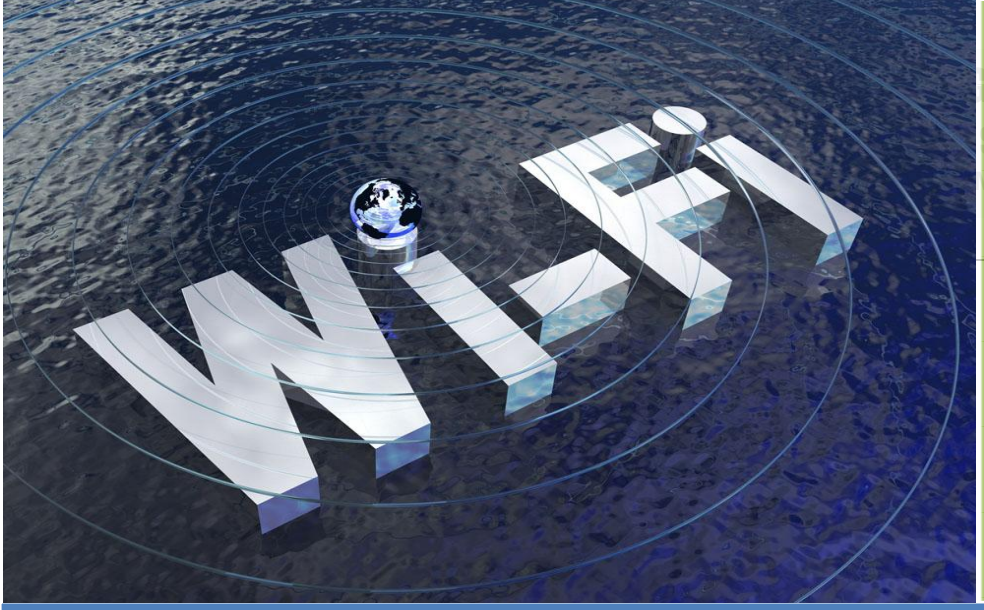


WF-01 is a wireless networking router, which is used for project of RS232/ RS485 serial equipment to WIFI or Ethernet networking!

Because of it, lots of industrial data transmission via serial to WIFI or Ethernet can be possible!

RS232/RS485 TO RJ45&WIFI Converter

KING PIGEON

User Manual

Ver 1.0
WF-01
Date Issued: 2016-05-05

Content

This handbook has been designed as a guide to the installation and operation of WF-01 WIFI Converter. Statements contained in the handbook are general guidelines only and in no way are designed to supersede the instructions contained with other products.

We recommend that the advice of a registered electrician be sought before any Installation work commences.
King Pigeon company its employees and distributors, accept no liability for any loss or damage including consequential damage due to reliance on any material contained in this handbook.

King Pigeon company its employees and distributors, accept no liability for GSM Network upgrading or SIMCard upgrading due to the technology specifications contained in this handbook.

Caution!

Please read this user manual carefully before install/operate the WIFI

Converter,basic electronic acknowledges required.

1. Product details

WF-01 provides a serial port to WIFI function, can be RS-232/485 converted into a TCP/IP serial network interface, RS-232/485 serial port and WIFI/ Ethernet bidirectional data transparent transmission. The serial device can immediately with the TCP/IP network interface functions, connect to the network for data communication, communication range extended serial device greatly.

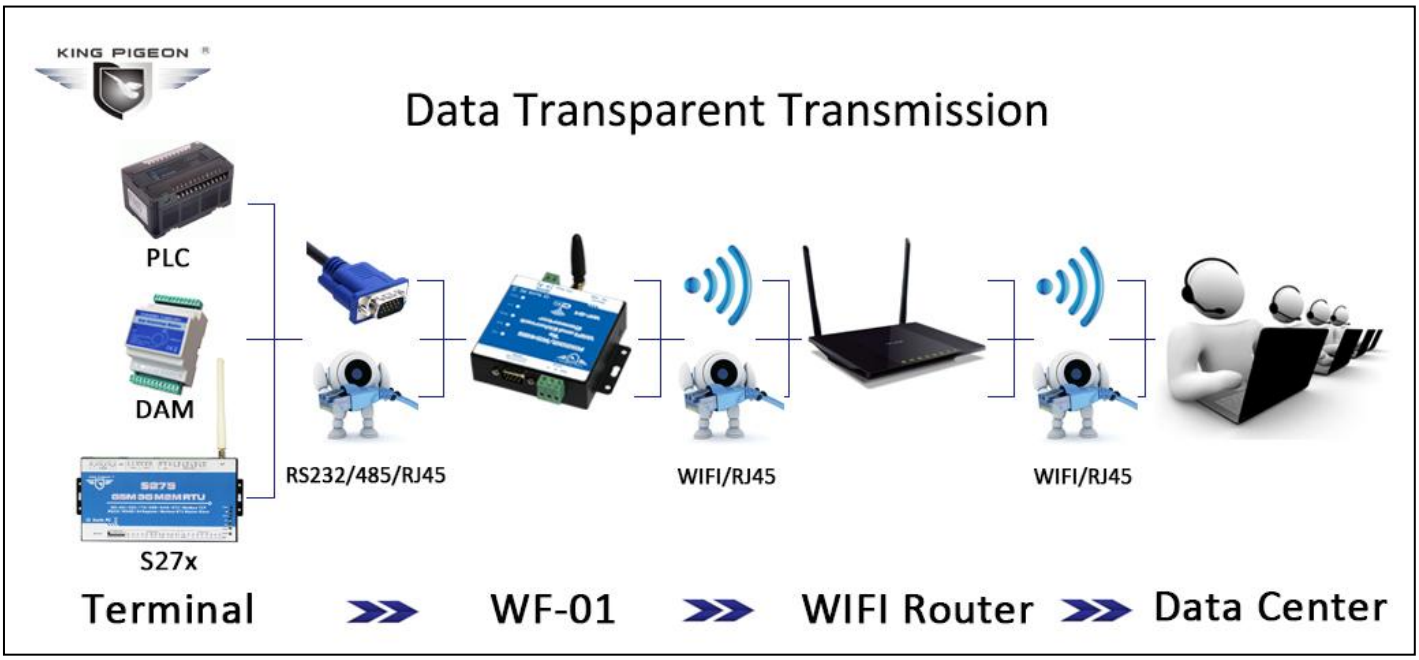
1.1 Features:

