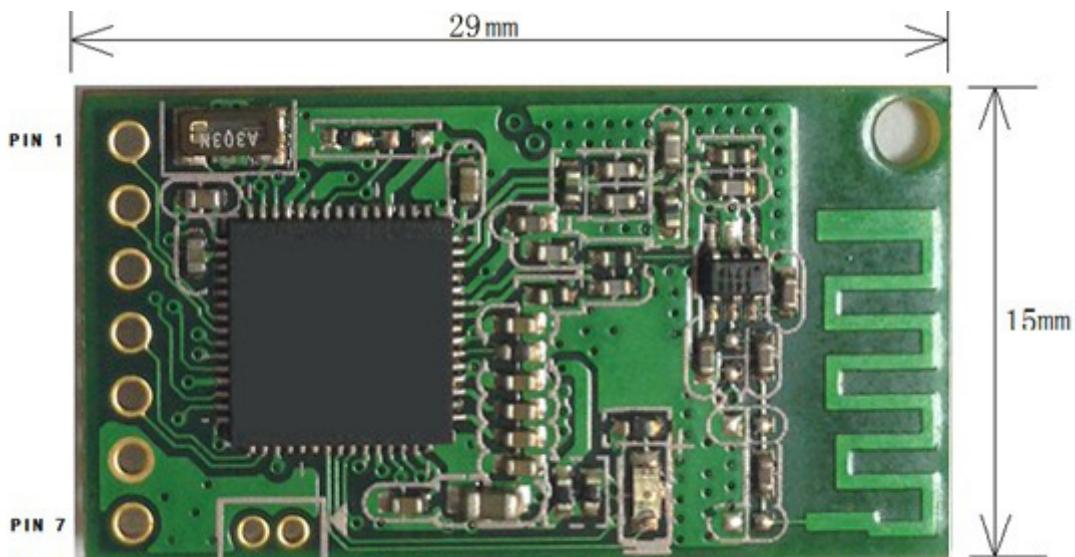

TGD-210D Module

PIN NO.	Item	Description
1	P1 / LED STATUS	GPIO P1，the default is module LED status light
2	P2 / RESET	GPIO P2，The default is to restore factory setting, active low
3	VCC33	3.3v power supply
4	RXD	UART interface, can reset as GPIO interface
5	TXD	UART interface, can reset as GPIO interface
6	GND	Ground
7	P3	GPIO P3，suspension if not in use

MODEL 2: TGD-210S (expected in MAY 2014)

Main characteristics：

➢ 18 X 31MM, thickness 2.0MM, , Stamp hole package , shield available

➢ optional pcb antenna and external antenna IPEX Interface

➢ 3.3V power supply, 1 UART interface, 1 SPI Slave interface, 8 GPIO interface
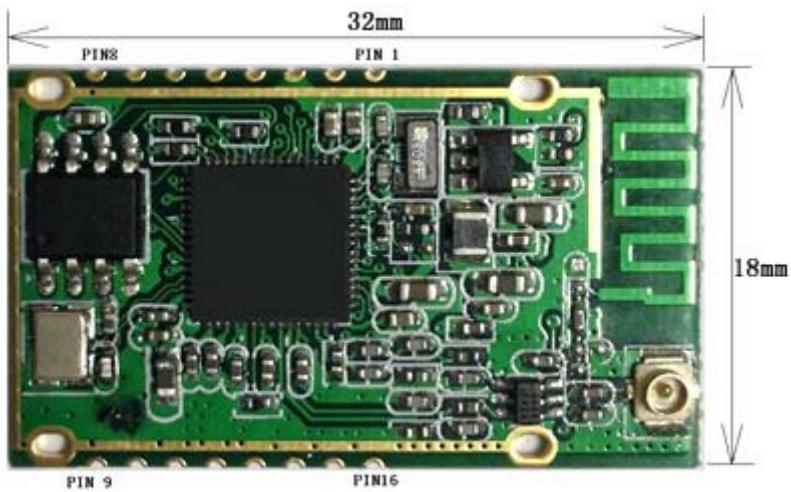
TGD-210S Module

PIN NO.	Item	Description
1	VCC33	3.3v power supply
2	P4	GPIO P4，suspension if not in use
3	GND	Grouding
4	P3	GPIO P3，suspension if not in use
5	P1 / LED STATUS	GPIO P1，the default is module LED status light
6	P2 / RESET	GPIO P2，The default is to restore factory setting, active low
7	RXD	UART interface，can reset as GPIO interface
8	TXD	UART interface，can reset as GPIO interface
9	P5	GPIO P5 suspension if not in use
10	P6	GPIO P6，suspension if not in use
11	P7	GPIO P7，suspension if not in use
12	SPIS_CS	SPI Slavei interface ，can reset as GPIO interface

13	SPIS_MOSI	SPI Slave interface，can reset as GPIO interface
14	SPIS_MISO	SPI Slave interface，can reset as GPIO interface
15	SPIS_CLK	SPI Slave interface，can reset as GPIO interface
16	P0	GPIO P0，suspension if not in use; if need this pin, please advice factory.

MODEL 3: TGD-210A

Main characteristics：

➢ Size: 15 X 23MM, double-side board, 6 PIN , 2.0 pin pitch, external antenna IPEX Interface available

➢ 3.3V power supply, 1 UART interface, 2 GPIO interfaces, if without UART, can be up to 4 GPIO interfaces.
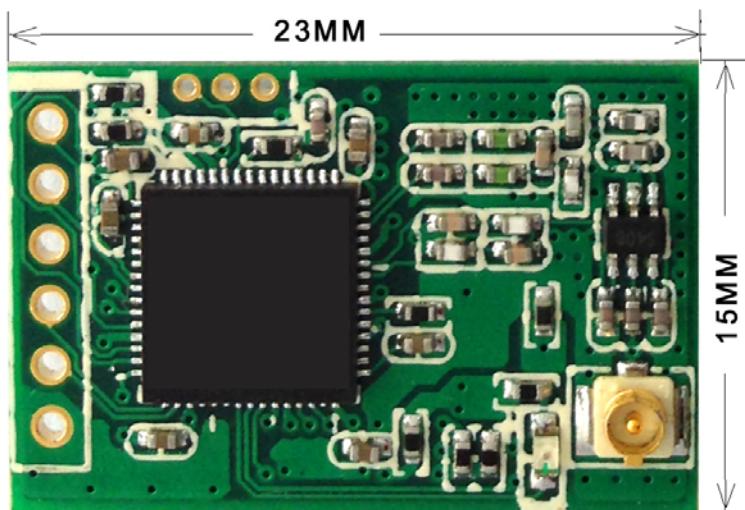
TGD-210A Module

PIN NO.	Item	Description
1	P1 / LED STATUS	GPIO P1，the default is module LED status ligh
2	P2 / RESET	GPIO P2，The default is to restore factory setting, active low
3	VCC33	3.3v power supply
4	RXD	UART interface，can reset as GPIO interface
5	TXD	UART interface，can reset as GPIO interface
6	GND	Ground

