F7X14 Series User Manual

The user manual is suitable for the following model:

Model	Product Type
F7114	GPS+GPRS IP MODEM
F7214	GPS+CDMA IP MODEM
F7414	GPS+WCDMA IP MODEM
F7614	GPS+EVDO IP MODEM

Xiamen Four-Faith Communication Technology Co., Ltd.

Add：Floor 11, Area A06, No 370, chengyi street, Jimei, Xiamen

Tel：+86 592-5907276 Fax:+86 592-5912735

Web:en.four-faith.com

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Note: There may be different components and interfaces in different model, please in kind prevail.

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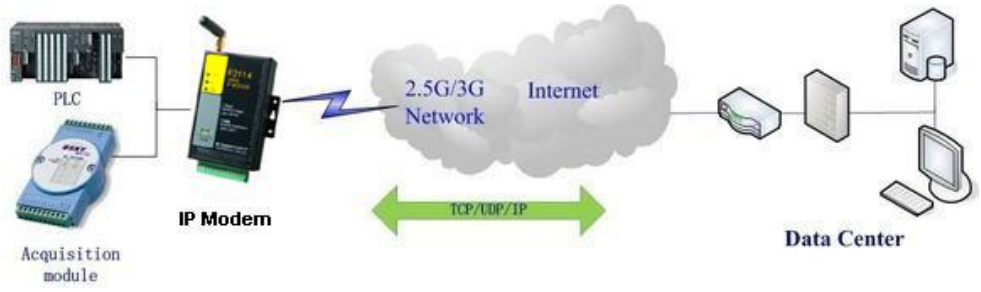
Chapter 1 Brief Introduction of Product

1.1 General

F7X14 series IP MODEM is a kind of cellular terminal device that provides data transfer and GPS function by public cellular network.

It adopts high-powered industrial 32 bits CPU and embedded real time operating system. It supports RS232 and RS485 (or RS422) port that can conveniently and transparently connect one device to a cellular network, allowing you to connect to your existing serial devices with only basic configuration. It has low power consumption states in which the power consumption could be lower 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 GPS 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 scheduled 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

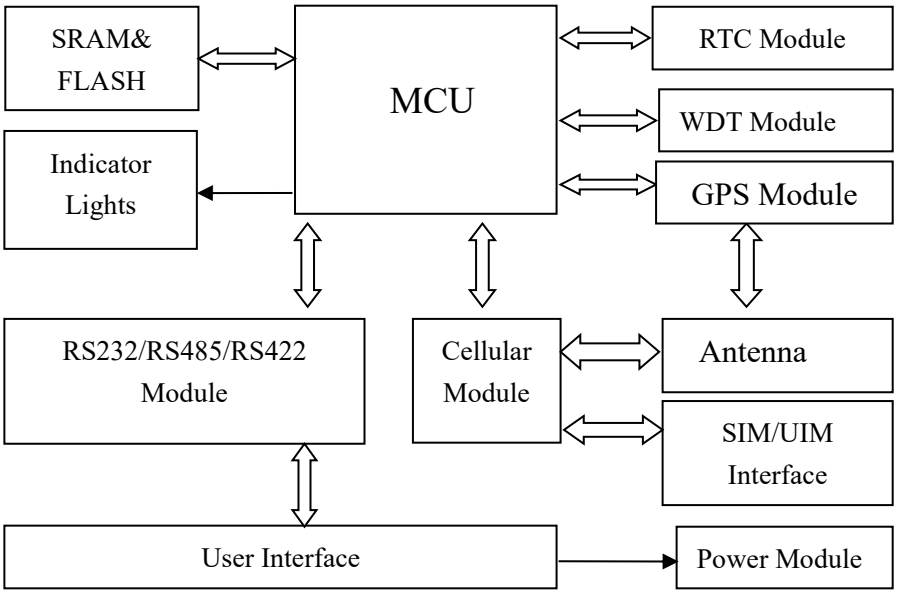
- Adopt terminal block interface, convenient for industrial application
- Support standard RS232 and RS485(or RS422) port that can connect to serial devices directly
- TTL logic level RS232 interface can be customized
- Support intellectual mode, enter into communication state automatically when powered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

High-performance

- Support 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 F7X14 is as following:



1.4 Specifications

Cellular Specification

Item	Content
F7114 GPS+ GPRS IP MODEM	
Standard and Band	EGSM 900/GSM 1800MHz, GSM 850/900/1800/1900MHz(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
F7214 GPS+ CDMA IP MODEM	
Standard and Band	CDMA2000 1xRTT 800MHz, 450MHz(optional)
Bandwidth	153.6Kbps
TX power	<30dBm
RX sensitivity	<-104dBm
F7414 GPS+ WCDMA IP MODEM	
Standard and Band	UMTS/WCDMA/HSDPA/HSUPA/HSPA+ 850/1900/2100MHz, 850/900/1900/2100MHz(optional) GSM 850/900/1800/1900MHz GPRS/EDGE CLASS 12
Bandwidth	DC-HSPA+: Download speed 42Mbps, Upload speed 5.76Mbps HSPA+: Download speed 21Mbps, Upload speed 5.76Mbps HSDPA: Download speed 7.2Mbps, HSUPA: Upload speed 5.76Mbps UMTS: 384Kbps
TX power	<24dBm
RX sensitivity	<-109dBm
F7614 GPS+ EVDO IP MODEM	
Standard and Band	CDMA2000 1X EVDO Rev A 800MHz, 800/1900MHz(optional), 450MHz(optional) CDMA2000 1X EVDO Rev B 800/1900MHz(optional) CDMA2000 1X RTT, IS-95 A/B
Bandwidth	EVDO Rev. A: Download speed 3.1Mbps, Upload speed 1.8Mbps EVDO Rev. B: Download speed 14.7Mbps, Upload speed 5.4Mbps (optional)
TX power	<23dBm
RX sensitivity	<-104dBm

GPS Specification

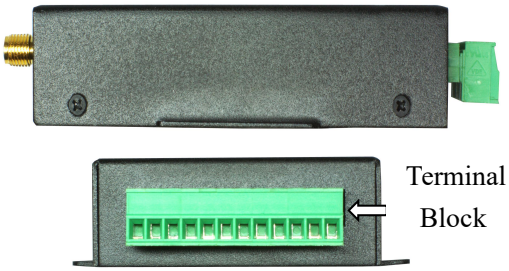
Item	Content
GPS Module	Industrial GPS Module
Receiver Type	50-Channel GPS L1（1575.42MHz）C/A Code SBAS:WAAS，EGNOS，MSAS，GAGAN Compatible: GALILEO
Maximum Navigation Update Rate	4 Hz
Horizontal position accuracy	Autonomous：2.5m CPE SBAS：2.0m CPE
Time-To-First -Fix	Cold Start(Autonomous)：29S Warm Start(Autonomous)：29S Aided Starts：<1S Hot Starts(Autonomous)：<1S
Sensitivity	Tracking & Navigation：-160dBm Reacquisition：-160dBm Cold Start(Autonomous)：-144dBm
Timing Accuracy	RMS：30ns 99%：<60ns Granularity：21ns
Time Pulse Frequency	Configurable 0.25Hz to 1000Hz

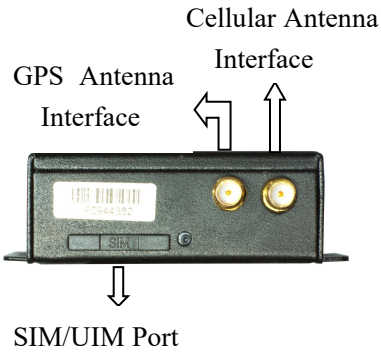
Hardware System

Item	Content
CPU	Industrial 32 bits CPU
FLASH	512KB(Extendable)
SRAM	256KB(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", "GPS"
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	50-90mA@12VDC；115-165mA@5VDC
Standby	25mA@12VDC；45mA@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	-35~+75° C(-31~+167℉)
Storage Temperature	-40~+85° C (-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	
Cellular Antenna	1	
GPS Antenna	1	
Power adapter	1	
RS232 data cable	1	optional
RS485 data cable	1	optional
Manual CD	1	
Certification card	1	
Maintenance card	1	

2.3 Installation and Cable Connection

Dimension: (unit: mm)

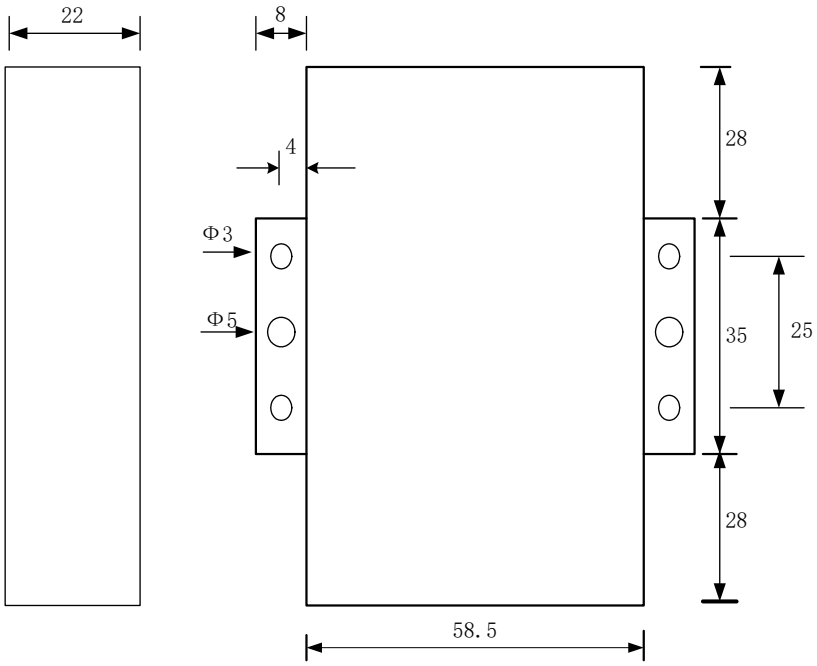


Figure 2-1 Installation Chart

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 cellular antenna to the female SMA interface of the IP MODEM with sign “ANT”.