Advantages

- Can use as a Router;
- Support Hardware AP, HTTPD Client and WEB IO;
- Suport TCPB Function;
- Fast Access WiFi;
- Support hardware flow control (RTS/CTS) RS232 interface, male mouth(needle) consistent with computer pin definition;
- RS232 RS485 automatic switching;
- Support Webpage Configuration；
- RJ45 network connection, support wired Ethernet transmission;
- Rich status indicator light: Power/Ready/Link/RXD/TXD;
- Reload button, do not worry incorrect settings(in working status, press the button 3s then it load to default settings and automatic restart);
- Design with positioning hole, convenient installation;
- Highest support baud rate 460800 bps;
- Optional TCP Server/TCP Client/UDP Client/ UDP Server mode, the TCP Server mode can support up to 32 Client connection;
- Multiple applications for data transmission from wired to wireless.

Setting

- Webpage Configuration;
- Highly Security & Fast Speed for data transmission;



1.2 Specifications

	Item	Parameter
Wireless	Certification	FCC/CE
	Wireless standard	802.11 b/g/n
	Frequency range	2.412GHz-2.484GHz
	Transmit power	802.11b: +20dBm(Max.)
		802.11g: +18dBm(Max.)
		802.11n: +15dBm(Max.)
		configurable
	Receiver Sensitivity	802.11b: -89dBm
		802.11g: -81dBm
		802.11n: -71dBm
	Antenna Option	External 3Dbi antenna
Hardware	Data Interface	UART: 1200bps - 230400bps
		Ethernet: 100Mpbs
		GPIOs
	Operating voltage	5-18V (+/-5%)
	Operating current	170mA~300mA
	Operating temp	-40℃- 85℃
	Storage temp	-40℃- 125℃
	Dimensions	80×78×25mm
Software	Network type	Station/AP mode, STA+AP
	Security mechanisms	WEP/WPA-PSK/WPA2-PSK
	Encryption	WEP64/WEP128/TKIP/AES
	Work mode	Transparent Transmission
	Serial command	AT+instruction set
	Network Protocol	TCP/UDP/ARP/ICMP/DHCP/ DNS/HTTP
	Max. TCP Connection	32
	User Configuration	Web Server&AT command
	User Application	Supportcustomizedapplicati on software

1.3 Dimensions

1.4. Standard Packing List

- ✓ WF-01 WIFI Converter * 1
- ✓ Antenna * 1
- ✓ LAN Cable for 1 Meter* 1
- ✓ User Manual *1
- ✓ Packing size: 17*9.5*4 cm
- ✓ Gross Weight: 0.32kg

1.5 Applications:

1. Data transmission System applications;
2. Supervision and monitoring alarm systems
3. Automatic monitoring system;
4. Vending Machines;
5. Pumping Stations;
6. Buildings and Real Estate;
7. Weather Stations remote control and data logging;
8. River Monitoring and Flood Control remote control;
9. Oil and gas pipelines remote control and data logging;
10. Corrosion protection
11. Valve controls;
12. Wellheads;
13. Energy saving,street lights control system;
14. Tanks, levels, temp, water leakage applications;
15. Transformer stations;
16. Unmanned machine rooms;
17. Control room application;
18. PLC and Automation System, M2M;

2. Safety Directions

Safe Startup
Do not use WIFI Converter when using WIFI equipment is prohibited or might bring disturbance or danger.

Interference
All wireless equipment might interfere network signals of WIFI Converter and influence its performance.

Avoid Use at Gas Station
Do not use WIFI Converter at a gas station. Power off WIFI Converter when it near fuels or chemicals.

Power it off near Blasting Places
Please follow relevant restrictive regulations. Avoid using the device in blasting places.

Reasonable Use
Please install the product at suitable places as described in the product documentation. Avoid signal shielded by covering the mainframe.

Use Qualified Maintenance Service
Maintenance can be carried out only by qualified maintainer.

3. Diagram

INDICATORS		
Power	**ON**:Connect to the power supply already **OFF**:Have not connect to the power supply.	
Link	**ON:** Network connect already **OFF:** Can't connect to the WIFI or ethernet network	
Ready	**ON:** Ready to work or connect. **OFF:**Not ready to work or connect.	
RXD	Flashing when receiving data	
TXD	Flashing when Sending data	
Connection Terminals		
Power	**+**	Power supply input, Positive wire(Red).
	–	Power supply input, Negative wire(Black).
RS485	**A**	Data A for RS485 interface
	B	Data B for RS485 interface
	GND	GND for RS485 interface
RS232	RS232 interface	
Ethernet	RJ45 for Ethernet interface	
ANT	Connect to antenna.	
Reset	Press it for 5 seconds, the module will be reset into default setting	

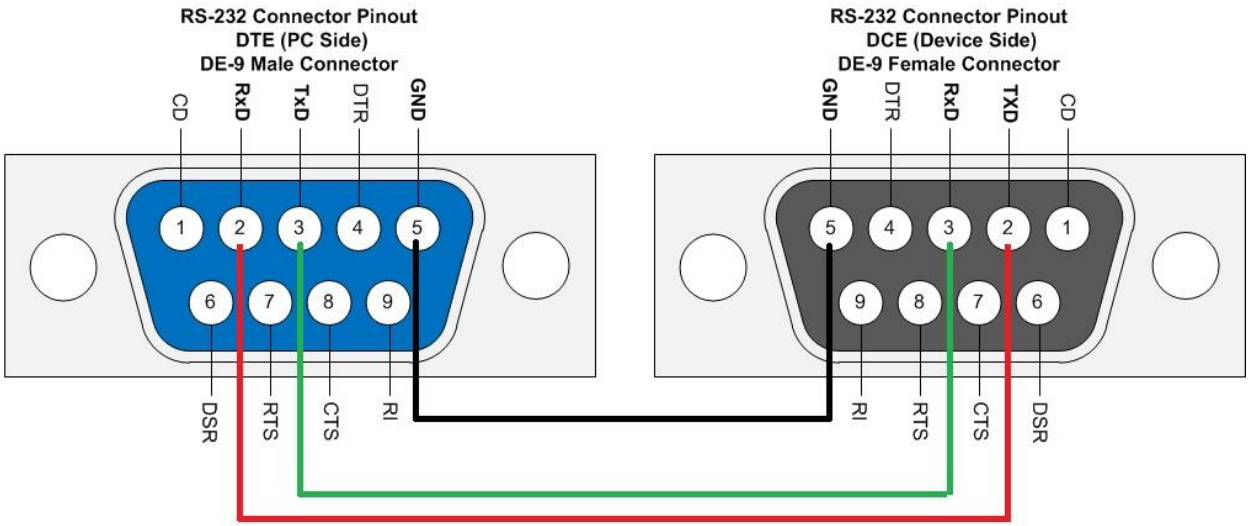
4. Typical wiring connection:

1）Power on the device.(9~24V DC)

2) Connect the Serial port (RS232/485) to PC. Serial port can be replace by USB port if the notebook has no serial port.

