F8X14 Series User Manual

The user manual is suitable for the following model:

Model	Product Type
F8114	ZigBee + GPRS IP MODEM
F8214	ZigBee + CDMA IP MODEM
F8414	ZigBee + WCDMA IP MODEM
F8614	ZigBee + EVDO IP MODEM

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ANT
ZigBee
Online
Act
Power
ZigBee
F8114
ZigBee+GPRS
IP MODEM
工作电压
Operating Voltage:
+5V~35VDC
工作温度
Operating Temperature:
-25℃~65℃
Four-Faith
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厦门四信通信科技有限公司
http://www.four-faith.com
Xiamen Four-Faith Communication Technology Co., Ltd.
PWR GND GND RX TX A B IO1 IO2 IO3 IO4 IO5
1 2 3 4 5 6 7 8 9 10 11 12

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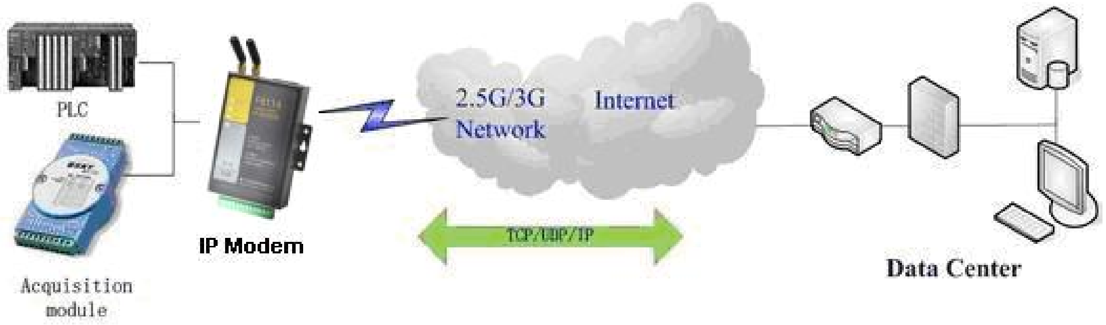
Chapter 1 Brief Introduction of Product

1.1 General

F8X14 IP MODEM is a kind of data terminal device that provides data transfer function by public cellular network and ZigBee network.

It adopts high-powered industrial 32 bits CPU and embedded real time operating system. It supports RS232, RS485 (or RS422) and ZigBee port that can conveniently and transparently connect one device to a cellular network, allowing you to connect to your existing serial and ZigBee devices with only basic configuration. It has low power consumption states in which the power consumption could be 1ower than 1mA@12VDC. It has compatible digital I/O channel, ADC, input pulse counter and pulse wave output function.

It has been widely used on M2M fields, such as intelligent transportation, smart grid, industrial automation, telemetry, finance, POS, water supply, environment protection, post, weather, and so on.



1.2 Features and Benefits

Design for Industrial Application

- High-powered industrial cellular module
- High-powered industrial ZigBee module
- High-powered industrial 32 bits CPU
- Support low power consumption mode, including multi-sleep and trigger modes to reduce the power dissipation farthest
- Embedded Real Time Clock(RTC) circuit which can realize timing online/offline function
- Housing: iron, providing IP30 protection
- Power range: DC 5~35V

Stability and Reliability

- Support hardware and software WDT
- Support auto recovery mechanism, including online detect, auto redial when offline to make

it always online

- RS232/RS485/RS422 port: 15KV ESD protection
- SIM/UIM port: 15KV ESD protection
- Power port: reverse-voltage and overvoltage protection
- Antenna port: lightning protection(optional)

Standard and Convenience

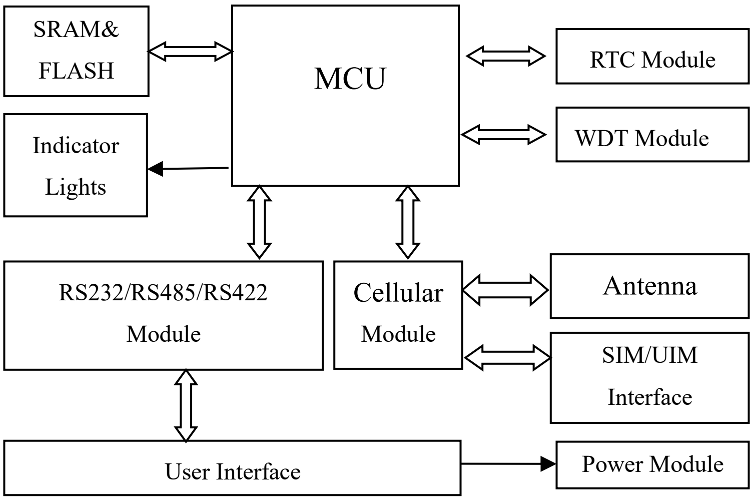
- Adopt terminal block interface, convenient for industrial application
- Support standard RS232 and RS485(or RS422) port that can connect to serial devices directly
- TTL logic level RS232 interface can be customized
- Support intellectual mode, enter into communication state automatically when powered
- Provide management software for remote management
- Support several work modes
- Convenient configuration and maintenance interface

High-performance

- Support data transfer by cellular and ZigBee network
- Support TCP server and support multi TCP client connection(optional)
- Support double data centers, one main and another backup
- Supply 5 I/O channels, compatible 2 pulse wave output channels, 2 analog inputs and one pulse input counters.
- Support multi data centers and it can support 5 data centers at the same time
- Support multi online trigger ways, including SMS, ring and data. Support link disconnection when timeout
- Support dynamic domain name(DDNS) and IP access to data center
- Design with standard TCP/IP protocol stack
- Support APN/VPDN

1.3 Working Principle

The principle chart of the IP MODEM is as following:



1.4 Specifications

Cellular Specification

F8114 Specification

Item	Content
Cellular Module	Industrial cellular module
Standard and Band	EGSM900/GSM1800MHz, GSM850/900/1800/1900MHz(optional) Compliant to GSM phase 2/2+ GPRS class 10, class 12(optional)
Bandwidth	85.6Kbps
TX power	GSM850/900: <33dBm GSM1800/1900: <30dBm
RX sensitivity	<-107dBm

F8214 Specification

Item	Content
Cellular Module	Industrial cellular module
Standard and Band	CDMA2000 1xRTT 800MHz CDMA800/1900MHz(optional) CDMA450MHz(optional)
Bandwidth	153.6Kbps
TX power	<30dBm
RX sensitivity	<-104dBm

F8314 Specification

Item	Content
Cellular Module	Industrial cellular module
Standard and Band	GSM850/900/1800/1900MHz GPRS/EDGE Class 12
Bandwidth	236.8Kbps
TX power	GSM850/900：<33dBm GSM1800/1900：<30dBm
RX sensitivity	<-106dBm

F8414 Specification

Item	Content
Cellular Module	Industrial cellular module
Standard and Band	UMTS/WCDMA/HSDPA/HSUPA 850/1900/2100MHz UMTS/WCDMA/HSDPA/HSUPA 850/900/1900/2100MHz(optional) GSM850/900/1800/1900MHz GPRS/EDGE CLASS 12
Bandwidth	HSUPA: 5.76Mbps / HSDPA: 7.2Mbps /UMTS: 384Kbps (DL/UL)
TX power	<24dBm
RX sensitivity	<-109dBm

F8514 Specification

Item	Content
Cellular Module	Industrial cellular module
Standard and Band	TD-SCDMA/HSDPA/HSUPA 1880-1920/2010-2025MHz GSM850/900/1800/1900MHz GPRS/EDGE CLASS 12
Bandwidth	2.8Mbps(down)， 2.2Mbps(up)
TX power	<24dBm
RX sensitivity	<-108dBm

F8614 Specification

Item	Content
Cellular Module	Industrial cellular module
Standard and Band	CDMA2000 1X EVDO Rev A 800MHz CDMA2000 1X EVDO Rev A 800/1900MHz (optional) CDMA2000 1X EVDO Rev A 450MHz (optional) IS-95 A/B 、CDMA2000 1xRTT
Bandwidth	3.1Mbps(down)， 1.8Mbps(up)
TX power	<23dBm
RX sensitivity	<-104dBm

ZigBee Specification

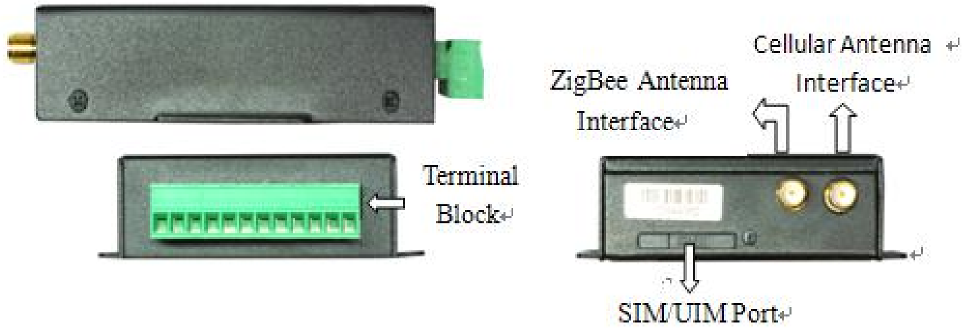
Item	Content
ZigBee Chip	Industrial ZigBee Chip
Standard and Band	IEEE 802.15.4 ISM 2.4 ~2.5GHz
Indoor/Urban Range	30m 90m(With PA)
Outdoor/RF Line-of-Sight Range	500m 2000m(With PA)
Transmit Power	2.82mw(+4.5dBm) 100mw(+20dBm) (With PA)
Bandwidth	250Kbps
Receiver Sensitivity	-97dBm -103dBm(With PA)
Network Topologies	Point-to-Point, Point-to-Multipoint, Peer-to-Peer and Mesh
Number of channels	16 Direct Sequence Channels
Channels	11 to 26

Hardware System

Item	Content
CPU	Industrial 32 bits CPU
FLASH	2MB(Extendable)
SRAM	512KB(Extendable)

Interface Type

Item	Content
Serial	1 RS232 port and 1 RS485(orRS422) port, 15KV ESD protection Data bits: 5, 6 ,7, 8 Stop bits: 1, 1.5, 2 Parity: none, even, odd, space, mark Baud rate: 110~230400 bps
Indicator	"Power", "ACT", "Online",“ZigBee”
Antenna	Cellular: Standard SMA female interface, 50 ohm GPS: Standard SMA female interface, 50 ohm lighting protection(optional)
SIM/UIM	Standard 3V/1.8V user card interface, 15KV ESD protection
Power	Terminal block interface, reverse-voltage and overvoltage protection



Power Input

Item	Content
Standard Power	DC 12V/0.5A
Power Range	DC 5~35V

Power Consumption

Working States	Power Consumption
Communication	50-80mA@12VDC；115-150mA@5VDC
Standby	20mA@12VDC；35mA@5VDC
Sleep	8mA@12VDC；18mA@5VDC
Timing Power Off	0.6mA@12VDC；1mA@5VDC

Physical Characteristics

Item	Content
Housing	Iron, providing IP30 protection
Dimensions	91x58.5x22 mm
Weight	210g

Environmental Limits

Item	Content

Operating Temperature	-25~+65ºC（-13~+149℉）
Extended Operating Temperature	-30~+75ºC（-22~+167℉）
Storage Temperature	-40~+85ºC（-40~+185℉）
Operating Humidity	95% (Non-condensing)

Chapter 2 Installation Introduction

2.1 General

The IP MODEM must be installed correctly to make it work properly.

Warning: Forbid to install the IP MODEM when powered!

2.2 Encasement List

Name	Quantity	Remark
IP MODEM host	1	
2.4G ZigBee Antenna	1	
Cellular Antenna	1	
Power adapter	1	
RS232 data cable	1	optional
RS485 data cable	1	optional
Manual CD	1	
Certification card	1	
Maintenance card	1	

Table 2-1 Encasement List

2.3 Installation and Cable Connection

Dimension: (unit: mm)

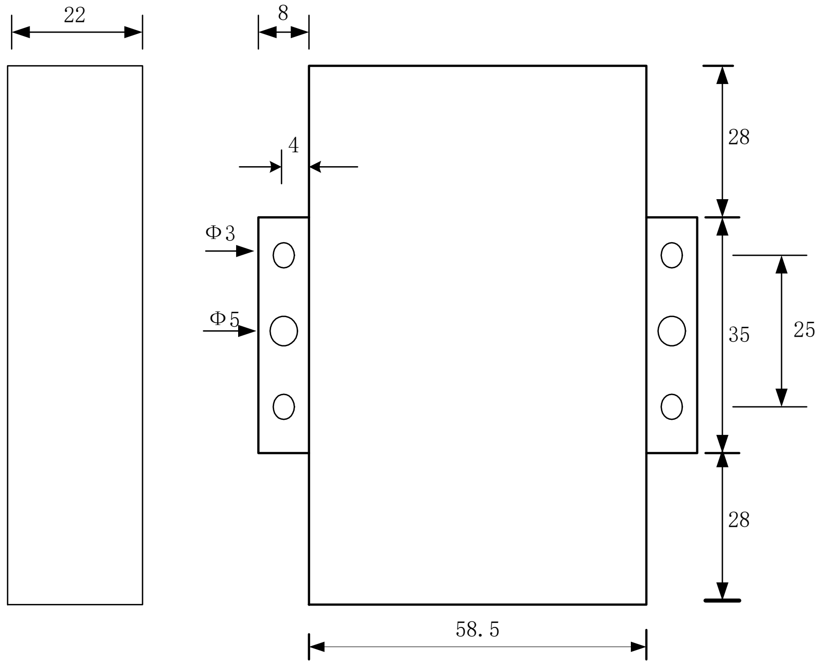


Figure 2-1 Installation Chart

Installation of SIM/UIM card:

Firstly power off the IP MODEM, and press the out button of the SIM/UIM card outlet with a needle object. Then the SIM/UIM card sheath will flick out at once. Put SIM/UIM card into the card sheath (Pay attention to put the side which has metal point outside), and insert card sheath back to the SIM/UIM card outlet.

Warning: Forbid to install SIM/UIM card when powered!