Screw the SMA male pin of the GPS antenna to the female SMA interface of the IP MODEM with sign “GPS”.

Warning: The cellular antenna and the GPS antenna can not be connected wrongly. And the antennas must be screwed tightly, or the signal quality of antenna will be influenced!

User Interface Signals Define

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

Installation of cable:

F7X14 adopts industrial terminal block interface. The recommendatory cable is 28-16AWG. The details description of standard layout adapter and communication cables is as following:

Adapter（Rating Output 12VDC/0.5A）:

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

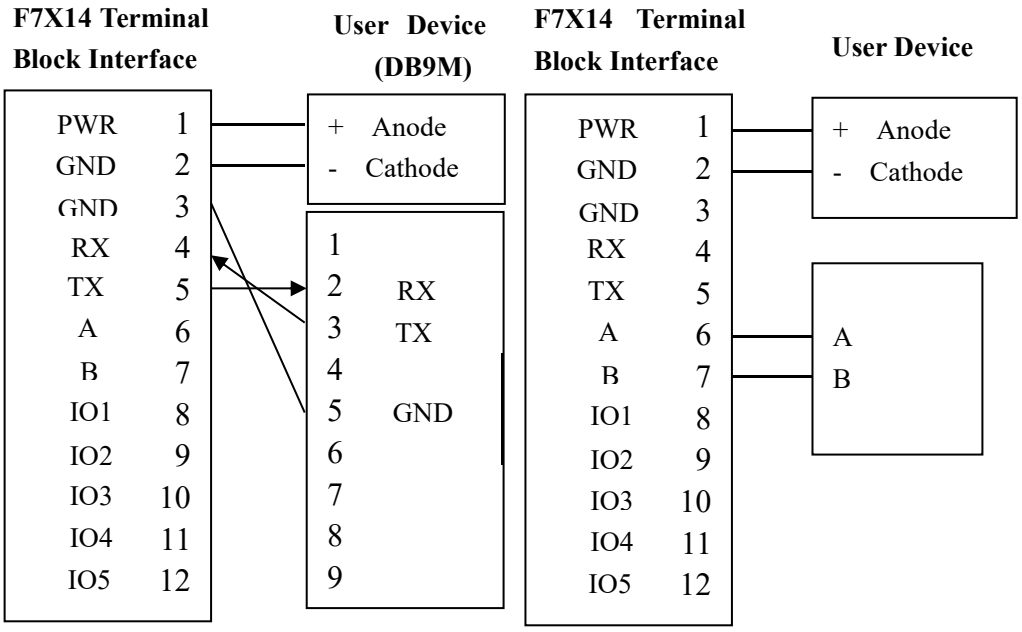
RS232 Cable:

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

RS485 Cable:

Cable Color	Corresponding DB9-M Pin Number
Red	RS485(A)
Block	RS485(B)

Power adapter and communication cable connection chart as following:



Communication Interface: RS232 **Communication Interface: RS485**

2.4 Power

The power range of the IP MODEM is DC 5~35V

Warning: When we use other power, we should make sure that the power source 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”, “GPS”.

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
GPS	ON	GPS data is communicating
	OFF	No GPS data is communicating

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

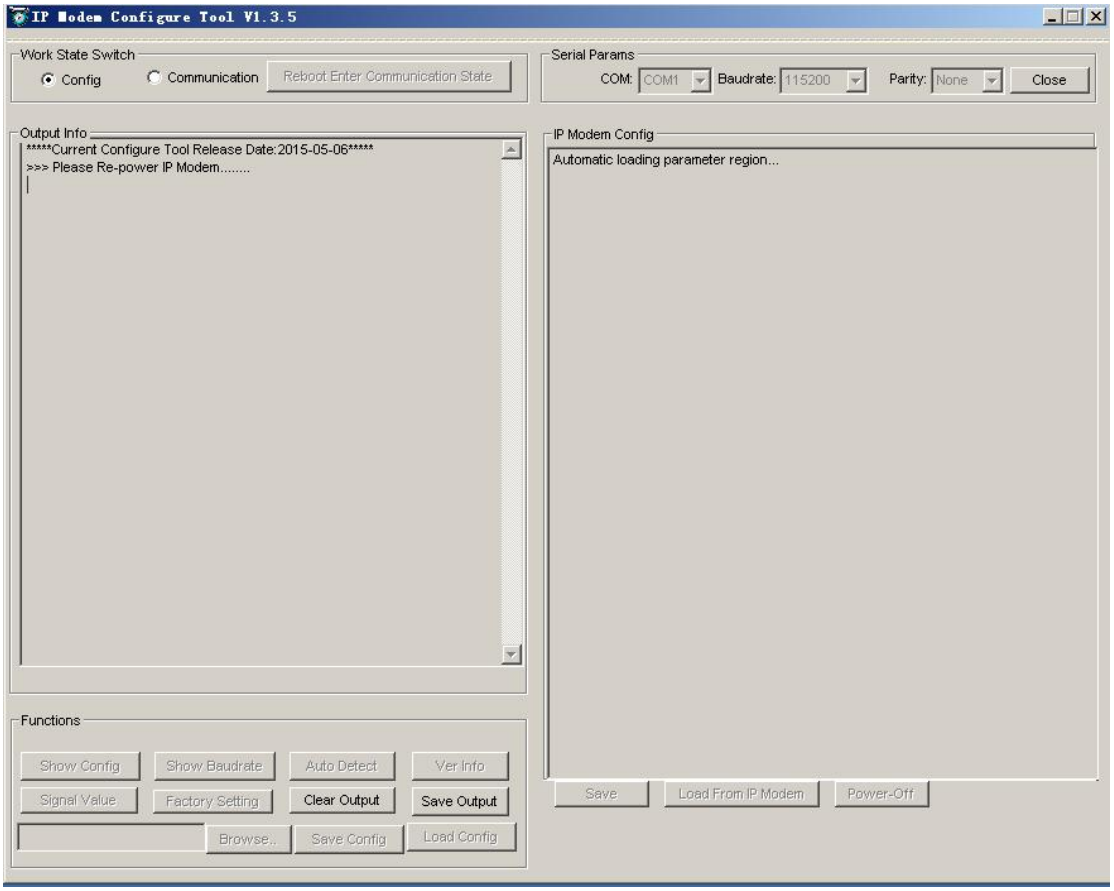
There are two ways to configure the IP MODEM:

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

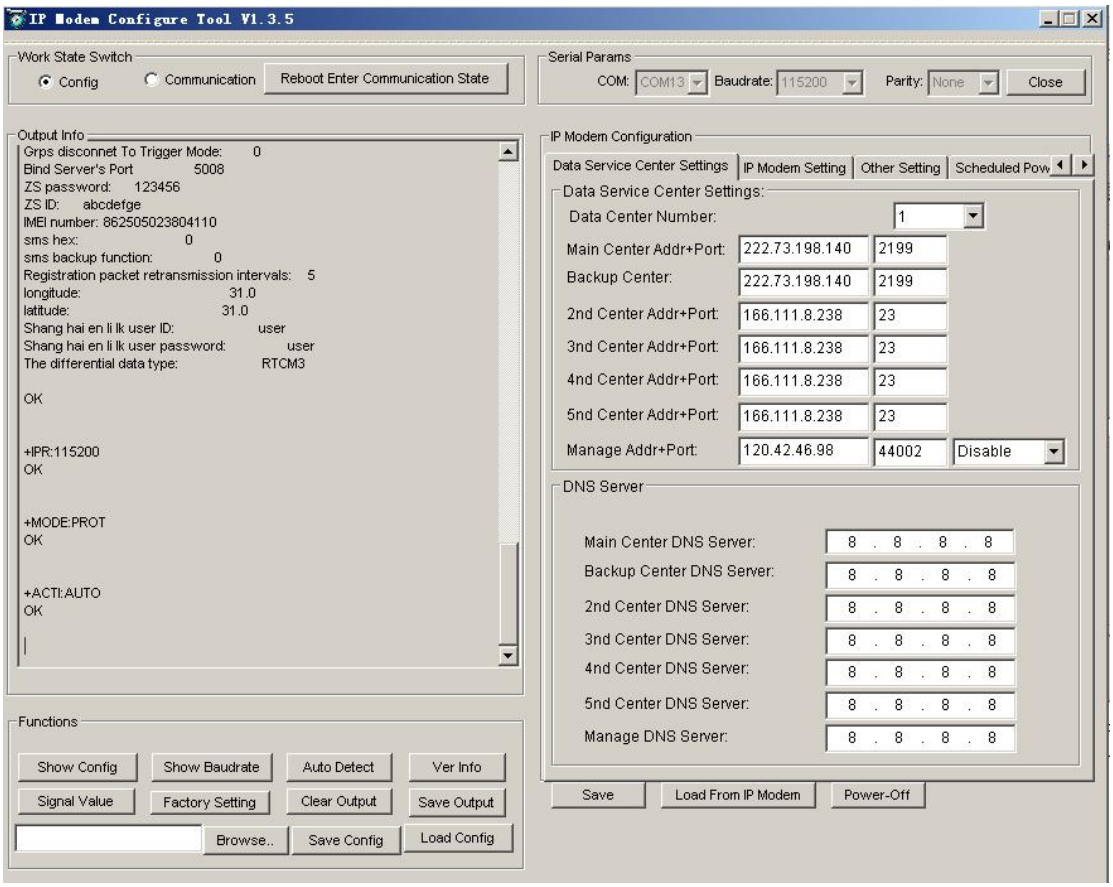


The “Serial Parameters” column shows the current serial port settings. To configure IP MODEM, please choose the correct serial port which connects to IP MODEM, and the baud-rate is 115200 with no parity, then open the serial port. If the button text is “Close”, it shows the serial port now has been opened.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



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

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

Note：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 .