3) Connect to the network via LAN cable or WIFI.

Noticed: WF-01 serial port is a standard DB9 male, when tested, please use cross-connected method，that is TXD<-->RXD， RXD<->TXD，.serial port pins as shown below:



RXD	Data receiving pin of serial port server
TXD	Data sending pin of serial port server
GND	GND
RTS	When Flow control is enabled and pin is 0 serial server will receive data from serial devices
CTS	When Flow control is enabled and pin is 0 serial server will send data to serial devices

5. Communication Testing:

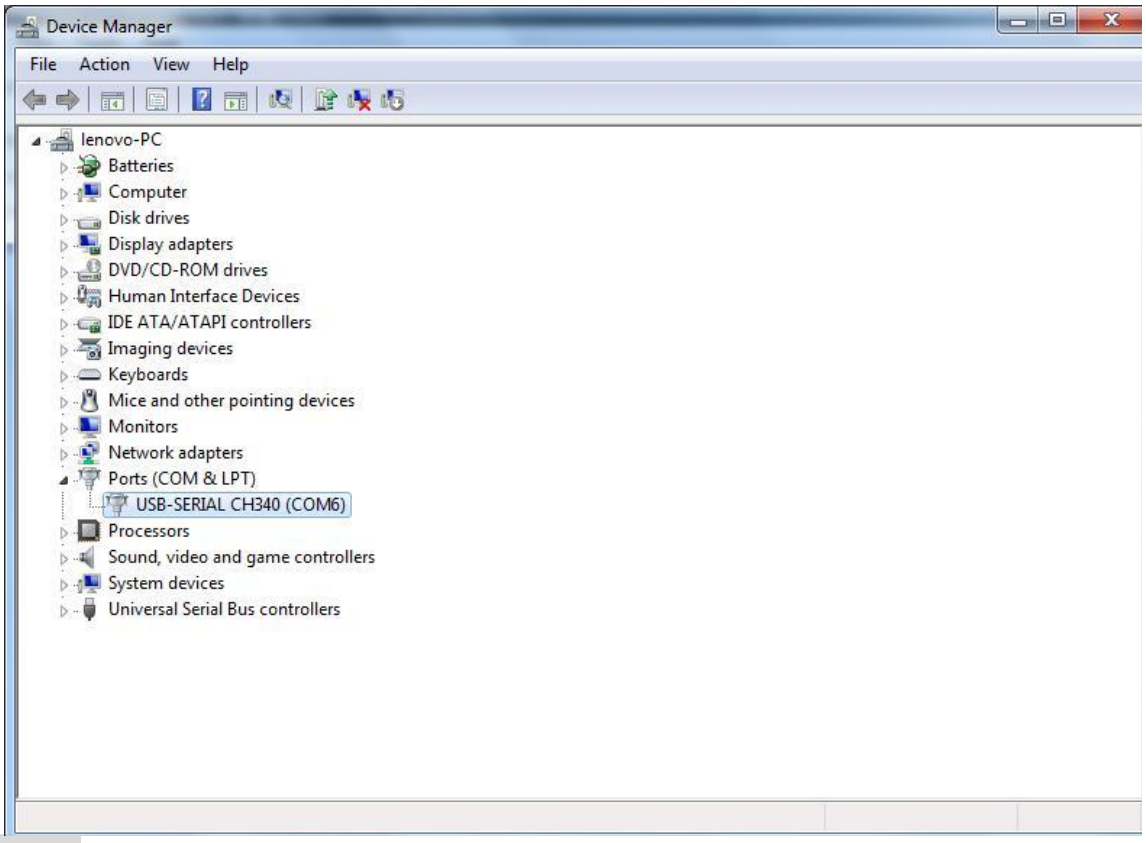
5.1 . Configuration for use the WF-01 as AP:

Step1: Power on the WF-01. (9~20V DC)
Step2: When the “Ready” light on, then use PC to connect to it via WIFI.

Description	Default Setting
SSID	DTU-H100XXXX
IP address	10.10.100.254
Subnet mask	255.255.255.0
User name	admin
Password	Admin

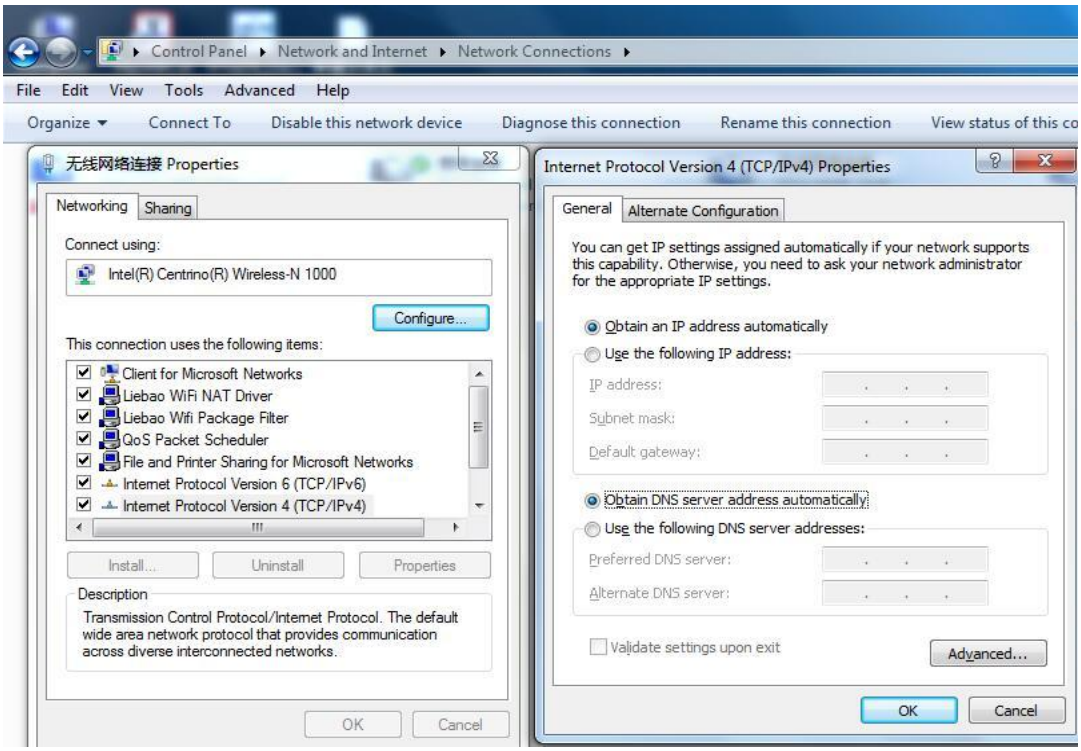
Noticed: if cannot see the SSID of the WF-01, please reset the device and try again.