目录

1.Quick Start

1.1Preparation

➢ Hardware Requirement
  ✓ TGD-210D WiFi module
  ✓ Serial adapter board
  ✓ 9 PIN RS232 Crossover serial cable (female connectors on both end)
  ✓ DC5V power adapter
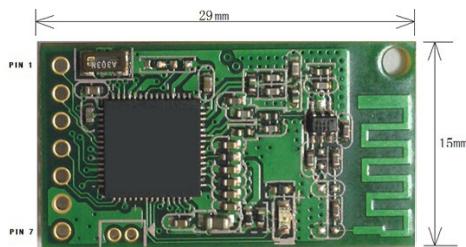
TGD-210D

Serial Adapter Board

➢ Software
  ✓ Serial debugging assistant, like CommAssisstant
  ✓ Terminal emulation program, like Secure CRT
  ✓ TCPUDP testing software, like TCPUDPDebug
 ✓

1.2   Command Line Interface

1、Install the WIFI module onto the serial adapter board and connect to the board and PC connector by serial line.
(Notice: the 1ˢᵗ pin on the module should connect to the 1ˢᵗ pin of J2 on the Serial Adapter board)

2、Turn the DIP switches of serial adapter board towards to COM2 side.

3、Open SecureCRT on the PC. Select "file"and open dialog box of " Quick Connect". Set Baud Rate to 115200 as following figure. Notice: select port type according to the serial port used on PC end.
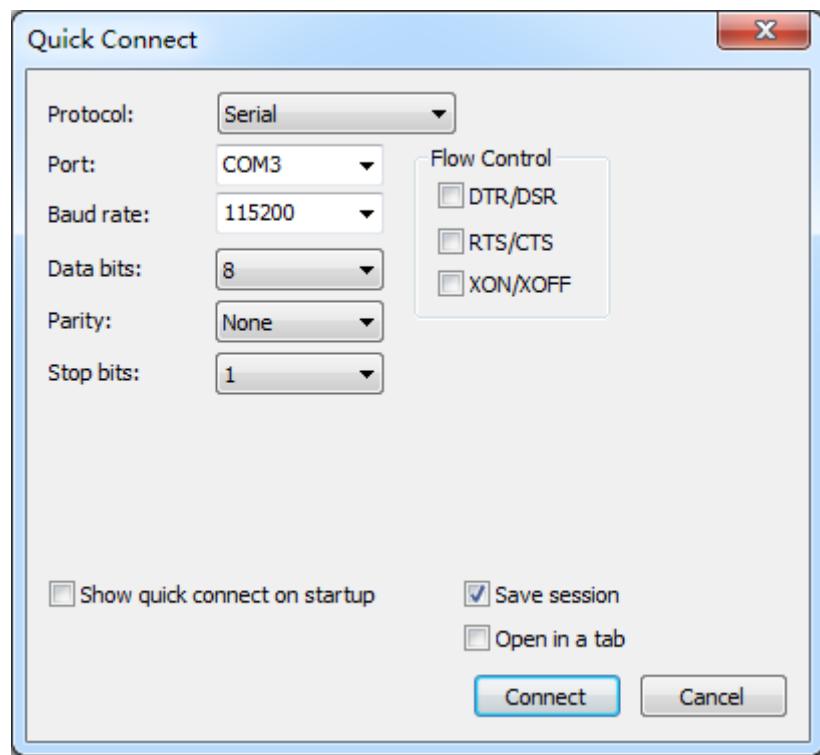
Click "connect " and show up as following figure. If the prompt is :Unable to open serial port COM3". Check the serial port the one using or it has been occupied.
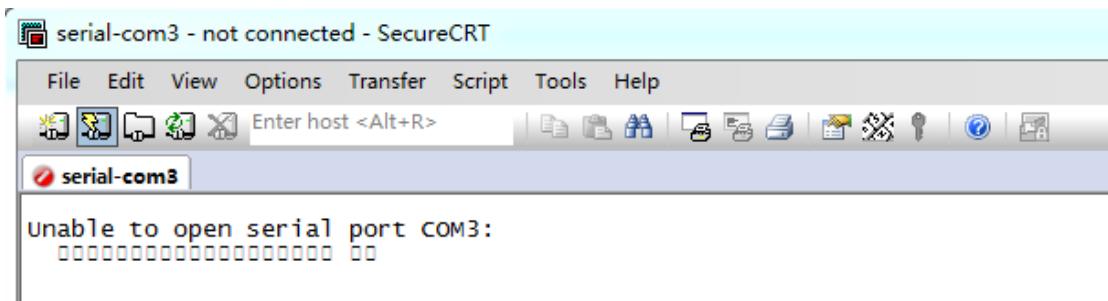
As following figure, show the serial port open correctly.
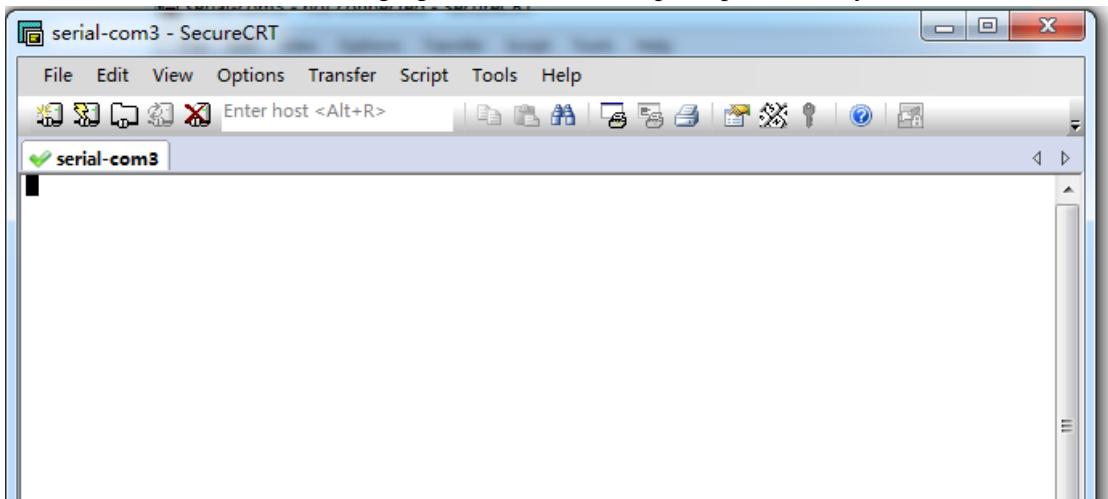
4、Use DC 5V power adapter to connect with power socket on the serial adapter board. Once LED light turns on, the begin to slow flash, the module starts working.

5、Type "+++"" to switch to command mode in SecureCRT. After Module show command prompt "cmd>", command to configure set or check setting of the module. Enter "quit" to exit command line status.

6、Enter "version" command to check module MAC address and version of current hardware.

```
cmd> version
mac: 000ec600b48d
ver: 1.02.12
Ok
cmd> version 1
Error
cmd>
```

Notice 1: if the command is correct, the prompt should be " ok". If not, it should be "Error".