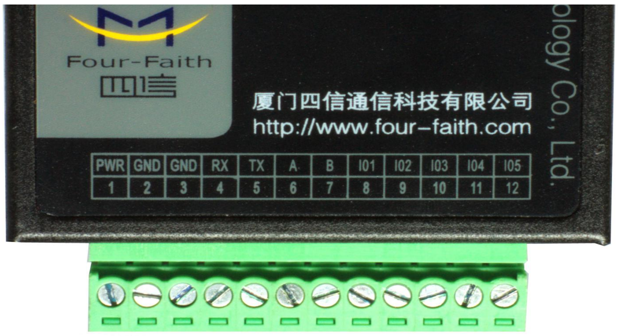
Installation of antenna:

Screw the SMA male pin of the antenna to the female SMA outlet of the IP MODEM tightly. Warning: The antenna must be screwed tightly, or the signal quality of antenna will be influenced!

User Interface Signal Definition

Pin Number	Signal Name	Default Function	Extensible Function
1	PWR	Power input anode	N/A
2	GND	Power Ground	N/A
3	GND	Power Ground	N/A
4	RX	RS232 RX	N/A
5	TX	RS232 TX	N/A
6	A	RS485 anode	Reserved compatible DTR
7	B	RS485 cathode	Reserved compatible DSR
8	IO1	GPIO	Reserved compatible RTS and RS232 RX (TTL logic level)
9	IO2	GPIO	Reserved compatible CTS and RS232 TX (TTL logic level)
10	IO3	GPIO	Reserved compatible DCD
11	IO4	GPIO	Reserved compatible RI,ADC, and pulse output

12	IO5	GPIO	Reserved compatible pulse wave input counter, ADC, and pulse output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http://www.four-faith.com
ology Co., Ltd.
PWR GND GND RX TX A B IO1 IO2 IO3 IO4 IO5
1 2 3 4 5 6 7 8 9 10 11 12

Installation of cable:

F8X14 adopts industrial terminal block interface. The recommendatory cable is 28-16AWG. The detail description of standard layout adapter and communication cables as is following:

Adapter（Rating Output 12VDC/0.5A）:

Cable Color	**Power Output Polarity**
Black &White Alternate	Anode
Black	Cathode

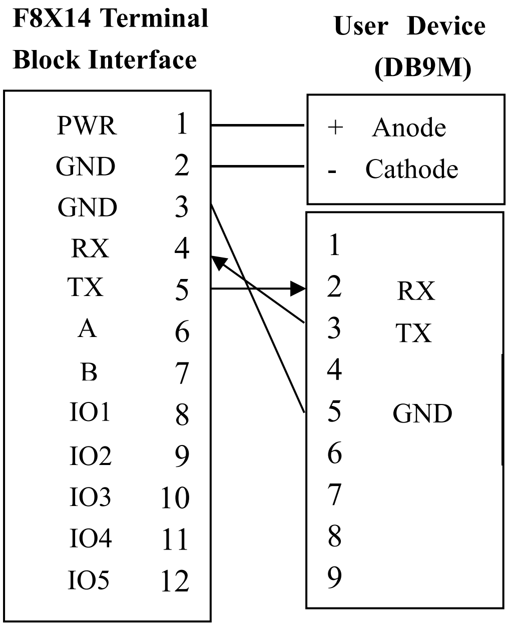
RS232 Cable:

Cable Color	**Corresponding DB9-M Pin Number**
Brown	Pin 2
Blue	Pin 3
Black	Pin 5

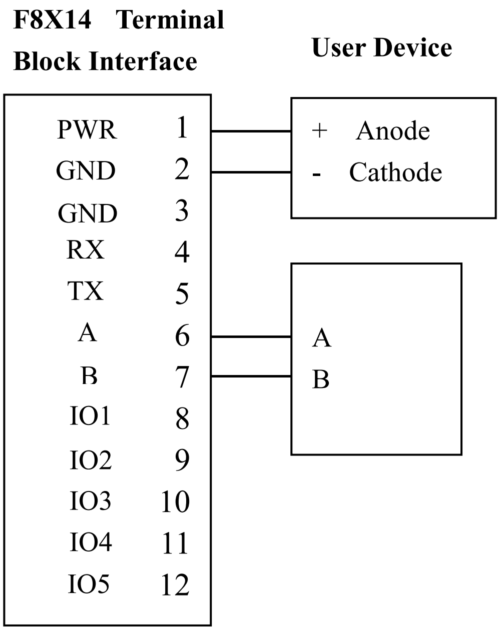
RS485 Cable:

Cable Color	**Signal definition**
Red	RS485(A)
Black	RS485(B)

Power adapter and communication cable connection chart as following:


F8X14 Terminal Block Interface
User Device (DB9M)
PWR 1
GND 2
GND 3
RX 4
TX 5
A 6
B 7
IO1 8
IO2 9
IO3 10
IO4 11
IO5 12
+ Anode
- Cathode
1
2 RX
3 TX
4
5 GND
6
7
8
9

Communication Interface: RS232


F8X14 Terminal Block Interface
User Device
PWR 1
GND 2
GND 3
RX 4
TX 5
A 6
B 7
IO1 8
IO2 9
IO3 10
IO4 11
IO5 12
+ Anode
- Cathode
A
B

Communication Interface: RS485

2.4 Power

The power range of the IP MODEM is DC 5~35V. When we use other power, we should make sure that the power can supply power above 4W.

We recommend user to use the standard DC 12V/0.5A power adaptor.

2.5 Indicator Lights Introduction

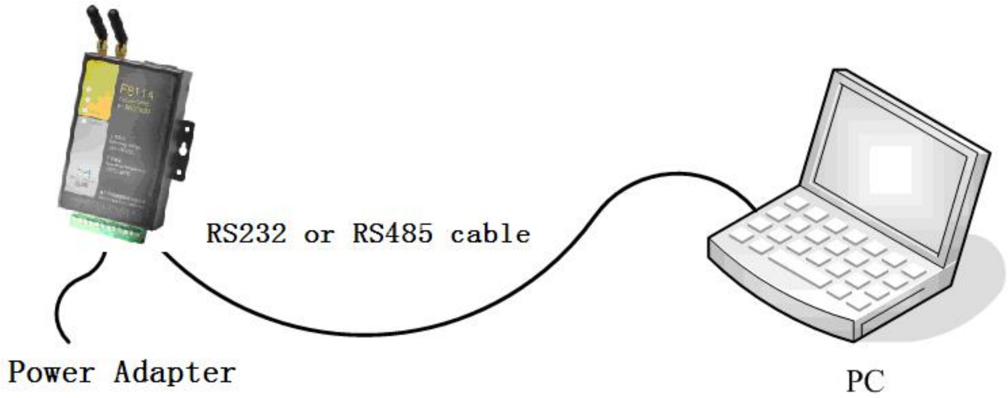
The IP MODEM provides three indicator lights: “Power”, “ACT”, “Online”.

Indicator Light	State	Introduction
Power	ON	IP MODEM is powered on
	OFF	IP MODEM is powered off
ACT	BLINK	Data is communicating
	OFF	No data
Online	ON	IP MODEM has logged on network
	OFF	IP MODEM hasn’t logged on network
ZigBee	ON	ZigBee Transport data
	OFF	No data

Chapter 3 Configuration

3.1 Configuration Connection

Before configuration, It’s necessary to connect the IP MODEM with the configure PC by the shipped RS232 or RS232-485 conversion cable as following.



3.2 Configuration Introduction

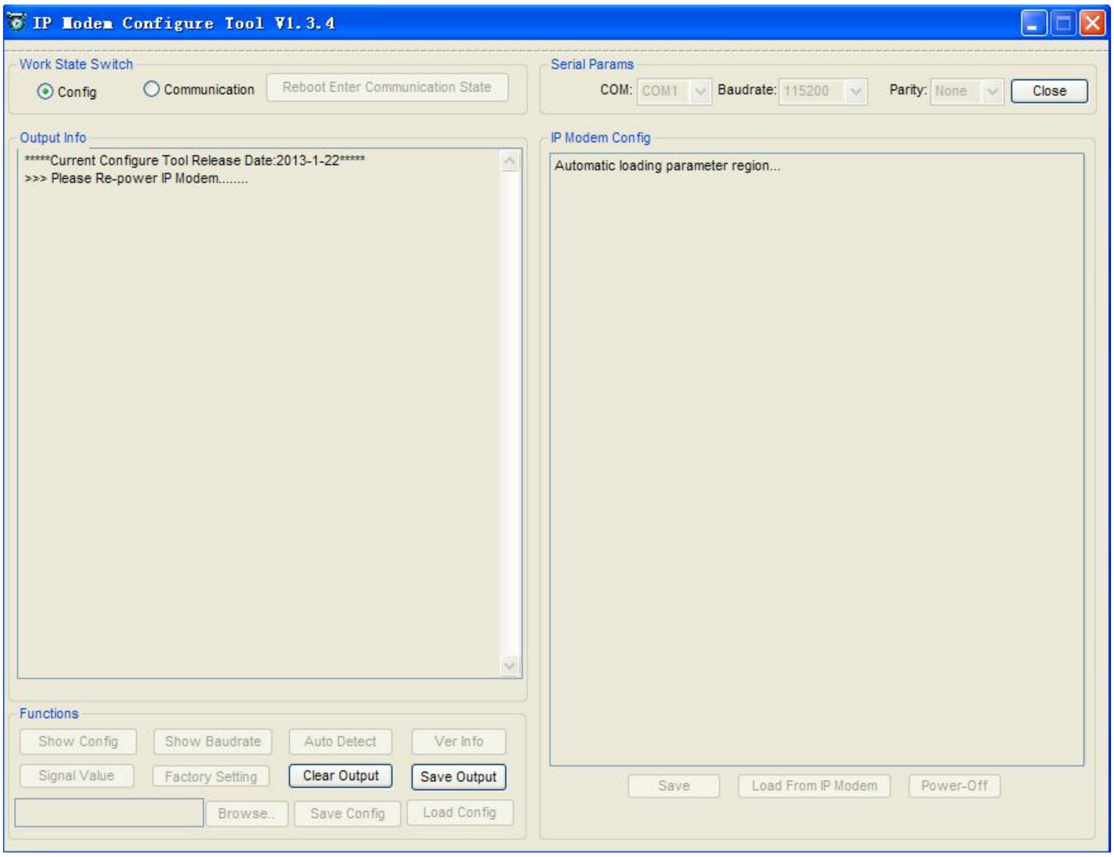
There are two ways to configure the IP MODEM:

Configuration software tool: All the settings are configured through the shipped software tool. It’s necessary to have one PC to run this tool.

Extended AT command: All the settings are configured through AT command, so any device with serial port can configure it. Before configuration with extended AT command, you should make IP MODEM enter configure state. The steps how to make IP MODEM enter configure state, please refer to appendix.

The following describes how to configure IP MODEM with the configure software tool. At the same time, it gives out the corresponding AT command of each configuration item.

3.3 Run the configure Tool: IP Modem Configure.exe


IP Modem Configure Tool V1.3.4
Work State Switch
● Config
○ Communication
Reboot Enter Communication State
Serial Params
Close
Output Info
IP Modem Config
Functions
Show Config
Show Baudrate
Auto Detect
Ver Info
Signal Value
Factory Setting
Clear Output
Save Output
Browse..
Save Config
Load Config
Save
Load From IP Modem
Power-Off

COM: COM1 Baudrate: 115200 Parity: None

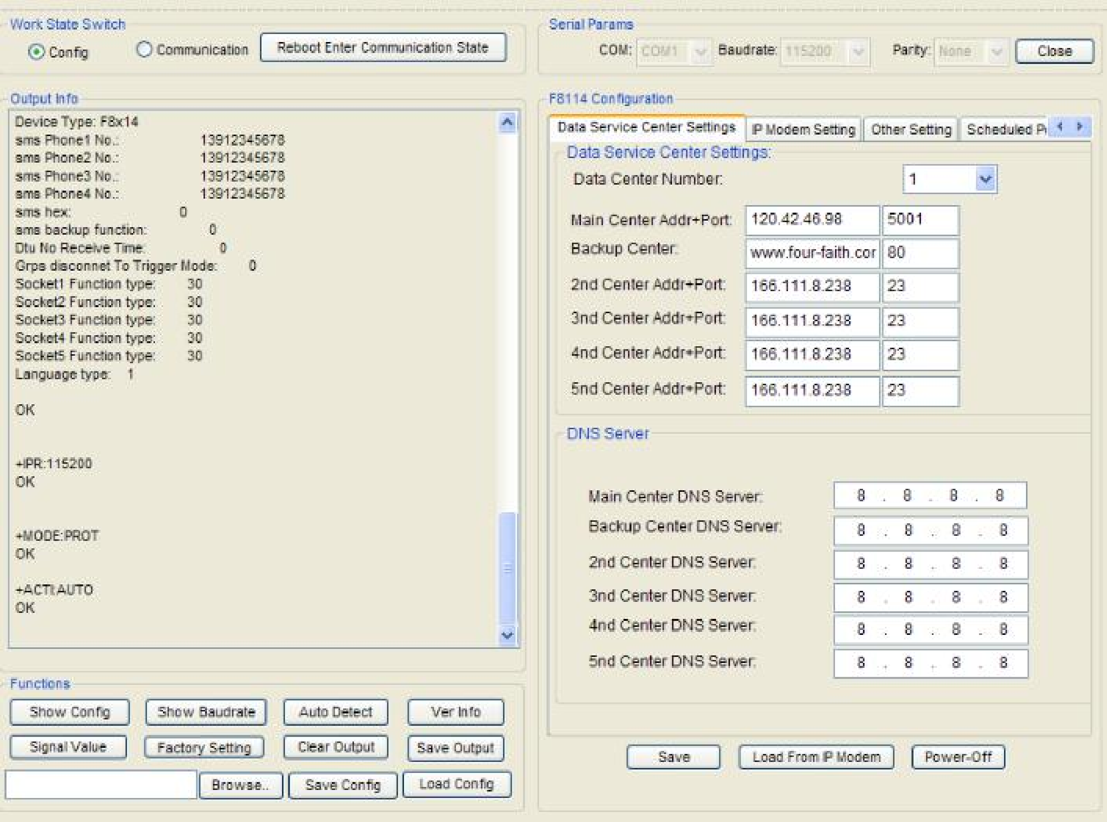
```
*****Current Configure Tool Release Date:2013-1-22*****
>>> Please Re-power IP Modem........
```

```
Automatic loading parameter region...
```

The “Serial Parameters” column shows the current serial port settings. To configure IP MODEM, please choose the correct serial port which connects to IP MODEM, and the baud-rate is 115200 with no parity, then open the serial port. If the button text is“Close”, it shows the serial port now has been opened. If the text is “Open”, you should open the port first. When the port opened, the “Output Info” column will display

“Port(COM1) Has Opened，Please Re-Power the IP MODEM,
Waiting IP MODEM Enter Configure State...”