Step3: Connect the WF-01 to PC via RS232/485 port, check the Com port, see the picture as below:



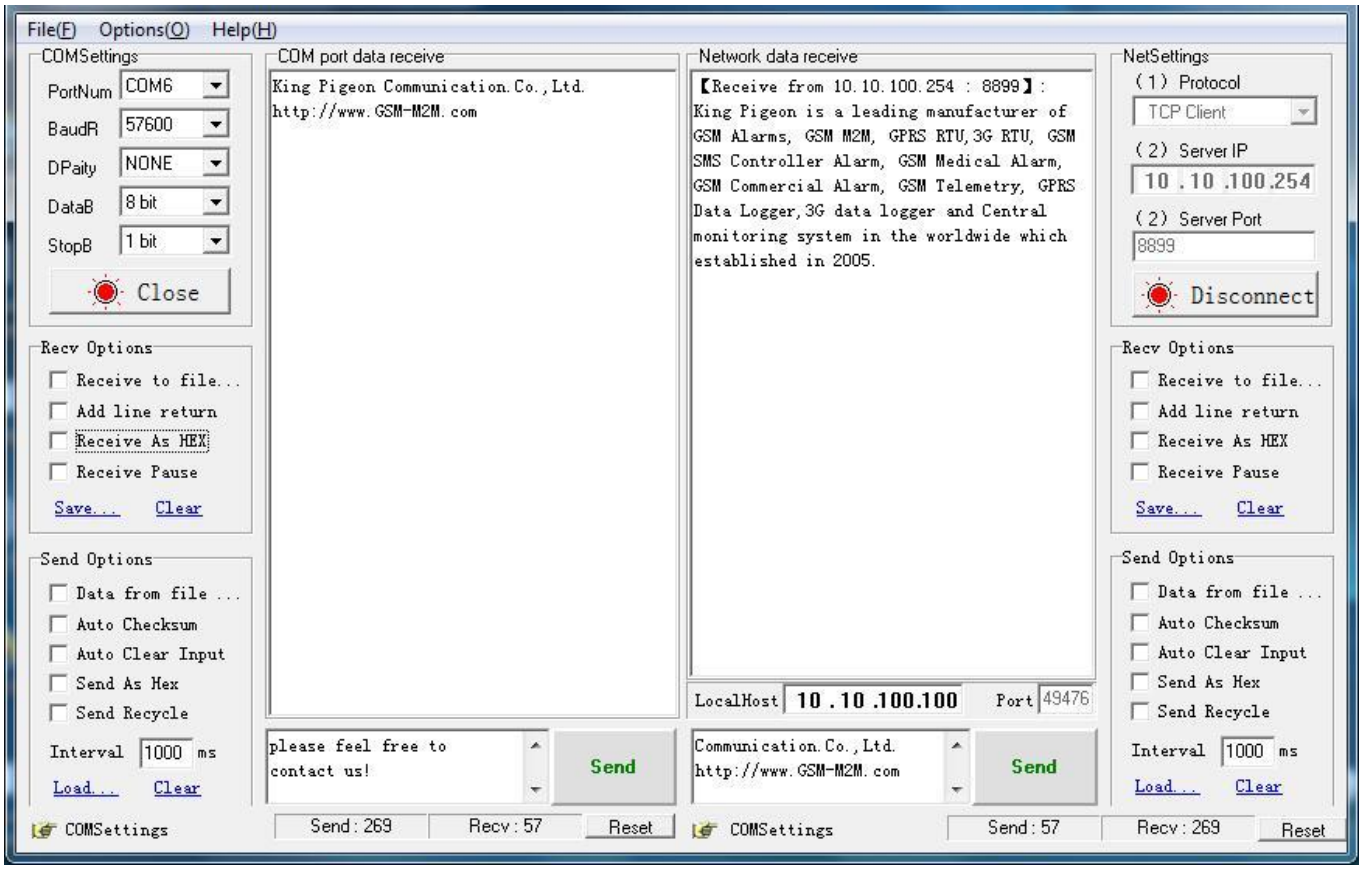
Noticed: if cannot see the com ports, then need to install the serial port driver.

Step4: When connect to the WF-01 successfully, the "Link" light will on, then "Open Network and Sharing Center", need to confirmed the IP and DNS is obtain automatically, see the picture as below:



Notice: If the the PC without Wireless LAN Adapter, then also can use the LAN cable to configuration.

Step5: Run the TCP/IP communication testing tool.



Notice: About the testing tool, please search it in the internet and download, lots of tool can do it.

	Description	Default Setting
COM Settings	Baud Rate	57600
	DPaity	NONE
	DataB	8 bit
	StopB	1 bit
Net Settings	Protocol	TCP Client
	Server IP	xxx.xxx.x.xxx
	Server Port	8899

This is the default setting, if need to changed, then can log in the WF-01.

>>> Open a Webpage, then login IP, default is 10.10.100.254;

>>> Default user name :**admin** Password :**admin**

>>> Then into the configuration page.

