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|------------------------------------|---------------------|----------|
| F8X36 Series Router<br>User Manual | Document Version    | Page     |
|                                    | V2.0.0              |          |
|                                    | Product Name: F8X36 | Total:92 |

# F8X36 Series Router User Manual



**Xiamen Four-Faith Smart Power Technology Co., Ltd.**

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

Tel: +86 17750019379 Email:business@four-faith.com

Web: <http://en.four-faith.net>




## Files Revised Record

| Date       | Version | Remark                    | Author |
|------------|---------|---------------------------|--------|
| 2015-3-24  | 1.00    | F8x36 ZigBee Router       | ZZF    |
| 2017-10-10 | V2.0.0  | Change of company address | LXP    |
|            |         |                           |        |
|            |         |                           |        |
|            |         |                           |        |

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

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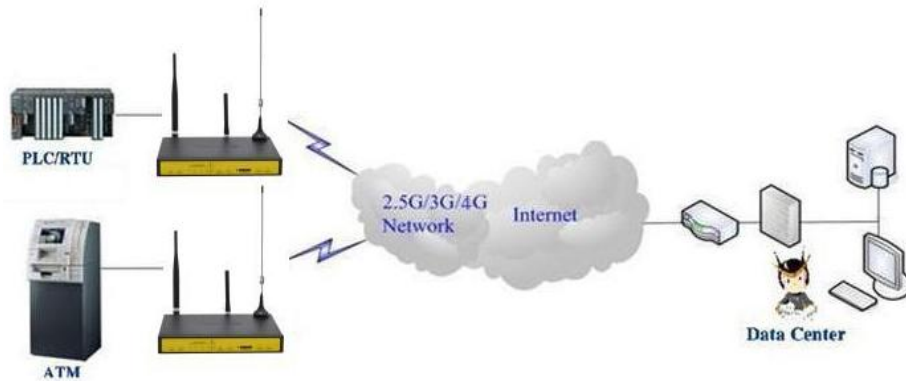
## Chapter 1 Brief Introduction of Product

### 1.1 General

F8X36 series Router is a kind of cellular terminal device that provides data transfer function by public cellular network. Also, it supports ZigBee function.

It adopts high-powered industrial 32-bits CPU and embedded real time operating system. It supports RS232 (or RS485/RS422), Ethernet and WIFI port that can conveniently and transparently connect one device to a cellular network, allowing you to connect to your existing serial, Ethernet and WIFI devices with only basic configuration. Also, it supports ZigBee 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 32bits CPU
- ◆ High-powered industrial ZigBee module
- ◆ Support low-consumption mode, including sleep mode, scheduled online/offline mode, scheduled power-on/power-off mode(optional)
- ◆ Housing: iron, providing IP30 protection.
- ◆ Power range: DC 5~36V

#### Stability and Reliability

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

- ◆ Ethernet port: 1.5KV magnetic isolation protection
- ◆ 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

- ◆ Support standard RS232(or RS485/RS422), Ethernet and WIFI port that can connect to serial, Ethernet and WIFI devices directly
- ◆ Support standard WAN port and PPPOE protocol that can connect to ADSL directly
- ◆ 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 (WEB or CLI)

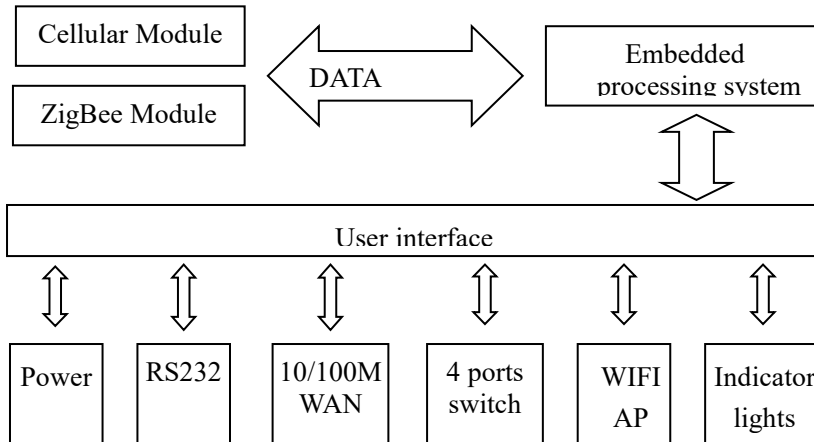
### High-performance

- ◆ Support multiple WAN access methods, including static IP, DHCP, L2TP, PPTP,PPPOE,2G/3G/4G
- ◆ Support ZigBee function
- ◆ Support double link backup between cellular and WAN(PPPOE, ADSL) (optional)
- ◆ Support VPN client(PPTP, L2TP, OPENVPN, IPSEC and GRE)(only for VPN version)
- ◆ Support VPN server(PPTP, L2TP, OPENVPN, IPSEC and GRE)(only for VPN version)
- ◆ Support local and remote firmware upgrade,import and export configure file
- ◆ Support NTP, RTC embedded
- ◆ Support multiple DDNS provider service
- ◆ Support VLANs, MAC Address clone, PPPoE Server
- ◆ WIFI support 802.11b/g/n. support AP, client, Adhoc, Repeater, Repeater Bridge and WDS(optional) mode
- ◆ WIFI support WEP,WPA,WPA2 encryption,Support RADIUS authentication and MAC address filter
- ◆ Support multiple online trigger ways, including SMS, ring and data. Support link disconnection when timeout
- ◆ Support APN/VPDN
- ◆ Support DHCP server and client, firewall, NAT, DMZ host, URL block, QoS, traffic statistics, real time link speed statistics etc
- ◆ Full protocol support , such as TCP/IP, UDP, ICMP, SMTP(optional), HTTP, POP3(optional), OICQ(optional), TELNET, FTP(optional), SNMP, SSHD, etc
- ◆ Schedule Reboot, Schedule Online and Offline,etc



## 1.3 Working Principle

The principle chart of the router is as following:



## 1.4 Specifications

### Cellular Specification

| ITEM                                  | CONTENT                                                                                                                                                                                       |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>F8136 ZigBee+GPRS WIFI ROUTER</b>  |                                                                                                                                                                                               |
| Standard and Band                     | EGSM 900/GSM 1800MHz, GSM 850/900/1800/1900MHz(optional)<br>Compliant to GSM phase 2/2+<br>GPRS class 10, class 12(optional)                                                                  |
| Bandwidth                             | 85.6Kbps                                                                                                                                                                                      |
| TX power                              | GSM850/900:<33dBm<br>GSM1800/1900:<30dBm                                                                                                                                                      |
| RX sensitivity                        | <-107dBm                                                                                                                                                                                      |
| <b>F8236 ZigBee+CDMA WIFI ROUTER</b>  |                                                                                                                                                                                               |
| Standard and Band                     | CDMA2000 1xRTT 800MHz, 450MHz(optional)                                                                                                                                                       |
| Bandwidth                             | 153.6Kbps                                                                                                                                                                                     |
| TX power                              | <30dBm                                                                                                                                                                                        |
| RX sensitivity                        | <-104dBm                                                                                                                                                                                      |
| <b>F8436 ZigBee+WCDMA WIFI ROUTER</b> |                                                                                                                                                                                               |
| Standard and Band                     | UMTS/WCDMA/HSDPA/HSUPA/HSPA+ 850/1900/2100MHz,<br>850/900/1900/2100MHz(optional)<br>GSM 850/900/1800/1900MHz<br>GPRS/EDGE CLASS 12                                                            |
| Bandwidth                             | DC-HSPA+: Download speed 42Mbps, Upload speed 5.76Mbps<br>HSPA+: Download speed 21Mbps, Upload speed 5.76Mbps<br>HSDPA: Download speed 7.2Mbps, HSUPA: Upload speed 5.76Mbps<br>UMTS: 384Kbps |

|                                              |                                                                                                                                                                                                                                                       |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TX power                                     | <24dBm                                                                                                                                                                                                                                                |
| RX sensitivity                               | <-109dBm                                                                                                                                                                                                                                              |
| <b>F8636 ZigBee+EVDO WIFI ROUTER</b>         |                                                                                                                                                                                                                                                       |
| Standard and Band                            | CDMA2000 1X EVDO Rev A 800MHz, 800/1900MHz(optional), 450MHz(optional)<br>CDMA2000 1X EVDO Rev B 800/1900MHz(optional)<br>CDMA2000 1X RTT, IS-95 A/B                                                                                                  |
| Bandwidth                                    | EVDO Rev. A: Download speed 3.1Mbps, Upload speed 1.8Mbps<br>EVDO Rev. B: Download speed 14.7Mbps, Upload speed 5.4Mbps (optional)                                                                                                                    |
| TX power                                     | <23dBm                                                                                                                                                                                                                                                |
| RX sensitivity                               | <-104dBm                                                                                                                                                                                                                                              |
| <b>F8736 ZigBee+LTE/TD-SCDMA WIFI ROUTER</b> |                                                                                                                                                                                                                                                       |
| Standard and Band                            | LTE TDD 2600/1900/2300MHz(Band 38/39/40), 800/1400/1800MHz(Band 27/61/62)(optional)<br>TD-SCDMA 2010/1900MHz(A/F frequency band, Band 34/39)<br>GSM /GPRS/EDGE 900/1800/1900MHz                                                                       |
| Bandwidth                                    | LTE TDD: Download speed 61Mbps, Upload speed 18Mbps<br>TD-HSPA+: Download speed 4.2Mbps, Upload speed 2.2Mbps<br>TD-HSPA: Download speed 2.2Mbps, Upload speed 2.2Mbps                                                                                |
| TX power                                     | <23dBm                                                                                                                                                                                                                                                |
| RX sensitivity                               | <-97dBm                                                                                                                                                                                                                                               |
| <b>F8836 ZigBee+LTE/WCDMA WIFI ROUTER</b>    |                                                                                                                                                                                                                                                       |
| Standard and Band                            | LTE FDD 2600/2100/1800/900/800MHz, 700/1700/2100MHz(optional)<br>DC-HSPA+/HSPA+/HSDPA/HSUPA/UMTS 850/900/2100MHz, 800/850/1900/2100MHz(optional)<br>EDGE/GPRS/GSM 850/900/1800/1900MHz<br>GPRS CLASS 10<br>GPRS CLASS 12                              |
| Bandwidth                                    | LTE FDD: Download speed 100Mbps, Upload speed 50Mbps<br>DC-HSPA+: Download speed 42Mbps, Upload speed 5.76Mbps<br>HSPA+: Download speed 21Mbps, Upload speed 5.76Mbps<br>HSDPA: Download speed 7.2Mbps, HSUPA: Upload speed 5.76Mbps<br>UMTS: 384Kbps |
| TX power                                     | <23dBm                                                                                                                                                                                                                                                |
| RX sensitivity                               | <-97dBm                                                                                                                                                                                                                                               |
| <b>F8A36 ZigBee+LTE WIFI ROUTER</b>          |                                                                                                                                                                                                                                                       |
| Standard and Band                            | LTE FDD,LTE TDD,EVDO,WCDMA,TD-SCDMA,CDMA1X,GPRS/EDGE                                                                                                                                                                                                  |
| Bandwidth                                    | LTE FDD: Download speed 100Mbps, Upload speed 50Mbps<br>LTE TDD: Download speed 61Mbps, Upload speed 18Mbps<br>DC-HSPA+: Download speed 42Mbps, Upload speed 5.76Mbps<br>TD-HSPA+: Download speed 4.2Mbps, Upload speed 2.2Mbps                       |

|                |                                                           |
|----------------|-----------------------------------------------------------|
|                | EVDO Rev. A: Download speed 3.1Mbps, Upload speed 1.8Mbps |
| TX power       | <23dBm                                                    |
| RX sensitivity | <-97dBm                                                   |

### ZigBee Specification

| Item                           | Content                                                    |
|--------------------------------|------------------------------------------------------------|
| ZigBee Module                  | Industrial ZigBee Platform                                 |
| Standard and Band              | IEEE 802.15.4<br>ISM 2.4~2.5 GHz                           |
| Indoor/Urban Range             | 30m<br>90m(With PA)                                        |
| Outdoor/RF Line-of-Sight Range | 500m<br>2000m(With PA)                                     |
| Transmit Power                 | 2.82 mw (+4.5dBm)<br>100 mw (+20dBm) (With PA)             |
| Bandwidth                      | 250Kbps                                                    |
| Receiver Sensitivity           | -97dBm<br>-103dBm(With PA)                                 |
| Network Topologies             | Point-to-Point, Point-to-Multipoint, Peer-to-Peer and Mesh |
| Number of channels             | 16 Direct Sequence Channels                                |
| Channel                        | 11 to 26                                                   |
| Max package size               | 300 Bytes                                                  |

### WIFI Specification

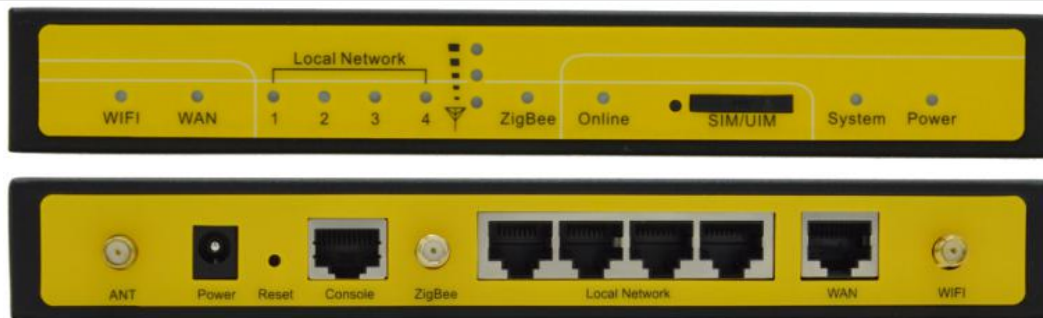
| Item           | Content                                                   |
|----------------|-----------------------------------------------------------|
| Standard       | IEEE802.11b/g/n                                           |
| Bandwidth      | IEEE802.11b/g: 54Mbps (max)<br>IEEE802.11n: 150Mbps (max) |
| Security       | WEP, WPA, WPA2, etc<br>WPS (optional)                     |
| TX power       | 20dBm(11n),24dBm(11g),26dBm(11b)                          |
| RX sensitivity | <-72dBm@54Mbps                                            |

### Hardware System

| Item  | Content                  |
|-------|--------------------------|
| CPU   | Industrial 32bits CPU    |
| FLASH | 16MB(Extendable to 64MB) |
| DDR2  | 128MB                    |

**Interface Type**

| Item      | Content                                                                                                                                                                                                |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WAN       | 1 10/100 Mbps WAN port(RJ45), auto MDI/MDIX, 1.5KV magnetic isolation protection                                                                                                                       |
| LAN       | 4 10/100 Mbps Ethernet ports(RJ45), auto MDI/MDIX, 1.5KV magnetic isolation protection                                                                                                                 |
| Serial    | 1 RS232(or RS485/RS422) port, 15KV ESD protection<br>Data bits: 5, 6, 7, 8<br>Stop bits: 1, 1.5(optional), 2<br>Parity: none, even, odd, space(optional), mark(optional)<br>Baud rate: 2400~115200 bps |
| Indicator | "Power", "System", "Online", "ZigBee", "Local Network", "WAN", "WIFI", "Signal Strength"                                                                                                               |
| Antenna   | Cellular: Standard SMA female interface, 50 ohm<br>ZigBee: Standard SMA female interface, 50 ohm<br>WIFI: Standard SMA male interface, 50 ohm                                                          |
| SIM/UIM   | Standard 3V/1.8V user card interface, 15KV ESD protection                                                                                                                                              |
| Power     | Standard 3-PIN power jack, reverse-voltage and over-voltage protection                                                                                                                                 |
| Reset     | Restore the Router to its original factory default settings                                                                                                                                            |


**Power supply**

| Item           | Content     |
|----------------|-------------|
| Standard Power | DC 12V/1.5A |
| Power Range    | DC 5~36V    |

**Consumption**

| Working condition                    | Consumption      |
|--------------------------------------|------------------|
| Schedule shutdown                    | 2.57~4.2mA@12DVC |
| <b>F8136 ZigBee+GPRS WIFI ROUTER</b> |                  |
| Standby                              | 254~297mA@12VDC  |
| Communication                        | 300~365mA@12VDC  |
| <b>F8236 ZigBee+CDMA WIFI ROUTER</b> |                  |
| Standby                              | 256~296mA@12VDC  |

|                                                  |                 |
|--------------------------------------------------|-----------------|
| Communication                                    | 305~368mA@12VDC |
| <b>F8436 ZigBee+WCDMA WIFI ROUTER</b>            |                 |
| Standby                                          | 284~307mA@12VDC |
| Communication                                    | 318~395mA@12VDC |
| <b>F8636 ZigBee+CDMA2000 1X EVDO WIFI ROUTER</b> |                 |
| Standby                                          | 280~305mA@12VDC |
| Communication                                    | 314~390mA@12VDC |
| <b>F8736 ZigBee+LTE/TD-SCDMA WIFI ROUTER</b>     |                 |
| Standby                                          | 293~340mA@12VDC |
| Communication                                    | 357~598mA@12VDC |
| <b>F8836 ZigBee+LTE/WCDMA WIFI ROUTER</b>        |                 |
| Standby                                          | 292~342mA@12VDC |
| Communication                                    | 360~597mA@12VDC |
| <b>F8A36 ZigBee+LTE WIFI ROUTER</b>              |                 |
| Standby                                          | 305~338mA@12VDC |
| Communication                                    | 345~589mA@12VDC |

#### Physical Characteristics

| Item       | Content                         |
|------------|---------------------------------|
| Housing    | Iron, providing IP30 protection |
| Dimensions | 207x135x28 mm                   |
| Weight     | 790g                            |

#### Environmental Limits

| Item                  | Content               |
|-----------------------|-----------------------|
| Operating Temperature | -35~+75°C(-31~+167°F) |
| Storage Temperature   | -40~+85°C(-40~+185°F) |
| Operating Humidity    | 95% (Non-condensing)  |

## Chapter 2 Installation Introduction

### 2.1 General

The router must be installed correctly to make it work properly.