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

GPS data transmission DSC is self-governed. Setting details please reference the section 3.5.5.

AT command:

AT+SVRCNT=x

x: Data Service Center number

Note: 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.

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

AT command of the Backup DSC IP address or domain

AT+IPSEC=xxx

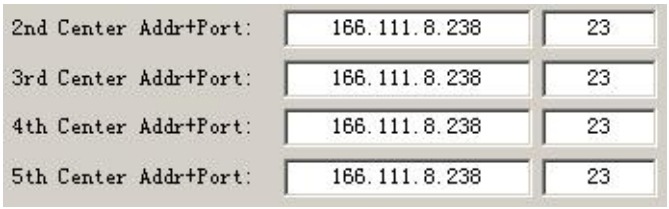
xxx: The IP address or domain name

AT command of the Backup DSC port

AT+PTSEC=xxx

xxx: The port value

Multi DSC Configuration



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

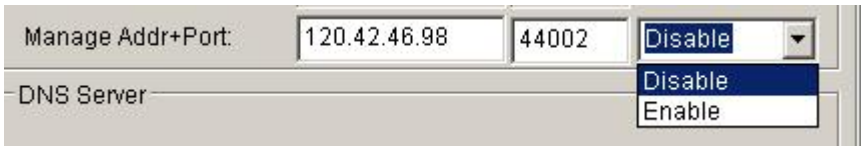
Example:

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

◆Manage Addr+Port



IP MODEM management platform is mainly used to remote configuration, remote upgrade equipment, as well as the equipment location tracking and positioning.

The expansion of the IP MODEM management platform of IP or domain name AT commands are:

AT+DTUMANAIP=xxx

XXX as the center of the domain name or IP address

the expansion of the IP MODEM management platform port AT commands are:

AT+DTUMANAPORT=xxx

XXX is a center of port number

Not all of the terminals are need management platform, so can choose to enable or disable

IP MODEM management platform.After disable IP MODEM will not go to the address of the connection Settings.

The expansion of the IP MODEM management platform to enable or disable the AT command are:

AT+CONNTOMANA=x

When x is 0 disables equipment management platform;

When x is 1 enabled equipment management platform;

◆ Main and Backup Center DNS Server

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

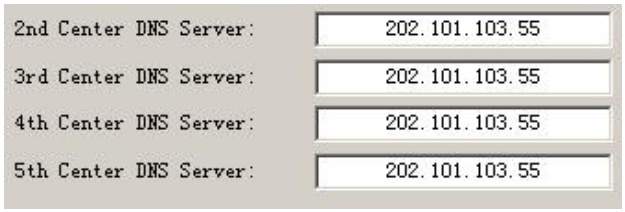
aaa.bbb.ccc.ddd: The DNS server IP address(must be IP address）.

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.

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 WorkkMode

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.

TUDP: Heartbeat with UDP protocol, Data transmission with UDP protocol, Heartbeat packet and application data are in the same UDP connection.

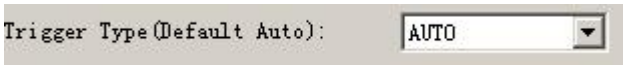
TCST： User can set custom register and heartbeat string, Data transmission with TCP protocol.

AT command:

AT+MODE=xxxx

xxxx: one of the above workmode

◆ Trigger Type



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

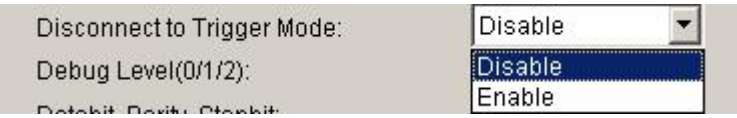
MIXD: the combination of SMSD, CTRL, DATA. IP MODEM will be online when meet one of these three trigger methods.

AT Command:

AT+ACTI=xxxx

xxxx: one of the above trigger methods

◆ Disconnect To Trigger Mode



The only effective under the trigger mode except of AUTO.When IP MODEM connection is disconnected with all center will re-enter after trigger mode.

AT Command of the After disconnection re-enter trigger mode:

AT+ISTRIGMODE=x

When x is 0 not enabled to re-enter the trigger mode;

When x is 1 enabled to re-enter the trigger mode;

◆ Debug Level

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

Note: 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

8N1 --- 8 Databit, No parity, 1 Stopbit
8E1 --- 8 Databit, Even parity, 1 Stopbit
8O1 --- 8 Databit, Odd parity, 1 Stopbit

AT Command:

AT+SERMODE=xxx
xxx: one of the above serial mode

◆ Communication Baudrate

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

◆ Free time before network offline

IP MODEM connected to the center, in a set time, no center and IP MODEM upload data, IP

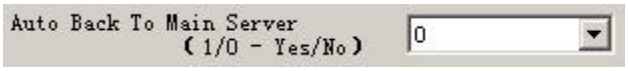
MODEM active disconnected with the center.When the setting time of 0, the function is invalid.

AT Command of the Free time before network offline:

AT+DTUNORECMINU=x

X is 0 to 65535 (minutes)

◆ Auto Back To Main Server



0 --- No

1 ---Yes

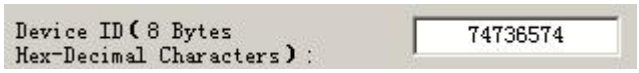
This item is only valid when you set “Data Center Number” as 1. In this mode, IP MODEM will switch to backup center when main center have problems. If this item is set to 1 , IP MODEM will check whether the main center work fine timely. When it detects the main server work fine, it will return back to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

AT Command:

AT+RETMAIN=x

x : 0 or 1

◆ Device ID



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

The phone number of the SIM card .

AT Command:

AT+PHON=xxxxxxxxxx

xxxxxxxxxx: the SIM card phone number

◆ Bytes Interval

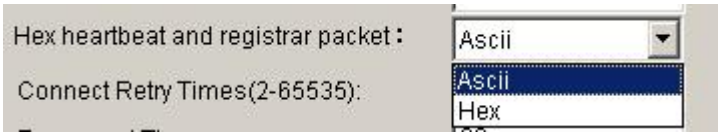
The time interval used to determine whether the serial data frame transmission has completed, IP MODEM will send the serial data to the center when two bytes transmit time interval larger than this item value.

AT Command:

AT+BYTEINT=xxx

xxx: bytes interval time value（millisecond）

◆ Hex heartbeat package registered package



This item is only valid when the WorkMode is TCST.Used to configure a custom heartbeat packets and custom registration packet content, specific as follows:

ASCII: The string, the input and uploaded to the center of the same content.

hex：Hexadecimal string.for example: Enter 313233, reported value is: 123

AT Command of the Hex heartbeat package registered package：

AT+HEXLOGIN=x

0： ASCII;

1： hex;

note：1. Hexadecimal input must be an even number of characters, and in the 0-9 or a - f or a - f within the scope of the three groups.

2. When after modify the parameters of the custom heartbeat package with custom registration package to reset again.

◆ 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

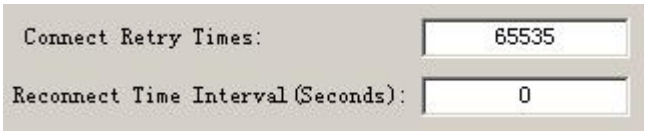
◆ Custom Heartbeat String

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



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.

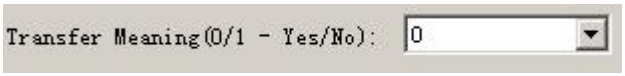
"Connect Retry Times" AT Command:

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



0 --- Yes, enable transfer meaning

1 --- No, disable transfer meaning

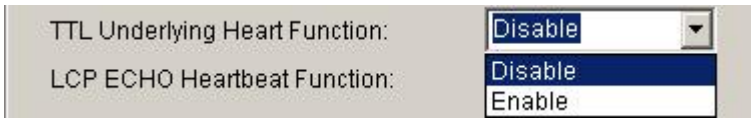
This item is only valid when the WorkMode is PROT. If this item is set to 0, IP MODEM will transfer meaning to 0xfd and 0xfe. To know detail transfer meaning method, please refer <<IP MODEM Transfer Meaning Explanation In the PROT work mode>>. If this item is set to 1, all the transmission is transparent.

AT Command:

AT+STRAIGHT=x

x：0 or 1

◆ TTL lower heartbeat mechanism



Only the IP MODEM is effective in server mode or UDP mode.If you enable this function will be judged by TTL heartbeat IP MODEM IP MODEM online status.