5.2 . Configuration for use the WF-01 as STA:

When WF-01 works in AP mode, we don't need access to the web for parameter setting, but in most practical application, a serial port server WF-01 works as a STA, because data need to be uploaded to the public network which is not available for AP mode. STA mode means the serial port server WF-01 to be connected to the router or other AP. in this case, the server WF-01 is substantially equivalent to a wireless network card. Detailed test steps are as follows:

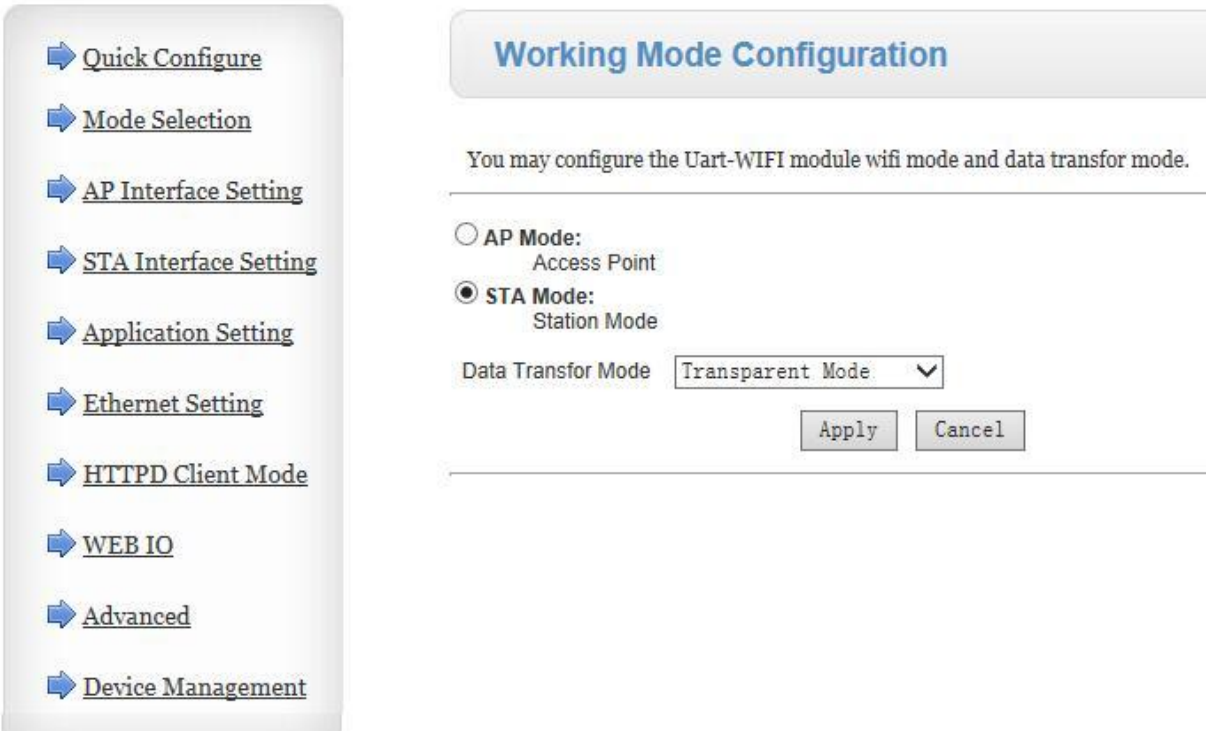
Step1: After connecting to the WF-01:

>>> Open a Webpage, then login IP, default is 10.10.100.254;

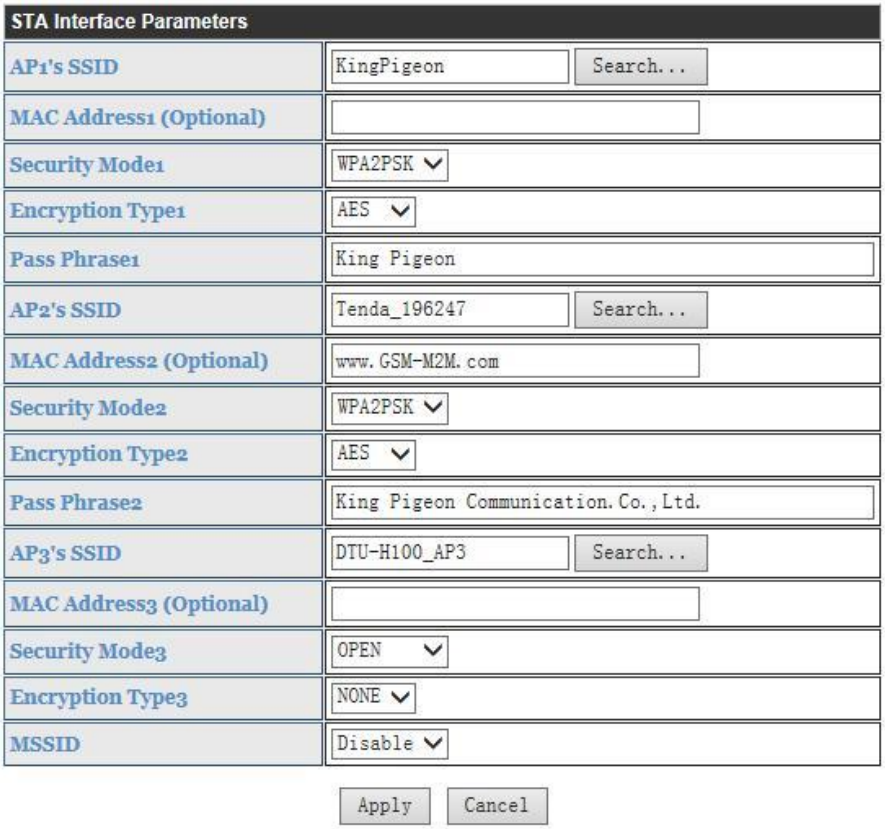
>>> Default user name :**admin** Password :**admin**

>>> Then into the configuration page.

Step2: Click “mode selection” => select " STA "mode => click “Apply”, it will inform you to reboot the module, can do it right now, also can do it later.



Step3: Click “STA Interface Setting" to search router, select the correct “SSID”, and “Apply” ,then input password and click “Apply”. Also can add 2 backup routers, when WF-01 fails to be connected in 1st router, it will be change to connect to the another one automatically.