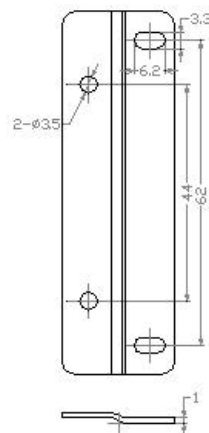
Warning: Forbid to install the router when powered!

### 2.2 Encasement List

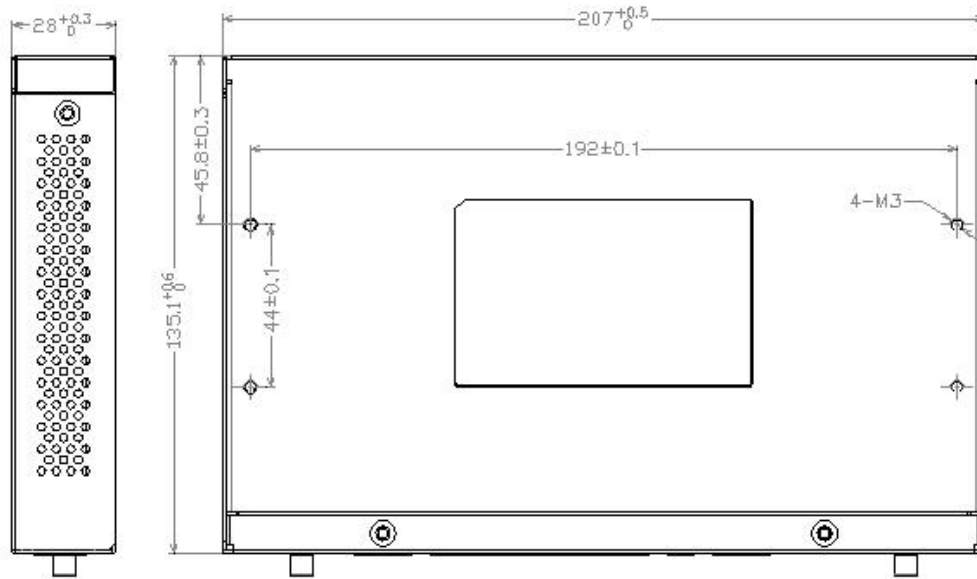
| Name                        | Quantity | Remark   |
|-----------------------------|----------|----------|
| Router host                 | 1        |          |
| Cellular antenna (Male SMA) | 1        |          |
| WIFI antenna (Female SMA)   | 1        |          |
| ZigBee antenna (Female SMA) | 1        |          |
| Network cable               | 1        |          |
| Console cable               | 1        | optional |
| Power adapter               | 1        |          |
| Manual CD                   | 1        |          |
| Certification card          | 1        |          |
| Maintenance card            | 1        |          |

### 2.3 Installation and Cable Connection

Stator and routing equipment of screw specification for: M3 \* 5 mm countersunk head screws (black)



Fixed Size

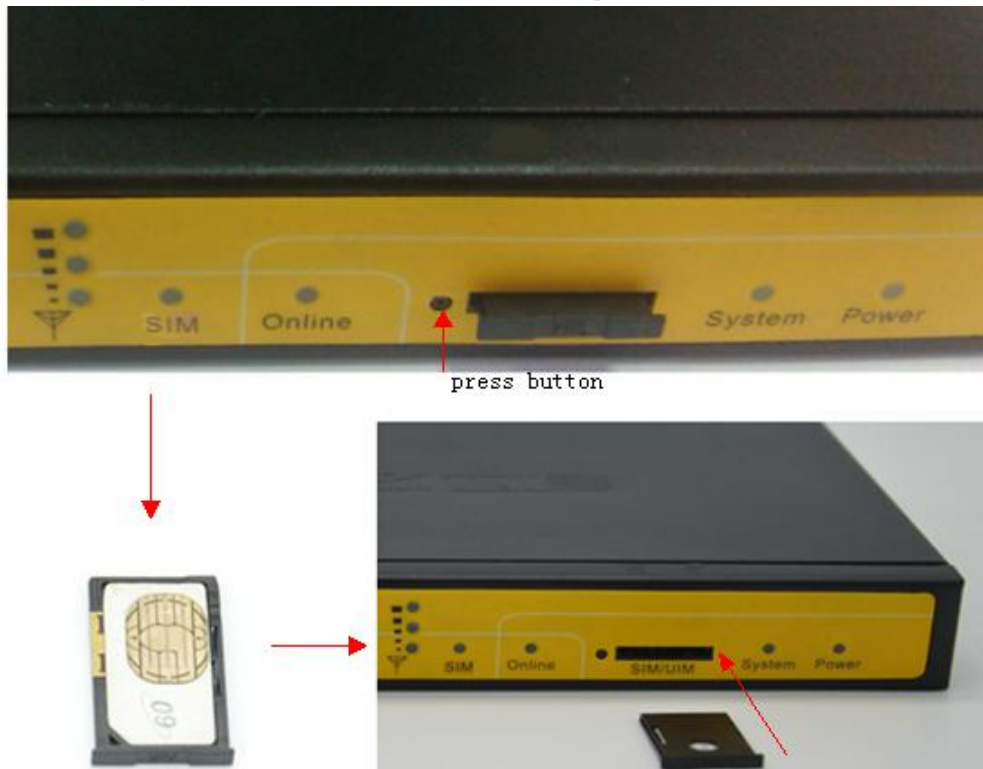


Router Size

### Installation of SIM/UIM card:

Firstly power off the Router, 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 router with sign “ANT”.

Screw the SMA male pin of the ZigBee antenna to the female SMA interface of the router with sign “ZigBee”.

Screw the SMA female pin of the WIFI antenna to the male SMA interface of the router with sign “WIFI”.

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

**Installation of cable:**

Insert one end of the network cable into the Local network interface , and insert the other end into the Ethernet interface of user’s device. The signal connection of network direct cable is as follows:

| RJ45-1 | RJ45-2 | Color        |
|--------|--------|--------------|
| 1      | 1      | White/Orange |
| 2      | 2      | Orange       |
| 3      | 3      | White/Green  |
| 4      | 4      | Blue         |
| 5      | 5      | White/Blue   |
| 6      | 6      | Green        |
| 7      | 7      | White/Brown  |
| 8      | 8      | Brown        |



Insert the RJ45 end of the console cable into console interface, and insert the DB9F end of the console cable into the RS232 serial interface of user’s device.

The signal connection of the console cable is as follows:



| Console line definition (RS232) |                  |        |      |                     |              |
|---------------------------------|------------------|--------|------|---------------------|--------------|
| RJ45                            | Color            | Signal | DB9F | Description         | Dir (Router) |
| 1                               | White/<br>Orange | CTS    | 8    | Clera To Send       | Output       |
| 2                               | Orange           | DSR    | 6    | Data Set Ready      | Output       |
| 3                               | White/<br>Green  | RXD    | 2    | Receive Data        | Output       |
| 4                               | Blue             | DCD    | 1    | Data Carrier Detect | Output       |
| 5                               | White/<br>Blue   | GND    | 5    | System Ground       |              |
| 6                               | Green            | TXD    | 3    | Transmit Data       | Input        |
| 7                               | White/<br>Brown  | DTR    | 4    | Data Terminal Ready | Input        |
| 8                               | Brown            | RTS    | 7    | Request To Send     | Input        |



## 2.4 Power

The power range of the Router is DC 5~36V.

Warning: When we use other power, we should make sure that the power can supply power above 8W.

We recommend user to use the standard DC 12V/1.5A power.

## 2.5 Indicator Lights Introduction

The Router provides following indicator lights: “Power”, “System”, “Online”, “ZigBee”, “Local Network”, “WAN”, “WIFI”, “Signal Strength”.

| Indicator Light | State           | Introduction                                                      |
|-----------------|-----------------|-------------------------------------------------------------------|
| Power           | ON              | Router is powered on                                              |
|                 | OFF             | Router is powered off                                             |
| System          | BLINK           | System works properly                                             |
|                 | OFF             | System does not work                                              |
| Online          | ON              | Router has logged on network                                      |
|                 | OFF             | Router hasn't logged on network                                   |
| ZigBee          | ON              | ZigBee is active                                                  |
|                 | OFF             | ZigBee is not active                                              |
| Local Network   | OFF             | The corresponding interface of switch is not connected            |
|                 | ON / BLINK      | The corresponding interface of switch is connected /Communicating |
| WAN             | OFF             | The interface of WAN is not connected                             |
|                 | ON / BLINK      | The interface of WAN is connected /Communicating                  |
| WIFI            | OFF             | WIFI is not active                                                |
|                 | ON              | WIFI is active                                                    |
| Signal Strength | One Light ON    | Signal strength is weak                                           |
|                 | Two Lights ON   | Signal strength is medium                                         |
|                 | Three Lights ON | Signal strength is good                                           |

## 2.6 Reset Button Introduction

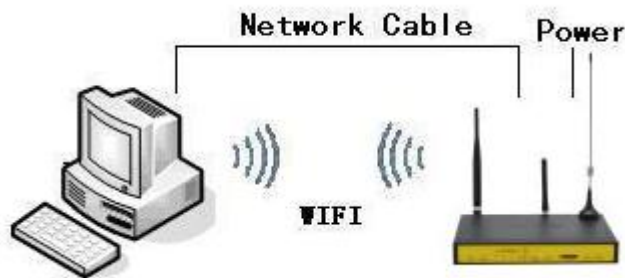
The Router has a “Reset” button to restore it to its original factory default settings. When user press the “Reset” button for up to 15s, the Router will restore to its original factory default settings and restart automatically.

## Chapter 3 Configuration and Management

This chapter describes how to configure and manage the router.

### 3.1 Configuration Connection

Before configuration, you should connect the router and your configuration PC with the supplied network cable. Plug the cable's one end into the Local Network port of the router, and another end into your configure PC's Ethernet port. The connection diagram is as following:



Please modify the IP address of PC as the same network segment address of the router, for instance, 192.168.1.9. Modify the mask code of PC as 255.255.255.0 and set the default gateway of PC as the router's IP address (192.168.1.1).

### 3.2 Access the Configuration Web Page

The chapter is to present main functions of each page. Users visit page tool via web browser after connect users' PC to the router. There are eleven main pages: Setting, Wireless, Service, VPN, Security, Access Restrictions, NAT, QoS Setting, Applications, Management and Status. Users enable to browse slave pages by click one main page..

Users can open IE or other explorers and enter the router's default IP address of 192.168.1.1 on address bar, then press the botton of Enter to visit page Web management tool of the router. The users login in the web page at the first name, there will display a page shows as blow to tip users to modify the default user name and password of the router. Users have to click "change password" to make it work if they modify user name and password.

**Router Management**

**Your Router is currently not protected and uses an unsafe default username and password combination, please change it using the following dialog!**

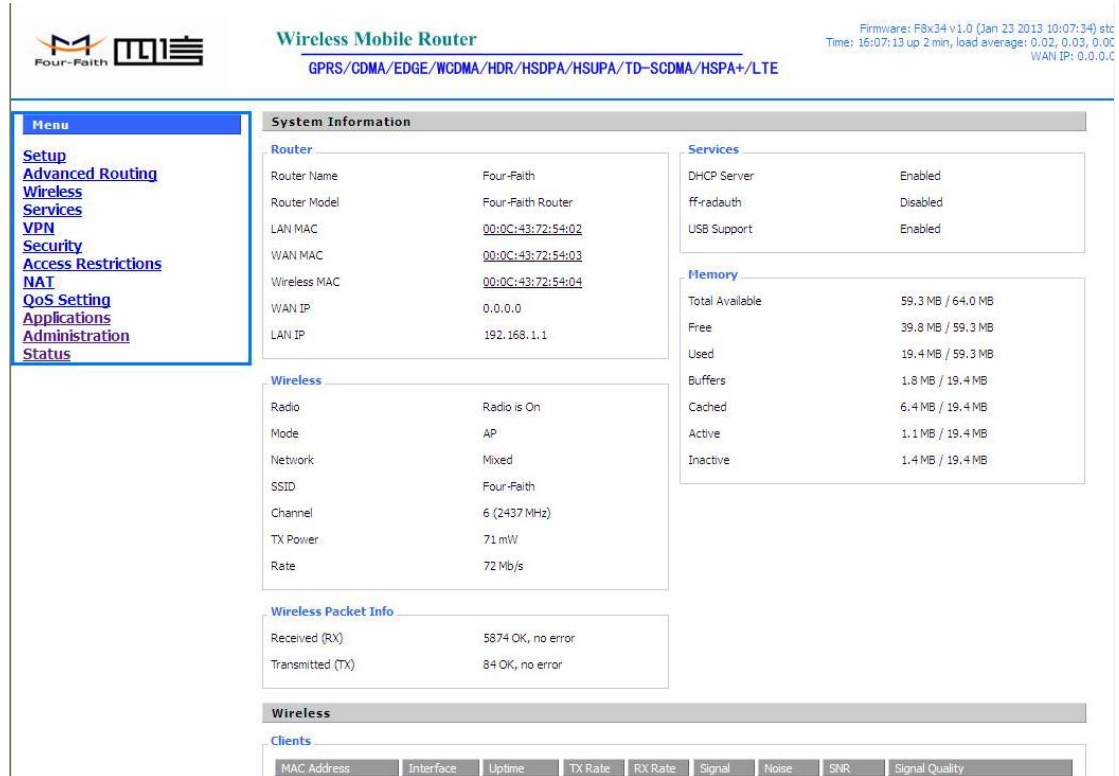
**Router Password**

Router Username:

Router Password:

Re-enter to confirm:

After access to the information main page



The screenshot shows the main information page of the router. At the top, it displays the Four-Faith logo and the title "Wireless Mobile Router". The firmware version is F8x34 v1.0 (Jan 23 2013 10:07:34) etc. The supported standards are GPRS/CDMA/EDGE/WCDMA/HDR/HSDPA/HSUPA/TD-SCDMA/HSPA+/LTE.