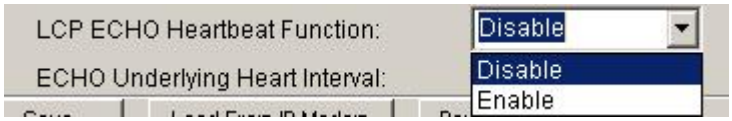
“TTL lower heartbeat mechanism” AT Command:

AT+EXFUN=x

When x is 0 to disable the TTL heartbeat mechanism

When x is 3 open TTL heartbeat mechanism

◆ LCP ECHO heartbeat mechanism



This is IP MODEM in LCP layer a heartbeat detection mechanism。

“LCP ECHO heartbeat mechanism” AT Command:

AT+ECHOENABLE=x

When x is 0 to disable the LCP ECHO heartbeat mechanism

When x is 1 open the LCP ECHO heartbeat mechanism

◆The ECHO of the underlying heartbeat interval

This layer for IP MODEM in LCP heartbeat detection mechanism of the heartbeat interval。
“The ECHO of the underlying heartbeat interva” AT Command:

AT+ECHOINT=x
X is 1 ~ 65535

3.5.3 Other Settings

◆ Network

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
F7114	Cmnet	null	*99***1#
F7214	null	card	#777
F7314	cmnet	null	*99***1#
F7414	3gnet	null	*99#
F7514	cmnet	null	*98*1#
F7614	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

Your local SMS center number

AT Command:

AT+SMSC=xxx

xxx: your local SMS center number

◆ Heartbeat Interval

Time interval sent heartbeat packet. (unit is second)

AT Command:

AT+POLLTIME=xxx

xxx: heartbeat packet time interval

◆ 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

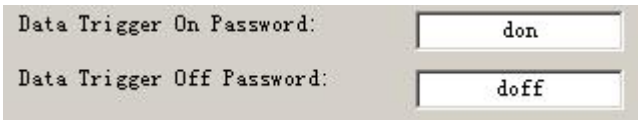
This item is valid only when the “Trigger Type” is SMSD or MIXD, IP MODEM will keeps in idle state until it receives the trigger short message, Then it will connect to the center.

AT Command:

AT+SMSDPSWD=xxx

xxx : SMS content to trigger IP MODEM online

◆ Data Trigger Password



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

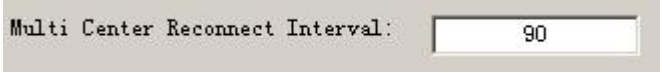
The maximum transmission unit of TCP packet

AT Command:

AT+TCPMTU=xxx

xxx : the MTU value

◆ Multi Center Reconnect Interval



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)

◆ Setting by AT command of SMS

When parameters configuration using this way, the length of SMS should not more than 140 bytes, It means that does not support long SMS.
Note: When parameters configuration using this way, the contents of setting must not include a semicolon.
The following format:
<password;command1;command2…>
password: This is a valid setting command, when this password is the same as the password at “SMS Configure PassWord”.
command: one sms can include multiple commands. AT command remove AT+ remaining command. This command is AT command of SMS. Multiple commands are separated by a semicolon.
…: This symbol indicates that one sms can include multiple commands.

For example: <123456;IPAD=120.42.46.98;PORT=5007>
Explanation: password is 123456, main center IP is 120.42.46.98, main center port is 5007.

SMS setting response as following:
setting successful: DTU will send one response SMS to user. SMS content: command(Corresponding settting command): Configure successful.
setting failed: DTU will send one response SMS to user, SMS content: command(Corresponding settting command): Configure failed.

AT Command:
AT+SMSCF=x
When the x configuration parameter to 0 to disable the messages
When the x configuration parameter to 1 to enable messages

◆ SMS Configure PassWord

This is the configuration parameter password configuration text messages.

AT Command:

AT+SMSCPW=xxx

xxx ： To set the password, the maximum length of 6

3.5.4 Scheduled Power ON/OFF Setting

◆ RTC(Real Time Clock) Time Setting

Click “

” to ensure the setting

AT Command:

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

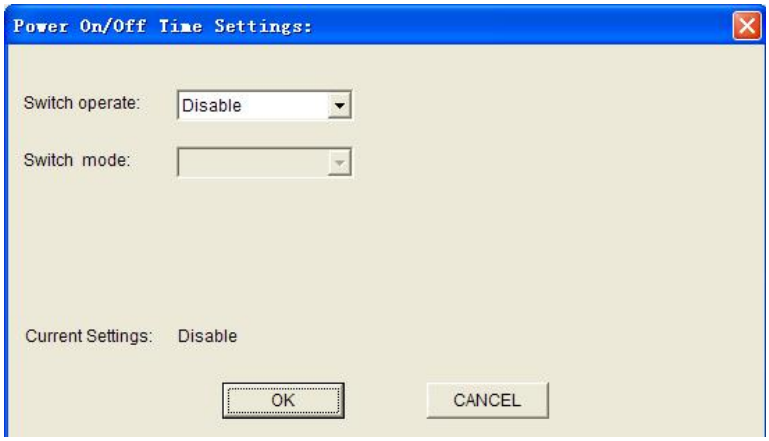
For example:

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

◆ Power On/Off Setting

Press “Set” you will see the follow window, you can do the setting.



AT Command:

AT+EXCALx=<options>[, <value1>[,<value2>[,<value3>]]]

Options:

D -- Disabled. Scheduled Power On/Off function is disabled (Default).

O – On. Set the IP Modem power on time.

S – Shut Down. Set the IP Modem power off time.

Setting type, [IP] use for power on, C use for power off

T -- Time. Set the action time point.

H -- per Hour. Set a time point of every hour

D -- per Day. Set a time point of every day

W -- per Week. Set a time point of every week

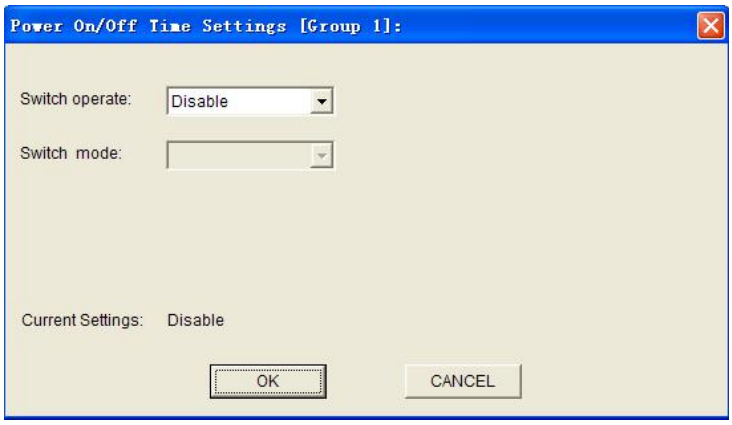
M -- per Month. Set a time point of every month

I -- Interval. Set the time interval.

P -- Power always on.

C -- Count down. Set the count down length.

1. Disable

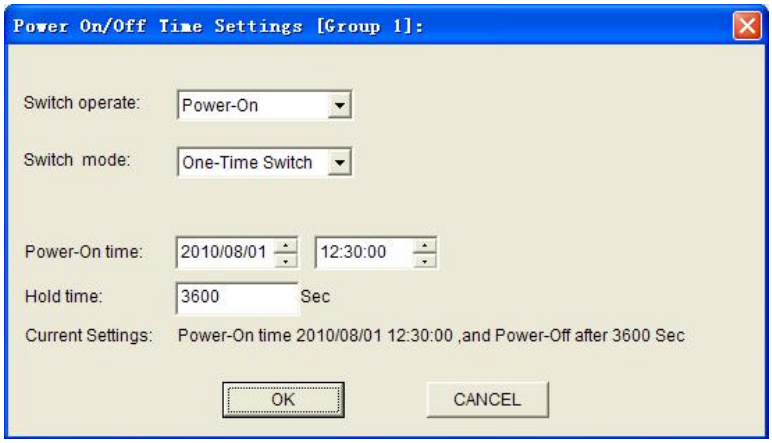


AT Command:

AT+EXCALx=D

Note: There is no blank in this AT command, the same as followings.