*Notice2: if no operation after 30s, the module will exit automatically and back to unvarnished transmission mode.*

7、Enter "setssid" command to check the current setting of SSID is R2WiFi; Enter "setssid 210x" ssid can be modified to 210x.

```
cmd> setssid
SSID: R2WiFi
Ok
cmd> setssid 210x
Ok
cmd>
```

8、Enter "saveconfig" command to save the current SSID, and then restart the module to enable the setting. Through a wireless network card or mobile phone, it can be found in the current SSID has been modified from "R2WiFi" to "210x".

```
cmd> saveconfig
Saving Configuration to FLASH
Ok
cmd>
```


9、Enter "help" to check all current command list module supported. Enter "help" + "command", such as "help setmode". Command can query "setmode" command usage.

```
cmd> help setmode
                Usage: setmode <mode>
    <mode>: 0: SERVER    1: CLIENT
Ok
cmd>
```

1.3   Data Unvarnished Transmission Testing

1.   Refer to above steps. Ensure the computer's wireless card is connected to wifi hotspots module, then enter "ping 192.168.2.3" command to check the wireless connection is in function.

Notice: 192.168.2.3 is the default ip address of the WIFI module.

2. Open TCP / UDP debugging software, in this case using TCPUDPdebug.exe, to create a TCP client to connect to a TCP server module

Notice: The module default to tcp server mode, listening port 5000.

3. Open serial debugging assistant CommAssistant, remember to disconnect SecureCRT connection, to prevent occupation serial port. Setting is as follows:
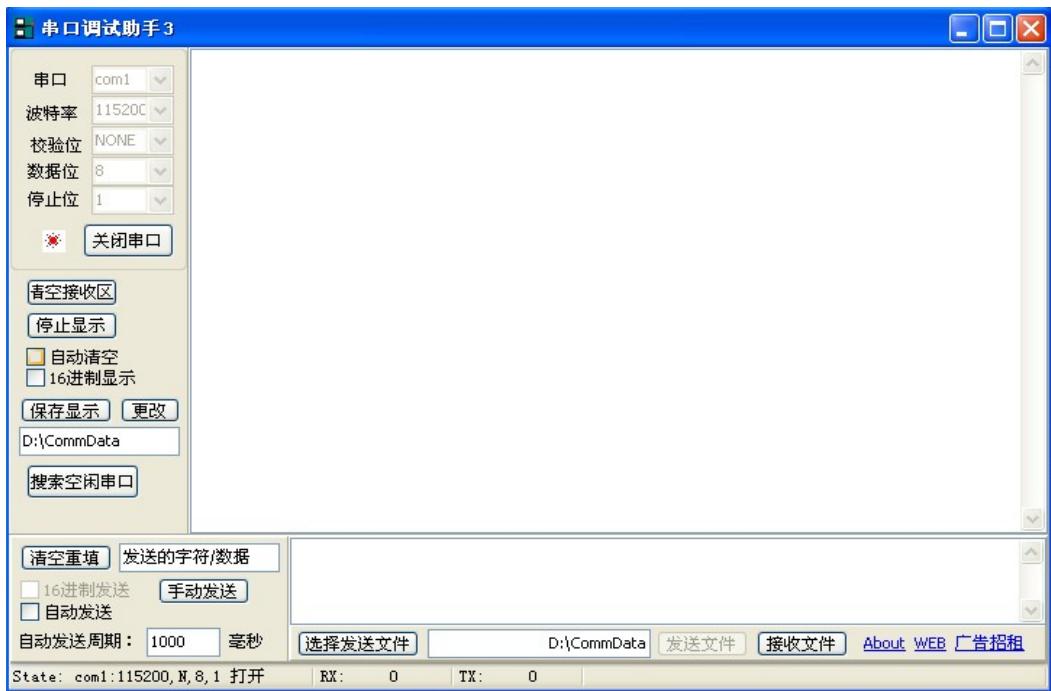
4. Manually click in the serial debugging assistant tp send data. TCP / UDP Debug program can receive data.

5. Click " send data" in the TCP / UDP Debug. The serial debugging assistant can receive data.

6. To this step, bi-directional data transfer shoud be in function. If there is no distortion, no loss of data reception, it

    means the data transfer performs correctly.

2　Product Oveview

2.1Main functions

2.1.1Connect to wireless network

➢　Network Topology

wireless network built on basis of AP structure 　（Infrastructure). It is a kind wireless network consisted of AP & many STA joined. The feature of such network is that AP is the center of the entire network and forwarding all communication in the system.
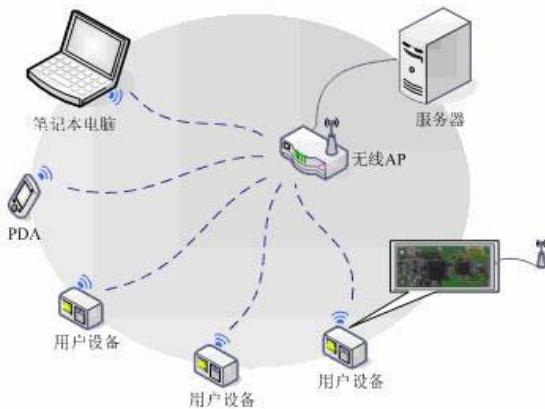
TGD-210x supports both modes of wireless networks, either as AP allows access to other modules, or to be used as a basis for the formation of AP and STA joined to form the Infrastructure network.

➢　Security policy

　The module supports a variety of wireless network encryption & can fully guarantee the secure transmission of user dat, including:

● 　Non encrypted
● 　WEP64
● 　WEP128
● 　WPA-PSK/TKIP
● 　WPA-PSK/AES
● 　WPA2-PSK/TKIP
● 　WPA2-PSK/AES
● 　Auto adapted
➢ 　Wireless Roaming

The module supports 802.11-based wireless roaming agreements. Wireless roaming refers to, in order to expand the coverage of a wireless network, a plurality of co-AP with the same SSID / ESSID formed a wireless network, each AP to cover different areas, STA accessing the network by selecting to connect to a nearest AP (i.e., the strongest signal) and switch between different AP

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according to its geographical location .

When the wireless roaming is on, the module will scan automatically scan every 100 seconds and select a nearest AP to connect on basis of the current scan result. During wireless roaming, network may occur short interruption. It is recommended to turn it off if not using.

Be aware that the BSSID address binding is enabled, the wireless roaming is dis-enabled.

➢ Channel setting

The module supports wireless channel setting function. Users can configure parameters to set the radio channel frequency of the current module.

Notice: When conducting certification tests, sometimes fix the module on the specified frequency, then enter "setch" command to set the channel module in the frequency corresponding to the channel.

2.1.2 Serial Data Transmission

The module supports Serial data transmission can be a real serial plug and play, giving maximum convenience to user. Under this mode, user simply pre-set network parameters. Thereafter, once the module is turned on, it can automatically connect to the default wireless network and servers. Since the serial data is transmitted transparently, users only need send and receive data like regular serial data transportation . In other word, the module is used instead of serial cable to connect the user's original serial so that users can use it for wireless data transmission without any change.