The page is divided into several sections:

- Menu:** Setup, Advanced Routing, Wireless, Services, VPN, Security, Access Restrictions, NAT, QoS Setting, Applications, Administration, Status.
- System Information:**
  - Router:** Router Name: Four-Faith; Router Model: Four-Faith Router; LAN MAC: 00:0C:43:72:54:02; WAN MAC: 00:0C:43:72:54:03; Wireless MAC: 00:0C:43:72:54:04; WAN IP: 0.0.0.0; LAN IP: 192.168.1.1.
  - Wireless:** Radio: Radio is On; Mode: AP; Network: Mixed; SSID: Four-Faith; Channel: 6 (2437 MHz); TX Power: 71 mW; Rate: 72 Mb/s.
  - Wireless Packet Info:** Received (RX): 5874 OK, no error; Transmitted (TX): 84 OK, no error.
- Services:** DHCP Server: Enabled; ff-radauth: Disabled; USB Support: Enabled.
- Memory:**
  - Total Available: 59.3 MB / 64.0 MB
  - Free: 39.8 MB / 59.3 MB
  - Used: 19.4 MB / 59.3 MB
  - Buffers: 1.8 MB / 19.4 MB
  - Cached: 6.4 MB / 19.4 MB
  - Active: 1.1 MB / 19.4 MB
  - Inactive: 1.4 MB / 19.4 MB
- Wireless Clients:** A table with columns: MAC Address, Interface, Uptime, TX Rate, RX Rate, Signal, Noise, SNR, Signal Quality.

Users need to input user name and password if it is their first time to login.



Input correct user name and password to visit relevant menu page. Default user name is admin, password is admin. (available to modify user name and password on management page, then click submit)

## 3.3 Management and configuration

### 3.3.1 Setting

The Setup screen is the first screen users will see when accessing the router. Most users will be able to configure the router and get it work properly using only the settings on this screen. Some Internet Service Providers (ISPs) will require users to enter specific information, such as User Name, Password, IP Address, Default Gateway Address, or DNS IP Address. These information can be obtained from your ISP, if required.

#### 3.3.1.1 Basic Setting

WAN Connection Type

FiveWays: Disabled, Static IP, Automatic Configuration-DHCP, PPPOE, 3G/UNMTS/4G/LTE

**Disabled**

Connection Type

Forbid the setting of WAN port connection type

**Static IP**

|                 |               |
|-----------------|---------------|
| Connection Type | Static IP     |
| WAN IP Address  | 0 . 0 . 0 . 0 |
| Subnet Mask     | 0 . 0 . 0 . 0 |
| Gateway         | 0 . 0 . 0 . 0 |
| Static DNS 1    | 0 . 0 . 0 . 0 |
| Static DNS 2    | 0 . 0 . 0 . 0 |
| Static DNS 3    | 0 . 0 . 0 . 0 |

**WAN IP Address:** Users set IP address by their own or ISP assigns

**Subnet Mask:** Users set subnet mask by their own or ISP assigns

**Gateway:** Users set gateway by their own or ISP assigns

**Static DNS1/DNS2/DNS3:** Users set static DNS by their own or ISP assigns

**Automatic Configuration-DHCP**

|                 |                                |
|-----------------|--------------------------------|
| Connection Type | Automatic Configuration - DHCP |
|-----------------|--------------------------------|

IP address of WAN port gets automatic via DHCP

**PPPOE**

|                              |                                                                       |                                 |
|------------------------------|-----------------------------------------------------------------------|---------------------------------|
| Connection Type              | PPPoE                                                                 |                                 |
| User Name                    | <input type="text"/>                                                  |                                 |
| Password                     | <input type="text"/>                                                  | <input type="checkbox"/> Unmask |
| Service Name                 | <input type="text"/>                                                  |                                 |
| PPP Compression (MPPC)       | <input type="radio"/> Enable <input checked="" type="radio"/> Disable |                                 |
| T-Home VDSL VLAN 7/8 Tagging | <input type="radio"/> Enable <input checked="" type="radio"/> Disable |                                 |
| MPPE Encryption              | <input type="text"/>                                                  |                                 |
| Single Line Multi Link       | <input type="checkbox"/>                                              |                                 |

**User Name:** login the Internet

**Password:** login the Internet

**Service Name:** provided by ISP server, if not, keep it null

**PPP Compression (MPPC):** provides a method to negotiation and use of compressed in PPP encapsulation link protocol

**T-Home VDSL VLAN 7/8 Tagging:** enable to support the front of the modem is vdsl

**MPPE Encryption:** Microsoft point to point encryption. It is used to encrypt the point-to-point link connection agreement of the encrypted data packet

**Single Line Multi Link:** enable single line link or disable multi link

### 3G/UMTS/4G/LTE

|                 |                                                      |                                 |
|-----------------|------------------------------------------------------|---------------------------------|
| Connection Type | <input type="text" value="3G/UMTS/4G/LTE"/>          |                                 |
| User Name       | <input type="text"/>                                 |                                 |
| Password        | <input type="password"/>                             | <input type="checkbox"/> Unmask |
| Dial String     | <input type="text" value="*99***1# (UMTS/3G/3.5G)"/> |                                 |
| APN             | <input type="text"/>                                 |                                 |
| PIN             | <input type="text"/>                                 | <input type="checkbox"/> Unmask |

### dhcp-4G

#### WAN Connection Type

|                 |                                        |                                 |
|-----------------|----------------------------------------|---------------------------------|
| Connection Type | <input type="text" value="dhcp-4G"/>   |                                 |
| User Name       | <input type="text" value="admin"/>     |                                 |
| Password        | <input type="password" value="•••••"/> | <input type="checkbox"/> Unmask |
| APN             | <input type="text" value="cmnet"/>     |                                 |

**User Name:** login users' ISP(Internet Service Provider)

**Password:** login users' ISP

**Dial String:** dial number of users' ISP

**APN:** access point name of users' ISP

**PIN:** PIN code of users' SIM card

### Connection type

|                 |                                   |
|-----------------|-----------------------------------|
| Connection type | <input type="text" value="Auto"/> |
|-----------------|-----------------------------------|

**Connection type:** Auto, Force 3G, Force 2G, Prefer 3G, Prefer 2G options. If using 4G module, there has 4G network option. Users select different mode depending on their need

### Keep Online

|                             |                                                                                                                                          |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Keep Online Detection       | <input type="text" value="Ping"/>                                                                                                        |
| Detection Interval          | <input type="text" value="60"/> Sec.                                                                                                     |
| Primary Detection Server IP | <input type="text" value="166"/> . <input type="text" value="111"/> . <input type="text" value="8"/> . <input type="text" value="238"/>  |
| Backup Detection Server IP  | <input type="text" value="202"/> . <input type="text" value="119"/> . <input type="text" value="32"/> . <input type="text" value="102"/> |

This function is used to detect whether the Internet connection is active, if users set it and when the router detect the connection is inactive, it will redial to users' ISP immediately to make the connection active.

### Detection Method:

**None:** do not set this function

**Ping:** Send ping packet to detect the connection, when choose this method, users should also configure "Detection Interval", "Primary Detection Server IP" and "Backup Detection Server IP" items.

**Route:** Detect connection with route method, when choose this method, users should also configure "Detection Interval", "Primary Detection Server IP" and "Backup Detection Server IP" items.

**PPP:** Detect connection with PPP method, when choose this method, users should also configure "Detection Interval" item.

**Detection Interval:** time interval between two detections, unit is second

**Primary Detection Server IP:** the server used to response the router’s detection packet. This item is only valid for method "Ping" and "Route".

**Backup Detection Server IP:** the server used to response the router’s detection packet. This item is valid for method "Ping" and "Route".

**Note:** When users choose the “Route” or “Ping” method, it’s quite important to make sure that the “Primary Detection Server IP” and “Backup Detection Server IP” are usable and stable, because they have to response the detection packet frequently.

### Connection Strategy

Connection Strategy  Connect on Demand: Max Idle Time  Min.  Keep Alive: Redial Period  Sec.

**Connection Strategy:** one way is Connect on Demand, that is the link turnoff automatic under the situation that the ready link is idle and idle time meets users' configuration requirement, but it will connect again if users visit Internet. The other way is to keep alive, that is the link enable to dial again when reaching the re-dial period users set after disconnection.

Force reconnect  Enable  Disable  
Time  :

**Force reconnect:** this option schedules the pppoe or 3G reconnection by killing the pppd daemon and restart it.

**Time:** needed time to reconnect

### Wan Nat

Wan Nat  Enable  Disable

WAN NAT mode

### STP

STP  Enable  Disable

STP (Spaning Tree Protocol) can be applied to loop network. Through certain algorithm achieves path redundancy, and loop network cuts to tree-based network without loop in the meantime, thus to avoid the hyperplasia and infinite circulation of a message in the loop network



### Optional Configuration

|             |                                                                         |
|-------------|-------------------------------------------------------------------------|
| Router Name | <input type="text" value="Four-Faith"/>                                 |
| Host Name   | <input type="text"/>                                                    |
| Domain Name | <input type="text"/>                                                    |
| MTU         | Auto <input type="button" value="v"/> <input type="text" value="1500"/> |

**Router Name:** set router name

**Host Name:** ISP provides

**Domain Name:** ISP provides

**MTU:** auto (1500) and manual (1200-1492 in PPPOE/PPTP/L2TP mode, 576-16320 in other modes)

### Router Internal Network Settings

#### Router IP

|                  |                                  |                                  |                                  |                                |
|------------------|----------------------------------|----------------------------------|----------------------------------|--------------------------------|
| Local IP Address | <input type="text" value="192"/> | <input type="text" value="168"/> | <input type="text" value="1"/>   | <input type="text" value="1"/> |
| Subnet Mask      | <input type="text" value="255"/> | <input type="text" value="255"/> | <input type="text" value="255"/> | <input type="text" value="0"/> |
| Gateway          | <input type="text" value="0"/>   | <input type="text" value="0"/>   | <input type="text" value="0"/>   | <input type="text" value="0"/> |
| Local DNS        | <input type="text" value="0"/>   | <input type="text" value="0"/>   | <input type="text" value="0"/>   | <input type="text" value="0"/> |

**Local IP Address:** IP address of the router

**Subnet Mask:** the subnet mask of the router

**Gateway:** set internal gateway of the router. If default, internal gateway is the address of the router

**Local DNS:** DNS server is auto assigned by network operator server. Users enable to use their own DNS server or other stable DNS servers, if not, keep it default

#### Network Address Server Settings (DHCP)

These settings for the router's Dynamic Host Configuration Protocol (DHCP) server functionality configuration. The Router can serve as a network DHCP server. DHCP server automatically assigns an IP address for each computer in the network. If they choose to enable the router's DHCP server option, users can set all the computers on the LAN to automatically obtain an IP address and DNS, and make sure no other DHCP server in the network.

|                      |                                                                                                                                   |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| DHCP Type            | <input type="text" value="DHCP Server"/>                                                                                          |
| DHCP Server          | <input checked="" type="radio"/> Enable <input type="radio"/> Disable                                                             |
| Start IP Address     | 192.168.1. <input type="text" value="100"/>                                                                                       |
| Maximum DHCP Users   | <input type="text" value="50"/>                                                                                                   |
| Client Lease Time    | <input type="text" value="1440"/> minutes                                                                                         |
| Static DNS 1         | <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> |
| Static DNS 2         | <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> |
| Static DNS 3         | <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> |
| WINS                 | <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> |
| Use DNSMasq for DHCP | <input checked="" type="checkbox"/>                                                                                               |
| Use DNSMasq for DNS  | <input checked="" type="checkbox"/>                                                                                               |
| DHCP-Authoritative   | <input checked="" type="checkbox"/>                                                                                               |

#### DHCP Type: DHCP Server and DHCP Forwarder

Enter DHCP Server if set DHCP Type to DHCP Forwarder as blow:

|             |                                                                                                                                   |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
| DHCP Type   | <input type="text" value="DHCP Forwarder"/>                                                                                       |
| DHCP Server | <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> |

**DHCP Server:** keep the default Enable to enable the router's DHCP server option. If users have already have a DHCP server on their network or users do not want a DHCP server, then select Disable

**Start IP Address:** enter a numerical value for the DHCP server to start with when issuing IP addresses. Do not start with 192.168.1.1 (the router's own IP address).

**Maximum DHCP Users:** enter the maximum number of PCs that users want the DHCP server to assign IP addresses to. The absolute maximum is 253 if 192.168.1.2 is users' starting IP address.

**Client Lease Time:** the Client Lease Time is the amount of time a network user will be allowed connection to the router with their current dynamic IP address. Enter the amount of time, in minutes, that the user will be "leased" this dynamic IP address.

**Static DNS (1-3):** the Domain Name System (DNS) is how the Internet translates domain or website names into Internet addresses or URLs. Users' ISP will provide them with at least one DNS Server IP address. If users wish to utilize another, enter that IP address in one of these fields. Users can enter up to three DNS Server IP addresses here. The router will utilize them for quicker access to functioning DNS servers.

**WINS:** the Windows Internet Naming Service (WINS) manages each PC's interaction with the Internet. If users use a WINS server, enter that server's IP address here. Otherwise, leave it blank.

**DNSMasq:** users' domain name in the field of local search, increase the expansion of the host option, to adopt DNSMasq can assign IP addresses and DNS for the subnet, if select DNSMasq, dhcpd service is used for the subnet IP address and DNS.

#### Time Settings

Select time zone of your location. To use local time, leave the checkmark in the box next to Use local time.

|                   |                                                                             |
|-------------------|-----------------------------------------------------------------------------|
| NTP Client        | <input checked="" type="checkbox"/> Enable <input type="checkbox"/> Disable |
| Time Zone         | UTC+08:00 ▼                                                                 |
| Summer Time (DST) | last Sun Mar - last Sun Oct ▼                                               |
| Server IP/Name    | <input type="text"/>                                                        |

**NTP Client:** Get the system time from NTP server

**Time Zone:** Time zone options

**Summer Time (DST):** set it depends on users' location

**Server IP/Name:** IP address of NTP server, up to 32 characters. If blank, the system will find a server by default

### Adjust Time

**Adjust Time**

|        |                             |     |
|--------|-----------------------------|-----|
| Auto ▼ | 2015 - 06 - 05 15 : 33 : 00 | Set |
|--------|-----------------------------|-----|

To adjust time by the system and refresh to get the time of the web, user can set to modify the time of the system. They can change to adjust time by manual to achieve adjust time by the system if the system fails to get NTP server

### 3.3.1.2 Dynamic DNS

If user's network has a permanently assigned IP address, users can register a domain name and have that name linked with their IP address by public Domain Name Servers (DNS). However, if their Internet account uses a dynamically assigned IP address, users will not know in advance what their IP address will be, and the address can change frequently. In this case, users can use a commercial dynamic DNS service, which allows them to register their domain to their IP address, and will forward traffic directed at their domain to their frequently-changing IP address.