3.4 Re-power IP MODEM


Work State Switch
● Config
○ Communication
Reboot Enter Communication State
Output Info
Functions
Show Config
Show Baudrate
Auto Detect
Ver Info
Signal Value
Factory Setting
Clear Output
Save Output
Browse..
Save Config
Load Config
Serial Params
Close
F8114 Configuration
Data Service Center Settings
IP Modem Setting
Other Setting
Scheduled P
Data Service Center Settings:
DNS Server
Save
Load From IP Modem
Power-Off

```
Device Type: F8x14
sms Phone1 No.:                 13912345678
sms Phone2 No.:                 13912345678
sms Phone3 No.:                 13912345678
sms Phone4 No.:                 13912345678
sms hex:                  0
sms backup function:          0
Dtu No Receive Time:            0
Grps disconnet To Trigger Mode:      0
Socket1 Function type:      30
Socket2 Function type:      30
Socket3 Function type:      30
Socket4 Function type:      30
Socket5 Function type:      30
Language type:    1

OK


+IPR:115200
OK


+MODE:PROT
OK

+ACTI:AUTO
OK
```

COM: COM1 Baudrate: 115200 Parity: None

Data Center Number: 1

Main Center Addr+Port:	120.42.46.98	5001
Backup Center:	www.four-faith.cor	80
2nd Center Addr+Port:	166.111.8.238	23
3nd Center Addr+Port:	166.111.8.238	23
4nd Center Addr+Port:	166.111.8.238	23
5nd Center Addr+Port:	166.111.8.238	23

Main Center DNS Server:	8 . 8 . 8 . 8
Backup Center DNS Server:	8 . 8 . 8 . 8
2nd Center DNS Server:	8 . 8 . 8 . 8
3nd Center DNS Server:	8 . 8 . 8 . 8
4nd Center DNS Server:	8 . 8 . 8 . 8
5nd Center DNS Server:	8 . 8 . 8 . 8

After Re-power IP MODEM, The configure tool will make it enter configure state. At the same time, the software will load current settings from IP MODEM and displays on the right configure columns. It’s now ready to configure.

3.5 Configuration(F8114 for example)

3.5.1 Data Service Center Settings

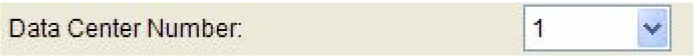
Settings on this page are the parameters related to Data Service Center (DSC).

◆Data Center Number

IP MODEM support two Data Service Center methods to transmit data.

Main and Backup: IP MODEM always tries to connect with the Main DSC. If fails to connect with Main DSC, it will connect with Backup DSC at once

Attention: If no Backup DSC exists, please configure the Backup DSC same as Main DSC.
Multi Data Service Center: IP MODEM can connect with at most five DSC at the same time. All the multi DSC can receive the same application data .



Data Center Number: 1

If the Data Center Number is 0,there is no DSC working.If the Data Center Number is 1, IP MODEM work in Main and Backup DSC method. When “Data Center Number” is greater than 1, IP MODEM works in Multi Data Service Center method.

AT command:

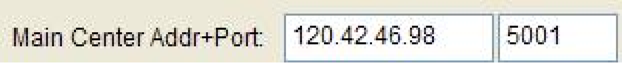
AT+SVRCNT=x

x: Data Service Center number, 1~5.

Attention: Every AT command is terminated with a enter character!

◆Main Center Addr+Port:

IP Address and Port of the Main DSC, It’s better to set the port greater than 1024.



Main Center Addr+Port: 120.42.46.98 5001

AT command of the Main DSC IP address or domain name:

AT+IPAD=xxx

xxx: The IP address or domain name.

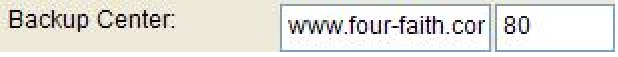
AT command of the Main DSC port:

AT+PORT=xxx

xxx: The port value

◆Backup Center Addr+Port:

IP address and port of the Backup DSC



Backup Center: www.four-faith.cor 80

AT command of the Backup DSC IP address or domain

AT+IPSEC=xxx

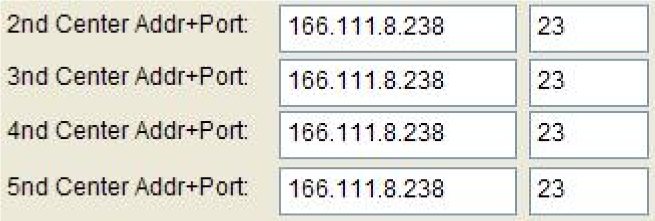
xxx: The IP address or domain name

AT command of the Backup DSC port

AT+PTSEC=xxx

xxx: The port value

◆Multi DSC Configuration



2nd Center Addr+Port: 166.111.8.238 23
3nd Center Addr+Port: 166.111.8.238 23
4nd Center Addr+Port: 166.111.8.238 23
5nd Center Addr+Port: 166.111.8.238 23

When "Data Center Number" is greater than 1, this setting is valid. For example， setting the "Data Center Number" as 3, Main Center, 2nd Center, 3rd Center work as these three DSC

AT Command of the 2~5 DSC IP address or domain name

AT+IPADn=xxx
n is 1~4 correspond to center 2~5
xxx: The IP address or domain name

AT Command of the 2~5 DSC port

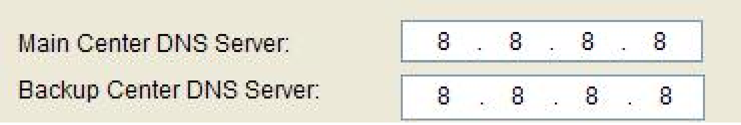
AT+PORTn=xxx
n is 1~4 correspond to port of center 2~5
xxx: The port value

Example:

Set IP address of center 3 as 166.111.8.238, and port 5001, the AT command is as following:

```
AT+IPAD2=166.111.8.238
AT+PORT2=5001
```

◆ Main and Backup Center DNS Server



Main Center DNS Server: 8 . 8 . 8 . 8
Backup Center DNS Server: 8 . 8 . 8 . 8

When the DSC Internet access uses domain name, It's necessary to set DNS server resolving the DSC domain name. When the Data Center Number is 1, Main and Backup Center DNS Server is used to resolve the Main center and Backup center correspondingly.

AT command of Main Center DNS server:

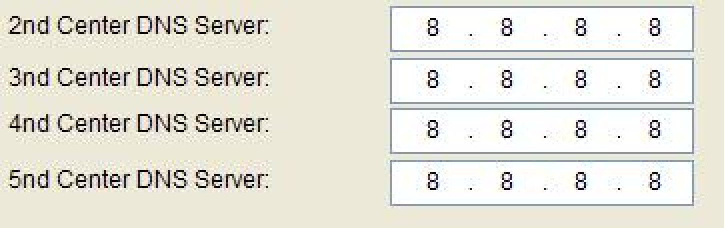
AT+DNSSVR=aaa.bbb.ccc.ddd
aaa.bbb.ccc.ddd: The DNS server IP address(must be IP address）.

AT command of Backup Center DNS server:

AT+DNSSV2=aaa.bbb.ccc.ddd
aaa.bbb.ccc.ddd: the DNS server IP address

◆ Center 2~5 DNS Server

When the IP MODEM work in Multi Data Service Center method and the centers use domain name, 2~5 DNS server is used to resolve center 2~5 correspondingly.



2nd Center DNS Server: 8 . 8 . 8 . 8
3nd Center DNS Server: 8 . 8 . 8 . 8
4nd Center DNS Server: 8 . 8 . 8 . 8
5nd Center DNS Server: 8 . 8 . 8 . 8

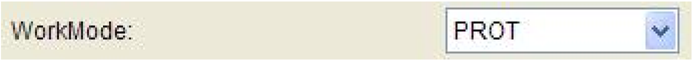
AT command of 2~5 DNS Server

```
AT+DNSSVRn=aaa.bbb.ccc.ddd
```

n is 1~4 correspond to center 2~5 DNS server.
aaa.bbb.ccc.ddd is the DNS server IP address

3.5.2 IP MODEM Settings

◆ IP MODEM WorkMode



WorkMode: PROT

According to different application requirements, there are several protocol workmode to choose.

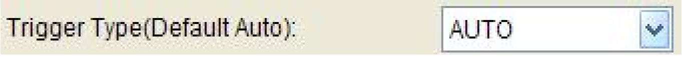
PROT： Heartbeat packet with TCP protocol, Data transmission with TCP protocol, heartbeat packet and application data transmission are in the same TCP connection.
TRNS： IP MODEM work as a common GPRS MODEM, It can be used in SMS, CSD, Dial-up applications.
TTRN： Heartbeat packet with UDP protocol, Data transmission with TCP protocol
TLNT： IP MODEM work as a telnet client
LONG： Heartbeat packet with UDP protocol, Data transmission with TCP protocol, It can transmit at most 8192 bytes data one time through extra application protocol.
LNGT： Heartbeat with UDP protocol, Data transmission with TCP protocol, It can transmit at most 8192 bytes data one time through extra application protocol.
TCST： User can set custom register and heartbeat string, Data transmission with TCP protocol.
TCPSVR： No heartbeat packet or register packet in the same TCP connection.
SUDP： User can set custom register and heartbeat string, Data transmission with UDP protocol, Heartbeat packet and application data are in the same UDP connection.
PUDP： No heartbeat packet or register packet in the same UDP connection.

AT command:

```
AT+MODE=xxxx
```

xxxx: one of the above workmode

◆ Trigger Type



Trigger Type(Default Auto): AUTO

Normally, IP MODEM always keeps online and always be ready for data transmission. But in some circumstances, it's important to reduce wireless data flow. To realize this function, the software can makes IP MODEM into sleep state in idle time. When there is application data to transmit, IP MODEM can be triggered online ready for data transmission. There are total five methods to make IP MODEM online:

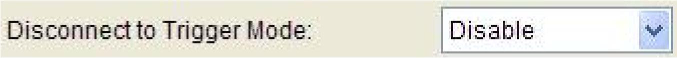
AUTO: IP MODEM always keeps online
SMSD: send a special short message to make IP MODEM online
CTRL: make IP MODEM online through a phone call to IP MODEM
DATA: send special serial data to make IP MODEM online
MIXD: the combination of SMSD, CTRL, DATA. IP MODEM will be online when meet one of these three trigger methods.

AT Command:

AT+ACTI=xxxx

xxxx: one of the above trigger methods

◆ Disconnect to Trigger Mode



Disconnect to Trigger Mode: Disable

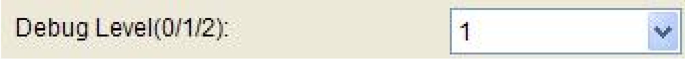
If the Trigger Type is not **AUTO** and the Disconnect to Trigger Mode is enable, the modem will go to trigger mode when the modem disconnect to the server.

AT Command:

AT+ISTRIGMODE=x

x = 0/1 0: Disable disconnect to Trigger Mode
1: Enable disconnect to Trigger Mode

◆ Debug Level



Debug Level(0/1/2): 1

Debug information is used to debug software when there is software problem.

0 --- no debug information output
1 --- simple prompt information output
2 --- detail debug information output

AT Command:

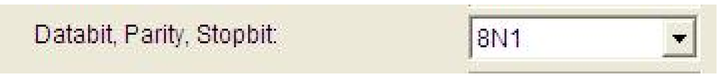
AT+DEBUG=x

x : the debug level value

Attention: Only there is some problem to the IP MODEM, It's necessary to set this value

as 2, In normal applications, this value should set to 0 or 1, the default value is 1.

◆ Databit, Parity, Stopbit



Databit, Parity, Stopbit: 8N1

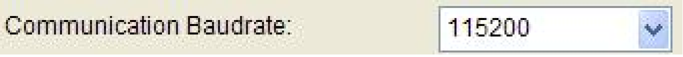
8N1 --- 8 Databit, No parity, 1 Stopbit
8E1 --- 8 Databit, Even parity, 1 Stopbit
8O1 --- 8 Databit, Odd parity, 1 Stopbit
7O1 --- 7 Databit, Odd parity, 1 Stopbit
7E1 --- 7 Databit, Even parity, 1 Stopbit
7N1 --- 7 Databit, No parity, 1 Stopbit
8N2 --- 8 Databit, No parity, 2 Stopbit
8E2 --- 8 Databit, Even parity, 2 Stopbit
8O2 --- 8 Databit, Odd parity, 2 Stopbit
7O2 --- 7 Databit, Odd parity, 2 Stopbit
7E2 --- 7 Databit, Even parity, 2 Stopbit
7N2 --- 7 Databit, No parity, 2 Stopbit

AT Command:

```
AT+SERMODE=xxx
```

xxx: one of the above serial mode

◆ Communication Baudrate



Communication Baudrate: 115200

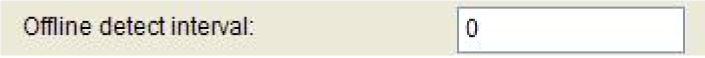
110 --- 110 bps
300 --- 300 bps
600 --- 600 bps
1200 --- 1200 bps
2400 --- 2400 bps
4800 --- 4800 bps
9600 --- 9600 bps
14400 --- 14400 bps
19200 --- 19200 bps
38400 --- 38400 bps
56000 --- 56000 bps
57600 --- 57600 bps
115200 --- 115200 bps

AT Command:

```
AT+IPR=xxx
```

xxx : one of the above baudrate

◆ Offline detect interval



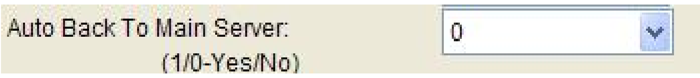
Offline detect interval: 0

When the modem is online, if the modem has not received any data from server or serial for offline detect interval, the modem will offline itself. But if the offline detect interval is 0, the modem will not offline anymore.