Under transparent transmission mode, the module allow user to set automatical trigger frame length and trigger time. Automatical trigger frame length means the procedure that after the module receives a specified length of data from the serial port, consists of a network of data frames and immediately start the process of sending the data.

Automatic framing trigger time means the procedure that after the module receives data less than above specified length from the serial port, module will send consists of a network of data frames and immediately start the process of sending the data.

 that when data is received from the serial port to a specified length less than the above, the module will be compelled to send out the data consisted of current data frame after the specified timeout period, and start sending.

2.1.3 SPI Slave Data Unvarnished Transmission

TGD-210S module supports SPI Slave mode transparent data transmission. Data can be sent under a really high rate. When SPI Slave firmware version and the standard version of SPI Slave serial unvarnished transmission are not the same version, it support to be done after updating firmware.

Because of the hardware pin limitations, TGD-210D does not support the SPI Slave function. For details, please contact the relevant technical advisory.

2.1.4 SPI Master Data Unvarnished Transmission

TGD-210S module supports SPI Master function. But it need customized special version as SPI Master function need to modify the code of the module.

2.1.5 Multifunction GPIO

TGD-210D provides up to five GPIO function pins. XLW-210S offers up to 13 function pins. To fulfill customer special requirements , only need customized pins .

2.1.6 TCP/IP Protocol Stack

This module contains a complete TCP / IP protocol stack and supports TCP / UDP / ICMP / ARP / DHCP / DNS / HTTP protocol.

    Supports up to 32 TCP connections (adjustable according to user requirement)
    Supports up to 32 UDP connections (adjustable according to user requirement)
    Supports UDP broadcast
    Support DHCP Server / Client
    Support DNS
    Supports HTTP, built-in WEB server
    Support Socket Programming Interface

2.1.7 Flexible Parameter Configuring

This module is mainly running based on the default parameters. The configuration parameters are stored in the internal flash memory. Support power-down save, . User can select different ways to modify the configuration parameters of the module, including:

1) Configurating parameters based on the serial port

Under the default state of the UART interface, the baud rate is 115200bps, check bits none, data bits 8, stop bit 1.UART has two alternative working modes: data mode and command mode. Data mode is used for transparent data transmission. Command mode is used to configure the module parameters. Every time after start-up, UART2 is under data model. Enter three "+" to switch from data mode to command mode, which is called escape character. Enter "quit" command to switch module from command mode to data mode. Under command mode, it would automatically switch back to data mode if no operation is occurred over 30s.

If need, user could integrate parameter configuration function into MCU. User need program their own MCU and send command string to do configuration.

2) Configuring parameters based on WEB browser

The WIFI module also has built-in WEB server(similar to the router),in wireless network connectivity conditions,the user may through the WEB browser,input WIFI module IP address,and then enter the username/password(default is admin), parameter query and configurations,this approach has the advantage of simple operation,intuitive interface.

3) Configuring parameters based on the socket

The module has a built-in socket server,the user can through own app,send commands to the port, parameter configuration of modules, the advantages of this approach is convenient for the user to the parameter configuration function intergrated into their mobile phone APP.

2.1.8 SmartConfig Function

The WIFI module through the SmartConfig function can quickly connect to the router. SmartConfig have two kinds of configure mode.The user by entering the command "smartconfig"to make the module into the SmartConfig configuration status; Or enter the reset level button,after a second to release the button,automatically enter the SmartConfig status. (Users can also the GPIO pin functions, custom startup of smartconfig process)

When the WIFI module into the SmartConfig mode, can input the router SSID name and password via the mobile APP, click the APP configuration to configure the WIFI module.

This process takes around 15-30s,the module will automatically connect to routers,if the connection is successful,the indicator light on the module is continuous light ,at the same time the WIFI module can save configuration parameters.After reboot, the WIFI module will automatically connects to the designated router.

If the module connected to the router failure,the reboot to restore the original parameters.

```
cmd> smartconfig
SmartConfig start...
SmartConfig recv...
SmartConfig success.
Ok
cmd>
```

2.1.9 App Server function

The WIFI through APP Server commands supports remote server's applications ,mobile phone through the APP Server can remote to control home devices, e.g. smart sockets. When using APP Server commands , the data in the specified format sent form the user's phone applications will sent to the MCU via the serial port. Responded data from MCU , will also send to the user's phone application through the APP Server.

2.1.10 Firmware Upgrade Online

The WIFI module support this funcion.

2.2 Technical specification

Item		Specification
wireless standard		802.11 b/g/n
Anternna		on-board antenna or external antenna optional
Frequency		2.412 ~ 2.484 GHz
Data Transfer Rate		IEEE 802.11b：1, 2, 5.5 和 11 Mbps IEEE 802.11g：6, 9, 12, 18, 24, 36, 48 和 54 Mbps IEEE 802.11n: 6.5M-65Mbps
RF receiver sensitivity		802.11b 1M bps: -97 dBm 802.11g 54M bps: -15 dBm 802.11n MCS7:-75dBm
RF maximum output power		802.11b: 17dBm 802.11n: 16dBm
Encryption mode		WEP-64/128, WPA-PSK(TKIP) 和 WPA2-PSK(AES)
I/O function	UART interface	Baud rate 1200-115200, Contact technical support for high er rate
	SPI Slave interface	Support SPI Slave function but need upgrade firmware.
	SPI Master interface	Need to customize,must modify the module's program coed
	I2C interface	Need to customize,must modify the module's program coed
	GPIO	Support up to 13 GPIO(Need to customize)
Average Power	AP mode, data transportaiotn	90mA
	STA mode ，Shallow sleep	5mA
	Deep Sleep Mode	10uA（only Wakened by GPIO PIN)
Working Voltage		3.3V
Working Temperature		-20°C ~ +70°C

2.3 Applications

Applications	Products
Utilities and smart energy	• Thermostat • Smart Meter • White appliances • HVAC
Consuming Electronics	• Remote Control • Internet Radio • Family Security • Toy • M2M Communications
Industrial Controlling	• Chemical Sensors • Security System
Equipment remote management	• Location and Asset Tracking • Automobile • Code Updating
Retailing	• POS terminals • Wireless price tag • Digital Remote
Health, fitness and wellness	• Blood glucose meter • Fitness Equipment • Patients history tracking