**DDNS Service:** Four-Faith router currently support DynDNS, freedns, Zoneedit, NO-IP, 3322, easyDNS, TZO, DynSIP and Custom based on the user.

|              |            |
|--------------|------------|
| DDNS Service | 3322.org ▼ |
|--------------|------------|

|                              |                                                               |                                 |
|------------------------------|---------------------------------------------------------------|---------------------------------|
| User Name                    | <input type="text"/>                                          |                                 |
| Password                     | <input type="text"/>                                          | <input type="checkbox"/> Unmask |
| Host Name                    | <input type="text"/>                                          |                                 |
| Type                         | <input type="text" value="Dynamic"/>                          |                                 |
| Wildcard                     | <input type="checkbox"/>                                      |                                 |
| Do not use external ip check | <input checked="" type="radio"/> Yes <input type="radio"/> No |                                 |

**User Name:** users register in DDNS server, up to 64 characteristic

**Password:** password for the user name that users register in DDNS server, up to 32 characteristic

**Host Name:** users register in DDNS server, no limited for input characteristic for now

**Type:** depends on the server

**Wildcard:** support wildcard or not, the default is OFF. ON means \*.host.3322.org is equal to host.3322.org

**Do not use external ip check:** enable or disable the function of 'do not use external ip check'

Force Update Interval  (Default: 10 Days, Range: 1 - 60)

**Force Update Interval:** unit is day, try forcing the update dynamic DNS to the server by setted days

## Status

### DDNS Status

```
Fri Nov 25 13:58:32 2011: INADYN: Started 'INADYN Advanced version 1.96-ADV' - dynamic DNS updater.  
Fri Nov 25 13:58:32 2011: INADYN: IP read from cache file is '192.168.8.222'. No update required.  
Fri Nov 25 13:58:32 2011: I:INADYN: IP address for alias 'testsixin.3322.org' needs update to '192.168.8.38'  
Fri Nov 25 13:58:33 2011: I:INADYN: Alias 'testsixin.3322.org' to IP '192.168.8.38' updated successfully.
```

DDNS Status shows connection log information

### 3.3.1.3 MAC Address Clone

Some ISP need the users to register their MAC address. The users can clone the router MAC address to their MAC address registered in ISP if they do not want to re-register their MAC address

Enable  Disable

Clone LAN MAC

Clone WAN MAC

[Get Current PC MAC Address](#)

Clone Wireless MAC

**Clone MAC address** can clone three parts: Clone LAN MAC, Clone WAN MAC, Clone Wireless MAC.

**Noted** that one MAC address is 48 characteristic, can not be set to the multicast address, the first byte must be even. And MAC address value of network bridge br0 is determined by the smaller value of wireless MAC address and LAN port MAC address.

### 3.3.1.4 Advanced Router

**Operating Mode:** Gateway and Router

**Operating Mode**

Operating Mode

If the router is hosting users' Internet connection, select Gateway mode. If another router exists on their network, select Router mode.

### Static Routing

**Static Routing**

Select set number  [Delete](#)

Route Name

Metric

Destination LAN NET

Subnet Mask

Gateway

Interface

[Show Routing Table](#)

**Select set number:** 1-50

**Route Name:** defined routing name by users, up to 25 characters

**Metric:** 0-9999

**Destination LAN NET:** the Destination IP Address is the address of the network or host to which users want to assign a static route

**Subnet Mask:** the Subnet Mask determines which portion of an IP address is the network portion,

and which portion is the host portion

**Gateway:** IP address of the gateway device that allows for contact between the router and the network or host.

**Interface:** indicate users whether the Destination IP Address is on the LAN & WLAN (internal wired and wireless networks), the WAN (Internet), or Loopback (a dummy network in which one PC acts like a network, necessary for certain software programs)

**Show Routing Table**

| Routing Table Entry List |                 |             |            |
|--------------------------|-----------------|-------------|------------|
| Destination LAN NET      | Subnet Mask     | Gateway     | Interface  |
| 192.168.1.1              | 255.255.255.255 | 0.0.0.0     | WAN        |
| 192.168.1.0              | 255.255.255.0   | 0.0.0.0     | LAN & WLAN |
| 192.168.1.0              | 255.255.255.0   | 0.0.0.0     | WAN        |
| 169.254.0.0              | 255.255.0.0     | 0.0.0.0     | WAN        |
| 0.0.0.0                  | 0.0.0.0         | 192.168.1.1 | LAN & WLAN |

Refresh
Close

**3.3.1.5 VLANs**

| VLAN | Port                                |                                     |                                     |                                     |                                     | Assigned To Bridge |
|------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------|
|      | W                                   | 1                                   | 2                                   | 3                                   | 4                                   |                    |
| 0    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | LAN                |
| 1    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 2    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 3    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 4    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 5    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 6    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 7    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 8    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 9    | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 10   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 11   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 12   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 13   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 14   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |
| 15   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | None               |

VLANs function is to divide different VLAN ports by users' will. The system supports 16 VLAN port from VLAN0-VLAN15. However there is only 5 time ports (1 WAN port and 4 LAN port) divided by users themselves, and LAN port and WAN port disable to divide into one VLAN port meanwhile.

### 3.3.1.6 Networking

**Bridging**

**Create Bridge**

Bridge 0  STP  Prio  MTU

**Assign to Bridge**

**Current Bridging Table**

| Bridge Name | STP enabled | Interfaces |
|-------------|-------------|------------|
| br0         | no          | vlan0 ra0  |

**Bridging-Create Bridge:** creates a new empty network bridge for later use. STP means Spanning Tree Protocol and with PRIO users are able to set the bridge priority order. The lowest number has the highest priority.

**Bridging - Assign to Bridge:** allows users to assign any valid interface to a network bridge. Consider setting the Wireless Interface options to Bridged if they want to assign any Wireless Interface here. Any system specific bridge setting can be overridden here in this field.

**Current Bridging Table:** shows current bridging table

**Create steps as below:**

Click 'Add' to create a new bridge, configuration is as below:

**Create Bridge**

Bridge 0  STP  Prio  MTU

Bridge 1  STP  Prio  MTU

Create bridge option: the first br0 means bridge name. STP means to on/off spanning tree protocol. Prio means priority level of STP, the smaller the number, the higher the level. MTU means maximum transfer unit, default is 1500, delete if it is not need. And then click 'Save' or 'Add'. Bride properties is as below:

**Create Bridge**

|                                    |               |     |     |      |       |     |      |        |
|------------------------------------|---------------|-----|-----|------|-------|-----|------|--------|
| Bridge 0                           | br0           | STP | Off | Prio | 32768 | MTU | 1500 | Delete |
| Bridge 1                           | br1           | STP | On  | Prio | 32768 | MTU | 1500 | Delete |
| IP Address                         | 0 . 0 . 0 . 0 |     |     |      |       |     |      |        |
| Subnet Mask                        | 0 . 0 . 0 . 0 |     |     |      |       |     |      |        |
| <input type="button" value="Add"/> |               |     |     |      |       |     |      |        |

Enter relevant bridge IP address and subnet mask, click 'Add' to create a bridge.

**Note:** Only create a bridge can apply it.

**Assign to Bridge**

|                                    |      |           |     |      |    |        |
|------------------------------------|------|-----------|-----|------|----|--------|
| Assignment 0                       | none | Interface | ra0 | Prio | 63 | Delete |
| <input type="button" value="Add"/> |      |           |     |      |    |        |

Dropdown menu options: none, br0, br1

Assign to Bridge option: to assign different ports to created bridge. For example: assign port (wireless port) is ra0 in br1 bridge as below:

Prio means priority level: work if multiple ports are within the same bridge. The smaller the number, the higher the level. Click 'Add' to take it effect.

**Note:** corresponding interface of WAN ports interface should not be binding, this bridge function is basically used for LAN port, and should not be binding with WAN port

If bind success, bridge binding list in the list of current bridging table is as below:

**Current Bridging Table**

| Bridge Name | STP enabled | Interfaces |
|-------------|-------------|------------|
| br0         | no          | vlan0      |
| br1         | yes         | ra0        |

To make br1 bridge has the same function with DHCP assigned address, users need to set multiple DHCP function, see the introduction of multi-channel DHCPD:



**Port Setup**

|                              |                                 |                                          |
|------------------------------|---------------------------------|------------------------------------------|
| Network Configuration eth2   | <input type="radio"/> Unbridged | <input checked="" type="radio"/> Default |
| Network Configuration vlan0  | <input type="radio"/> Unbridged | <input checked="" type="radio"/> Default |
| Network Configuration ra0    | <input type="radio"/> Unbridged | <input checked="" type="radio"/> Default |
| Network Configuration apcli0 | <input type="radio"/> Unbridged | <input checked="" type="radio"/> Default |
| Network Configuration wds0   | <input type="radio"/> Unbridged | <input checked="" type="radio"/> Default |
| Network Configuration wds1   | <input type="radio"/> Unbridged | <input checked="" type="radio"/> Default |
| Network Configuration wds2   | <input type="radio"/> Unbridged | <input checked="" type="radio"/> Default |
| Network Configuration wds3   | <input type="radio"/> Unbridged | <input checked="" type="radio"/> Default |
| Network Configuration br0    | <input type="radio"/> Unbridged | <input checked="" type="radio"/> Default |

**Port Setup:** Set the port property, the default is not set

Network Configuration ra0  Unbridged  Default

MTU

Multicast forwarding  Enable  Disable

Masquerade / NAT  Enable  Disable

IP Address ...

Subnet Mask ...

Choose not bridge to set the port's own properties, detailed properties are as below:

MTU: maximum transfer unit

Multicast forwarding: enable or disable multicast forwarding

Masquerade/NAT: enable or disable Masquerade/NAT

IP Address: set ra0's IP address, and do not conflict with other ports or bridge

Subnet Mask: set the port's subnet mask

**Multiple DHCP Server**

DHCP 0   Start  Max  Leasetime

Multiple DHCPD: using multiple DHCP service. Click 'Add' in multiple DHCP server to appear relevant configuration. The first means the name of port or bridge (do not be configured as eth0), the second means whether to on DHCP. Start means start address, Max means maximum assigned DHCP clients, Leasetime means the client lease time, the unit is second, click 'Save' or 'Apply' to put it into effect after setting.

**Note:** Only configure and click 'Save' can configure the next, can not configure multiple DHCP at the same time.

### 3.3.2 Wireless

#### 3.3.2.1 Basic Settings

**Wireless Physical Interface wl0 [2.4 GHz]**

Wireless Network  Enable  Disable

**Physical Interface ra0 - SSID [dd-junjinlee] HWAddr [00:AA:BB:CC:DD:15]**

|                              |                                                                          |
|------------------------------|--------------------------------------------------------------------------|
| Wireless Mode                | <input type="text" value="AP"/>                                          |
| Wireless Network Mode        | <input type="text" value="N-Only"/>                                      |
| 802.11n Transmission Mode    | <input type="text" value="Mixed"/>                                       |
| Wireless Network Name (SSID) | <input type="text" value="dd-junjinlee"/>                                |
| Wireless Channel             | <input type="text" value="11 - 2.462 GHz"/>                              |
| Channel Width                | <input type="text" value="40 MHz"/>                                      |
| Extension Channel            | <input type="text" value="upper"/>                                       |
| Wireless SSID Broadcast      | <input checked="" type="radio"/> Enable <input type="radio"/> Disable    |
| Network Configuration        | <input type="radio"/> Unbridged <input checked="" type="radio"/> Bridged |

**Virtual Interfaces**

**Wireless Network:** “Eanble”, radio on.  
 “Disable”, radio off.

**Wireless Mode:** AP, Client, Adhoc, Repeater, Repeater Bridge four options。

**Wireless Network Mode:**

**Mixed:** Support 802.11b, 802.11g, 802.11n wireless devices.

**BG-Mixed:** Support 802.11b, 802.11g wireless devices.

**B-only:** Only supports the 802.11b standard wireless devices.

**B-only:** Only supports the 802.11b standard wireless devices.

**G-only:** Only supports the 802.11g standard wireless devices.

**NG-Mixed:** Support 802.11g, 802.11n wireless devices.

**N-only :** Only supports the 802.11g standard wireless devices.

**802.11n Transmission Mode:** In the wireless network mode to "N-only" choose to transfer its transmission mode.

**Greenfield:** When you determine the surrounding environment, there is no other 802.11a/b/g devices use the same channel, use this mode to increase throughput. Other 802.11a/b/g devices use the same channel in the environment, the information you send may generate an error, re-issued.

**Mixed:** This mode is contrary to the green mode, but will reduce the throughput.

**Wireless Network Name(SSID):** The SSID is the network name shared among all devices in a wireless network. The SSID must be identical for all devices in the wireless network. It is case-sensitive and must not exceed 32 alphanumeric characters, which may be any keyboard character. Make sure this setting is the same for all devices in your wireless network.。

**Wireless Channel:** A total of 1-13 channels to choose more than one wireless device environment, please try to avoid using the same channel with other devices.。

**Channel Width:** 20MHZ and 40MHZ.。

**Extension Channel:** Channel for 40MHZ, you can choose upper or lower.

**Wireless SSID Broadcast:**

**Enable:** SSID broadcasting.

**Disable:** Hidden SSID.

**Network Configuration:**

**Bridged:** Bridge to the router, under normal circumstances, please select the bridge.

**Unbridged:** There is no bridge to the router, IP addresses need to manually configure.

|                       |                                                                                                                                       |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Network Configuration | <input checked="" type="radio"/> Unbridged <input type="radio"/> Bridged                                                              |
| Multicast forwarding  | <input type="radio"/> Enable <input checked="" type="radio"/> Disable                                                                 |
| Masquerade / NAT      | <input checked="" type="radio"/> Enable <input type="radio"/> Disable                                                                 |
| IP Address            | <input type="text" value="192"/> . <input type="text" value="168"/> . <input type="text" value="1"/> . <input type="text" value="1"/> |
| Subnet Mask           | <input type="text" value="255"/> . <input type="text" value="255"/> . <input type="text" value="0"/> . <input type="text" value="0"/> |

**Virtual Interfaces:** Click Add to add a virtual interface. Add successfully, click on the remove, you can remove the virtual interface.。

**Virtual Interfaces**

**Virtual Interfaces ra1 SSID [dd-wrt\_vap] HWAddr [00:AA:BB:CC:DD:16]**

|                              |                                                                          |
|------------------------------|--------------------------------------------------------------------------|
| Wireless Network Name (SSID) | <input style="width: 90%;" type="text" value="dd-wrt_vap"/>              |
| Wireless SSID Broadcast      | <input checked="" type="radio"/> Enable <input type="radio"/> Disable    |
| AP Isolation                 | <input type="radio"/> Enable <input checked="" type="radio"/> Disable    |
| Network Configuration        | <input type="radio"/> Unbridged <input checked="" type="radio"/> Bridged |

**AP Isolation:** This setting isolates wireless clients so access to and from other wireless clients are stopped.

**Note :** Save your changes, after changing the "Wireless Mode", "Wireless Network Mode", "wireless width", "broadband" option, please click on this button, and then configure the other options.

### 3.3.2.2 Wireless Security

Wireless security options used to configure the security of your wireless network. This route is a total of seven kinds of wireless security mode. Disabled by default, not safe mode is enabled. Such as changes in Safe Mode, click Apply to take effect immediately.

**Wireless Security w10**

Physical Interface ra0 SSID [dd-junjinlee] HWAddr [00:AA:BB:CC:DD:15]

Security Mode Disabled ▼

Save
Apply Settings

**Wireless Security w10**

Physical Interface ra0 SSID [SSID] HWAddr []

Security Mode WPA2 Personal ▼

WPA Algorithms AES ▼

WPA Shared Key 

 Unmask

Key Renewal Interval (in seconds) 

(Default: 3600, Range: 1 - 99999)

Save
Apply Settings

**WPA2 Personal:**TKIP/AES/TKIP+AES , dynamic encryption keys. TKIP + AES, self-applicable TKIP or AES.

**WPA Shared Key:** Between 8 and 63 ASCII character or hexadecimal digits.。

Key Renewal Interval (in seconds): 1-99999。

**Wireless Security w10**

Physical Interface ra0 SSID [dd-junjinlee] HWAddr [00:AA:BB:CC:DD:15]

Security Mode WPA Enterprise ▼

WPA Algorithms AES ▼

Radius Auth Server Address 
 .  .  .

Radius Auth Server Port 

(Default: 1812)

Radius Auth Shared Secret 

 Unmask

Key Renewal Interval (in seconds)

**WPA Enterprise/WPA2 Enterprise/WPA2 Enterprise Mixed:** WPA Enterprise uses an external RADIUS server to perform user authentication.