AT Command:

```
AT+DTUNORECMINU=x
x= 0~65535    (Unit: Minute)
```

◆ Auto Back To Main Server



Auto Back To Main Server: (1/0-Yes/No) 0

0 --- No

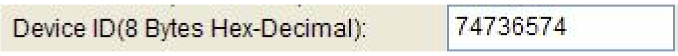
1 ---Yes

This item is only valid when you set “Data Center Number” as 1. In this mode, IP MODEM will switch to backup center when main center have problems. If this item is set to 1 , IP MODEM will check whether the main center work fine timely. When it detects the main server work fine, it will return back to the main server at once.

AT Command:

```
AT+RETMAIN=x
x : 0 or 1
```

◆ Device ID



Device ID(8 Bytes Hex-Decimal): 74736574

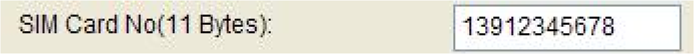
The identity number of IP MODEM, the value should be 8 bytes hex-decimal characters.

AT Command:

```
AT+IDNT=aabbccdd
```

aabbccdd: the identity number of IP MODEM

◆ SIM Card No



SIM Card No(11 Bytes): 13912345678

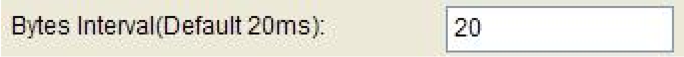
The phone number of the SIM card .

AT Command:

```
AT+PHON=xxxxxxxxxxx
```

xxxxxxxxxxx: the SIM card phone number

◆ Bytes Interval



Bytes Interval(Default 20ms): 20

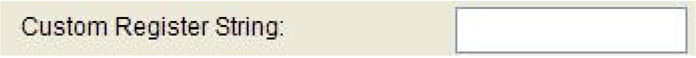
The time interval used to determine whether the serial data frame transmission has completed, IP MODEM will send the serial data to the center when two bytes transmit time interval larger than this item value.

AT Command:

AT+BYTEINT=xxx

xxx: bytes interval time value（millisecond）

◆ Custom Register String



Custom Register String:

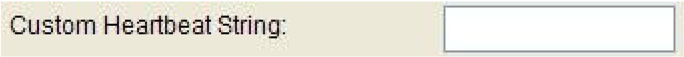
This item is only valid when the WorkMode is TCST. It’s the self defined register string. It can be empty, the maximum length is 70 bytes.

AT Command:

AT+CONNRGST=xxx

xxx： self defined register string

◆ Custom Heartbeat String



Custom Heartbeat String:

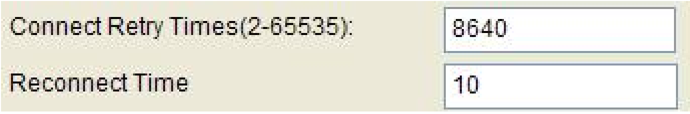
This item is only valid when the WorkMode is TCST. It’s the self defined heartbeat string, It can be empty, the maximum length is 70 bytes.

AT Command:

AT+LINKRGST=xxx

xxx： self defined heartbeat string

Connect Retry Times, Reconnect Time Interval



Connect Retry Times(2-65535): 8640

Reconnect Time: 10

In normal applications, IP MODEM will always try to connect with the center even if the center has problems or closed. To reduce these unnecessary wireless data flow, you can configure the "Connect Retry Times" and "Reconnect Time Interval" items. When IP MODEM fail to connect to the center with the configured Retry Time, It will sleep "Reconnect Time Interval" time, then start next retry.

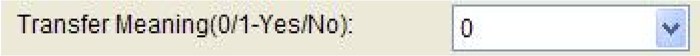
"Connect Retry Times" AT Command:

AT+RETRY=xxx
xxx： times try to connect to the center

"Reconnect Time Interval" AT Command:

AT+RDLWT=xxx
xxx: the sleep time until next retry.

◆ Transfer meanning


Transfer Meaning(0/1-Yes/No): 0

0 --- Yes, enable transfer meaning
1 --- No, disable transfer meaning

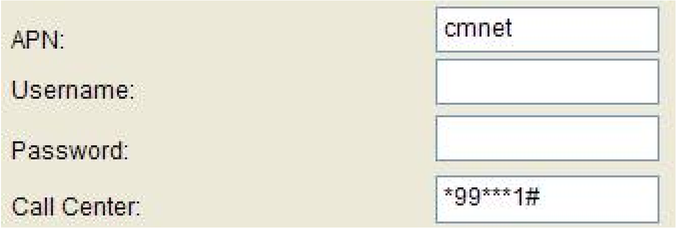
This item is only valid when the WorkMode is PROT. If this item is set to 0, IP MODEM will transfer meaning to 0xfd and 0xfe. To know detail transfer meaning method, please refer <<IP MODEM Transfer Meaning Explanation In the PROT work mode>>. If this item is set to 1, all the transmission is transparent.

AT Command:

AT+STRAIGHT=x
x： 0 or 1

3.5.3 Other Settings

◆ Network


APN: cmnet
Username:
Password:
Call Center: *99***1#

APN:	access point name.
Username:	username to login the ISP network.

Password: password to login the ISP network

Call Center: the call center phone number

Model	APN	Username and password	Call center
F8114	Cmnet	null	*99***1#
F8214	null	card	#777
F8314	cmnet	null	*99***1#
F8414	3gnet	null	*99#
F8514	cmnet	null	*98*1#
F8614	null	card	#777

AT Command of APN:

```
AT+APN=xxxx
  xxxx: access point name
```

AT Command of Username:

```
AT+USERNAME=xxx
  xxx：  username
```

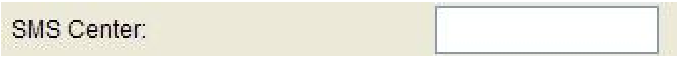
AT Command of Password:

```
AT+PASSWORD=xxx
xxx：  password
```

AT Command of Call Center:

```
AT+CENT=xxx
xxx: call center phone number of  ISP
```

◆ SMS Center



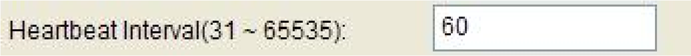
SMS Center:

Your local SMS center number

AT Command:

```
AT+SMSC=xxx
xxx: your local SMS center number
```

◆ Heartbeat Interval



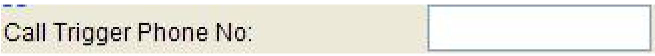
Heartbeat Interval(31～65535): 60

Time interval sent heartbeat packet. (unit is second)

AT Command:

```
AT+POLLTIME=xxx
xxx: heartbeat packet time interval
```

◆ Call Trigger Phone No



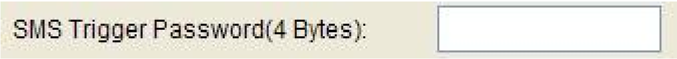
Call Trigger Phone No:

This item is only valid when the "Trigger Type" is CTRL or MIXD. In this trigger type, IP MODEM will keeps in idle state until it receives the trigger phone call, then it will connect to the center.

AT Command:

```
AT+CTRLNO=xxx
xxx : trigger phone number
```

◆ SMS Trigger Password



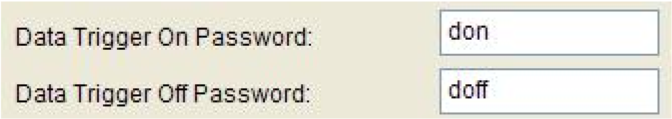
SMS Trigger Password(4 Bytes):

This item is valid only when the "Trigger Type" is SMSD or MIXD, IP MODEM will keeps in idle state until it receives the trigger short message, Then it will connect to the center.

AT Command:

```
AT+SMSDPSWD=xxx
xxx : SMS content to trigger IP MODEM online
```

◆ Data Trigger Password



Data Trigger On Password: don
Data Trigger Off Password: doff

This item is valid only when the "Trigger Type" is DATA or MIXD, IP MODEM will keeps in idle state until it receives the trigger on data, then it will connect to the center, It will return to the idle state when receives trigger off data.

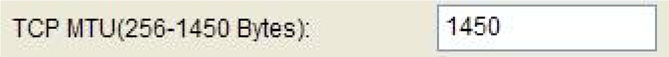
AT Command of Data Trigger On Password:

```
AT+DONPSWD=xxx
xxx : data trigger on password
```

AT Command of data trigger off password:

```
AT+DOFFPSWD=xxx
xxx :data trigger off password
```

◆ TCP MTU



TCP MTU(256-1450 Bytes): 1450

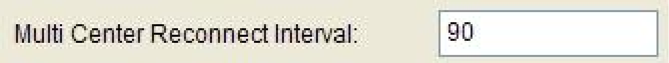
The maximum transmission unit of TCP packet

AT Command:

AT+TCPMTU=xxx

xxx : the MTU value

◆ Multi Center Reconnect Interval



Multi Center Reconnect Interval: 90

This item is valid only when the "Data Center Number" is greater than 1.

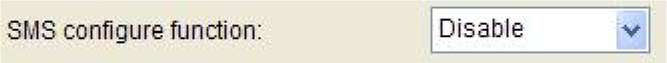
When one of the configured data center lost connection, IP MODEM will try to reconnect after the configured reconnect interval

AT Command:

AT+MCONTIME=xxx

xxx : reconnect time interval (unit is second)

◆ SMS Configure



SMS configure function: Disable

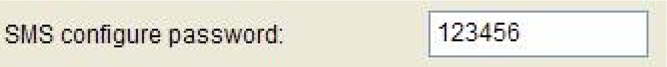
The SMS configure function should be set **Enable** if you want to configure the para of IP MODEM by means of sms. The specific format of the configure message is in the part of 3.6 SMS Config Setting.

AT Command:

AT+SMSCF=x

x = 0/1 0: Disable SMS configure function
1: Enable SMS configure function

Example: AT+SMSCF=1



SMS configure password: 123456

AT Command:

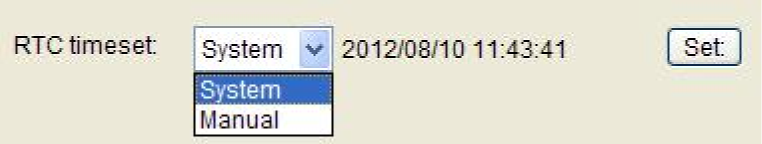
AT+SMSCPW=xxx

xxx: SMS configure password.(Max length is 6)

Example:： AT+SMSCPW=123456

3.5.4 Scheduled Power On/Off Setting

◆ RTC(Real Time Clock) Time Setting



RTC timeset: System 2012/08/10 11:43:41

Click “Set” to ensure the setting

AT Command:

```
AT+EXCCLK="yyyy/mm/dd,HH:MM:SS",W
```

For example:

If the current time is at 12:30 on September 1st,2010, Wednesday, the corresponding at command:

```
AT+EXCCLK="2010/09/01,12:30:00",3
```

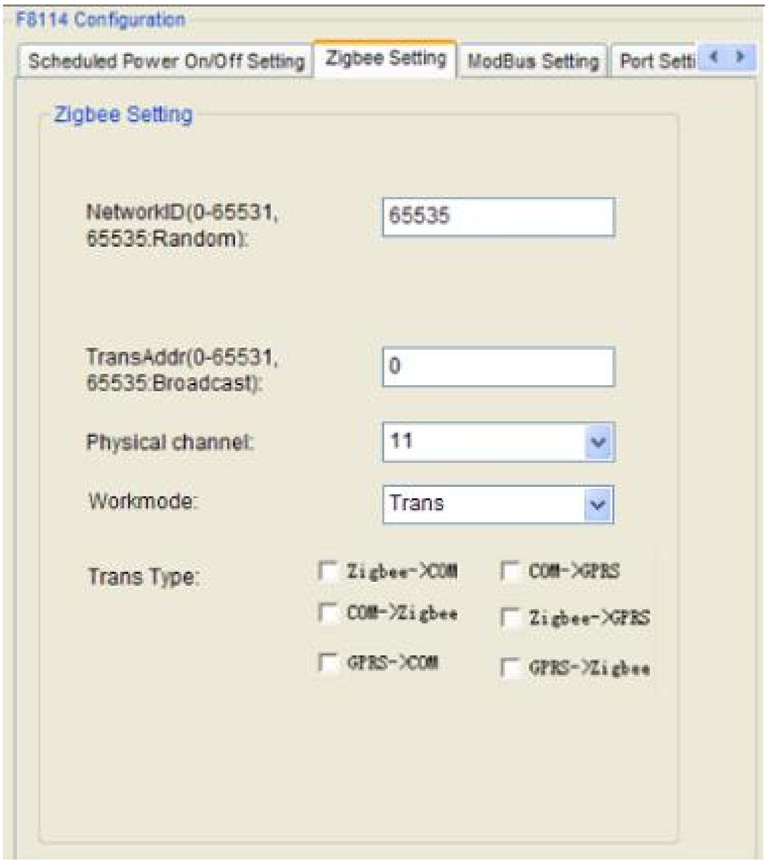
3.5.5 ZigBee Setting

1、It is quite straight-forward to configure your F8X14 devices into a full-mesh-capable device. You should prepare to setup every node with the following common configurations:
    a、An identical RF Channel
    b、An identical MAC Layer Network Identifier (from 0 to 65531,   65535: Random)

2. Now provision a unique MAC Node Identifier into each module. The unique Node Identifier can be selected from the range of 0 to 65531, 65535: Random . Note that Node 0 in a full mesh network does not have any supremacy over other nodes any more. A full mesh network can operate even without Node 0.

3. Turning on devices: For a full mesh network, devices can be turned on at any arbitrary order.

4. Validating connection: you can via any node to start querying the entire crew in the network.



Zigbee Setting

NetworkID(0-65531, 65535:Random): 65535

TransAddr(0-65531, 65535:Broadcast): 0

Physical channel: 11

Workmode: Trans

Trans Type:
☐ Zigbee->COM ☐ COM->GPRS
☐ COM->Zigbee ☐ Zigbee->GPRS
☐ GPRS->COM ☐ GPRS->Zigbee

F8114 Setting Space

◆ NetworkID Setting

The Device has Same Network ID can work in the same Mesh Network.