3. Application Circuit

3.1 Reset circuit
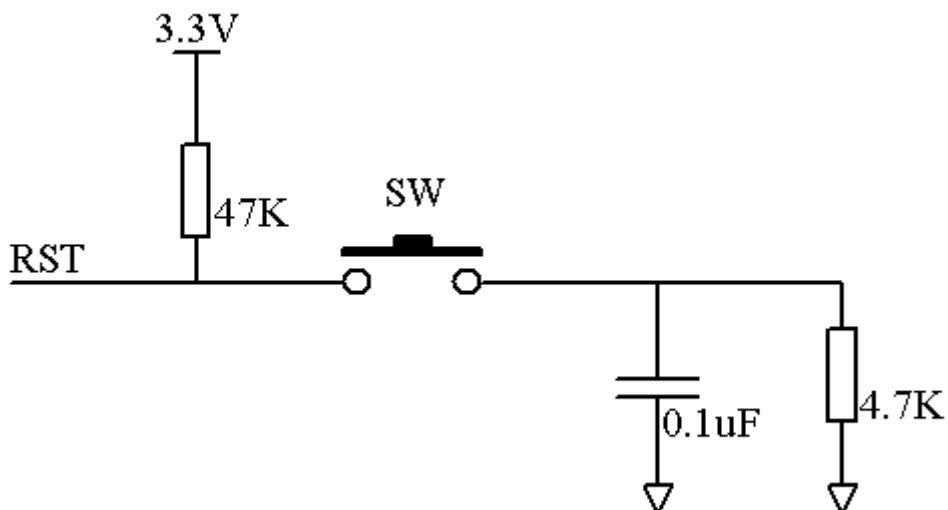
Figure：Reset circuit

3.2 LED Status driving circuit LED Status
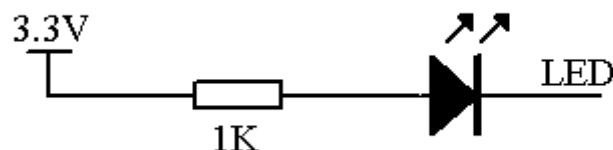
LED Status driver circuit

3.3 UART Application Circuit
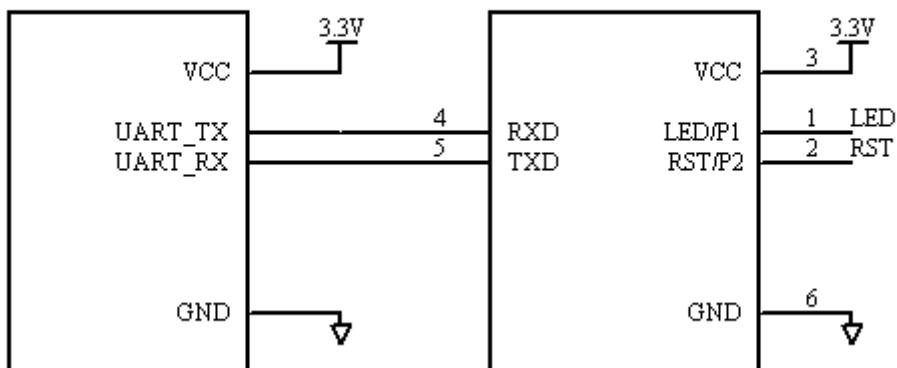
NOTICE:

1. If the UART and PC connected, need use RS232 interface chip to do level conversion.

2. If PIN NOT used , keep it suspended.

4. Configuring the WIFI Module

4.1 Configuring function introduction

TGD-210x WiFi module provides three optional interfaces for the user to configure the module parameters, namely, UART, Web interface, network configuration. UART is based on the command line interface. The user can log into the module and configure by HyperTerminal program built in Windows or a third-party terminal emulation program (such as secureCRT) . If necessary, the user can do configuration by programming their own MCU module to send a command string.

UART module has two alternative operational modes, called data mode (data mode) and configuration mode (command mode). Data mode is used for transparent data transmission. Configuration mode is used to configure the module parameters. After start the module, UART in data mode, switch from data mode to command mode needs to send three "+" sign. It is called the escape character. Switching the command mode to data mode needs to send "quit" command. UART factory parameters are: baud rate 115200bps, check bits none, data bit 8 , stop bit 1 .

The WEB Configuration interface, pleases "Using the WEB management interface."

4.2 Command Mode (configure the module parameters)

Firstly,the serial port on the Serial Adapter Board and computer are connected through a serial line. Open secureCRTon the computer as following figure:

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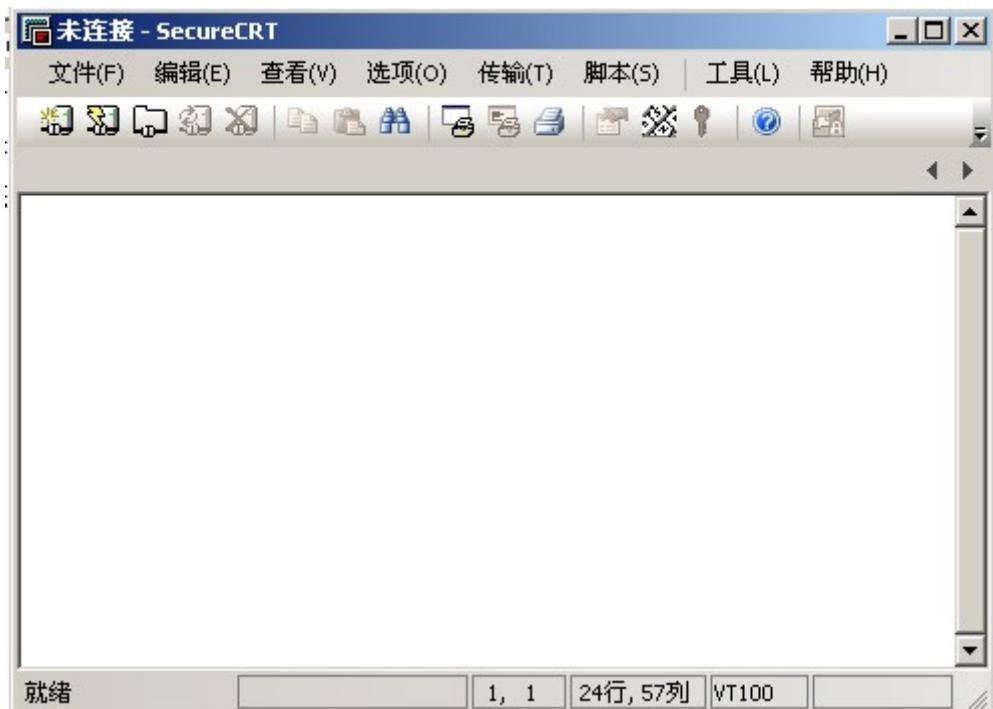
Slecet "document" and click "quick connect" or shortcut icon "⬚". Select "Serial" in quick connect dialog box and configure serial port parameters as following figure
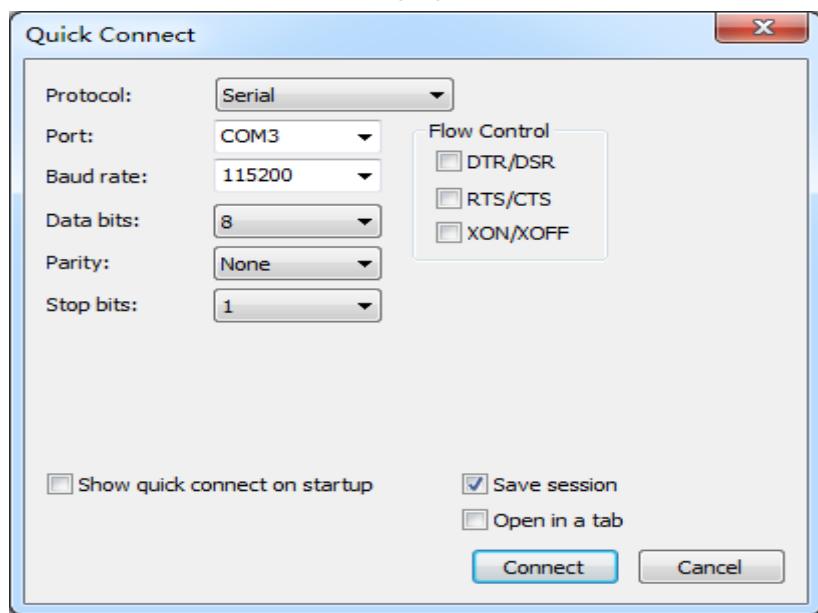
Notice:The Port number must be consistent with the connected computer serial port,attention to the need to close the RTS/CTS options.
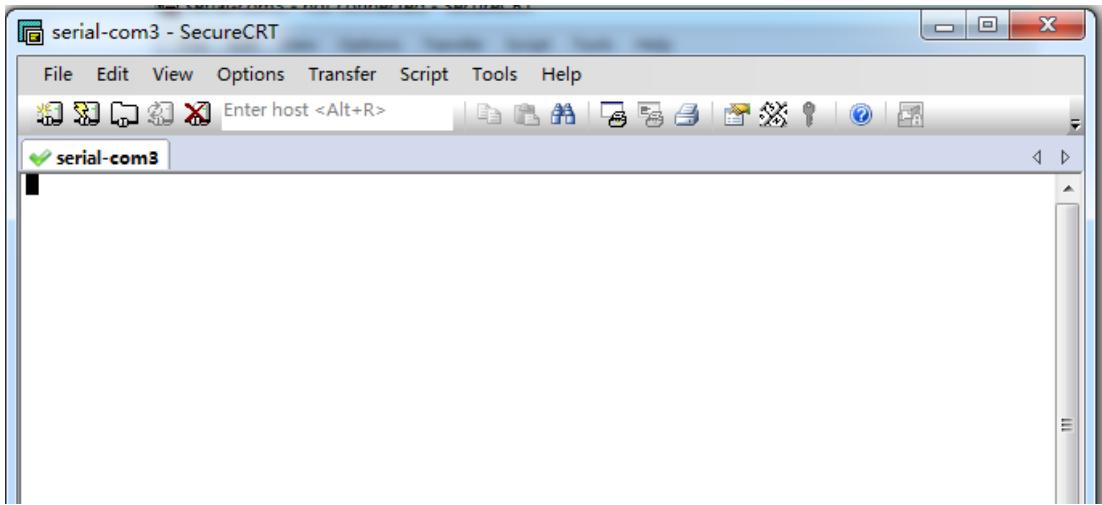
Use DC 5V power adapter to connect with power socket on the Serial Adapter board. Once LED light turns on, the module starts working. Then input "+++"" to switch to command mode. We can configurate parameters or check current parameters in SecureCRT. Such as inputting "setssid" command and press "Enter",then we can check module SSID information.

Once setting is successful, notice will appear. If using wrong parameter, it would be noticed as well.

Nornally, the command without parameter could check current setting.

4.2.1 Serial Port Setting Command

Command：serialport

Function： set/check UART2 following setting: Baud rate, data bits, parity, stop bits, flow control

Format： serialport <baud rate> <data bits> <parity> <stop bits> <flow ctrl>

                                                 <baud rate>: 0: 115200   5: 4800

                                                            1: 57600   6: 2400

                                                            2: 38400   7: 1200

                                                            3: 19200   8: 300

                                                            4: 9600   9: 110

                              <data bits>: 0: 5   1: 6   2: 7   3: 8

                              <parity>:   0: Odd   1: Even 2: None

                              <stop bits>: 0: 1   1: 1.5   2: 2

                              <flow ctrl>:   0: Xon/Xoff   1: Hardware   2: None

4.2.2 Transportation protocol settings Command

command：connectype

Function： set/check network transportation protocol

Format： connectype <protocol>

                <protocol>: 0: TCP   1: UDP

4.2.3 Client/Server setting Command

Command：setmode

Function: set/check C/S mode(client/server)

Format： setmode <mode>

        <mode>: 0: the WIFI modules is SERVER

            1: the WIFI module is CLIENT

Command：setsrvport

Function: when module is set as a server, set/ check module's listening port; when it is
         Set as client end, set/check local port.

Format： setsrvport <port>

Command：setdstport

Function: set/check target server's listening port.

Format：setdstport   <port>

Command：setdsthn

Function: set/check target sever's domain name or IP address.

Format：setdsthn <Host name/IP>

4.2.4 Wirelss Setting Command

Command：setnt

Function: set/check wireless network type

Format：setnt   <mode>

     <mode>   0：sta mode

           1：adhoc mode

           2：ap mode

Command：setssid

Function: set/check SSID

Format：setch   <ssid>   <ssid> The maximum number of bytes is 31.

Command：setch

Function: set/check wireless network channel

Format：setch <channel index>

     <channel index>   0: Auto 1: 1   2: 2   3: 3   4: 4   5: 5   6: 6

                            7: 7   8: 8   9: 9 10: 10 11: 11

4.2.5   Seurity Encryption Setting Command

Command：setet

Function: set/check encryption type

Format： setet <Encryption Type>

       <Encryption Type>   0: No Security   4: WPA2-AES

                       1: WEP-WEP64   5: WPA1-TKIP

                       2: WEP-WEP128   6: WPA1-AES

                       3: WPA2-TKIP   7: AUTO

In the WEP64/WEP128 encryption type，use the following command to set the password：
Command：wepklen
Function： set/check WEP password length
Format： wepklen <0:64 bits, 1:128 bits>

Command：setw64k
Function： set/check WEP64 key; In the WEP 64 encryption type.
Format：setw64k <index = 0 ~ 3> <HEX Byte 0> <HEX Byte 1> ... <HEX Byte 4>

Command：setw128k
Function：set/check WEP128 key; In the WEP128 encryption type.
Format：Usage: setw128k <index = 0 ~ 3> <HEX Byte 0> <HEX Byte 1> ... <HEX Byte 12>

Command：setwki
Function: set/ check encryption index
Format：Usage: setwki <WEP key index = 0 ~ 3>

In the TKIP/AES encryption type, use following command setting the password:
Command：setwp
Function： set/check WPA key; use this key when AES/TKIP is selected.
Format： Usage: setwp <WPA Passphrase, 8 ~ 63 characters>

4.2.6 Network Setting Command
Command：setdhcpcli
Function: open/ close DHCP client.
Format：setdhcpcli<status>
        <status>：0: disable   1: enable

Command：setdhcpsrv
Function: open/close DHCP server
Format：setdhcpsrv <status>
          <status>: 0: disable   1: enable
Command：setip
Function: set/check local IP address
Format：setip <ip addr>

Command：setmask
Function: set/check local subnet mask
Format： setmask <netmask>
Command：setgateway

Function: set/check local gateway
Format：   setgateway <ip addr>

Command：setdns
Function： set/check local DNS server
Format：   setdns <ip addr>

Command：setdhcpsrv
Function： set/check DHCP server status
Format：   setdhcpsrv   <status>
<status>: 0: disable   1: enable

Command：dhcpsrv
Function
Format：dhcpsrv <start addr> <end addr> <netmask> <gateway> <lease>
        <start addr>：start address
        <end addr>：end address
        <netmask>：network mask
        <gateway>：gateway address
        <lease>：Lease time

4.3How to use WEB management interface

4.3.1 Login Page

First enter the IP address of the module "192.168.2.3" in the browser address bar , the page will appear as shown below,
Then enter the user name and password (default username: admin; default password: admin). Click "Login" to module configuration interface.