**WPA Algorithms:** AES/TKIP/TPIP+AES.

**Radius Auth Sever Address:** The IP address of the RADIUS server.

**Radius Auth Server Port:** The RADIUS Port (default is 1812)。

**Radius Auth Shared Secret:** The shared secret from the RADIUS server。

**Key Renewal Interva(in seconds):** 1-99999。

### 3.3.3 Services

#### 3.3.3.1 Services

##### DHCP Server

DHCPd assigns IP addresses to users local devices. While the main configuration is on the setup page users can program some nifty special functions here.

##### DHCP Server

Additional DHCPd Options

| Static Leases                                                            |           |            |                   |
|--------------------------------------------------------------------------|-----------|------------|-------------------|
| MAC Address                                                              | Host Name | IP Address | Client Lease Time |
|                                                                          |           |            | minutes           |
| <input type="button" value="Add"/> <input type="button" value="Remove"/> |           |            |                   |

**Additional DHCPd Options:** some extra options users can set by entering them

##### DNSMasq

DNSmasq is a local DNS server. It will resolve all host names known to the router from dhcp (dynamic and static) as well as forwarding and caching DNS entries from remote DNS servers. Local DNS enables DHCP clients on the LAN to resolve static and dynamic DHCP hostnames.

##### DNSMasq

DNSMasq  Enable  Disable

Local DNS  Enable  Disable

No DNS Rebind  Enable  Disable

Additional DNSMasq Options

**Local DNS:** enables DHCP clients on the LAN to resolve static and dynamic DHCP hostnames

**No DNS Rebind:** when enabled, it can prevent an external attacker to access the router's internal Web interface. It is a security measure

**Additional DNSMasq Options:** some extra options users can set by entering them in Additional DNS Options.

**For example:**

**static allocation:** dhcp-host=AB:CD:EF:11:22:33,192.168.0.10,myhost,myhost.domain,12h

**max lease number:** dhcp-lease-max=2

**DHCP server IP range:** dhcp-range=192.168.0.110,192.168.0.111,12h

## SNMP

**SNMP**

SNMP  Enable  Disable

Location

Contact

Name

RO Community

RW Community

**Location:** equipment location

**Contact:** contact this equipment management

**Name:** device name

**RO Community:** SNMP RO community name, the default is public, Only to read.

**RW Community:** SNMP RW community name, the default is private, Read-write permissions

## SSHD

Enabling SSHd allows users to access the Linux OS of their router with an SSH client

**Secure Shell**

SSHd  Enable  Disable

SSH TCP Forwarding  Enable  Disable

Password Login  Enable  Disable

Port  (Default: 22)

Authorized Keys

**SSH TCP Forwarding:** enable or disable to support the TCP forwarding

**Password Login:** allows login with the router password (username is admin)

**Port:** port number for SSHd (default is 22)

**Authorized Keys:** here users paste their public keys to enable key-based login (more secure than a simple password)

## System log

Enable Syslogd to capture system messages. By default they will be collected in the local file /var/log/messages. To send them to another system, enter the IP address of a remote syslog server.

#### System Log

|                 |                                         |                                          |                           |
|-----------------|-----------------------------------------|------------------------------------------|---------------------------|
| Syslogd         | <input checked="" type="radio"/> Enable | <input type="radio"/> Disable            |                           |
| Syslog Out Mode | <input type="radio"/> Net               | <input checked="" type="radio"/> Console | <input type="radio"/> Web |

**Syslog Out Mode:** two log mode

**Net:** the log information output to a syslog server

**Console:** the log information output to console port

**Web:** the log information output to web

**Remote Server:** if choose net mode, users should input a syslog server's IP Address and run a syslog server program on it.

#### Telnet

|        |                                         |                               |
|--------|-----------------------------------------|-------------------------------|
| Telnet | <input checked="" type="radio"/> Enable | <input type="radio"/> Disable |
|--------|-----------------------------------------|-------------------------------|

**Telnet:** enable a telnet server to connect to the router with telnet. The username is `admin` and the password is the router's password.

**Note:** If users use the router in an untrusted environment (for example as a public hotspot), it is strongly recommended to use SSHd and deactivate telnet.

#### WAN Traffic Counter

|                     |                                         |                               |
|---------------------|-----------------------------------------|-------------------------------|
| WAN Traffic Counter | <input checked="" type="radio"/> Enable | <input type="radio"/> Disable |
|---------------------|-----------------------------------------|-------------------------------|

**Ttraff Daemon:** enable or disable wan traffic counter function

### 3.3.4 VPN

#### 3.3.4.1 PPTP

##### PPTP Server

**PPTP Server**

PPTP Server  Enable  Disable

Broadcast support  Enable  Disable

Force MPPE Encryption  Enable  Disable

DNS1

DNS2

WINS1

WINS2

Server IP

Client IP(s)

CHAP-Secrets

**Broadcast support:** enable or disable broadcast support of PPTP server

**Force MPPE Encryption:** enable or disable force MPPE encryption of PPTP data

**DNS1/DNS2/WINS1/WINS2:** set DNS1/DNS2/WINS1/WINS2

**Server IP:** input IP address of the router as PPTP server, differ from LAN address

**Client IP(s):** IP address assigns to the client, the format is xxx.xxx.xxx.xxx-xxx

**CHAP Secrets:** user name and password of the client using PPTP service

**Note:** client IP must be different with IP assigned by router DHCP.

The format of CHAP Secrets is user \* password \*.

### PPTP Client

**PPTP Client**

PPTP Client Options  Enable  Disable

Server IP or DNS Name

Remote Subnet  .  .  .

Remote Subnet Mask  .  .  .

MPPE Encryption

MTU  (Default: 1450)

MRU  (Default: 1450)

NAT  Enable  Disable

Fixed IP  Enable  Disable

Fixed IP Address  .  .  .

User Name

Password   Unmask

**Server IP or DNS Name:** PPTP server's IP Address or DNS Name



**Remote Subnet:** the network of the remote PPTP server

**Remote Subnet Mask:** subnet mask of remote PPTP server

**MPPE Encryption:** enable or disable Microsoft Point-to-Point Encryption。

**MTU:** maximum Transmission Unit

**MRU:** maximum Receive Unit

**NAT:** network Address Translation

**Fixed IP:** Tunnel IP enable

**Fixed IP Address:** in the mode of the tunnel IP to take effect

**User Name:** user name to login PPTP Server.

**Password:** password to log into PPTP Server.

### 3.3.4.2 L2TP

#### L2TP Server



**Force MPPE Encryption:** enable or disable force MPPE encryption of L2TP data

**Server IP:** input IP address of the router as PPTP server, differ from LAN address

**Client IP(s):** IP address assigns to the client, the format is xxx.xxx.xxx.xxx-xxx.xxx.xxx.xxx

**CHAP Secrets:** user name and password of the client using L2TP service

**Note:** client IP must be different with IP assigned by router DHCP.

The format of CHAP Secrets is user \* password \*.

#### L2TP Client

**L2TP Client**

|                                |                                                                                                                                   |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| L2TP Client Options            | <input checked="" type="radio"/> Enable <input type="radio"/> Disable                                                             |
| Tunnel name                    | <input type="text" value="Router"/>                                                                                               |
| User Name                      | <input type="text" value="DOMAIN\Username"/>                                                                                      |
| Password                       | <input type="password"/> <input type="checkbox"/> Unmask                                                                          |
| Tunnel Authentication Password | <input type="password"/> <input type="checkbox"/> Unmask                                                                          |
| Gateway (L2TP Server)          | <input type="text"/>                                                                                                              |
| Remote Subnet                  | <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> |
| Remote Subnet Mask             | <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> |
| MPPE Encryption                | <input type="text" value="mppe required"/>                                                                                        |
| MTU                            | <input type="text" value="1450"/> (Default: 1450)                                                                                 |
| MRU                            | <input type="text" value="1450"/> (Default: 1450)                                                                                 |
| NAT                            | <input checked="" type="radio"/> Enable <input type="radio"/> Disable                                                             |
| Fixed IP                       | <input checked="" type="radio"/> Enable <input type="radio"/> Disable                                                             |
| Fixed IP Address               | <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> . <input type="text" value="0"/> |
| Require CHAP                   | <input checked="" type="radio"/> Yes <input type="radio"/> No                                                                     |
| Refuse PAP                     | <input checked="" type="radio"/> Yes <input type="radio"/> No                                                                     |
| Require Authentication         | <input checked="" type="radio"/> Yes <input type="radio"/> No                                                                     |

**Gateway(L2TP Server):** L2TP server’s IP Address or DNS Name

**Remote Subnet:** the network of remote PPTP server

**Remote Subnet Mask:** subnet mask of remote PPTP server

**MPPE Encryption:** enable or disable Microsoft Point-to-Point Encryption

**MTU:** maximum transmission unit

**MRU:** maximum receive unit

**NAT:** network address translation

**User Name:** user name to login L2TP Server

**Password:** password to login L2TP Server

**Fixed IP:** Tunnel IP enable

**Fixed IP Address:** in the mode of the tunnel IP to take effect

**Require CHAP:** enable or disable support chap authentication protocol

**Refuse PAP:** enable or disable refuse to support the pap authentication

**Require Authentication:** enable or disable support authentication protocol

### 3.3.4.3 OPENVPN

#### OPENVPN Server

Start Type  WAN Up  System

**Start Type:** WAN UP----start after on-line, System----start when boot up

Config via  GUI  Config File

Server mode  Router (TUN)  Bridge (TAP)

**Config via:** GUI----Page configuration, Config File----config File configuration

**Server mode:** Router (TUN)-route mode, Bridge (TAP)----bridge mode

**Router (TUN):**

Network

Netmask

**Network:** network address allowed by OPENVPN server

**Netmask:** netmask allowed by OPENVPN server

**Bridge (TAP):**

DHCP-Proxy mode  Enable  Disable

Pool start IP

Pool end IP

Gateway

Netmask

**DHCP-Proxy mode:** enable or disable DHCP-Proxy mode

**Pool start IP:** pool start IP of the client allowed by OPENVPN server

**Pool end IP:** pool end IP of the client allowed by OPENVPN server

**Gateway:** the gateway of the client allowed by OPENVPN server

**Netmask:** netmask of the client allowed by OPENVPN server

Port  (Default: 1194)

Tunnel Protocol

Encryption Cipher

Hash Algorithm

**Port:** listen port of OPENVPN server

**Tunnel Protocol:** UCP or TCP of OPENVPN tunnel protocol

**Encryption Cipher:** Blowfish CBC, AES-128 CBC, AES-192 CBC, AES-256 CBC, AES-512 CBC

**Hash Algorithm:** Hash algorithm provides a method of quick access to data, including SHA1, SHA256, SHA512, MD5

**Advanced Options**

|                                    |                                         |                                          |
|------------------------------------|-----------------------------------------|------------------------------------------|
| Advanced Options                   | <input checked="" type="radio"/> Enable | <input type="radio"/> Disable            |
| Use LZO Compression                | <input type="radio"/> Enable            | <input checked="" type="radio"/> Disable |
| Redirect default Gateway           | <input type="radio"/> Enable            | <input checked="" type="radio"/> Disable |
| Allow Client to Client             | <input checked="" type="radio"/> Enable | <input type="radio"/> Disable            |
| Allow duplicate cn                 | <input type="radio"/> Enable            | <input checked="" type="radio"/> Disable |
| TUN MTU Setting                    | <input type="text" value="1500"/>       | (Default: 1500)                          |
| MSS-Fix/Fragment across the tunnel | <input type="text"/>                    | (Default: Disable)                       |
| TLS Cipher                         | <input type="text" value="Disable"/>    |                                          |
| Client connect script              | <input type="text"/>                    |                                          |

**Use LZO Compression:** enable or disable use LZO compression for data transfer

**Redirect default Gateway:** enable or disable redirect default gateway

**Allow Client to Client:** enable or disable allow client to client

**Allow duplicate cn:** enable or disable allow duplicate cn

**TUN MTU Setting:** set the value of TUN MTU

**TCP MSS:** MSS of TCP data

**TLS Cipher:** TLS (Transport Layer Security) encryption standard supports AES-128 SHA and AES-256 SHA

**Client connect script:** define some client script by user self

CA Cert

**CA Cert:** CA certificate

Public Server Cert

**Public Server Cert:** server certificate

Private Server Key

DH PEM

**Private Server Key:** the key seted by the server

**DH PEM:** PEM of the server

Additional Config

CCD-Dir DEFAULT file

TLS Auth Key

Certificate Revoke List

**Additional Config:** additional configurations of the server

**CCD-Dir DEFAULT file:** other file approaches

**TLS Auth Key:** authority key of Transport Layer Security

**Certificate Revoke List:** configure some revoke certificates

### OPENVPN Client

Server IP/Name

Port

(Default: 1194)

Tunnel Device

Tunnel Protocol

Encryption Cipher

Hash Algorithm

nsCertType verification

**Server IP/Name:** IP address or domain name of OPENVPN server

**Port:** listen port of OPENVPN client

**Tunnel Device:** TUN----Router mode, TAP----Bridge mode

**Tunnel Protocol:** UDP and TCP protocol

**Encryption Cipher:** Blowfish CBC, AES-128 CBC, AES-192 CBC, AES-256 CBC, AES-512 CBC

**Hash Algorithm:** Hash algorithm provides a method of quick access to data, including SHA1, SHA256, SHA512, MD5

**nsCertType verification:** support ns certificate type

|                                    |                                         |                                          |
|------------------------------------|-----------------------------------------|------------------------------------------|
| Advanced Options                   | <input checked="" type="radio"/> Enable | <input type="radio"/> Disable            |
| Use LZO Compression                | <input type="radio"/> Enable            | <input checked="" type="radio"/> Disable |
| NAT                                | <input type="radio"/> Enable            | <input checked="" type="radio"/> Disable |
| Bridge TAP to br0                  | <input type="radio"/> Enable            | <input checked="" type="radio"/> Disable |
| Local IP Address                   | <input type="text"/>                    |                                          |
| TUN MTU Setting                    | <input type="text" value="1500"/>       | (Default: 1500)                          |
| MSS-Fix/Fragment across the tunnel | <input type="text"/>                    | (Default: Disable)                       |
| TLS Cipher                         | <input type="text" value="Disable"/>    |                                          |
| TLS Auth Key                       | <input type="text"/>                    |                                          |
| Additional Config                  | <input type="text"/>                    |                                          |
| Policy based Routing               | <input type="text"/>                    |                                          |

**Use LZO Compression:** enable or disable use LZO compression for data transfer

**NAT:** enable or disable NAT through function

**Bridge TAP to br0:** enable or disable bridge TAP to br0

**Local IP Address:** set IP address of local OPENVPN client

**TUN MTU Setting:** set MTU value of the tunnel

**TCP MSS:** mss of TCP data

**TLS Cipher:** TLS (Transport Layer Security) encryption standard supports AES-128 SHA and AES-256 SHA

**TLS Auth Key:** authority key of Transport Layer Security

**Additional Config:** additional configurations of OPENVPN server

**Policy based Routing:** input some defined routing policy

|                    |                      |
|--------------------|----------------------|
| CA Cert            | <input type="text"/> |
| Public Client Cert | <input type="text"/> |
| Private Client Key | <input type="text"/> |

**CA Cert:** CA certificate

**Public Client Cert:** client certificate

**Private Client Key:** client key

### 3.3.4.4 IPSEC

#### Global settings

**Global settings**

Enable NAT-Traversal

Debug Level None ▾

[Save](#)

**Enable Nat-Traversal:** Default opened

**Debug Level:** Default None

#### Connect Status and Control

Show IPSEC connection and status of current router on IPSEC page.