Site Survey

	SSID	BSSID	RSSI	Channel	Encryption	Authentication	Network Type
○	CMS-Education	64:09:80:75:45:14	5%	1	AES	WPA2PSK	Infrastructure
○	HiWiFi_sai	d4:ee:07:23:b5:f0	34%	4	AES	WPA2PSK	Infrastructure
○	HiWiFi_sai-ext	00:e0:4b:be:b0:3e	0%	4	AES	WPA2PSK	Infrastructure
◉	KingPigeon	20:dc:e6:ff:d2:23	39%	11	AES	WPA2PSK	Infrastructure
○	Tenda_196247	c8:3a:35:19:62:48	20%	11	AES	WPA2PSK	Infrastructure

Apply Refresh

Step4: Open a New tap, log in the router, Mapped a port in router for received the data from WF-01.

>>> Then remember the port! (The port is very important!)

>>> Click “Application Setting”, must confirm the UART Setting is same as the UART Testing Tool setting.

>>> Especially the Baud rate, Data Bits…

Uart Setting

Baudrate	57600
Data Bits	8
Parity	None
Stop	1
Flow control	Disable
485 mode	Enable
Baudrate adaptive (RFC2117)	Enable

Apply Cancel

>>> In Network A Setting, select the Mode as “Client”, fill in the correct port and server IP address.

>>> Then “Apply”.

Network A Setting

Mode	Client
Protocol	TCP
Port	8899
Server Address	10. 10. 100. 254
MAX TCP Num. (1~32)	32
TCP Time out (MAX 600 s)	0

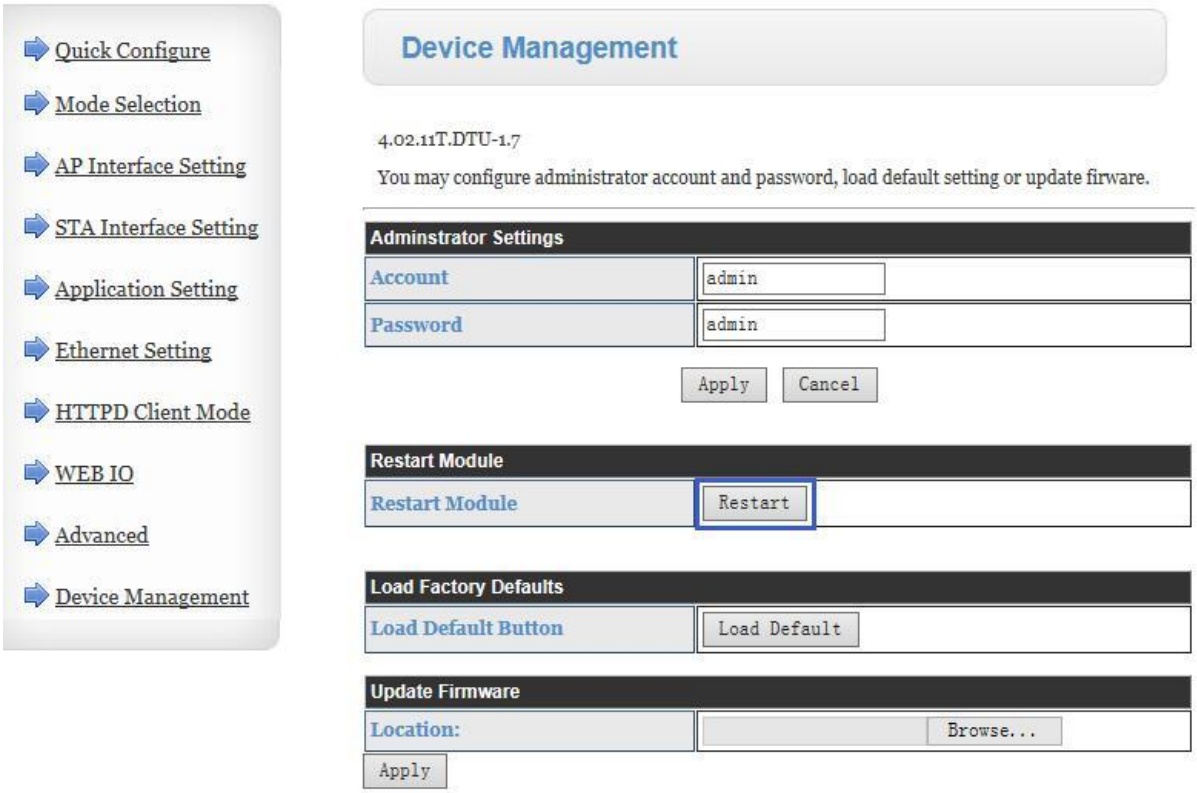
Socket B Setting

Open the SocketB function	on
Port	18899
Server Address	10. 10. 100. 100
TCPB Time out (MAX 600 s)	0