AT Command:

AT+PID=n

n = 0~65531, 65535: Random

NetworkID(0-65531, 65535:Random): 65535

◆ Transparent Addr Setting

TransAddr(0-65531, 65535:Broadcast): 0

AT Command:

AT+TID =n

n = 0~65531, 65535:Broadcast

Command “AT+TID =65535” means the message transfer with broadcasting mode.

◆ Workmode Setting

Workmode: Trans

Sets of Transfer mode of device.

The information of Trans mode is Transparent transmission.

API mode has protocol format.

AT mode, configuration and sending data by AT command.

AT Command:

```
AT+ZTXTYPE=n
n=0/1/2.    0:   Trans
            1:   API（Data format see appendix a）
            2:   AT
```

◆ Physical Channel Setting

Physical channel: 11

AT Command:

```
AT+ZCHANNEL=n
n = 11~26
```

◆ Trans Type Setting

There are six directions for data transferring as follows,

(1)Zigbgee to COM, data from Zigbgee module will transfer to serial port
(2)COM to Zigbee, data from serial port will transfer to Zigbee module
(3)GPRS to COM, data from remote center will transfer to serial port
(4)COM to GPRS, data from serial port will transfer to remote center
(5)Zigbee to GPRS, data from Zigbgee module will transfer to remote center
(6)GPRS to Zigbee, data from remote center will transfer to Zigbee module

AT Command:

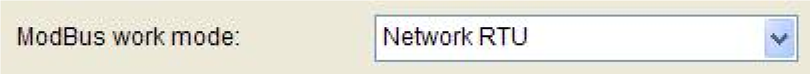
```
AT+ZDATCHAN=dir
```

Tab3.1 zigbee transfer direction

dir	description
0	NONE
1	Zigbee->COM
2	COM->Zigbee
4	GPRS->COM
8	COM->GPRS
16	Zigbee->GPRS
32	GPRS->Zigbee
255	ALL
dir default value is 255	

3.5.6 ModBus Setting

◆Modbus work mode


ModBus work mode: Network RTU

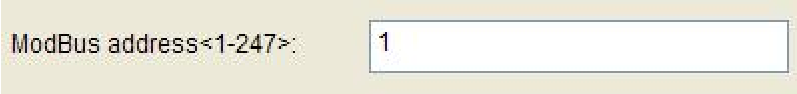
When the modbus's work mode is NetworkRTU, the IP MODEM can distinguish the modbus data sent from server. The modem will gather the data or set the state of port according to the modbus commomd consisted in the data. Then the modem will tranfer the result in modbus protocal form to the server.

AT Command:

AT+MBMODE=x

x = 0/1   0 : Disable MODBUS
               1 : Network RTU

◆Modbus address


ModBus address<1-247>: 1

ModBus address represents the MODBUS device address of IP MODEM itself. The server will find the modem on the basis of this address. Modbus address will work when the Modbus Work mode is Network RTU.

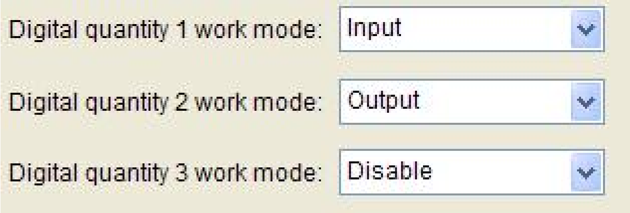
AT Command:

AT+MBADDRESS=x

x= 1~247

3.5.7 Port Setting

◆Digital quantity work mode


Digital quantity 1 work mode: Input
Digital quantity 2 work mode: Output
Digital quantity 3 work mode: Disable

The IP MODEM has 3 digital quantity ports in all, IO1, IO2, IO3. These ports are corresponding with pin 8,9,10. IP MODEM will operate these ports accord to the MODBUS commond received if the Modbus work mode is Network RTU.

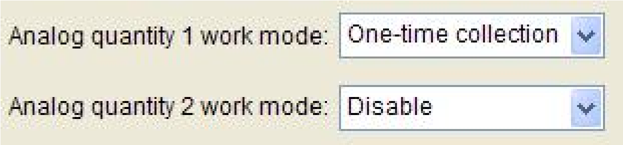
AT Command:

AT+DIOWORKMODE n = x

n = 1/2/3   1: IO1(Pin8)
               2: IO2(Pin9)
               3: IO3(Pin10)
x = 0/1/2   0: Disable
               1: Input

2: Output

◆Analog quantity work mode



Analog quantity 1 work mode: One-time collection

Analog quantity 2 work mode: Disable

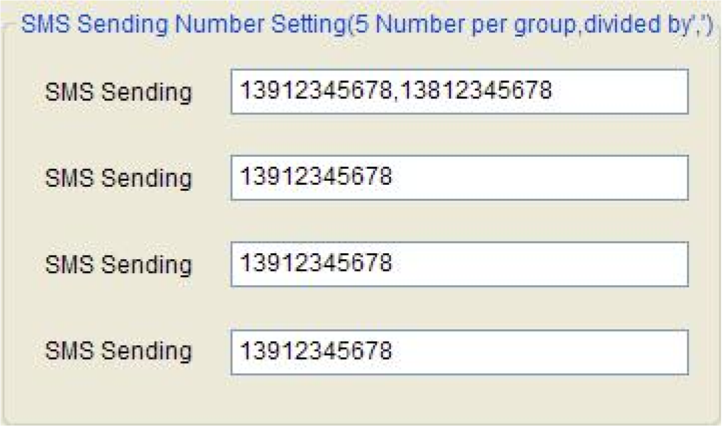
The IP MODEM has 2 analog quantity ports in all, IO4, IO5. These ports are corresponding with pin 11, pin 12. IP MODEM will gather the data of the analog quantity port as the MODBUS commond when the analog quantity work mode is One-time colletion and the Modbus work mode is Network RTU.

AT Command:
AT+ADCMODEn=x
n = 1/2 1: IO4 (Pin11)
2: IO5 (Pin12)

x = 0/1 0: Disable
1:One-time colletion

3.5.8 SMS Setting

◆SMS Sending Number



SMS Sending Number Setting(5 Number per group,divided by',')

SMS Sending 13912345678,13812345678

SMS Sending 13912345678

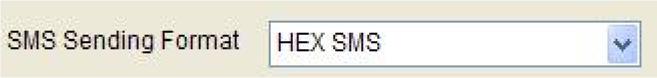
SMS Sending 13912345678

SMS Sending 13912345678

If the network connection fail, IP MODEM will send the data which come from serial port As the content of the messages to the SMS Sending number. (This function is called SMS backup function.) Each group can set 5 numbers at most, divided by ‘,’. Every phone number’ length is 15 characters at most.

AT Command:
AT+PHONEn=xxx
n = 1/2/3/4 1: SMS Sending group 1
2: SMS Sending group 2
3: SMS Sending group 3
4: SMS Sending group 4
xxx: SMS Sending Number
Example: AT+PHONE1=13912345678,13812345678

◆SMS Sending Format

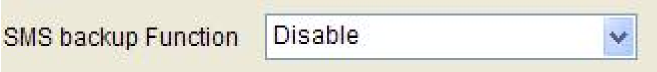


SMS Sending Format HEX SMS

As a general rule, the content of the message is Visible characters or Chinese character. If the SMS Sending Format is HEX SMS, the IP MODEM can send any hexadecimal number of 0x00 to 0xff. HEX sms is Very suitable for the transmission of Industrial control data in the porcess of monitoring to the Industrial control device.

AT Command:
AT+HEXSMS=x
x = 0/1 0: Common SMS
1: HEX SMS

◆SMS backup Function



SMS backup Function Disable

SMS backup function : If the network connection fail, IP MODEM will send the data which come from serial port in messages to the SMS Sending number.

AT Command:
AT+OPENSMSBCKP=x
x = 0/1 0: Disable SMS backup Function
1: Enable SMS backup Function

◆UDP mode lost package instructions

When the udp server disconnect or be shut down, IP MODEM will find the disconnection after some time, 35 seconds at least. In this period of time, the data send to IP MODEM through serial port will not send out in sms. This will cause lost package.So we suggest you use TCP connection.

3.6 SMS Config Setting

If the length of the Configuration messages is more than 140 characters, Please use multiple

SMS messages to send configuration content.

Format of sms configuration:
<Password;Commond 1;Commond 2>

Password: The password should be the same with the SMS configure password in 3.5.3.

Commond: The commond is the AT commond in the 3.5 Configuration and remove the “AT+”. Multiple comomds are divided by semicolons.

Example: <123456;IPAD=120.42.46.98;PORT=5007>
Comment: password 123456, ip address 120.42.46.98, port 5007

3.7 Functions

◆ Clear Output

Clear Output

Clear the output information

◆ Version Display

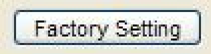
Show the software and hardware version

◆ Signal Value

Signal Value

Display current wireless signal value

◆ Factory setting



Restore to factory settings

◆ Show Config

Show Config

Show current IP MODEM settings

◆ Show Baudrate

Show Bandrate

Display the communication baudrate

◆ Auto Detect

Auto Detect

Simple way to determine whether IP MODEM work fine

◆ Save Output

Save Output

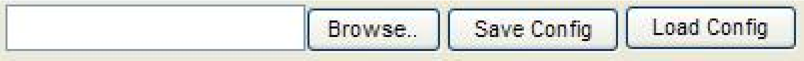
Save the output info to a file

◆ Save Config

Save Config

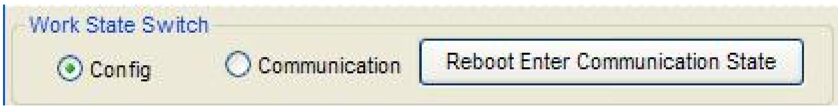
Save the current settings to a file, you can restore it from this file later

◆ Load Config


Browse..
Save Config
Load Config

Load settings from a previous saved configure file

3.8 Work State Switch


Work State Switch
● Config
○ Communication
Reboot Enter Communication State

This tool can work in two states, “Config” and “Communication”

Config:

This state is used to configure parameters of IP MODEM.

Communication:

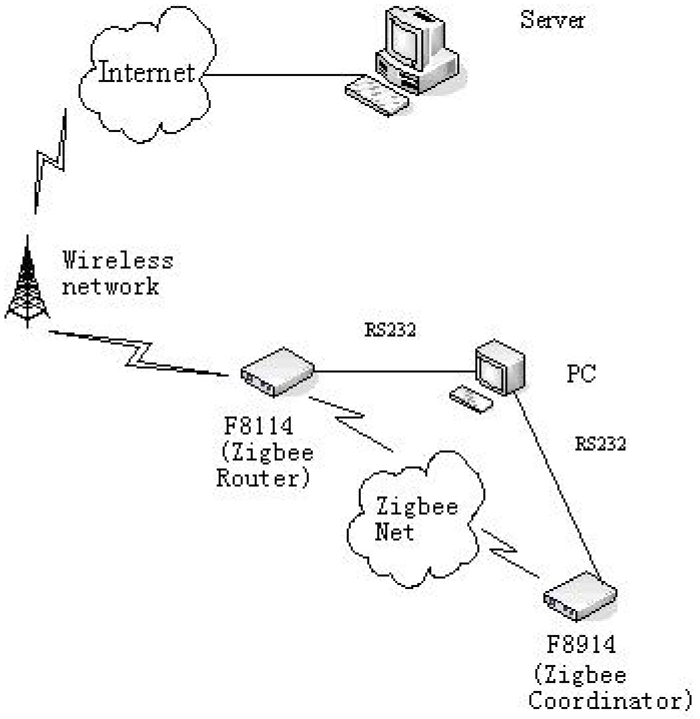
This state is used as a common serial communication tool

Reboot Enter Communication State:

This function button is used to reboot IP MODEM and make the software switch to Communication state

Chapter 4 Data Transfer Testing

4.1 Testing Environment



Server：Data server，run the Server Demo on data server.

Supposed the Server's IP address is **120.42.46.98**，Server Demo listen on port **5007**.

PC：Send data to F8114 and F8914 through RS232，run Serial debug tool.

F8914：As the Coordinator in Zigbee net，it will Build a zigbee network and collect data.

Attention: If there's other F8914 devices in the same zigbee net, please set their device type as Router or Terminal equipment!

The data flow from PC to F8114 (zigbee Router) through F8914 (zigbee Coordinator) is:

PC serial port 2 data →F8914 serial port →F8914's Zigbee protocol stack encapsule the data →send to Zigbee net →Zigbee net to F8114。

The data flow from F8114 to PC through F8914 (zigbee Coordinator) is the reverse transmission process above.

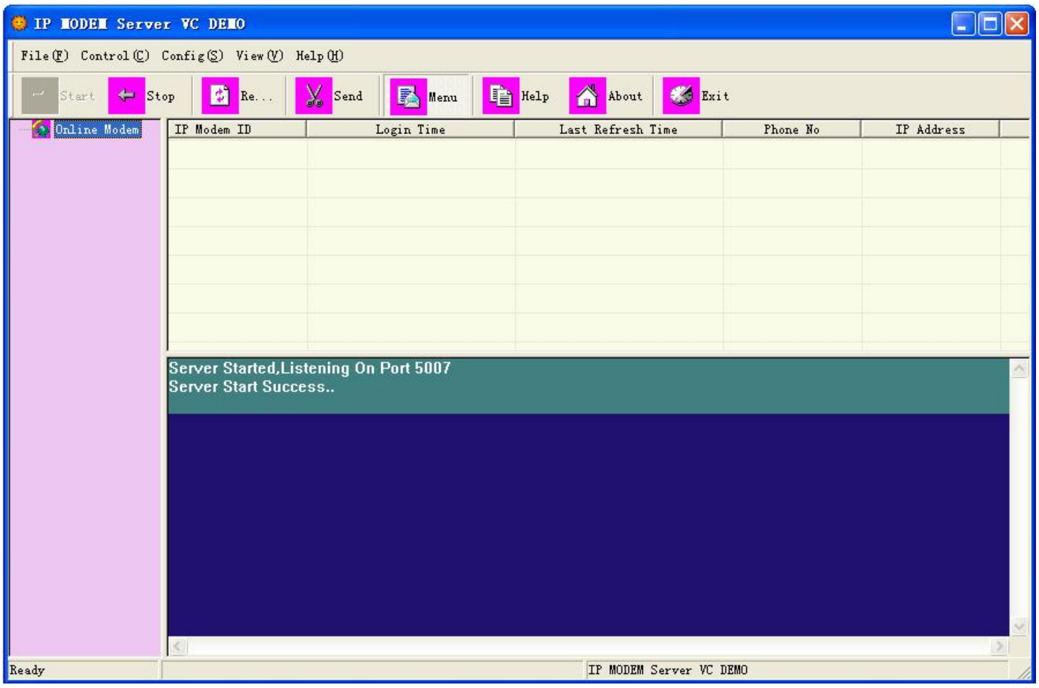
The data flow from PC to Server through F8114 (zigbee Router) is:

PC serial port 2 data → F8114 serial port → F8114 TCP/IP protocol stack encapsule the data → send data to wireless network → wireless network to INTERNET →INTERNET send data to Server.