**Connection status and control**

| Name                | Type | Common Name | status | Action |
|---------------------|------|-------------|--------|--------|
| <a href="#">Add</a> |      |             |        |        |

**Name:** the name of IPSEC connection

**Type:** The type and function of current IPSEC connection

**Common name:** local subnet, local address, opposite end address and opposite end subnet of current connection

**Status:** connection status: closed, negotiating, establish

**Closed:** this connection does not launch a connection request to opposite end

**Negotiating:** this connection launch a request to opposite end, is under negotiating, the connection has not been established yet

**Establish:** the connection has been established, enabled to use this tunnel

**Action:** the action of this connection, current is to delete, edit, reconnect and enable

**Delete:** to delete the connection, also will delete IPSEC if IPSEC has set up

**Edit:** to edit the configure information of this connection, reload this connection to make the configuration effect after edit

**Reconnect:** this action will remove current tunnel, and re-launch tunnel establish request

**Enable:** when the connection is enable, it will launch tunnel establish request when the system reboot or reconnect, otherwise the connection will not do it

**Add:** to add a new IPSEC connection

#### Add IPSEC connection or edit IPSEC connection

**Type:** to choose IPSEC mode and relevant functions in this part, supports tunnel mode client, tunnel mode server and transfer mode currently

**Type**

Type

IPSEC role  Client  Server

**Connection:** this part contains basic address information of the tunnel

**Connection**

|                     |                                  |                  |                                     |
|---------------------|----------------------------------|------------------|-------------------------------------|
| Name                | <input type="text"/>             | Enabled          | <input checked="" type="checkbox"/> |
| Local WAN Interface | <input type="text" value="WAN"/> | Peer WAN address | <input type="text"/>                |
| Local Subnet        | <input type="text"/>             | Peer subnet      | <input type="text"/>                |
| Local Id            | <input type="text"/>             | Peer ID          | <input type="text"/>                |

**Name:** to indicate this connection name, must be unique

**Enabled:** If enable, the connection will send tunnel connection request when it is reboot or re-connection, otherwise it is no need if disable

**Local WAN Interface:** local addresss of the tunnel

**Remote Host Address:** IP/domain name of end opposite; this option can not fill in if using tunnel mode server

**Local Subnet:** IPsec local protects subnet and subnet mask, i.e. 192.168.1.0/24; this option can not fill in if using transfer mode

**Remote Subnet:** IPsec opposite end protects subnet and subnet mask, i.e.192.168.7.0/24; this option can not fill in if using transfer mode

**Local ID:** tunnel local end identification, IP and domain name are available

**Remote ID:** tunnel opposite end identification, IP and domain name are available

**Detection:** this part contains configure information of connection detection

**Detection**

Enable DPD Detection

Time Interval  (S) Timeout  (S) Action

Enable Connection Detection

**Enable DPD Detection:** enable or disable this function, tick means enable

**Time Interval:** set time interval of connect detection (DPD)

**Timeout:** set the timeout of connect detection

**Action:** set the action of connect detection

**Advanced Settings:** this part contains relevant setting of IKE, ESP, negotiation mode, etc.



**Advanced Settings**

Enable advanced settings

**Phase 1**

IKE Encryption  IKE Integrity  IKE Grouptype

IKE Lifetime  hours

**Phase 2**

ESP Encryption  ESP Integrity

ESP Keylife  hours

IKE aggressive mode allowed. Avoid if possible (preshared key is transmitted in clear text)!

Perfect Forward Secrecy (PFS)

**Enable Advanced Settings:** enable to configure 1<sup>st</sup> and 2<sup>nd</sup> phase information, otherwise it will automatic negotiation according to opposite end

**IKE Encryption:** IKE phased encryption mode

**IKE Integrity:** IKE phased integrity solution

**IKE Grouptype:** DH exchange algorithm

**IKE Lifetime:** set IKE lifetime, current unit is hour, the default is 0

**ESP Encryption:** ESP encryption type

**ESP Integrity:** ESP integrity solution

**ESP Keylife:** set ESP keylife, current unit is hour, the default is 0

**IKE aggressive mode allowed:** negotiation mode adopt aggressive mode if tick; it is main mode if non-tick

**perfect Forard Secrecy:** If you hook, then enable

**Authentication**

Use a Pre-Shared Key:

Generate and use the X.509 certificate

### 3.3.4.5 GRE

GRE (Generic Routing Encapsulation, Generic Routing Encapsulation) protocol is a network layer protocol (such as IP and IPX) data packets are encapsulated, so these encapsulated data packets to another network layer protocol (IP)transmission. GRE Tunnel (tunnel) technology, Layer Two Tunneling Protocol VPN (Virtual Private Network).

**GRE Tunnel**

GRE Tunnel  Enable  Disable

**GRE Tunnel:** enable or disable GRE function

|                  |                                                         |
|------------------|---------------------------------------------------------|
| Number           | 1 (fff) <input type="button" value="Delete"/>           |
| Status           | Enable <input type="button" value="v"/>                 |
| Name             | fff <input type="text"/>                                |
| Through          | PPP <input type="button" value="v"/>                    |
| Peer Wan IP Addr | 120.42.46.98 <input type="text"/>                       |
| Peer Subnet      | 192.168.5.0/24 <input type="text"/> (eg:192.168.1.0/24) |
| Peer Tunnel IP   | 200.200.200.1 <input type="text"/>                      |
| Local Tunnel IP  | 200.200.200.5 <input type="text"/>                      |
| Local Netmask    | 255.255.255.0 <input type="text"/>                      |

**Number** : Switch on/off GRE tunnel app

**Status** : Switch on/off someone GRE tunnel app

**Name** : GRE tunnel name

**Through** : The GRE packet transmit interface

**Peer Wan IP Addr** : The remote WAN address

**Peer Subnet** : The remote gateway local subnet, eg: 192.168.1.0/24

**Peer Tunnel IP** : The remote tunnel ip address

**Local Tunnel IP** : The local tunnel ip address

**Local Netmask** : Netmask of local network

|             |                                                                       |
|-------------|-----------------------------------------------------------------------|
| Keepalive   | <input checked="" type="radio"/> Enable <input type="radio"/> Disable |
| Retry times | <input type="text"/>                                                  |
| Interval    | <input type="text"/>                                                  |
| Fail Action | Hold <input type="button" value="v"/>                                 |

**Keepalive** : Enable or disable GRE Keepalive function

**Retry times** : GRE keepalive detect fail retries

**Interval** : The time interval of GRE keepalive packet sent

**Fail Action** : The action would be exec after keeping alive failed

Click on “**View GRE tunnels**” keys can view the information of GRE

| GRE Tunnels list |      |        |         |                  |                |                |                 |               |           |             |          |             |
|------------------|------|--------|---------|------------------|----------------|----------------|-----------------|---------------|-----------|-------------|----------|-------------|
| Number           | Name | Enable | Through | Peer Wan IP Addr | Peer Subnet    | Peer Tunnel IP | Local Tunnel IP | Local Netmask | Keepalive | Retry times | Interval | Fail Action |
| 1                | fff  | Yes    | PPP     | 120.42.46.98     | 192.168.5.0/24 | 200.200.200.1  | 200.200.200.5   | 255.255.255.0 | No        | 0           | 0        | Hold        |

### 3.3.5 Security

#### 3.3.5.1 Firewall

You can enable or disable the firewall, filter specific Internet data types,and prevent

anonymous Internet requests,ultimately enhance network security.

## Firewall Protection

### Firewall Protection

SPI Firewall  Enable  Disable

Firewall enhance network security and use SPI to check the packets into the network.To use firewall protection, choose to enable otherwise disabled. Only enable the SPI firewall, you can use other firewall functions: filtering proxy, block WAN requests, etc.

## Additional Filters

### Additional Filters

Filter Proxy  
 Filter Cookies  
 Filter Java Applets  
 Filter ActiveX

**Filter Proxy:** Wan proxy server may reduce the security of the gateway, Filtering Proxy will refuse any access to any wan proxy server. Click the check box to enable the function otherwise disabled.

**Filter Cookies:** Cookies are the website of data the data stored on your computer.When you interact with the site ,the cookies will be used. Click the check box to enable the function otherwise disabled.

**Filter Java Applets:** If refuse to Java, you may not be able to open web pages using the Java programming.. Click the check box to enable the function otherwise disabled.

**Filter ActiveX:** If refuse to ActiveX, you may not be able to open web pages using the ActiveX programming. Click the check box to enable the function otherwise disabled.

## Prevent WAN Request

### Block WAN Requests

Block Anonymous WAN Requests (ping)  
 Filter IDENT (Port 113)  
 Block WAN SNMP access

**Block Anonymous WAN Requests (ping):** By selecting “Block Anonymous WAN Requests (ping)” box to enable this feature, you can prevent your network from the Ping or detection of other Internet users. so that make More difficult to break into your network. The default state of this feature is enabled ,choose to disable allow anonymous Internet requests.

**Filter IDENT (Port 113):** Enable this feature can prevent port 113 from being scanned from outside. Click the check box to enable the function otherwise disabled.

**Block WAN SNMP access:** This feature prevents the SNMP connection requests from the WAN. After Complete the changes, click the **Save Settings** button to save your changes. Click the **Cancel Changes** button to cancel unsaved changes.

## Impede WAN DoS/Bruteforce

**Impede WAN DoS/Bruteforce**

Limit SSH Access

Limit Telnet Access

Limit PPTP Server Access

Limit L2TP Server Access

**Limit ssh Access:** This feature limits the access request from the WAN by ssh, and per minute up to accept two connection requests on the same IP. Any new access request will be automatically dropped.

**Limit Telnet Access:** This feature limits the access request from the WAN by Telnet, and per minute up to accept two connection requests on the same IP. Any new access request will be automatically dropped.

**Limit PPTP Server Access:** When build a PPTP Server in the router,this feature limits the access request from the WAN by ssh, and per minute up to accept two connection requests on the same IP . Any new access request will be automatically dropped.

**Limit L2TP Server Access:** When build a L2TP Server in the router, this feature limits the access request from the WAN by ssh, and per minute up to accept two connection requests on the same IP. Any new access request will be automatically dropped.

**Log Management**

The router can keep logs of all incoming or outgoing traffic for your Internet connection.

**Log**

Log  Enable  Disable

**Log:** To keep activity logs, select Enable. To stop logging, select Disable. When select enable, the following page will appear.

**Log**

Log  Enable  Disable

Log Level

**Options**

Dropped

Rejected

Accepted

**Log Level:** Set this to the required log level. Set Log Level higher to log more actions.

**Options:** When select Enable, the corresponding connection will be recorded in the journal, the disabled are not recorded.

**Incoming Log:** To see a temporary log of the Router's most recent incoming traffic, click the Incoming Log button.

| Incoming Log Table                                                          |          |                         |      |
|-----------------------------------------------------------------------------|----------|-------------------------|------|
| Source IP                                                                   | Protocol | Destination Port Number | Rule |
| <input type="button" value="Refresh"/> <input type="button" value="Close"/> |          |                         |      |

**Outgoing Log:** To see a temporary log of the Router's most recent outgoing traffic, click the Outgoing Log button.

| Outgoing Log Table |                    |          |                     |          |
|--------------------|--------------------|----------|---------------------|----------|
| LAN IP             | Destination URL/IP | Protocol | Service/Port Number | Rule     |
| 192.168.1.164      | 223.203.188.56     | TCP      | www                 | Accepted |
| 192.168.1.164      | 183.60.16.200      | UDP      | 8000                | Accepted |
| 192.168.1.164      | 183.60.48.60       | UDP      | 8000                | Accepted |
| 192.168.1.164      | 112.95.240.183     | UDP      | 8000                | Accepted |
| 192.168.1.164      | 183.60.49.245      | UDP      | 8000                | Accepted |
| 192.168.1.164      | 119.147.32.204     | UDP      | 8000                | Accepted |
| 192.168.1.164      | 112.90.86.244      | UDP      | 8000                | Accepted |
| 192.168.1.164      | 119.147.45.157     | UDP      | 8000                | Accepted |
| 192.168.1.164      | 183.60.49.15       | UDP      | 8000                | Accepted |
| 192.168.1.164      | 183.60.16.70       | UDP      | 8000                | Accepted |
| 192.168.1.164      | 183.60.16.200      | UDP      | 8000                | Accepted |
| 192.168.1.164      | 183.60.48.60       | UDP      | 8000                | Accepted |

Click the **Save Settings** button to save your changes. Click the **Cancel Changes** button to cancel unsaved changes.

### 3.3.6 Access Restrictions

#### 3.3.6.1 WAN Access

Use access restrictions, you can block or allow specific types of Internet applications. You can set specific PC-based Internet access policies. This feature allows you to customize up to ten different Internet Access Policies for particular PCs, which are identified by their IP or MAC addresses.

**Access Policy**

Policy: 1 ( )

Status:  Enable  Disable

Policy Name:

PCs:

Deny  Filter

Internet access during selected days and hours.

Two options in the default policy rules: "Filter" and "reject". If select "Deny", you will deny specific computers to access any Internet service at a particular time period. If you choose to "filter", It will block specific computers to access the specific sites at a specific time period. You can set up 10 Internet access policies filtering specific PCs access Internet services at a particular time period.

**Access Policy:** You may define up to 10 access policies. Click Delete to delete a policy or Summary to see a summary of the policy.

**Status:** Enable or disable a policy.

**Policy Name:** You may assign a name to your policy.

**PCs:** The part is used to edit client list, the strategy is only effective for the PC in the list.

**Days**

|                                     |                          |                          |                          |                          |                          |                          |                          |
|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Everyday                            | Sun                      | Mon                      | Tue                      | Wed                      | Thu                      | Fri                      | Sat                      |
| <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**Times**

24 Hours

From  0:00 To  0:00

**Days:** Choose the day of the week you would like your policy to be applied.

**Times:** Enter the time of the day you would like your policy to be applied.

**Website Blocking by URL Address**

|                      |                      |                      |
|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> |
| <input type="text"/> | <input type="text"/> | <input type="text"/> |
| <input type="text"/> | <input type="text"/> | <input type="text"/> |

**Website Blocking by Keyword**

|                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

**Website Blocking by URL Address:** You can block access to certain websites by entering their URL.

**Website Blocking by Keyword:** You can block access to certain website by the keywords contained in their webpage

| List of clients                                                    |                                   |
|--------------------------------------------------------------------|-----------------------------------|
| Enter MAC Address of the clients in this format: xx:xx:xx:xx:xx:xx |                                   |
| MAC 01                                                             | 00:AA:BB:CC:DD:EE                 |
| MAC 02                                                             | 00:00:00:00:00:00                 |
| MAC 03                                                             | 00:00:00:00:00:00                 |
| MAC 04                                                             | 00:00:00:00:00:00                 |
| MAC 05                                                             | 00:00:00:00:00:00                 |
| MAC 06                                                             | 00:00:00:00:00:00                 |
| MAC 07                                                             | 00:00:00:00:00:00                 |
| MAC 08                                                             | 00:00:00:00:00:00                 |
| Enter the IP Address of the clients                                |                                   |
| IP 01                                                              | 192.168.1. 15                     |
| IP 02                                                              | 192.168.1. 0                      |
| IP 03                                                              | 192.168.1. 0                      |
| IP 04                                                              | 192.168.1. 0                      |
| IP 05                                                              | 192.168.1. 0                      |
| IP 06                                                              | 192.168.1. 0                      |
| Enter the IP Range of the clients                                  |                                   |
| IP Range 01                                                        | 192, 168, 1, 19 ~ 192, 168, 1, 30 |
| IP Range 02                                                        | 0, 0, 0, 0 ~ 0, 0, 0, 0           |

### set up Internet access policy

1. Select the policy number (1-10) in the drop-down menu.
2. For this policy is enabled, click the radio button next to "Enable"
3. Enter a name in the Policy Name field.
4. Click the Edit List of PCs button.
5. On the List of PCs screen, specify PCs by IP address or MAC address. Enter the appropriate IP addresses into the IP fields. If you have a range of IP addresses to filter, complete the appropriate IP Range fields. Enter the appropriate MAC addresses into the MAC fields.
6. Click the Apply button to save your changes. Click the Cancel button to cancel your unsaved changes. Click the Close button to return to the Filters screen.
7. If you want to block the listed PCs from Internet access during the designated days and time, then keep the default setting, Deny. If you want the listed PCs to have Internet filtered during the designated days and time, then click the radio button next to Filter.
8. Set the days when access will be filtered. Select Everyday or the appropriate days of the week.
9. Set the time when access will be filtered. Select 24 Hours, or check the box next to From and use the drop-down boxes to designate a specific time period.
10. Click the Add to Policy button to save your changes and active it.