2. On-time switch power on



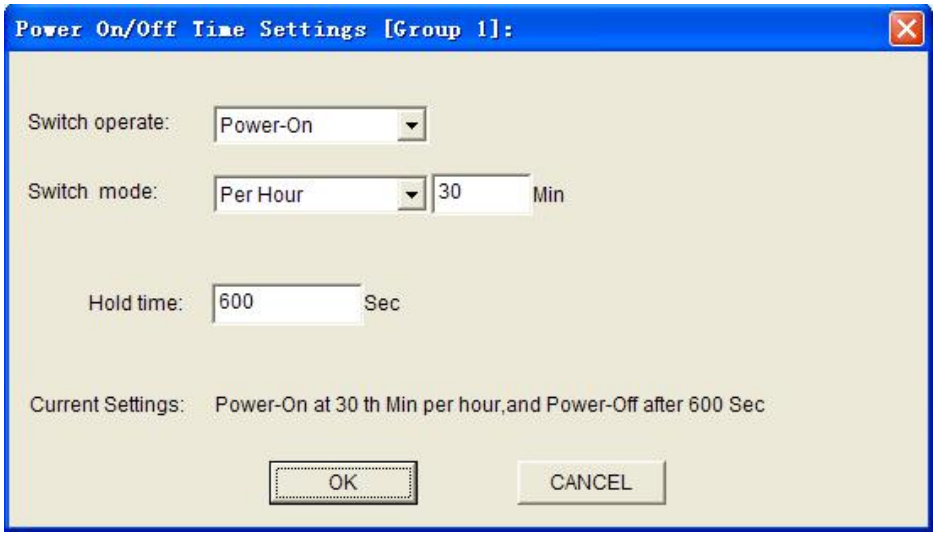
AT Command

AT+EXCALx=OT,<strLongTime>,<holdTime>
<strLongTime>: Format "2010/08/01,12:30:00"
<holdTime>: Hold time value.(Unit:Second)

For example:
IP Modem power on at 12:30:00, and power off at 13:30:00 on August 1st,2010

AT+EXCAL5=OT,"2010/08/01,12:30:00",3600

3. Power on per hour



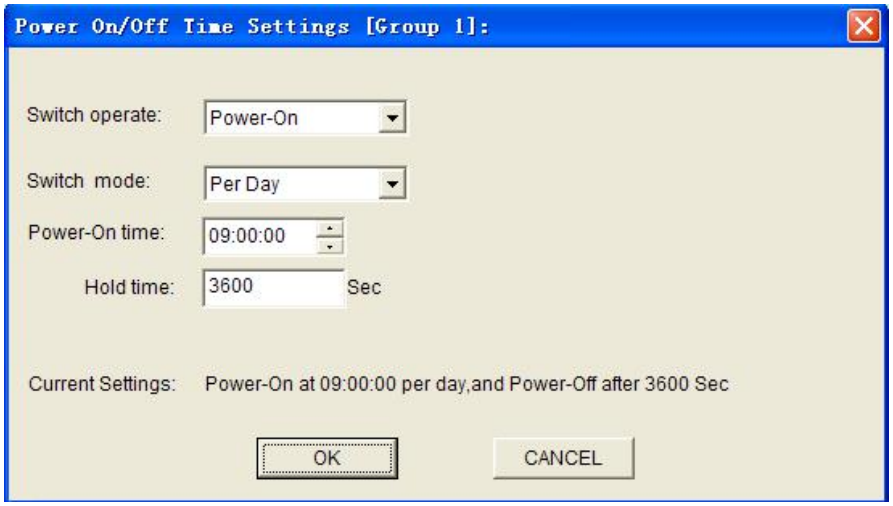
AT Command:

AT+EXCALx=OH,<strTime>,<holdTime>
<strTime>: Format "00:30:00"
<holdTime>: Hold time value.(Unit:Second)

For example:
IP Modem power on at the 30th minute in every hour, and power off 10 minutes later.

AT+EXCAL1=OH,"00:30:00",600

4.Power on per day



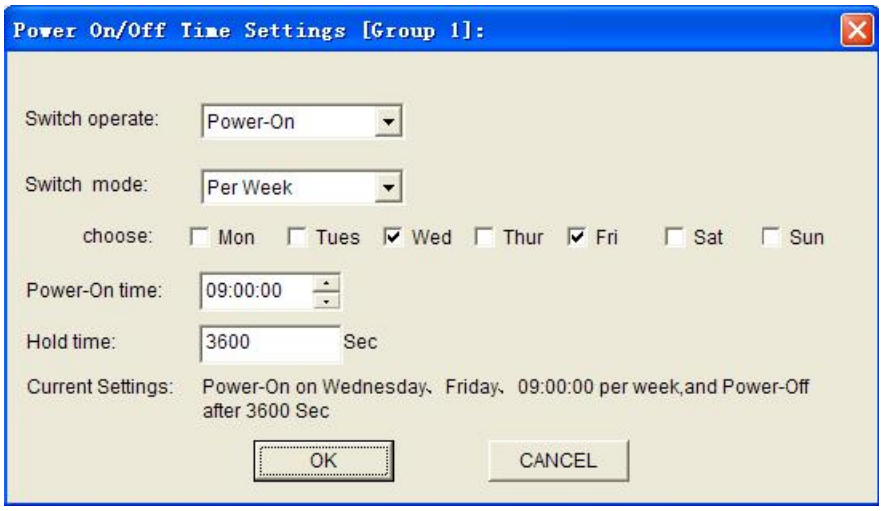
AT Command:

AT+EXCALx=OD,<strTime>,<holdTime>
<strTime>: Format "12:30:00"
<holdTime>: Hold on value(Unit:Second)

IP Modem power-On at 09:00:00 everyday, and power-off 1 hour later.

AT+EXCAL3=OD,"09:00:00",3600

5.Power on per week



AT Command:

AT+EXCALx=OW,<week>,<strTime>,<holdTime>

<week>: 0123456 replace to Sunday, Monday, Tuesday, Wednesday, Thursday, Friday and Sunday ordinal.

<strTime>: Format "12:30:00"

<holdTime>: Hold time value(Unit:Second)

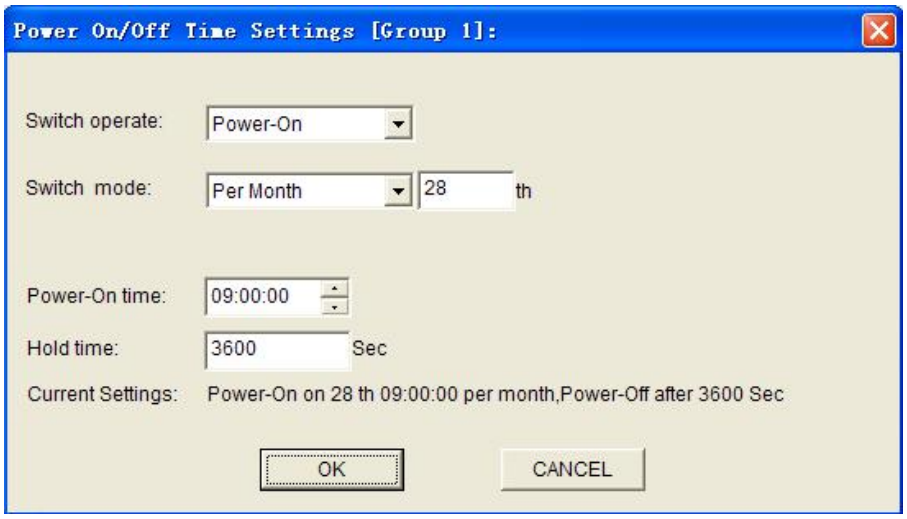
For example:

IP Modem power on at 09:00:00 on every Wednesday and Friday, and power off 1 hour later.

AT+EXCAL1=OW,35,"09:00:00",3600

The “35” replace to Wednesday and Friday.

6.Power on per month



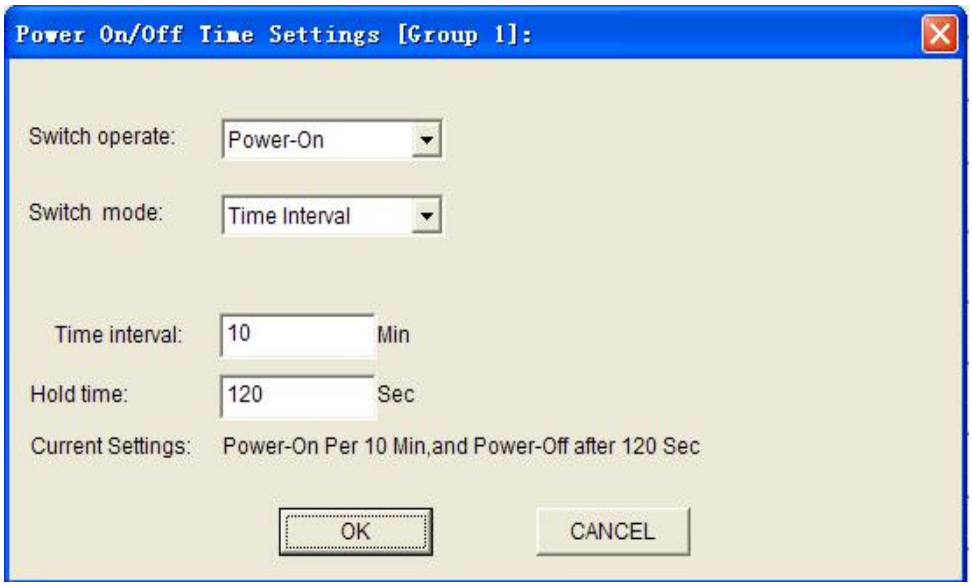
AT Command:

AT+EXCALx=OM,<date>,<strTime>,<holdTime>
<date>: 0-31
<strTime>: Format "12:30:00"
<holdTime>: Hold time value(Unit:Second)

For example:
IP Modem power on at 09:00:00 on the 28th every month,and power off 1 hour later.