The data flow from Server to PC through F8114 (zigbee Router) is the reverse transmission process above.

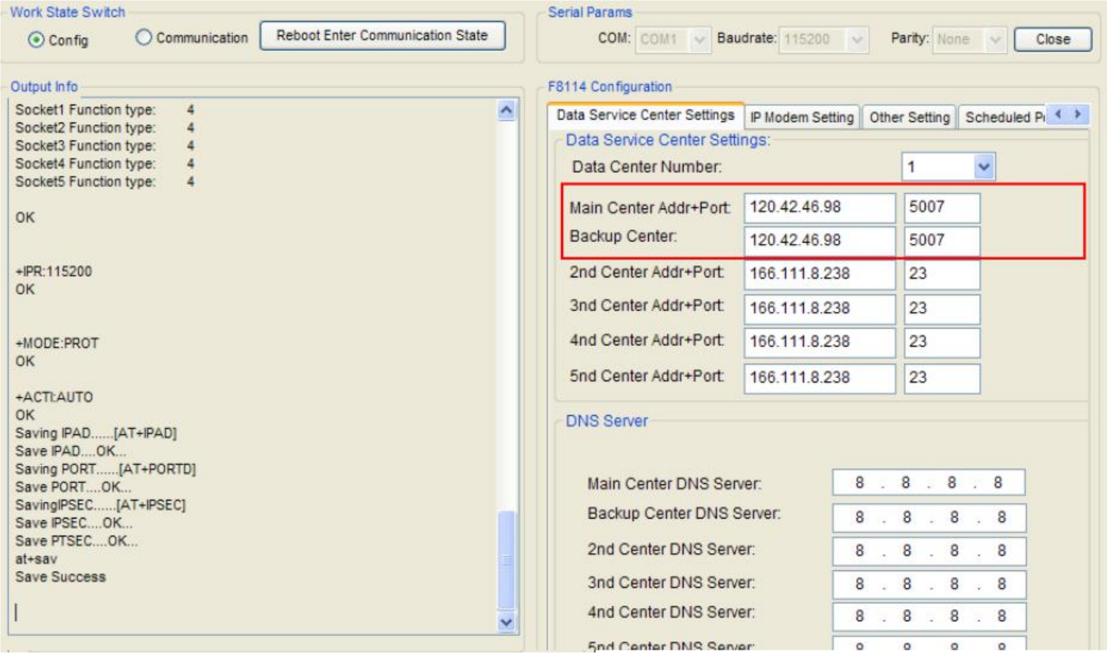
4.2 Testing steps

1. Run the Demo on the Server, click “Start” button on toolbar.
   The demo is listening on port 5007.


IP MODEM Server VC DEMO
File(F) Control(C) Config(S) View(V) Help(H)
Start
Stop
Re...
Send
Menu
Help
About
Exit
Online Modem
IP Modem ID
Login Time
Last Refresh Time
Phone No
IP Address
Ready
IP MODEM Server VC DEMO

Server Started,Listening On Port 5007
Server Start Success..

2. Config the para of IP MODEM，the data server’s ip address is **120.42.46.98**，port is **5007** shown in the red frame below：


Work State Switch
Config
Communication
Reboot Enter Communication State
Serial Params
Close
Output Info
F8114 Configuration
Data Service Center Settings
IP Modem Setting
Other Setting
Scheduled P
DNS Server

COM: COM1 Baudrate: 115200 Parity: None

```
Socket1 Function type:    4
Socket2 Function type:    4
Socket3 Function type:    4
Socket4 Function type:    4
Socket5 Function type:    4

OK


+IPR:115200
OK


+MODE:PROT
OK

+ACTI:AUTO
OK
Saving IPAD......[AT+IPAD]
Save IPAD....OK...
Saving PORT......[AT+PORTD]
Save PORT....OK...
SavingIPSEC......[AT+IPSEC]
Save IPSEC....OK...
Save PTSEC....OK...
at+sav
Save Success
```

Data Service Center Settings:

Data Center Number: 1

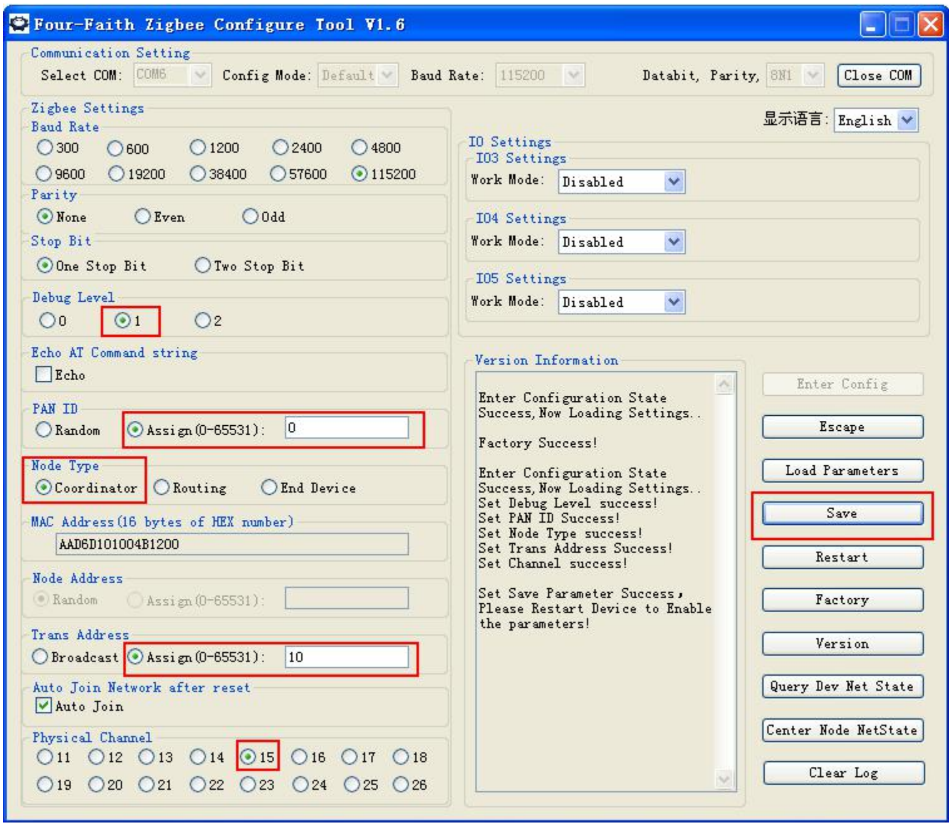
Main Center Addr+Port: 120.42.46.98 5007
Backup Center: 120.42.46.98 5007
2nd Center Addr+Port: 166.111.8.238 23
3nd Center Addr+Port: 166.111.8.238 23
4nd Center Addr+Port: 166.111.8.238 23
5nd Center Addr+Port: 166.111.8.238 23

Main Center DNS Server: 8 . 8 . 8 . 8
Backup Center DNS Server: 8 . 8 . 8 . 8
2nd Center DNS Server: 8 . 8 . 8 . 8
3nd Center DNS Server: 8 . 8 . 8 . 8
4nd Center DNS Server: 8 . 8 . 8 . 8
5nd Center DNS Server:

3. Config ZigBee Para

Set F8114 device type as **Coordinator**，PanID 10，TransAddr 65535（Broadcast），Physical channel 15， Trans Type choose all the direction,

Configure another Zigbee device (For example: F8914) as **Router** in the zigbee net, PAN ID 10, Physical channel 15, Debug level 1, as shown in the red frame below：


Four-Faith Zigbee Configure Tool V1.6
Communication Setting
Close COM
Zigbee Settings
IO Settings
Version Information
Enter Config
Escape
Load Parameters
Save
Restart
Factory
Version
Query Dev Net State
Center Node NetState
Clear Log

Select COM: COM6 Config Mode: Default Baud Rate: 115200 Databit, Parity, 8N1

显示语言: English

Baud Rate: ○300 ○600 ○1200 ○2400 ○4800 ○9600 ○19200 ○38400 ○57600 ●115200

Parity: ●None ○Even ○Odd

Stop Bit: ●One Stop Bit ○Two Stop Bit

Debug Level: ○0 ●1 ○2

Echo AT Command string: ☐Echo

PAN ID: ○Random ●Assign(0-65531): 0

Node Type: ●Coordinator ○Routing ○End Device

MAC Address(16 bytes of HEX number): AAD6D101004B1200

Node Address: ●Random ○Assign(0-65531):

Trans Address: ○Broadcast ●Assign(0-65531): 10

Auto Join Network after reset: ☑Auto Join

Physical Channel: ○11 ○12 ○13 ○14 ●15 ○16 ○17 ○18 ○19 ○20 ○21 ○22 ○23 ○24 ○25 ○26

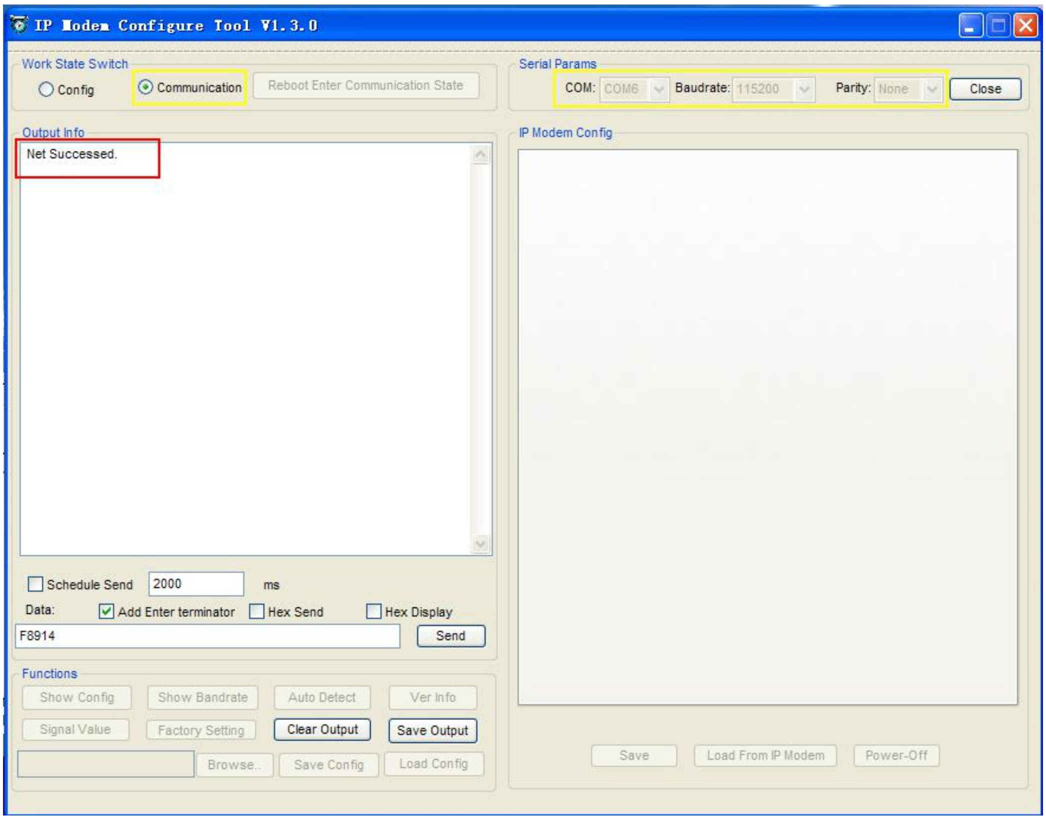
IO3 Settings Work Mode: Disabled
IO4 Settings Work Mode: Disabled
IO5 Settings Work Mode: Disabled

```
Enter Configuration State
Success, Now Loading Settings..

Factory Success!

Enter Configuration State
Success, Now Loading Settings..
Set Debug Level success!
Set PAN ID Success!
Set Node Type success!
Set Trans Address Success!
Set Channel success!

Set Save Parameter Success,
Please Restart Device to Enable
the parameters!
```

4．Close the config tools of F8914 and IP MODEM， run two **IP Modem Configure Tool** on the

PC，connect F8914 to COM6，connect F8114 to COM1.

Attention: Please power on the Zigbee Coordinator device (in this testing is F8914) first. After the info of "Net Successed" is shown on the IP Modem Configure Tool of COM6 and the Online light of F8914 is on, then power on the IP MODEM as Zigbee Router (in this testing is F8114)!!!