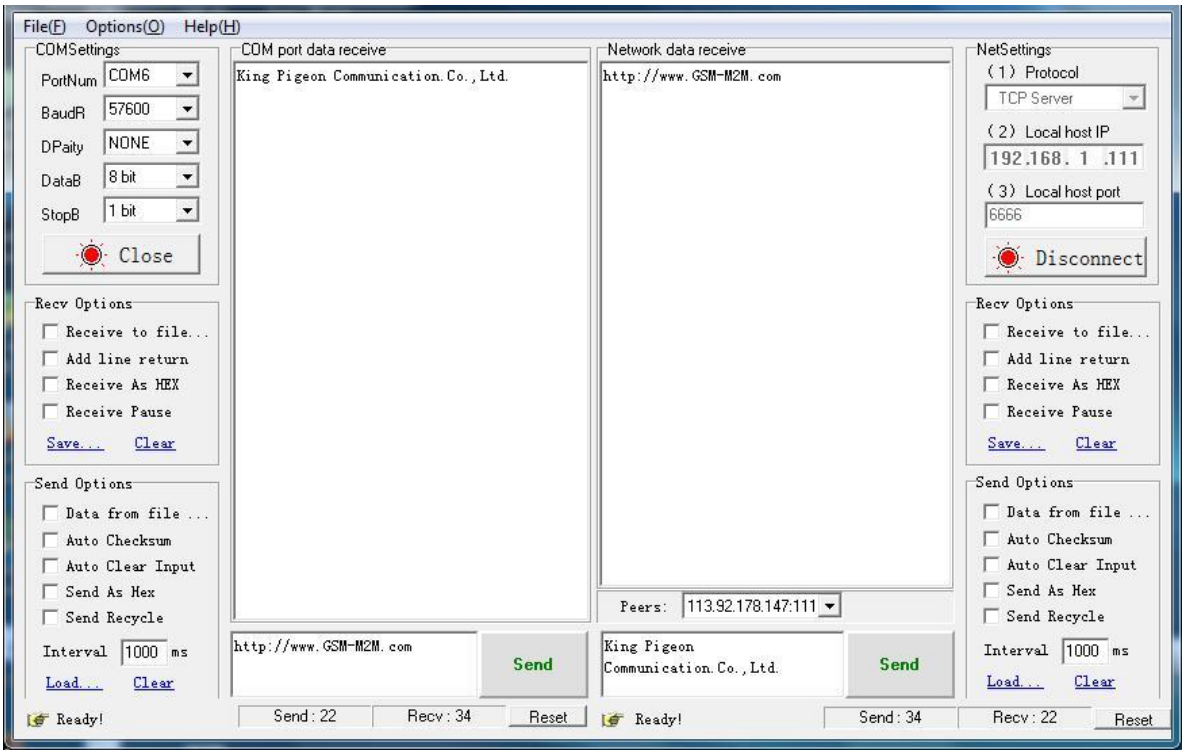
Apply Cancel

Notice: How to mapped a port in router: http://www.gsm-m2m.com/EnShownews.asp?ID=188#.VzWZYDHfp-U
How to know the router IP: Search it in the Google.

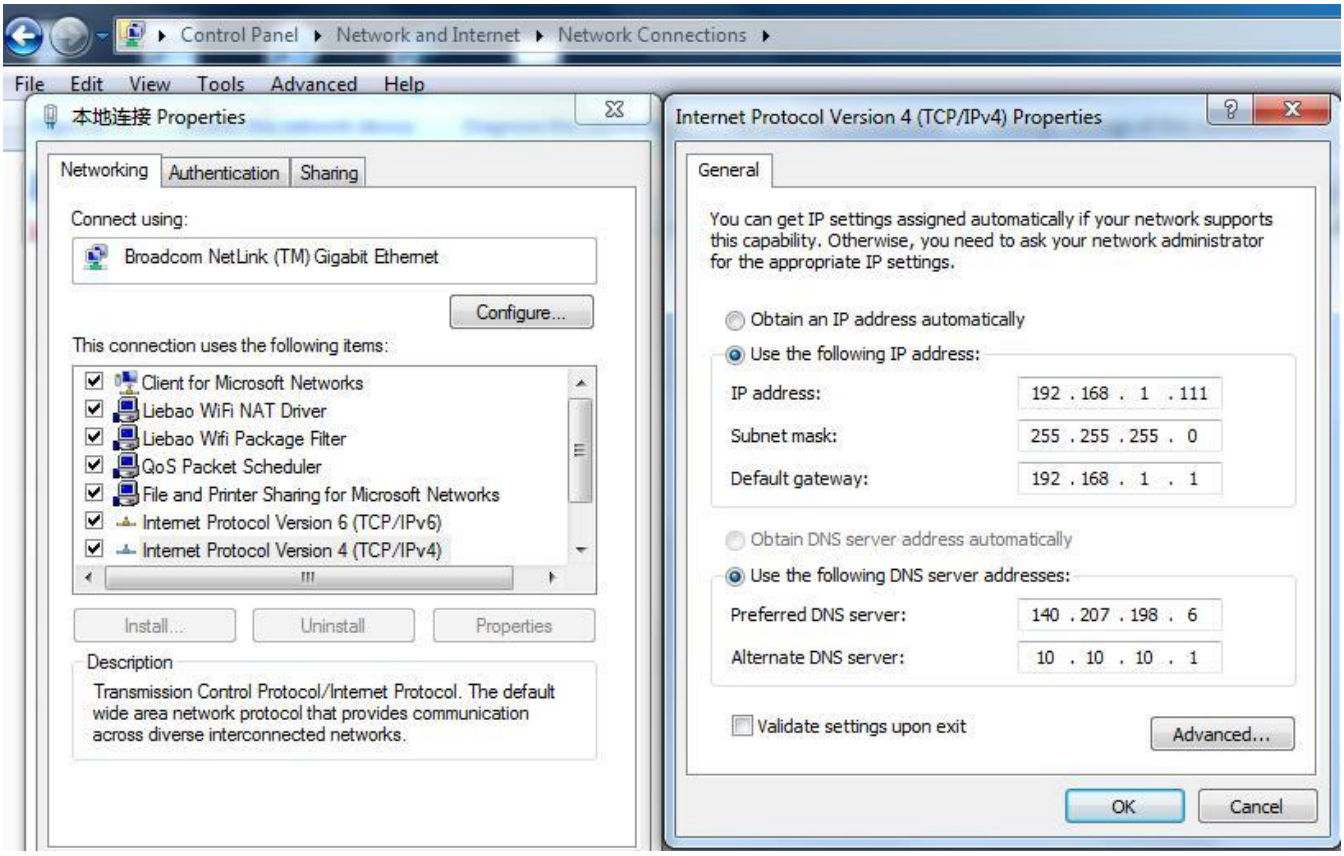
Step5: "Device Management", >>> Restart >>> Apply.



Step6: Open the UART and TCP tool, choose the protocol type as "TCP Server ", that means the laptop works as a Server, the serial port server WF-01 as a client. Then fill in the local host IP as the laptop's IP (This IP address is the local IP which mapped a port before).
Now, can start to testing! If it can send and received the data successfully, means it can working good!



Noticed: If assign a static IP for the Local host laptop/pc will be more better.



6. Application Mode Explanation

6.1 AP Application: (Wireless remote controller application)

As shown below, when WF - 01 works as AP (access point), it creates a wireless network and works as center node in this wireless network. Smart phones and other smart devices can remote control serial devices via wifi. This AP mode brings great convenience when extra network is not available for smart devices, just like a wifi router.