AT+EXCAL3=OM,28,"09:00:00",3600

7.Power on with time interval



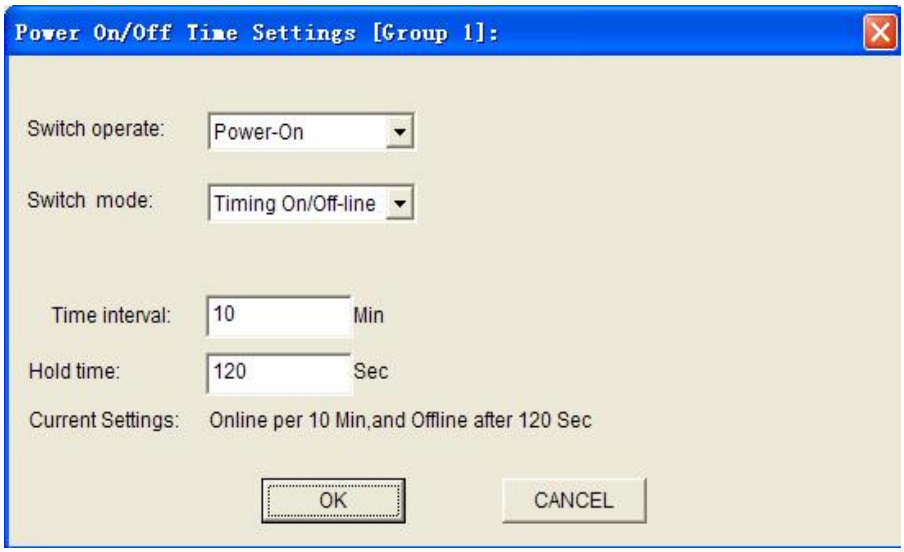
AT Command:

AT+EXCALx=OP,<intervalTime>,<holdTime>
<intervalTime>: interval time value(Unit:Minute)
<holdTime>: Hold time value(Unit:Second)

For example:
IP Modem power on interval every 10 minutes, and power off 120 seconds later.

AT+EXCAL1=OP,10,120

8.IP Modem online/offline with time interval



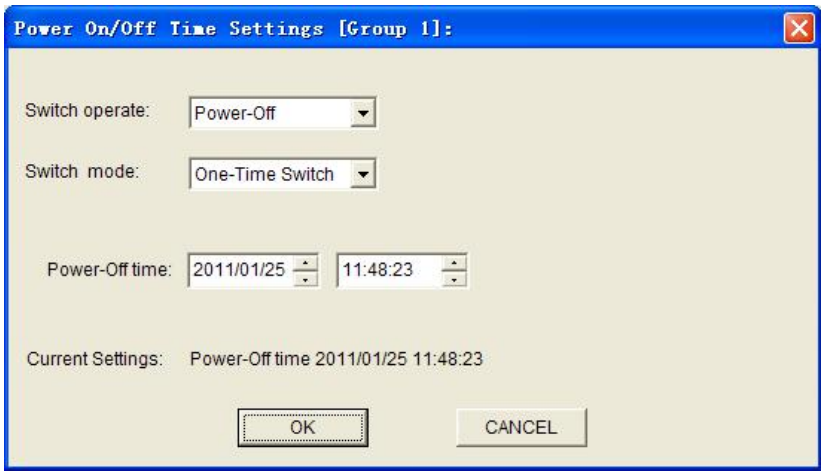
AT Command:

AT+EXCALx=OP,<intervalTime>,<holdTime>
<intervalTime>: interval time value(Unit:Minute)
<holdTime>: Hold time value(Unit:Second)

For example:
IP Modem online interval every 10 minute, and offline 120 seconds later.
AT+EXCAL1=OP,10,120

Note: IP Modem not power off in this mode, it is standby.

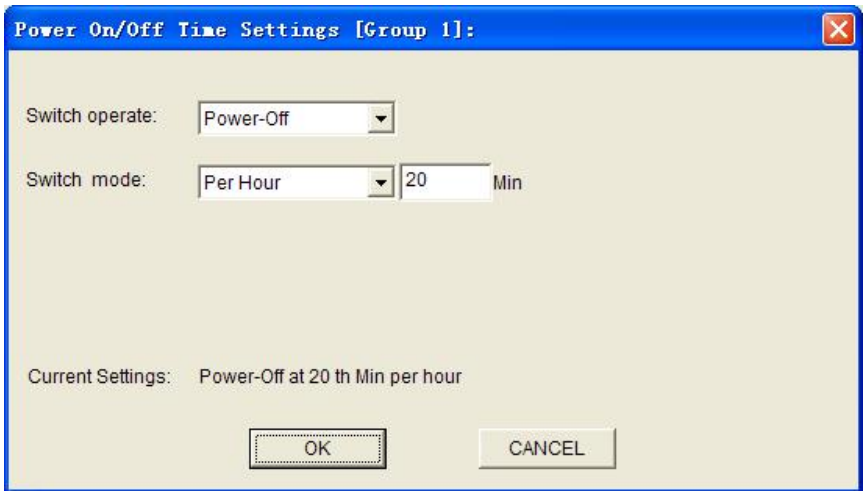
9.Power off at one time



AT Command:

AT+EXCALx=ST,<strTime>

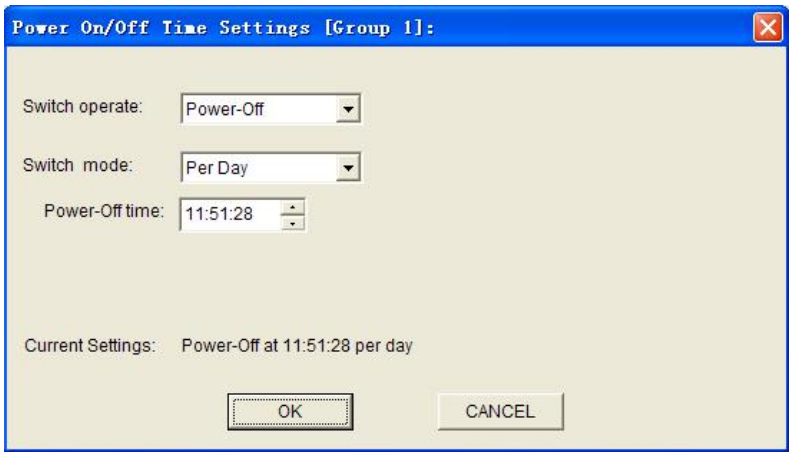
10.Power off per hour



AT Command:

AT+EXCALx=SH,<strTime>

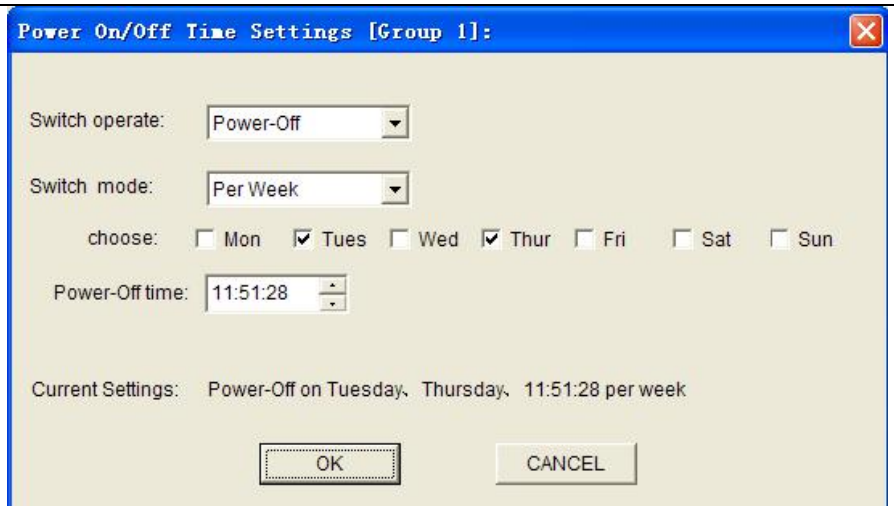
11.Power off per day



AT Command:

AT+EXCALx=SD,<strTime>

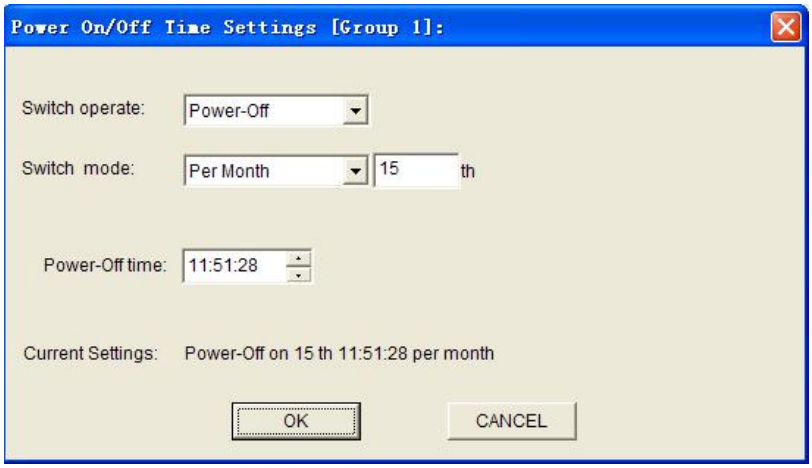
12.Power off at the same time in every week



AT Command:

AT+EXCALx=SW,<week>,<strTime>

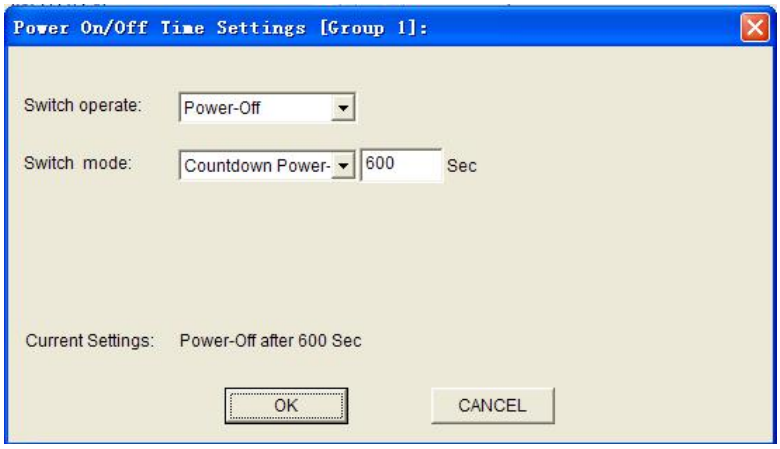
13.Power off per month



AT Command:

AT+EXCALx=SM,<date>,<strTime>

14.Power off with countdown



AT Command:

AT+EXCALx=SC,<afterTime>

<afterTime>: Countdown value(Unit:Second)

For example:

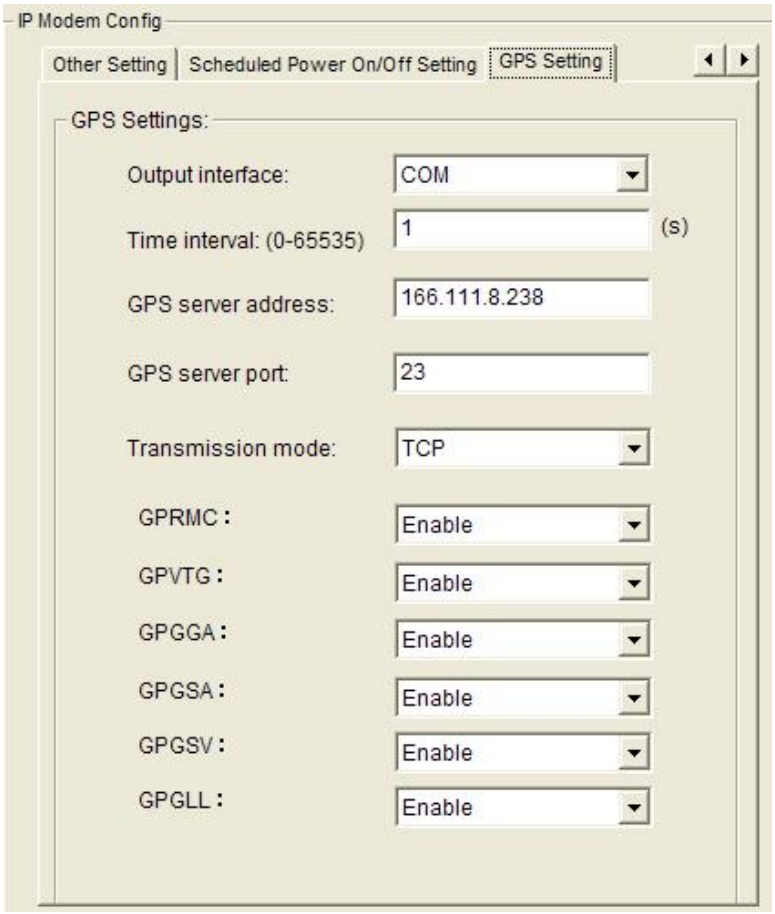
IP Modem power off 600 seconds later:

AT+EXCAL1=SC,60

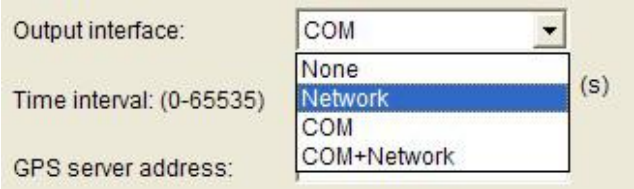
Note: If the <aftertime> is 0,the IP Modem will power off immediately.

3.5.5 GPS Setting

Settings on this page are the parameters of GPS function.



◆ GPS data output interface:



There are two output interface and four modes for choosing:

0- None: No GPS data output.

1- Network: GPS data output via GPRS network.

2- COM : GPS data output via serial port

3- COM + Network: GPS data output via serial port & GPRS network simultaneous

AT Command:

AT+GPSTRAN=x

x: 0-None. 1- Network 2- COM 3- COM + Network

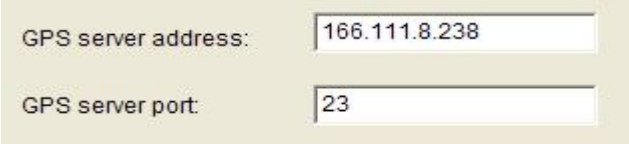
◆ GPS data output time interval

AT Command:

AT+GPSINT=xxx
xxx: The length of GPS data output time interval.

Note: xxx should larger than 1 second and less than 65535 seconds.

◆ GPS Data Service Center(DSC) Setting



AT Command of GPS DSC IP address or domain name:

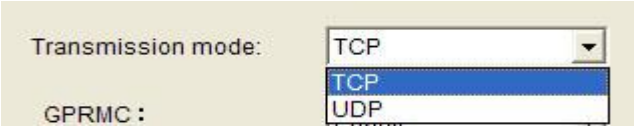
AT+GPSAD=xxx
xxx: The IP address or domain name.

AT Command of DSC port:

AT+PORT=xxx
xxx: The port value

Note: Please set the port value larger than 1024.

◆ GPS data transmit mode

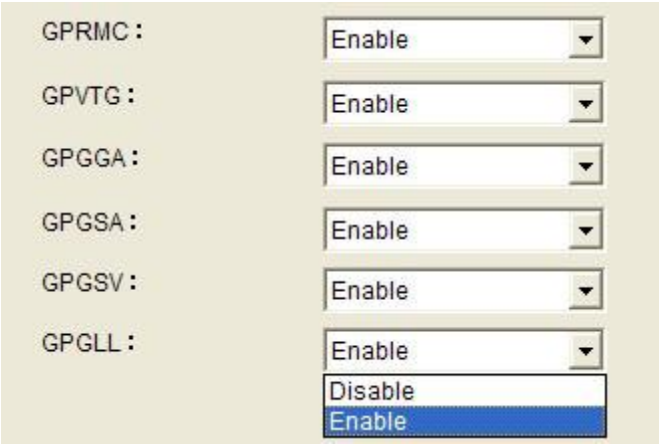


There are two modes for choosing: TCP and UDP.

AT Command:

AT+GPSTMOD=x
x: 0-TCP Mode, 1 –UDP Mode

◆ GPS data output information select



There are six items in the NEMA GPS data standard protocol, such as GPRMC/GPVTG/GPGGA/GPGSA/GPGSV/GPGLL. The customer can enable or disable any of them.

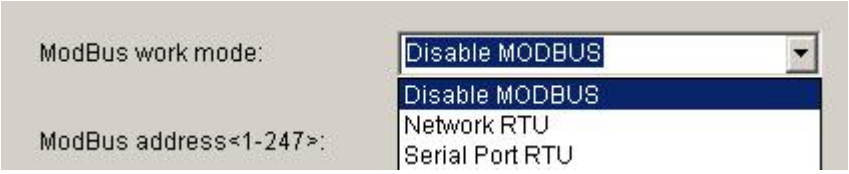
AT Command:

AT+FRMC=x
AT+FVTG=x
AT+FGGA=x
AT+FGSA=x
AT+FGSV=x
AT+FGLL=x
x: 0- Disable, 1 -Enable

Note: The default settings are all enabled.

3.5.5 ModBus Setting

◆ ModBus work mode



"ModBus Work mode" used for configuring the RTU work mode. There are the following options:

Disable MOBUS: disable MODBUS function

Network RTU: RTU uses TCP to virtual serial port convert software to support MODBUS RTU protocol(the data transmitted over ip network).

Serial Port RTU: RTU uses RS232/RS485 to support MODBUS RTU protocol.

Command: AT+MBMODE=x

Explanation: set MODBUS functions work mode.

Parameter: x range 0-2，0 means Disable MOBUS，1 means Network RTU, 2 means Serial Port RTU.

Example: AT+MBMODE=0

◆ ModBus address

It sets MODBUS device address of this RTU, server identify devices based on this address.

Command: AT+MBADDRESS=x

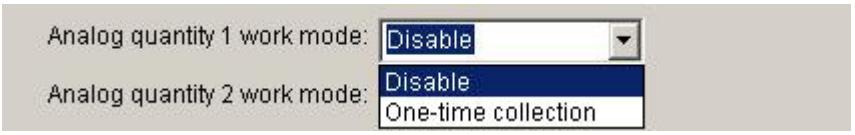
Explanation: set MODBUS device address.

Parameter: x range 1-247.

Example: AT+MBADDRESS=1

3.5.6 Port Interface Settings

◆ Analog working mode



Analog working mode：

Don't enable: analog acquisition function to shut down

Open the one-time acquisition: analog acquisition function

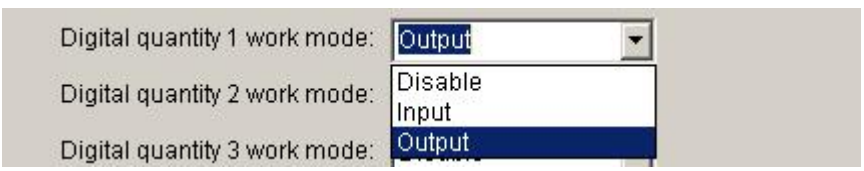
command：AT+ADCMODEn=x

instructions：N: on behalf of the analog channel, the value 1 or 2;X: 0 means is not enabled, 1 for one-time acquisition

Example: set the analog 1 working mode to one-time acquisition

AT+ADCMODE1=1

◆ Digital volume work mode



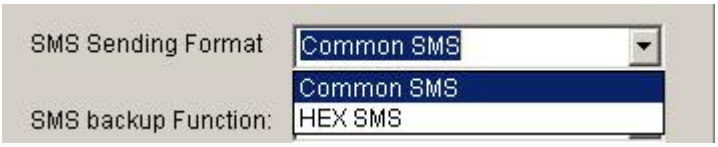
Data volume work mode：
Is not enabled, the data quantity function to shut down
Work entered: amount of data in input mode
Work output: the amount of data in the output mode
command：AT+DIOWORKMODEn=x
instructions：N: on behalf of the amount of data channel, values 1, 2, or 3;X: 0 is not enabled, 1 input, 2 output
Example：Set the data volume 1 work mode to output
AT+DIOWORKMODE1=2

3.5.7 SMS Setting

◆ Set the SMS backup

IP MODEM：After the equipment connected to the network interruption, serial data received will be issued by text messages。
Ban: to disable this feature
Open: open this function
AT Command:
AT+OPENSMSBCKP=x
X is 0 to 1, 0 disables, 1 is open.