IP Modem Configure Tool V1.3.0

Work State Switch: ○ Config ● Communication

Serial Params: COM: COM6 Baudrate: 115200 Parity: None

Output Info:

```
Net Successed.
```

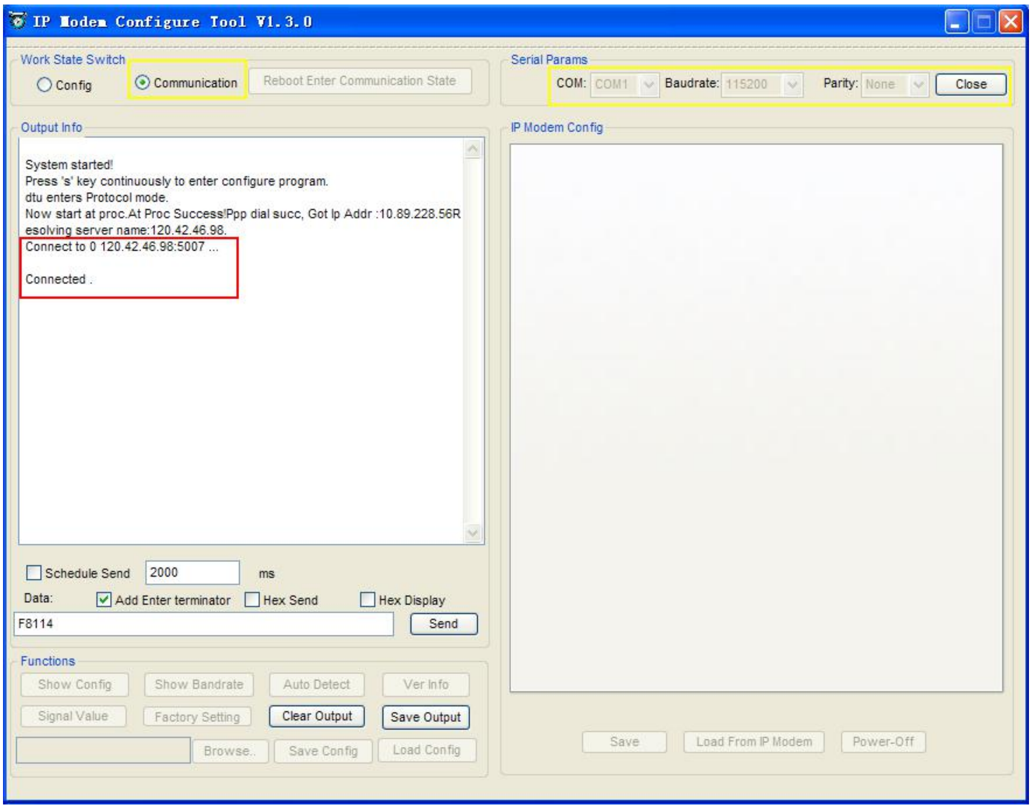
☐ Schedule Send 2000 ms

Data: ☑ Add Enter terminator ☐ Hex Send ☐ Hex Display

F8914

Reboot Enter Communication State
Close
IP Modem Config
Send
Functions
Show Config
Show Bandrate
Auto Detect
Ver Info
Signal Value
Factory Setting
Clear Output
Save Output
Browse..
Save Config
Load Config
Save
Load From IP Modem
Power-Off

5. Confirmed that the IP Modem has installed an usable SIM card, then power on the IP Modem again. If the IP Modem has connected with the Server, it will output the info in the red frame below. The Ip Modem online will appear on the DEMO. The ID number of F8114 is **74736574**.


IP Modem Configure Tool V1.3.0
Work State Switch
Reboot Enter Communication State
Serial Params
Close
Output Info
IP Modem Config
Send
Functions
Show Config
Show Bandrate
Auto Detect
Ver Info
Signal Value
Factory Setting
Clear Output
Save Output
Browse..
Save Config
Load Config
Save
Load From IP Modem
Power-Off

Work State Switch: ○ Config ● Communication

Serial Params: COM: COM1 Baudrate: 115200 Parity: None

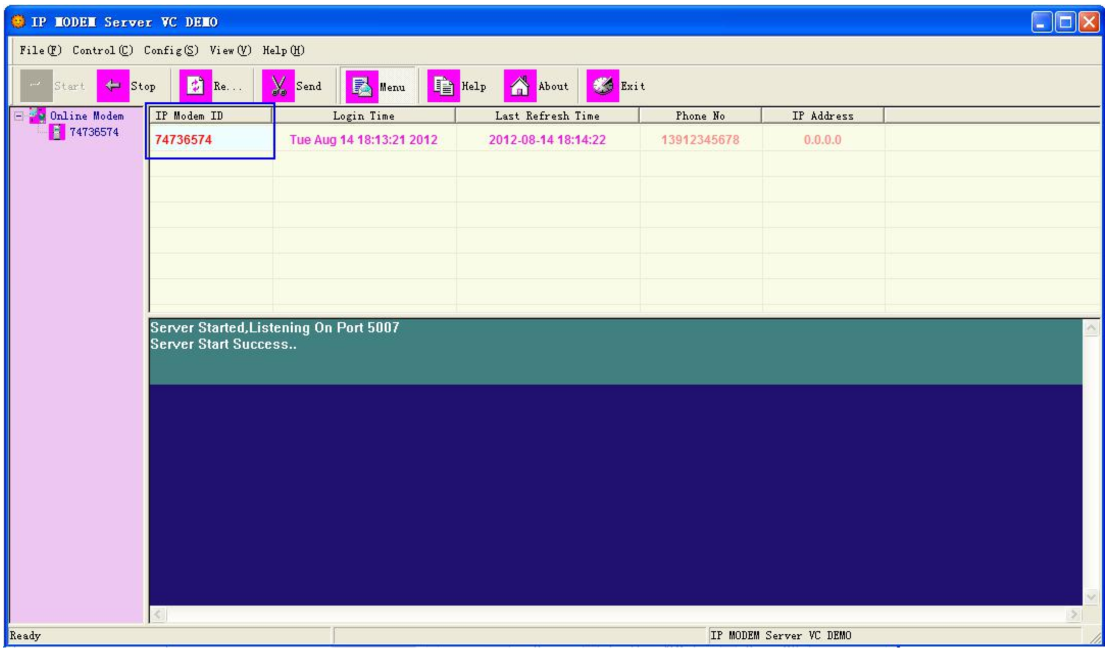
```
System started!
Press 's' key continuously to enter configure program.
dtu enters Protocol mode.
Now start at proc.At Proc Success!Ppp dial succ, Got Ip Addr :10.89.228.56R
esolving server name:120.42.46.98.
Connect to 0 120.42.46.98:5007 ...

Connected .
```

☐ Schedule Send 2000 ms

Data: ☑ Add Enter terminator ☐ Hex Send ☐ Hex Display

F8114

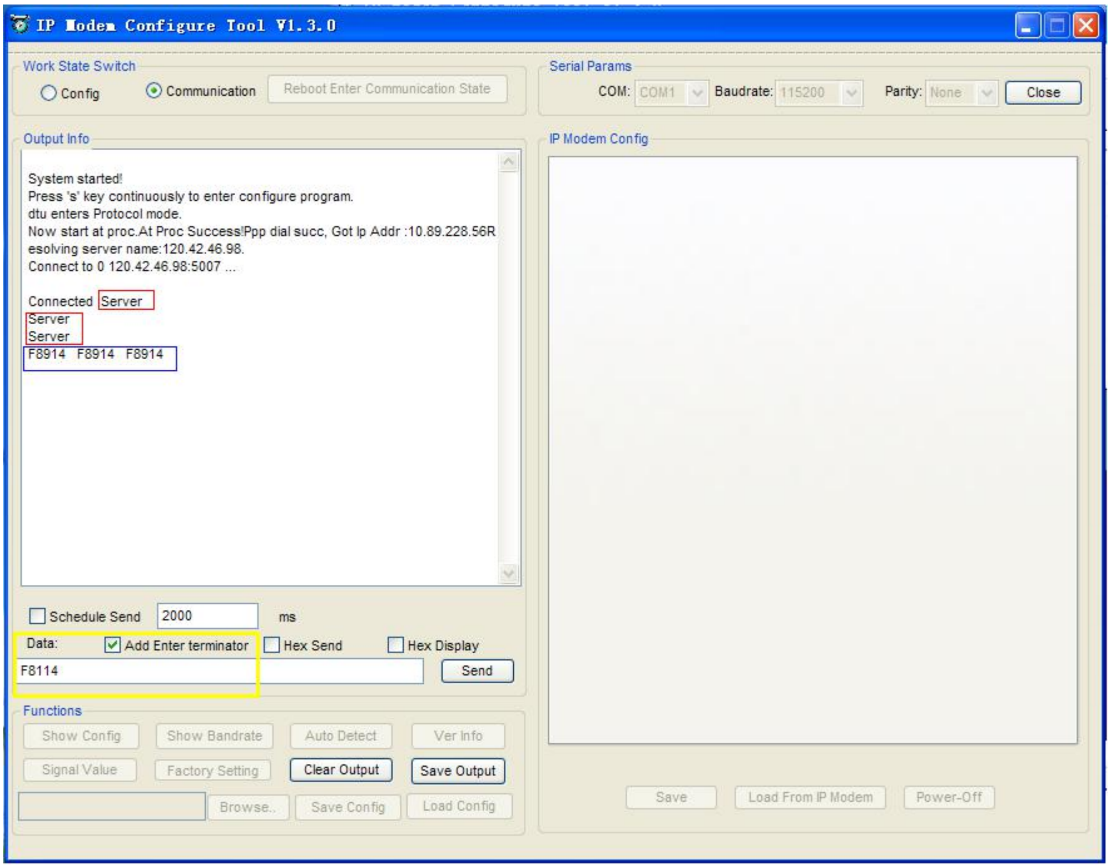
6. DEMO has shown the IP MODEM online, as shown in the blue frame below. The ID number of IP MODEM online is **74736574**. F8114 has logined on the Server successfully.


IP MODEM Server VC DEMO
File(F) Control(C) Config(S) View(V) Help(H)
Start
Stop
Re...
Send
Menu
Help
About
Exit
Online Modem
74736574
Ready
IP MODEM Server VC DEMO

IP Modem ID	Login Time	Last Refresh Time	Phone No	IP Address
74736574	Tue Aug 14 18:13:21 2012	2012-08-14 18:14:22	13912345678	0.0.0.0

```
Server Started,Listening On Port 5007
Server Start Success..
```

7. F8114 has sended “F8114” to Server and F8914 from COM1 as show in the yellow frame below. The data “Server”in the red frame below comes from data server Demo. The data “F8914” in the blue frame below comes from F8914(Zigbee Coordinator).



IP Modem Configure Tool V1.3.0
Work State Switch
○ Config
● Communication
Reboot Enter Communication State
Serial Params
Close
Output Info
IP Modem Config
Functions
Show Config
Show Bandrate
Auto Detect
Ver Info
Signal Value
Factory Setting
Clear Output
Save Output
Browse..
Save Config
Load Config
Save
Load From IP Modem
Power-Off
Send

COM: COM1 Baudrate: 115200 Parity: None

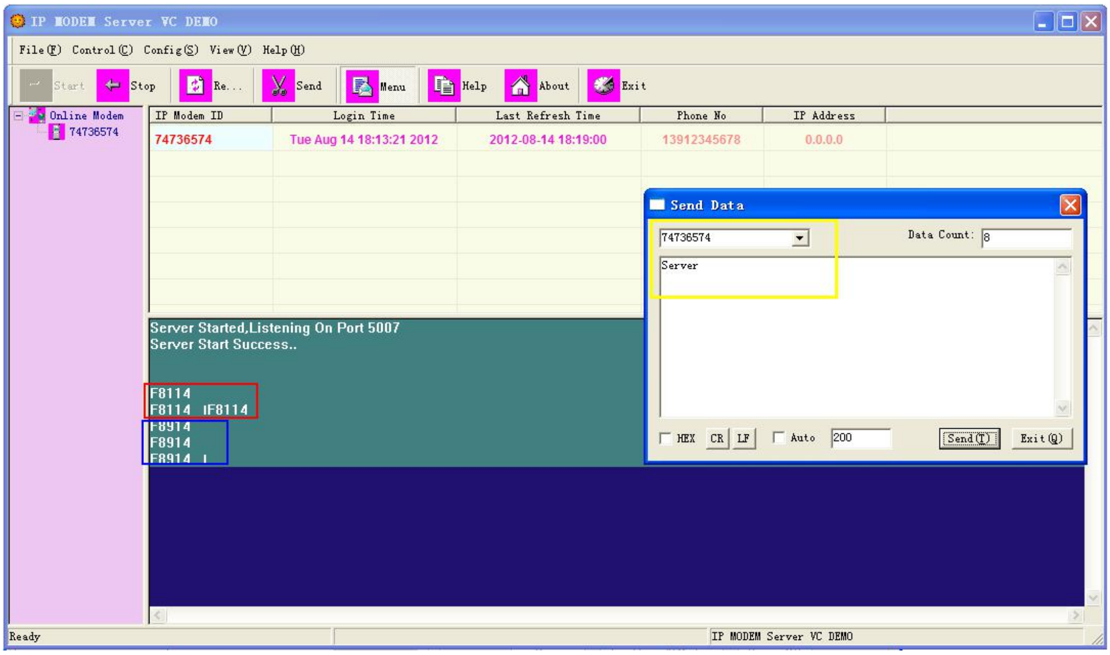
```
System started!
Press 's' key continuously to enter configure program.
dtu enters Protocol mode.
Now start at proc.At Proc Success!Ppp dial succ, Got Ip Addr :10.89.228.56R
esolving server name:120.42.46.98.
Connect to 0 120.42.46.98:5007 ...

Connected Server
Server
Server
F8914  F8914  F8914
```

☐ Schedule Send 2000 ms

Data: ☑ Add Enter terminator ☐ Hex Send ☐ Hex Display

F8114

8. DEMO has sended “Server” to F8114 and F8914 as show in the yellow frame below. The data “F8114”in the red frame below comes from F8114(Zigbee Router). The data “F8914” in the blue frame below comes from F8914(Zigbee Coordinator).