11. To create or edit additional policies, repeat steps 1-9.
12. To delete an Internet Access Policy, select the policy number, and click the Delete button.

**Note:**

- 1) The default factory value of policy rules is "filtered". If the user chooses the default policy rules for "refuse", and editing strategies to save or directly to save the settings. If the strategy edited is the first, it will be automatically saved into the second, if not the first, keep the original number.
- 2) Turn off the power of the router or reboot the router can cause a temporary failure。 After the failure of the router, if can not automatically synchronized NTP time server, you need to recalibrate to ensure the correct implementation of the relevant period control function.

### 3.3.6.2 URL Filter

If you want to prevent certain client access to specific network domain name, such as www.sina.com. We can achieved it through the function of URL filter.

URL filtering function



**Discard packets conform to the following rules:** only discard the matching URL address in the list .

**Accept only the data packets conform to the following rules:** receive only with custom rules of network address, discarded all other URL address.

### 3.3.6.3 Packet Filter

To block some packets getting Internet access or block some Internet packets getting local network access, you can configure filter items to block these packets.

Packet Filter

Packet filter function is realized based on IP address or port of packets.



Enable Packet Filter  Enable  Disable

Policy  ▼

**Enable Packet Filter:** Enable or disable “packet filter” function

**Policy:** The filter rule’s policy, you can choose the following options

Discard The Following--Discard packets conform to the following rules, Accept all other packets

Only Accept The Following-- Accept only the data packets conform to the following rules, Discard all other packets

Add Filter Rule

Direction  ▼

Protocol  ▼

Source Ports  -

Destination Ports  -

Source IP  .  .  .  /

Destination IP  .  .  .  /

**Direction**

**input:** packet from WAN to LAN

**output:** packet from LAN to WAN

**Protocol:** packet protocol type

**Source Ports:** packet's source port

**Destination Ports:** packet's destination port

**Source IP:** packet's source IP address

**Destination IP:** packet's destination IP address

**Note:** "Source Port" ,"Destination Port" ,"Source IP" ,"Destination IP" could not be all empty, you have to input at least one of these four parameters.

### 3.3.7 NAT

#### 3.3.7.1 Port Forwarding

Port Forwarding allows you to set up public services on your network, such as web servers, ftp servers, e-mail servers, or other specialized Internet applications. Specialized Internet applications are any applications that use Internet access to perform functions such as videoconferencing or online gaming. When users send this type of request to your network via the Internet, the router will forward those requests to the appropriate PC. If you want to forward a

whole range of ports, see [Port Range Forwarding](#).

**Forwards**

| Delete                   | Num | Application | Start | End | Protocol | IP Address | Enable                   |
|--------------------------|-----|-------------|-------|-----|----------|------------|--------------------------|
| <input type="checkbox"/> | 1   |             | 0     | 0   | Both ▼   | 0.0.0.0    | <input type="checkbox"/> |
| <input type="checkbox"/> | 2   |             | 0     | 0   | Both ▼   | 0.0.0.0    | <input type="checkbox"/> |

**Application:** Enter the name of the application in the field provided.

**Protocol:** Chose the right protocol TCP,UDP or Both. Set this to what the application requires.

**Source Net:** Forward only if sender matches this ip/net (example 192.168.1.0/24).

**Port from:** Enter the number of the external port (the port number seen by users on the Internet).

**IP Address:** Enter the IP Address of the PC running the application.

**Port to:** Enter the number of the internal port (the port number used by the application).

**Enable:** Click the Enable checkbox to enable port forwarding for the application.

Check all values and click **Save Settings** to save your settings. Click the **Cancel changes** button to cancel your unsaved changes.

### 3.3.7.2 Port Range Forward

Port Range Forwarding allows you to set up public services on your network, such as web servers, ftp servers, e-mail servers, or other specialized Internet applications. Specialized Internet applications are any applications that use Internet access to perform functions such as videoconferencing or online gaming. When users send this type of request to your network via the Internet, the router will forward those requests to the appropriate PC. If you only want to forward a single port, see [Port Forwarding](#).

**Port Range Forward**

**Forwards**

| Application | Start | End   | Protocol | IP Address   | Enable                              |
|-------------|-------|-------|----------|--------------|-------------------------------------|
| web-tftp    | 800   | 8100  | Both ▼   | 192.168.1.16 | <input checked="" type="checkbox"/> |
| game        | 9000  | 10000 | Both ▼   | 192.168.1.16 | <input checked="" type="checkbox"/> |

**Application:** Enter the name of the application in the field provided.

**Start:**Enter the number of the first port of the range you want to seen by users on the Internet and forwarded to your PC.

**End:** Enter the number of the last port of the range you want to seen by users on the Internet and forwarded to your PC.

**Protocol:** Chose the right protocol TCP,UDP or Both. Set this to what the application requires.

**IP Address:** Enter the IP Address of the PC running the application.

**Enable:** Click the Enable checkbox to enable port forwarding for the application.

Check all values and click **Save Settings** to save your settings. Click the **Cancel changes**

button to cancel your unsaved changes.

### 3.3.7.3 DMZ

The DMZ (DeMilitarized Zone) hosting feature allows one local user to be exposed to the Internet for use of a special-purpose service such as Internet gaming or videoconferencing. DMZ hosting forwards all the ports at the same time to one PC. The Port Forwarding feature is more secure because it only opens the ports you want to have opened, while DMZ hosting opens all the ports of one computer, exposing the computer so the Internet can see it.



Any PC whose port is being forwarded must should have a new static IP address assigned to it because its IP address may change when using the DHCP function.

**DMZ Host IP Address:** To expose one PC to the Internet, select Enable and enter the computer's IP address in the DMZ Host IP Address field. To disable the DMZ, keep the default setting: Disable

Check all values and click **Save Settings** to save your settings. Click the **Cancel changes** button to cancel your unsaved changes.

## 3.3.8 QoS Setting

### 3.3.8.1 Basic

Bandwidth management prioritizes the traffic on your router. Interactive traffic (telephony, browsing, telnet, etc.) gets priority and bulk traffic (file transfer, P2P) gets low priority. The main goal is to allow both types to live side-by side without unimportant traffic disturbing more critical things. All of this is more or less automatic.

QoS allows control of the bandwidth allocation to different services, netmasks, MAC addresses and the four LAN ports.

**Main WAN QoS Settings**

Start QoS  Enable  Disable

Port

Packet Scheduler

Uplink (kbps)

Downlink (kbps)

**Bkup WAN QoS Settings**

Start QoS  Enable  Disable

Port

Packet Scheduler

Uplink (kbps)

Downlink (kbps)

**Uplink (kbps) :** In order to use bandwidth management (QoS) you must enter bandwidth values for your uplink. These are generally 80% to 90% of your maximum bandwidth.

**Downlink (kbps) :** In order to use bandwidth management (QoS) you must enter bandwidth values for your downlink. These are generally 80% to 90% of your maximum bandwidth.

**HTB Setting**

**HTB Setting**

**HTB Prio Setting Uplink**

| Priority | Band range                                                            | Band value        |
|----------|-----------------------------------------------------------------------|-------------------|
| Premium  | <input type="text" value="75 %"/> - <input type="text" value="75 %"/> | WAN : 0 -- 0 kbps |
| Express  | <input type="text" value="15 %"/> - <input type="text" value="15 %"/> | WAN : 0 -- 0 kbps |
| Standard | <input type="text" value="10 %"/> - <input type="text" value="10 %"/> | WAN : 0 -- 0 kbps |
| Bulk     | <input type="text" value="1 %"/> - <input type="text" value="1 %"/>   | WAN : 0 -- 0 kbps |

**HTB Prio Setting Downlink**

| Priority | Band range                                                            | Band value        |
|----------|-----------------------------------------------------------------------|-------------------|
| Premium  | <input type="text" value="75 %"/> - <input type="text" value="75 %"/> | WAN : 0 -- 0 kbps |
| Express  | <input type="text" value="15 %"/> - <input type="text" value="15 %"/> | WAN : 0 -- 0 kbps |
| Standard | <input type="text" value="10 %"/> - <input type="text" value="10 %"/> | WAN : 0 -- 0 kbps |
| Bulk     | <input type="text" value="1 %"/> - <input type="text" value="1 %"/>   | WAN : 0 -- 0 kbps |

Save

Apply Settings

Cancel Changes

HTB - Hierarchical Token Bucket, it is a faster replacement for the CBQ qdisc in Linux. HTB helps in controlling the use of the outbound bandwidth on a given link. HTB allows you to use one physical link to simulate several slower links and to send different kinds of traffic on different

simulated links. In both cases, you have to specify how to divide the physical link into simulated links and how to decide which simulated link to use for a given packet to be sent. In other words, HTB is useful for limiting a client's download/upload rates, thereby preventing his monopolization of the available bandwidth.

### 3.3.8.2 Classify

#### Netmask Priority

**Netmask Priority**

| Delete                   | IP/Mask        | Priority |
|--------------------------|----------------|----------|
| <input type="checkbox"/> | 192.168.1.1/24 | Exempt   |
| <input type="checkbox"/> | 192.168.2.3/24 | Standard |
| <input type="checkbox"/> | 192.168.3.4/32 | Express  |
| <input type="checkbox"/> | 192.168.4.5/32 | Bulk     |

... /

You may specify priority for all traffic from a given IP address or IP Range.

Check all values and click **Save Settings** to save your settings. Click the **Cancel changes** button to cancel your unsaved changes.

#### Netmask Priority

**MAC Priority**

| Delete                   | Num | MAC Address       | Priority |
|--------------------------|-----|-------------------|----------|
| <input type="checkbox"/> | 1   | 00:00:00:00:00:00 | Standard |

:  :  :  :  :

You may specify priority for all traffic from a given MAC.

Check all values and click **Save Settings** to save your settings. Click the **Cancel changes** button to cancel your unsaved changes.

### 3.3.9 Applications

#### 3.3.9.1 Serial Applications

There is a console port on Four-Faith router. Normally, this port is used to debug the router. This port can also be used as a serial port. The router has embedded a serial to TCP program. The data sent to the serial port is encapsulated by TCP/IP protocol stack and then is sent to the destination server. This function can work as a Four-Faith DTU (Data Terminal Unit). Please refer [www.four-faith.com](http://www.four-faith.com) for more information about this product.

**Serial Applications**

Serial Applications  Enable  Disable

Baudrate

Databit

Stopbit

Parity

Flow Control

Protocol

Server Address

Server Port

Device Number

Device Id

Heartbeat Interval

**Baudrate:** The serial port's baudrate

**Databit:** The serial port's databit

**Parity:** The serial port's parity

**Stopbit:** The serial port's stopbit

**Flow Control:** The serial port's flow control type.

**Enable Serial TCP Function:** Enable the serial to TCP function

**Protocol Type:** The protocol type to transmit data.

UDP(DTU) – Data transmit with UDP protocol , work as a Four-Faith DTU which has application protocol and hear beat mechanism.

Pure UDP – Data transmit with standard UDP protocol.

TCP(DTU) -- Data transmit with TCP protocol , work as a Four-Faith DTU which has application protocol and hear beat mechanism.

Pure TCP -- Data transmit with standard TCP protocol, router is the client.

TCP Server -- Data transmit with standard TCP protocol, router is the server.

TCST -- Data transmit with TCP protocol, Using a custom data

**Server Address:** The data service center's IP Address or domain name.

**Server Port:** The data service center's listening port.

**Device ID:** The router's identity ID.

**Device Number:** The router's phone number.

**Heartbeat Interval:** The time interval to send heart beat packet. This item is valid only when you choose UDP(DTU) or TCP(DTU) protocol type.

**TCP Server Listen Port:** This item is valid when Protocol Type is "TCP Server"

**Custom Heartbeat Packet :** This item is valid when Protocol Type is "TCST"

**Custom Registration Packets:** This item is valid when Protocol Type is "TCST"

### 3.3.9.2 ZigBee Application

**ZigBee Application**

**ZigBee Application**

ZigBee Application  Enable  Disable

ZigBee Baudrate

Pan ID(0-65535):

Node Type

Node ID(0-65535)

Work Mode

Through Address(0-65535)

RF Channel

ZigBee receive interval(unit:ms)

Communicate Mode

Protocol

Server Address

Server Port

**Enable ZigBee :** Enable or disable ZigBee function

**ZigBee Baudrate:** zigbee communicate baudrate

**Pan ID:** zigbee communicate network id, input value must between 0~65535

**Node Type:** 3 kinds:Coordinator、Route、Terminal

**Node ID:** input value must between 0~65535,the identification number for unique identification of the device itself

**Work Mode:** 3 kinds, Broadcast、Master、API(Data format reference to Appendix A at the end of document)

**Through Address:** ZigBee Transmission node number of the target device, the operating mode to the broadcast 65535. Operating mode must be set to the API set entry is invalid, the transfer destination address is determined by custom packet

**RF Channel:** ZigBee RF Channel, support 16 channels: 11~26

**ZigBee receive interval:** Each time it receives a packet by zigbee, the longest wait for the timeout, in milliseconds, the input value must be in the range 1 to 999

**Communicate Mode:** Equipment transmission conversion: to support communication between ZigBee and serial port, network forwarding combination; Notice: about the serial's communicate parameter setting must turn on "serial application" web page setting

- Protocol Type:** The protocol type to transmit data.
- UDP(DTU) – Data transmit with UDP protocol , work as a Four-Faith DTU which has application protocol and hear beat mechanism.
  - Pure UDP – Data transmit with standard UDP protocol.
  - TCP(DTU) -- Data transmit with TCP protocol , work as a Four-Faith DTU which has application protocol and hear beat mechanism.
  - Pure TCP -- Data transmit with standard TCP protocol, router is the client.
  - TCP Server -- Data transmit with standard TCP protocol, router is the server.
  - TCST -- Data transmit with TCP protocol, Using a custom data
- Server Address:** The data service center’s IP Address or domain name.
- Server Port:** The data service center’s listening port.
- Device ID:** The router’s identity ID.
- Device Number:** The router’s phone number.
- Heartbeat Interval:** The time interval to send heart beat packet. This item is valid only when you choose UDP(DTU) or TCP(DTU) protocol type.
- TCP Server Listen Port:** This item is valid when Protocol Type is “TCP Server”
- Custom Heartbeat Packet :** This item is valid when Protocol Type is “TCST”
- Custom Registration Packets:** This item is valid when Protocol Type is “TCST”

**Control Serial Setting**

**Control Serial Setting**

|              |          |
|--------------|----------|
| Baudrate     | 115200 ▼ |
| Databit      | 8 ▼      |
| Stopbit      | 1 ▼      |
| Parity       | None ▼   |
| Flow Control | None ▼   |

- Baudrate:** The serial port’s baudrate
- Databit:** The serial port’s databit
- Parity:** The serial port’s parity
- Stopbit:** The serial port’s stopbit
- Flow Control:** The serial port’s flow control type.

**ZigBee Mode Upgrade:** Please Click ZigBee Mode Upgrade button , setup into flow setting interface, choose you want to upgrade zigbee mode file, and now goto upgrade process, notice in the upgrade processing don’t power off router or press the reset button

**ZigBee module upgrade**

please choose a zigbee upgrade file: 浏览... 未选择文件。

Upgrade
Cancel Changes



### 3.3.10 Administration

#### 3.3.10.1 Management

The Management screen allows you to change the router's settings. On this page you will find most of the configurable items of the router code.