4.3.2 Basic Setting

The basic setting page,can set module serial parameters such as: The baud rate parameter, IP address, network transmission protocol etc.

4.3.3 Advance Setting

The advanced setting page have firmware upgrade setting and DHCP server setting.

http://www.goodark.asia

4.3.4 Security Setting

On the security setting page, user can reset login username and password.

4.3.5 Check the WIFI Module Status

The "System Status" have the WIFI Module IP address、version、MAC address、protocol information etc.

4.3.6 WiFi Wireless setting

The "WiFi" setting page have system setting、SSID and encryption etc.

http://www.goodark.asia

4.3.7 WiFi Wizard

If the user is not familiar with module setting, WIFI Wizard could guide him/her to do the setup.

5. How to use Wi-Fi Module

5.1 PC connect to the WIFI module

Use the serial port or web interface to set and save module parameters , for example, using the command:

setnt 1	(set the type of wireless network: AP mode)
setssid R2WIFI	(set module SSID : R2WIFI)
setip 192.168.2.3	(set IP address: 192.168.2.3)
saveconfig	(save the setting)
reboot	(restart the module to effect the setting)

After finishing the module configuration,please open wireless network connection on PC, click "refresh"button on the left, find the wireless network of "R2WIFI" and double click "connect".

IP address could be chosen as auto gaining or manual setting. Under manual setting, ensure that module IP address is on the same network segment with PC IP address, but not repeated the Host IP address. Default gateway should set as same as the module IP address .
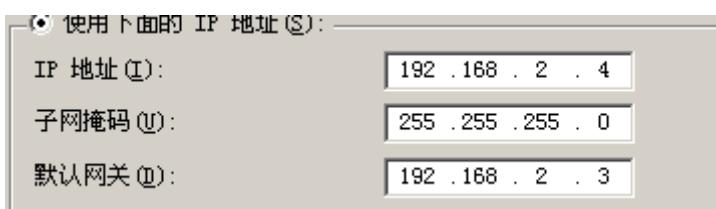
Check whether Ping is enabled. Click "start", then type "ping 192.168.2.3 " in " run " to confirm whether it has been connected or not. Following figure shows it has been connected successfully.

To check whether module could Ping to PC, use command "ping 192.168.2.4: on the serial erminal.

5.2 Connect WIFI Module to router

Use the serial port or web interface to set and save module parameters , for example, using the command:

command of accessing to the wireless LAN is as example steps:

1：Use UART interface to configure the module. For accessing to router, send commands to the module via UART interface in order as below:

   setdhcpcli 1   //directions: 0 stands for disable (off) ，1 stands for enable (on)   open state

   setdhcpsrv 0   //directions: 0 stands for disable (off) ，1 stands for enable (on)

   setnt 0   //directions：0 stands for STA mode that is connecting to route; 1 stands for

                 AD-HOC mode\

setssid xlwtech   //directions xlwtech stands for router SSID

setet 7   //directions：encryption type; 7 stands for automatic encryption

setwp 12345678   //directions：12345678 stands for password access to router

saveconfig   //directions：save configuration parameters

reboot   //directions：restart the module. Then it will automatically connect with WiFi

                router.

After successfully connecting the router, the WIFI module will be assigned an IP address. Use"ipconfig" command to check the ip address.

You can use the "ping" command on module or PC to check whether the module is successfully connected to the router.

```
uart> ipconfig
Current IP: 192.168.0.79
Current IP Mask: 255.255.255.0
Current Gateway: 192.168.0.1
Ok
uart>
```

2. To set the module to a fixed ip, send following commands to the module via UART interface.

setdhcpcli 0   //Notices："0" close the dhcp client function，use the static IP，"1" open the
                      DHCP client function.

setip 192.168.1.3   //Notices：Set the module IP address is 192.168.1.3

setmask 255.255.255.0

saveconfig

3. To send data to the application server via TCP protocol, need set IP and TCP port of the application server, for example:

setmode   1   //Set the module working mode; 1 indicates the working module is on TCP
                      client ; 0 indicates that the working module is on TCP server.

connectype 0   //Set application protocol, 0 indicates TCP protocol; 1 stands for UDP protocol   setdsthn
www.xlwtech.com   //Set IP address of the application server

setdstport   80   // Set listening Tcp port on the application server

saveconfig   //save setting

reboot   // After restarting,   the module will automatically initiate a connection to
                 www.xlwtech.com TCP port 80

6.   Application Case

6.1Active Serial Devices Networking

Active serial device networking refers that a connection initiated by a device and transport interactive data with back-end server (upload or download), typical active type devices, such as wireless POS. Right after completion of the transaction, it would connect to the back-end server, and upload transaction data. See topology network built by Active serial device as shown below. The back-end server is used as TCP Server; device access to the network via wireless AP / router as a TCP Client.

6.1.1 Application Scenarios
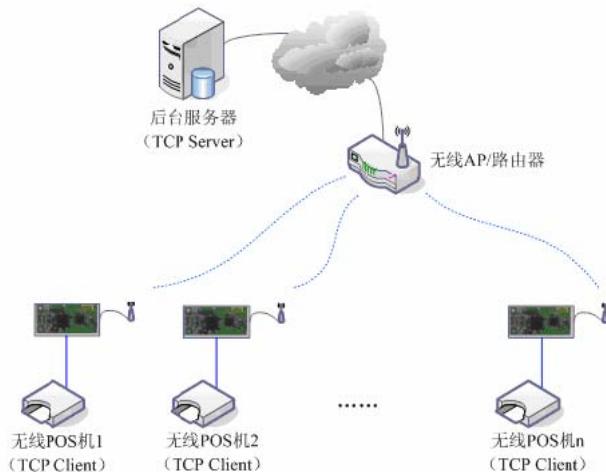

Figure: Active serial device networking

6.1.2 Setting reference

➢ Wireless Setup: The network name, encryption type, key, etc.

➢ Network settings: Enable DHCP client automatically obtain an IP

➢ Network type: STA mode

➢ Transportation Protocol: TCP

➢ Client / server settings:

      C / S mode: client

      Server Address: IP address of the backend server, such as 192.168.1.