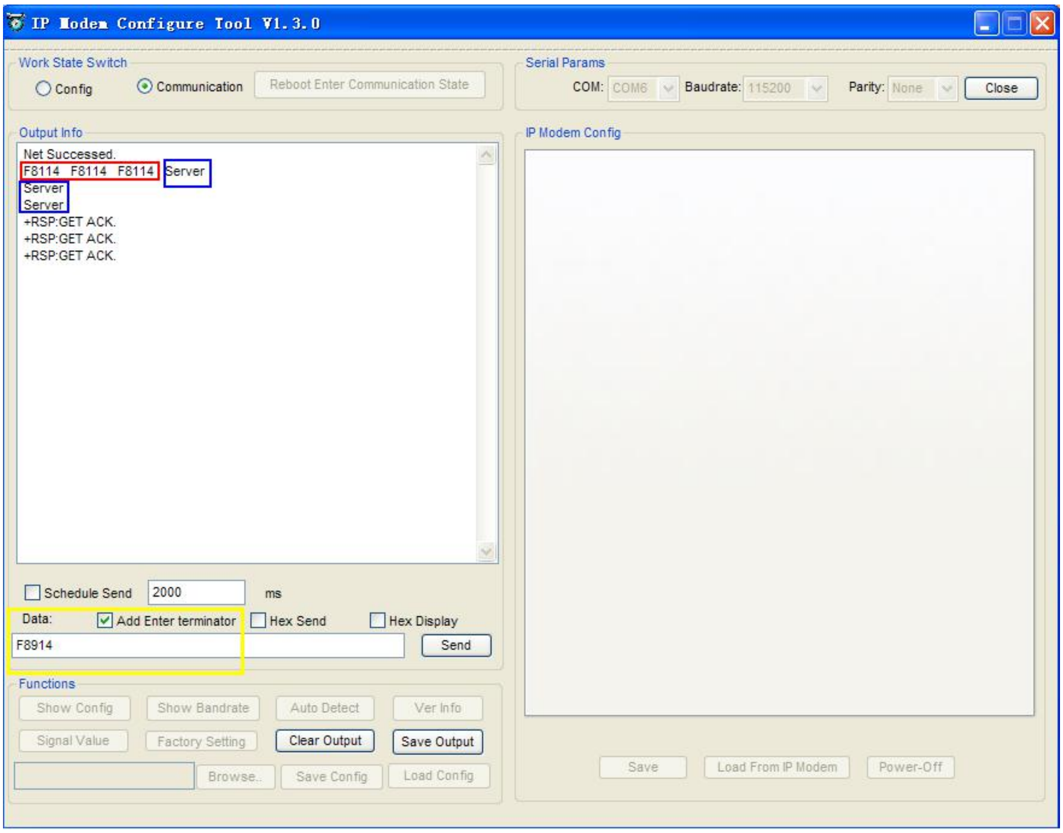

IP MODEM Server VC DEMO
File(F) Control(C) Config(S) View(V) Help(H)
Start
Stop
Re...
Send
Menu
Help
About
Exit
Online Modem
74736574
Send Data
HEX
CR
LF
Auto
Send(T)
Exit(Q)
Ready
IP MODEM Server VC DEMO

IP Modem ID	Login Time	Last Refresh Time	Phone No	IP Address
74736574	Tue Aug 14 18:13:21 2012	2012-08-14 18:19:00	13912345678	0.0.0.0

```
Server Started,Listening On Port 5007
Server Start Success..

F8114
F8114  IF8114
F8914
F8914
F8914  I
```

Send Data: 74736574
Data Count: 8
Server
☐ HEX ☐ Auto 200

9. F8914 has sended “F8914” to F8114 and server as show in the yellow frame below. The data “F8114”in the red frame below comes from F8114(Zigbee Router). The data “Server” in the blue frame below comes from data server DEMO.


IP Modem Configure Tool V1.3.0
Work State Switch
Reboot Enter Communication State
Serial Params
Close
Output Info
IP Modem Config
Send
Functions
Show Config
Show Bandrate
Auto Detect
Ver Info
Signal Value
Factory Setting
Clear Output
Save Output
Browse..
Save Config
Load Config
Save
Load From IP Modem
Power-Off

○ Config ● Communication

COM: COM6 Baudrate: 115200 Parity: None

```
Net Successed.
F8114  F8114  F8114 Server
Server
Server
+RSP:GET ACK.
+RSP:GET ACK.
+RSP:GET ACK.
```

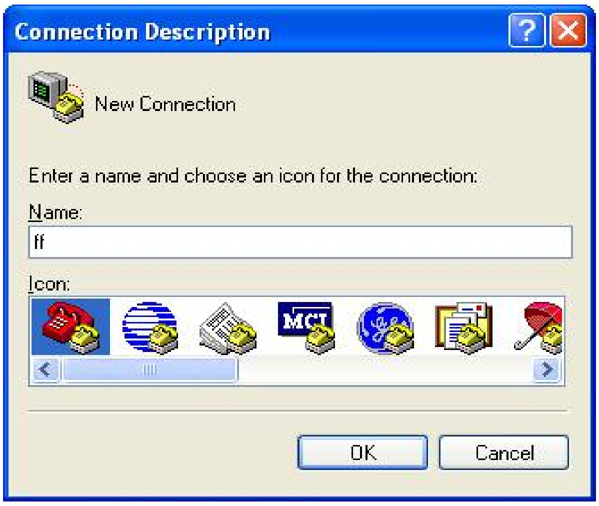
☐ Schedule Send 2000 ms
Data: ☑ Add Enter terminator ☐ Hex Send ☐ Hex Display
F8914

10. In this testing, it has shown that the data server DEMO, F8114 and F8914 can communicate with the two others.

Appendix

The following steps describe how to make IP MODEM enter configure state with the Windows XP Hyper Terminal.

1. Press “Start”→”Programs”→”Accessories”→”Communications”→”Hyper Terminal”



New Connection

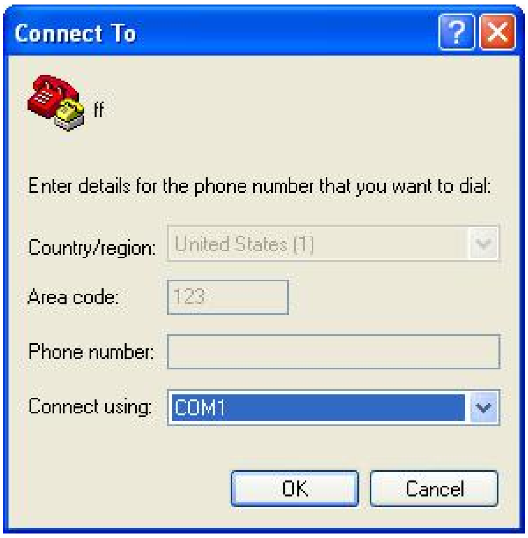
Enter a name and choose an icon for the connection:

Name: ff

Icon:

2. Input connection name, choose “OK”

3. Choose the correct COM port which connect to IP MODEM, choose “OK”



ff

Enter details for the phone number that you want to dial:

Country/region: United States (1)

Area code: 123

Phone number:

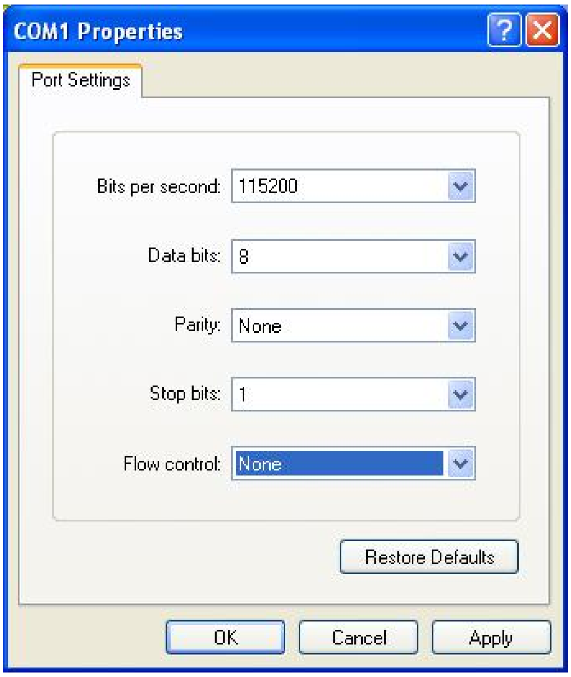
Connect using: COM1

4. Configure the serial port parameters as following, choose “OK”

Bits per second: 115200
Data bits: 8
Parity: None

Stop bits: 1

Flow control: None


COM1 Properties
Port Settings
Restore Defaults
OK
Cancel
Apply

Bits per second: 115200

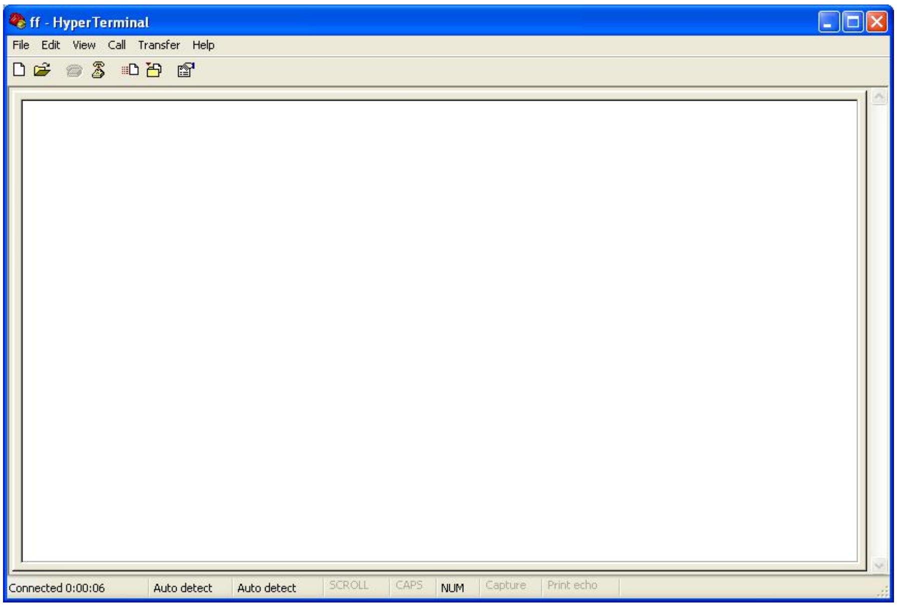
Data bits: 8

Parity: None

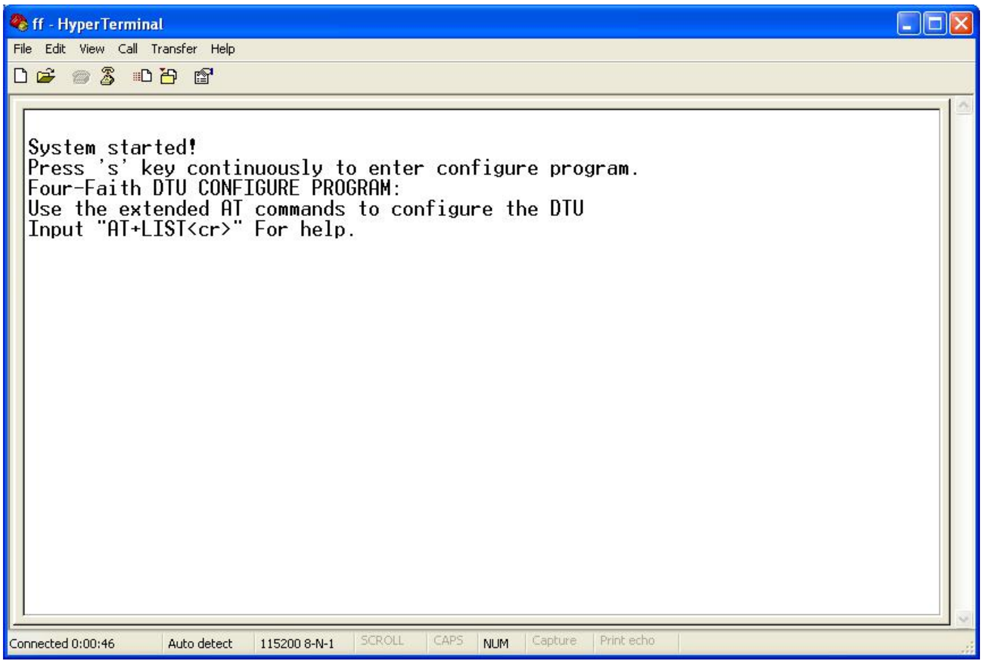
Stop bits: 1

Flow control: None

5. Complete Hyper Terminal operation, It runs as following


ff - HyperTerminal
File Edit View Call Transfer Help
Connected 0:00:06
Auto detect
Auto detect
SCROLL
CAPS
NUM
Capture
Print echo

6. Re-power IP MODEM, put mouse focus on the Hyper Terminal and press “s” key continuously until IP MODEM enter configure state as following



ff - HyperTerminal
File Edit View Call Transfer Help
Connected 0:00:46
Auto detect
115200 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

```
System started!
Press 's' key continuously to enter configure program.
Four-Faith DTU CONFIGURE PROGRAM:
Use the extended AT commands to configure the DTU
Input "AT+LIST<cr>" For help.
```

7. IP MODEM has entered configure state, you can configure the parameters through AT command.

Appendix A Accord Format

The UART data frame structure is defined as follows:

SOF	Length	Command	Frame data	Frame check sequence
1 Byte	1 Byte	2 Bytes	xx Bytes (xx<250)	1 Byte

SOF (Start of Frame): This is a one byte field with value equal to 0xFE that defines the start of each general serial packet.

Length : 1 byte length of the actual data.

Command : 2 byte command Id.

Frame data : the data ranging from 0-250 bytes.

FCS (Frame Check Sequence):

This is a one byte field that is used to ensure packet integrity. This field is computed as an XOR of all the bytes in the message starting with LEN field and through the last byte of data. The following is a sample code FCS calculation:

```
unsigned char calcFCS(unsigned char *pMsg, unsigned char len)
{
    unsigned char result = 0;
    while (len--)
    {
        result ^= *pMsg++;
    }
    return result;
}
```

Attention : The data content should be send with little-endian, the lowest byte come first.

1. Data send command

Send data:

Fields	Sub field	Offset	Example	Description
SOF		1	FE	0xFE
Length		1	06	The length of data
Command	Send	2	24 5F	Fixed to 24 5F
Data	Destination	2	00 00	Destination node address
	Content	<80	41 41 41 41	The content to be send
FCS		1	7D	Frame check sequence

Synchronous response:

Fields	Sub field	Offset	Example	Description
SOF		1	FE	0xFE
Length		1	01	The length of data
Command	Send	2	64 01	64 01 or 64 03
Data	State	1	00	00 = success, Others = error
FCS		1	64	Frame check sequence

2. Data receive command

Receive Data:

Fields	Sub field	Offset	Example	Description
SOF		1	FE	0xFE
Length		1	06	The length of data
Command	Recive	2	44 5F	Fixed to 44 5F
Data	Source	2	10 0E	The sender node address（little-endian）
	Content	<80	41 41 41 41	The content to be recived
FCS		1	03	Frame check sequence