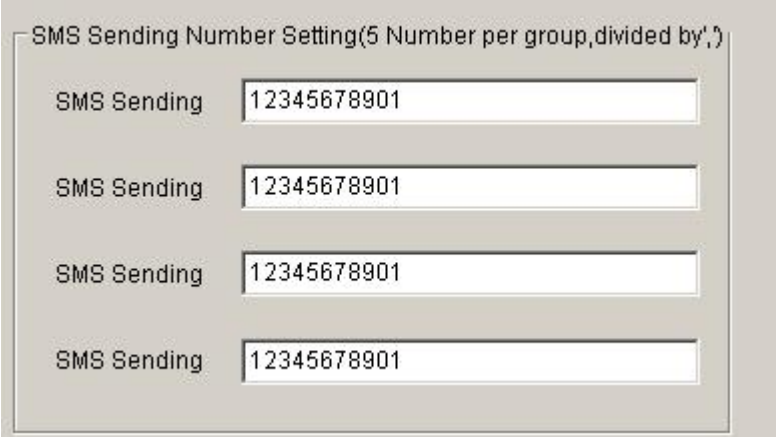
◆ SMS Sending Format



Common SMS: It means visible characters. ASCCI code value is less than 127.
HEX SMS: It can send any hexadecimal number of 0x00-0xff.

AT Command:
AT+HEXSMS=x
x range 0-1 0 means common SMS, 1 means HEX SMS.

◆ Destination sms number



These parameters should be set only when the "SMS backup" function is enable, The DTU will send report information by SMS. This parameter used for setting SMS destination number. Five phone numbers can be configured at each group, Each phone numbers are separated by comma. The length of each phone number should less than 15 bytes.

AT Command:
AT+PHONEn=xxx
n range 1-4 correspond to group 1-4.
xxx means destination phone number.

3.6 Functions

- Clear Output

Clear the output information

- Version Display

Show the software and hardware version

- Signal Value

Display current wireless signal value

- Factory setting

Restore to factory settings

- Show Config

Show current IP MODEM settings

- Show Baudrate

Display the communication baudrate

- Auto Detect

Simple way to determine whether IP MODEM work fine

- Save Output

Save the output info to a file

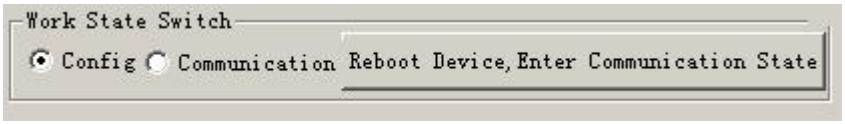
- Save Config

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

- Restore Config

Restore settings from a previous saved configure file

3.7 Work State Switch



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 Device, Enter Communication State:

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

Communication state

Appendix

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

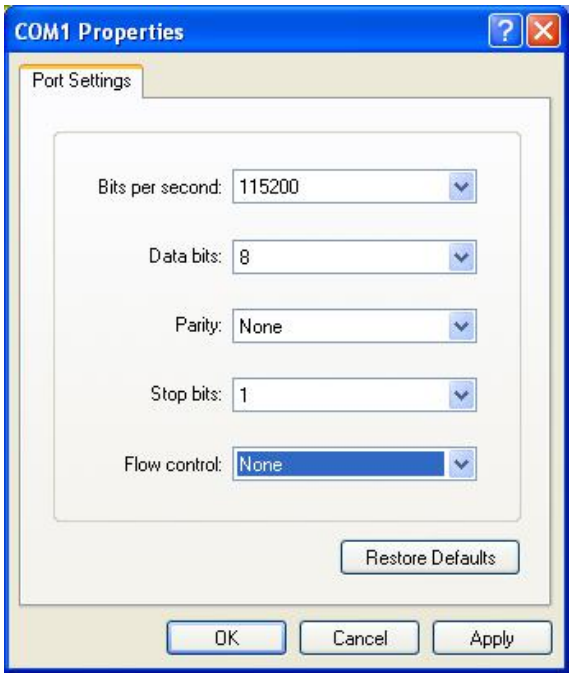
1. Press “Start”→”Programs”→”Accessories”→”Communications”→”Hyper Terminal”

2. Input connection name, choose “OK”

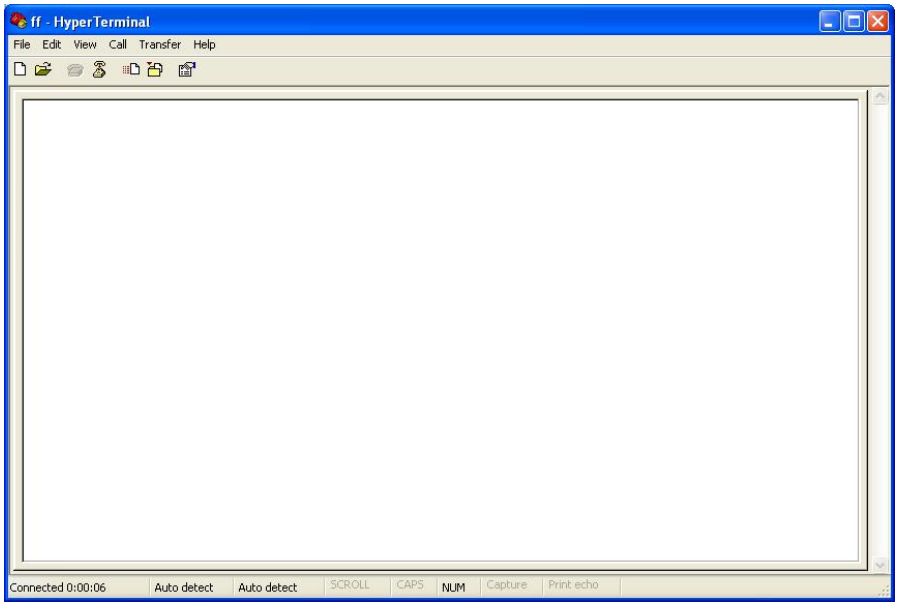
3. Choose the correct COM port which connect to IP MODEM, choose “OK”

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

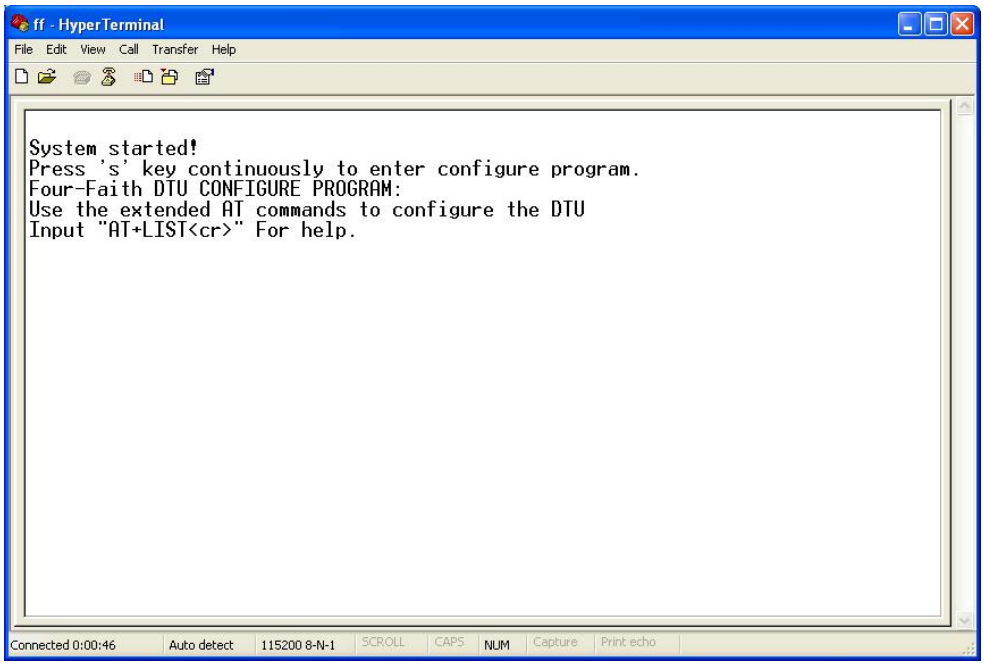


5. Complete Hyper Terminal operation, It runs as following



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

Add： Floor 11, Area A06, No 370, chengyi street, Jimei, Xiamen.China
http://en.four-faith.com Tel： +86 592-5907276 Fax：+86 592-5912735



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