6.2 STA Application: (Remote connection application)

As shown below, when WF - 01 works as STA (station), it can be connected to the Internet through the gateway. In this network construction, data from serial devices can be sent to Internet server for further processing by WF - 01 , also the Internet server can also send commands to control the serial devices via WF - 01.

8.Working Mode:

8.1 Data Transmission Modes

WF - 01 has three work modes: transparent transmission mode, serial instruction mode, HTTPD Client mode. (Serial instruction mode and HTTPD mode need to contact the company's technical staff to upgrade the software).

8.2 Transparent transmission mode

In this mode, the data transmission between the server and network is transparent transmission. Transparent transmission means the data length and content remain exactly the same between the sender and receiver. The server does not do any analysis. Transparent transmission mode is the simplest way of data transmission, because serial devices can realize wireless data transmission without make any software change basically.

Noticed: transparent transmission mode, as the lower level of data transmission, does not guarantee the zero error rates. Error rate can be cut down by adopting the upper TCP protocol handshake, or opening hardware flow control (CTS/RTS) function in the serial port (if this function is not adopted, please vacant CTS/RTS pin in the serial port).

8.3 Serial instruction mode

In this mode, the user can send data to the server through our protocol, the biggest advantage of this mode is that there is no need to reset the module WF-01.

8.4 HTTPD Client mode

In this mode, the wifi-serial server of WF-01 sends request and data to the HTTP server. Every time to send data, the wifi-serial server of WF-01 will automatically envelope the data into the HTTP protocol form, then sent the enveloped data to the specified HTTP server. It is convenient for users read or submit data from the HTTP server.

8.5 GPIO mode

WF-01 module can provide seven GPIO, including three indicator pin, 4 UART pin which can be customized to GPIO pins. In GPIO mode, users can send a few specific instructions via the network to control GPIO to ourput a high/low level and can also read the GPIO status.

9. Device reset

When WF - 01 in the STA mode, it will always automatically connect to the router or other AP once powered on, if you want the device back to initialization stage, please long press the reset button for 5 seconds, the Ready LED and Link LED will be off. When the device powered on again, it will recovery to default status.

10. Function Expansion

10.1 Keep Alive Function

When something abnormal happens to the network, WF-01 will automatically dignose connection problem and switch to other networks. When network signal is weak, WF-01 working as a STA will also switch to other networks. With the switching , WF-01 restart.

10.2 Web Socket Function

The WIFI serial port server can realize the function of the web socket server. It makes real-time communication possible between serial port server and the webpage, replacing previous HTTP GET, POST which response slow.

Noticed: This function is fit for network applications and other application highly demanding quick web page response. If users want to customize the specific web page, please contact our company directly .

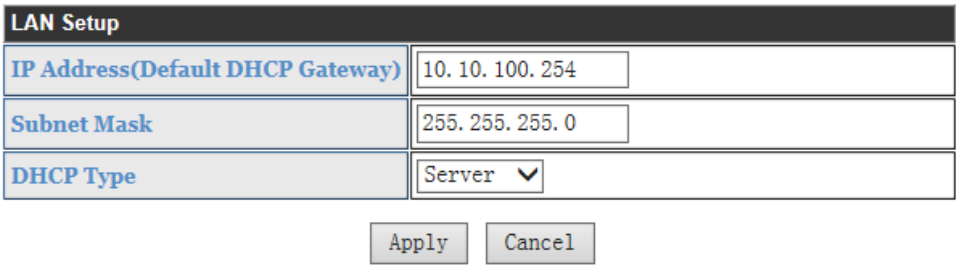
10.3 Hardware Upgrading

WIFI serial port server WF-01 Support firmware upgrade remotely through web.

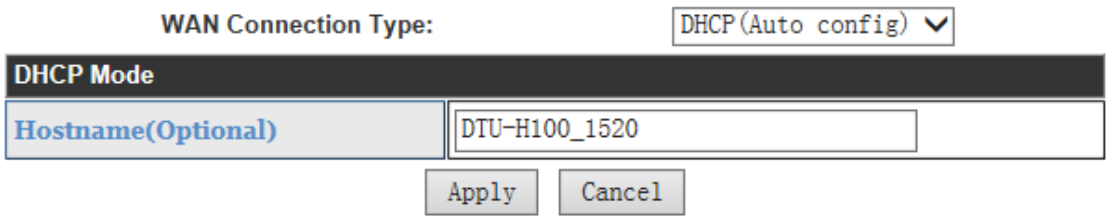
11. Frequently Asked Questions

Question 1： Where to set the LAN IP and WAN IP of WF-01？

>>> Please set LAN IP in the "wireless access point Settings" page, as following:



>>> Please set WAN IP in the "wireless terminal Settings" page, as following:



Question 2： When using WF-01, how to avoid an IP address conflict?

>>> The dynamic distribution IP address is .100--.200. For example, when the LAN address of WF-01 is 10.10.100.254, the dynamic distribution IP address of its STA is 10.10.100.100 to 10.10.100.200. While its Static distribution IP address is from 10.10.100.1 to 10.10.100.99, to avoid conflict between dynamic IP address and static IP address.

Question 3: what is the difference between TCP and UDP protocol?

>>> TCP is a protocol based on connection, that is, before formal data sending /receiving, a reliable connection must be established between two sides. UDP is not based on connection, that is the two sides directly send/receive data without establish any connection first. TCP is fit for applications where demand high accurate data transmission, such as web page browsing, files downloading. UDP is fit for applications where allow a small amount of data transmission or low accurate data transmission, such as QQ voice/video data.d

12. Important information

1) Please read the User Manual carefully before you install and use the WF-01.
2) Install the WF-01 in a hidden place.
3) Avoid getting water into the WF-01.
4) Have a secure connection to the main power supply.

13. Maintenance

1) In case of failure, please contact the distributor or manufacturer.
2) If the WF-01 works but fail to transfer the data, switch the power off and on again after one minute. Test it after few minutes later, or reset it.
3) Please contact the distributor or manufacturer if the problem can’t solved.

14. Warranty

1) The WF-01 is warranted to be free of defects in material and workmanship for one year from the date of purchase.
2) This warranty does not extend to any defect, malfunction or failure caused by abuse or misuse by the Operating Instructions. In no event shall the manufacturer be liable for any alarm system altered by purchasers.

The End!

Any questions please help to contact us feel free.