      Server port number: background server port number, such as 5000

6.2 Passive serial port devices networking

6.2.1 application scenarios 应用场景

Passive serial device networking means that all devices in the system has been in a state of passive waiting for a connection, and only the back-end server initiates the connection with the device, and request or download data. Typical applications, is like certain wireless sensor networks. Each sensor terminal is always in real-time data collection, but the data collected did not immediately upload, but temporarily stored in the device. The backend server is periodically every once active connected devices, and request uploading.
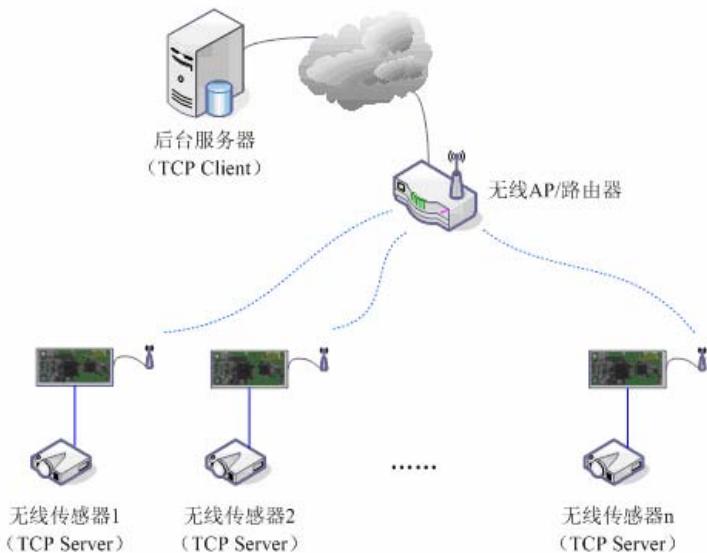
6.2.2 Setting reference

➢ Wireless Setup: The network name, encryption type, key, etc.
➢ Network setting：
  ✓ IP address：192.168.2.X
  ✓ Subnet mask：255.255.255.0
  ✓ Gateway address：192.168.2.1
  ✓ DNS server address ：192.168.2.1
➢ Transport protocol：TCP
➢ Client / server setting
  ✓ C/S mode: server C/S
  ✓ Server port：5000
  ✓ Connection timeout：120

6.3 Broadcast serial device networking

6.3.1 Application scenarios

Broadcast serial device networking is a networking protocol based on UDP. Network host work under UDP broadcast mode, all devices are working in client UDP unicast mode. This is also a way of essentially passive networks. Typical applications is to upgrade wireless network which is on the basis of traditional RS422/485 bus network. Under such kind of networking, there won't be any software change on any equipments or terminals controlled by those equipment in the original system. Use this module directly to replace the original RS422/485 hardware connection. It achieves truly "plug and play."
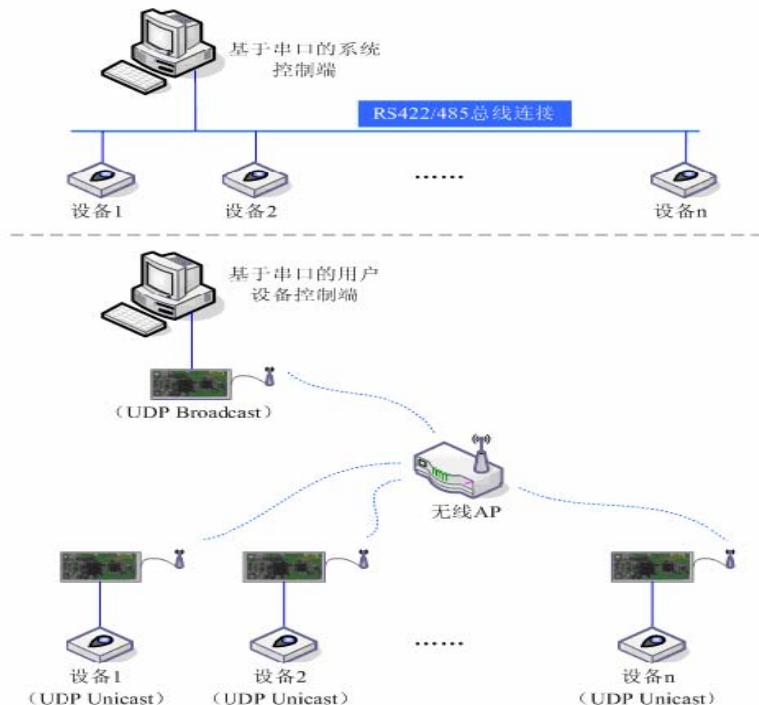
6.3.2 Setting reference

Network Host Device(Server)

➢ Wireless Setup:The network name、encryption、type、key、etc
➢ Network setting
  ✓ IP address：192.168.2.Y
  ✓ Subnet mask：255.255.255.0
  ✓ Gateway address：192.168.2.1
  ✓ DNS server address：192.168.2.1
➢ Transport protocol：UDP
➢ Client / server setting：
    ✓ C/S mode: broadcast
    ✓ Port:：5000
    ✓ Connection timeout: 0

Device end(client)

➢ Wireless network setting: name, encryption type, key etcc.
➢ Network setting
  ✓ IP address：192.168.2.X
  ✓ Subnet mask：255.255.255.0
  ✓ Gateway address：192.168.2.1
  ✓ DNS server address：192.168.2.1
➢ Transport protocol：UDP
➢ Client/server setting：

✓ C/S mode: unicast

✓ Port:：5000

✓ Connection timeout：0

7.GPIO

8.The Module Firmware Upgrade

9.Restore Default Settings

1、Keep REST pin low level condition for 5 seconds, the module will automatically reboot.   All the parameters will be restored to factory setting.
2、Input the "setdef" command through serial port.
3、Use web management interface.

10.The Module Dimension

Pleasee check the attached DWG document.

11.Appendix

11.1 Conmand list

NOTICES：
1、command without parameters means checking related parameters.
2、use "space"key among multiple parameters.

quit	Quit the configurating mode
setdef	Restore to default setting
saveconfig	Save setting
reboot	Restart the system
version	Check current vision
setnt	Set network mode
setssid	set WiFi SSID name
setet	set encryption type
setwp	Set WiFi password
setch	Set channel
setdhcpcli	Set DHCP client
setdhcpsrv	Set DHCP Server
dhcpsrv	Set DHCPserver parameters

setip	Set static IP
setmask	Set subnet mask
setgateway	Set gateway information
setdns	Set DNS parameter
serialport	Set UART parameter
connectype	Set connection protocol
setmode	Set client / server mode
setsrvport	Set server port
setdsthn	Set target server address
setdstport	Set target sever port
transmitimer	Set transmission timer
transmitsize	Set transmission packet size
wificonfig	Check current WiFi configuration
ipconfig	Check current IP address parameters
ping	Ping appointed IP address Ping
connstatus	Check current connection status
show	Check status