**Router Password**

|                     |                          |
|---------------------|--------------------------|
| Router Username     | <input type="password"/> |
| Router Password     | <input type="password"/> |
| Re-enter to confirm | <input type="password"/> |

The new password must not exceed 32 characters in length and must not include any spaces. Enter the new password a second time to confirm it.

**Note :**

Default username is admin.

It is strongly recommended that you change the factory default password of the router, which is admin. All users who try to access the router's web-based utility or Setup Wizard will be prompted for the router's password.

**Web Access**

This feature allows you to manage the router using either HTTP protocol or the HTTPS protocol. If you choose to disable this feature, a manual reboot will be required. You can also activate or not the router information web page. It's now possible to password protect this page (same username and password than above).

**Web Access**

|                               |                                                                         |
|-------------------------------|-------------------------------------------------------------------------|
| Protocol                      | <input checked="" type="checkbox"/> HTTP <input type="checkbox"/> HTTPS |
| Auto-Refresh (in seconds)     | <input type="text" value="3"/>                                          |
| Enable Info Site              | <input checked="" type="radio"/> Enable <input type="radio"/> Disable   |
| Info Site Password Protection | <input type="checkbox"/> Enabled                                        |

**Protocol :** This feature allows you to manage the router using either HTTP protocol or the HTTPS protocol

**Auto-Refresh :** Adjusts the Web GUI automatic refresh interval. 0 disables this feature completely

**Enable Info Site :** Enable or disable the login system information page

**Info Site Password Protection :** Enable or disable the password protection feature of the system information page

**Remote Access**

|                    |                                                                       |                                   |
|--------------------|-----------------------------------------------------------------------|-----------------------------------|
| Web GUI Management | <input checked="" type="radio"/> Enable <input type="radio"/> Disable |                                   |
| Use HTTPS          | <input type="checkbox"/>                                              |                                   |
| Web GUI Port       | <input type="text" value="8080"/>                                     | (Default: 8080, Range: 1 - 65535) |
| SSH Management     | <input checked="" type="radio"/> Enable <input type="radio"/> Disable |                                   |
| SSH Remote Port    | <input type="text" value="22"/>                                       | (Default: 22, Range: 1 - 65535)   |
| Telnet Management  | <input type="radio"/> Enable <input checked="" type="radio"/> Disable |                                   |

**Remote Access :** This feature allows you to manage the router from a remote location, via the Internet. To disable this feature, keep the default setting, Disable. To enable this feature, select Enable, and use the specified port (default is 8080) on your PC to remotely manage the router. You must also change the router's default password to one of your own, if you haven't already.

To remotely manage the router, enter `http://xxx.xxx.xxx.xxx:8080` (the x's represent the router's Internet IP address, and 8080 represents the specified port) in your web browser's address field. You will be asked for the router's password.

If you use https you need to specify the url as `https://xxx.xxx.xxx.xxx:8080` (not all firmwares does support this without rebuilding with SSL support).

**SSH Management:** You can also enable SSH to remotely access the router by Secure Shell. Note that SSH daemon needs to be enable in Services page.

**Note :**

If the Remote Router Access feature is enabled, anyone who knows the router's Internet IP address and password will be able to alter the router's settings.

**Telnet Management :** Enable or disable remote Telnet function

**Cron**

|                      |                                                                       |
|----------------------|-----------------------------------------------------------------------|
| Cron                 | <input checked="" type="radio"/> Enable <input type="radio"/> Disable |
| Additional Cron Jobs | <input type="text"/>                                                  |

**Cron :** The cron subsystem schedules execution of Linux commands. You'll need to use the command line or startup scripts to actually use this.

**Language Selection**

|          |                                      |
|----------|--------------------------------------|
| Language | <input type="text" value="English"/> |
|----------|--------------------------------------|

**Language :** Set up the router page shows the type of language, including simplified Chinese and English.

#### IP Filter Settings (adjust these for P2P)

|                          |       |                                    |
|--------------------------|-------|------------------------------------|
| TCP Congestion Control   | vegas |                                    |
| Maximum Ports            | 4096  | (Default: 4096, Range: 256 - 4096) |
| TCP Timeout (in seconds) | 3600  | (Default: 3600, Range: 1 - 86400)  |
| UDP Timeout (in seconds) | 120   | (Default: 120, Range: 1 - 86400)   |

#### Device Management

Device Management  Enable  Disable

**Device Management:** Through the custom development of remote management server for the router monitoring and management, parameter configuration, etc..

#### Remote Management Login Server

Remote Management Login Server  Enable  Disable

**Remote Management Login Server:** Enable or disable remote logon selection service functionality

#### Firmware Upgrade

Firmware Upgrade  Enable  Disable

### 3.3.10.2 Keep Alive

## Schedule Boot&Shutdown

#### Schedule Boot&Shutdown

|                        |                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Schedule Boot&Shutdown | <input checked="" type="radio"/> Enable <input type="radio"/> Disable                                                        |
| Match                  | <input checked="" type="radio"/> Day <input type="radio"/> Weekday <input type="radio"/> Days <input type="radio"/> Weekdays |
| Shutdown Time          | 00:00                                                                                                                        |
| Shutdown Date          | *-01-Sunday-Sunday                                                                                                           |
| Boot Time              | 00:00                                                                                                                        |
| Boot Date              | *-01-Sunday-Sunday                                                                                                           |

The user can set the startup or shutdown time:

For example, the user want to set the start time at 8:07 and boot time at 9:07.

**Schedule Boot&Shutdown**

|                        |                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Schedule Boot&Shutdown | <input checked="" type="radio"/> Enable <input type="radio"/> Disable                                                        |
| Match                  | <input checked="" type="radio"/> Day <input type="radio"/> Weekday <input type="radio"/> Days <input type="radio"/> Weekdays |
| Shutdown Time          | 08 : 07                                                                                                                      |
| Shutdown Date          | * 01 Sunday Sunday                                                                                                           |
| Boot Time              | 09 : 07                                                                                                                      |
| Boot Date              | * 01 Sunday Sunday                                                                                                           |

**Schedule Reboot**

**Schedule Reboot**

|                       |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| Schedule Reboot       | <input checked="" type="radio"/> Enable <input type="radio"/> Disable |
| Interval (in seconds) | <input checked="" type="radio"/> 3600                                 |
| At a set Time         | <input type="radio"/> 00 : 00 Sunday                                  |

**You can schedule regular reboots for the router :**

Regularly after xxx seconds.

At a specific date time each week or everyday.

**Note :**

For date based reboots Cron must be activated. See Management for Cron activation.

**3.3.10.3 Commands**

**Commands :** You are able to run command lines directly via the Webinterface.

**Command Shell**

Commands

Run Commands
Save Startup
Save Shutdown
Save Firewall

Save Custom Script

**Run Command :** You can run command lines via the web interface. Fill the text area with your command and click Run Commands to submit.

**Startup :** You can save some command lines to be executed at startup's router. Fill the text area with commands (only one command by row) and click Save Startup.

**Shutdown :** You can save some command lines to be executed at shutdown's router. Fill the text area with commands (only one command by row) and click Save Shutdown.

**Firewall** : Each time the firewall is started, it can run some custom iptables instructions. Fill the text area with firewall's instructions (only one command by row) and click Save Firewall.

**Custom Script** : Custom script is stored in /tmp/custom.sh file. You can run it manually or use cron to call it. Fill the text area with script's instructions (only one command by row) and click Save Custom Script.

### 3.3.10.4 Factory Defaults

**Factory Defaults**

Reset router settings

Restore Factory Defaults  Yes  No

**Reset router settings** : Click the Yes button to reset all configuration settings to their default values. Then click the Apply Settings button.

**Note :**

Any settings you have saved will be lost when the default settings are restored. After restoring the router is accessible under the default IP address 192.168.1.1 and the default password admin.

### 3.3.10.5 Firmware Upgrade

**Firmware Upgrade**

After flashing, reset to Don't reset ▼

Please select a file to upgrade 浏览... 未选择文件。

**WARNING**

**Upgrading firmware may take a few minutes.**

**Do not turn off the power or press the reset button!**

Upgrade

**Firmware Upgrade** : New firmware versions are posted at [www.four-faith.com](http://www.four-faith.com) and can be downloaded. If the Router is not experiencing difficulties, then there is no need to download a more recent firmware version, unless that version has a new feature that you want to use.

**Note :**

When you upgrade the Router's firmware, you lose its configuration settings, so make sure you write down the Router settings before you upgrade its firmware.

**To upgrade the Router's firmware:**

1. Download the firmware upgrade file from the website.
2. Click the Browse... button and chose the firmware upgrade file.
3. Click the Upgrade button and wait until the upgrade is finished.

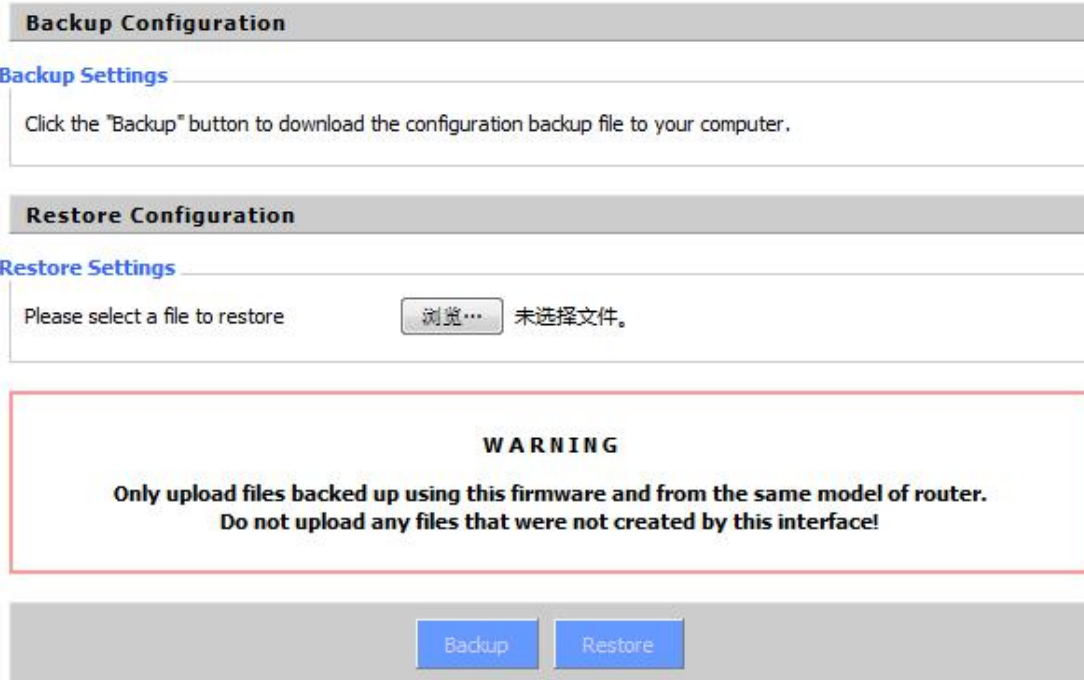
**Note :**

Upgrading firmware may take a few minutes.

Do not turn off the power or press the reset button!

**After flashing, reset to :** If you want to reset the router to the default settings for the firmware version you are upgrading to, click the Firmware Defaults option.

### 3.3.10.6 Backup



The screenshot shows a web interface for configuration management. It has two main sections: 'Backup Configuration' and 'Restore Configuration'. The 'Backup Configuration' section has a 'Backup Settings' box with the instruction: 'Click the "Backup" button to download the configuration backup file to your computer.' The 'Restore Configuration' section has a 'Restore Settings' box with the instruction: 'Please select a file to restore' and a '浏览...' button followed by the text '未选择文件。'. Below these sections is a red-bordered warning box that reads: 'WARNING Only upload files backed up using this firmware and from the same model of router. Do not upload any files that were not created by this interface!'. At the bottom, there are two buttons: 'Backup' and 'Restore'.

**Backup Settings :** You may backup your current configuration in case you need to reset the router back to its factory default settings. Click the Backup button to backup your current configuration.

**Restore Settings :** Click the Browse... button to browse for a configuration file that is currently saved on your PC. Click the Restore button to overwrite all current configurations with the ones in the configuration file.

**Note :**

Only restore configurations with files backed up using the same firmware and the same model of router.

### 3.3.11 Status

#### 3.3.11.1 Router

| System           |                                      |
|------------------|--------------------------------------|
| Router Name      | Four-Faith                           |
| Router Model     | Four-Faith Router                    |
| Firmware Version | FXXXX v1.0 (01/10/12) std - build 94 |
| MAC Address      | <u>00:AA:BB:CC:DD:44</u>             |
| Host Name        |                                      |
| WAN Domain Name  |                                      |
| LAN Domain Name  |                                      |
| Current Time     | Sat, 01 Jan 2000 00:51:29            |
| Uptime           | 51 min,                              |

**Router Name:** name of the router, setting→basic setting to modify

**Router Model:** model of the router, unavailable to modify

**Firmware Version:** software version information

**MAC Address:** MAC address of WAN, setting→Clone MAC Address to modify

**Host Name:** host name of the router, setting→basic setting to modify

**WAN Domain Name:** domain name of WAN, setting→basic setting to modify

**LAN Domain Name:** domain name of LAN, unavailable to modify

**Current Time:** local time of the system

**Uptime:** operating uptime as long as the system is powered on

| Memory          |                     |     |
|-----------------|---------------------|-----|
| Total Available | 28880 kB / 32768 kB | 88% |
| Free            | 12436 kB / 28880 kB | 43% |
| Used            | 16444 kB / 28880 kB | 57% |
| Buffers         | 1660 kB / 16444 kB  | 10% |
| Cached          | 5708 kB / 16444 kB  | 35% |
| Active          | 963 kB / 16444 kB   | 6%  |
| Inactive        | 1118 kB / 16444 kB  | 7%  |

**Total Available:** the room for total available of RAM (that is physical memory minus some reserve and the kernel of binary code bytes)

**Free:** free memory, the router will reboot if the memory is less than 500kB

**Used:** used memory, total available memory minus free memory

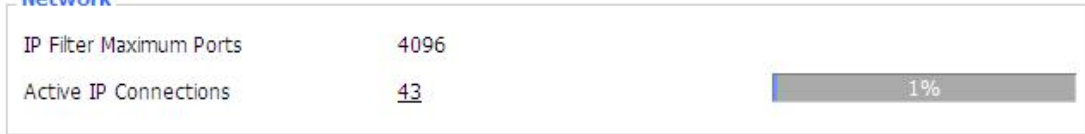
**Buffers:** used memory for buffers,

**Cached:** the memory used by high-speed cache memory

**Active:** active use of buffer or cache memory page file size

**Inactive:** not often used in a buffer or cache memory page file size

**Network**



**IP Filter Maximum Ports:** preset is 4096, available to re-management

**Active IP Connections:** real time monitor active IP connections of the system, click to see the table as blow:

Active IP Connections 53

| No. | Protocol | Timeout (s) | Source Address | Remote Address  | Service Name | State          |
|-----|----------|-------------|----------------|-----------------|--------------|----------------|
| 1   | TCP      | 60          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 2   | TCP      | 30          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 3   | TCP      | 65          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 4   | TCP      | 96          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 5   | TCP      | 99          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 6   | TCP      | 70          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 7   | TCP      | 74          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 8   | TCP      | 115         | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 9   | TCP      | 84          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 10  | TCP      | 3599        | 192.168.1.120  | 192.168.1.1     |              | 80 ESTABLISHED |
| 11  | TCP      | 3599        | 192.168.1.120  | 192.168.1.1     |              | 80 ESTABLISHED |
| 12  | TCP      | 108         | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 13  | TCP      | 3600        | 192.168.1.120  | 192.168.1.1     |              | 80 ESTABLISHED |
| 14  | TCP      | 93          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 15  | TCP      | 102         | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 16  | TCP      | 74          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 17  | TCP      | 3599        | 192.168.1.120  | 192.168.1.1     |              | 80 ESTABLISHED |
| 18  | TCP      | 15          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 19  | TCP      | 25          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 20  | TCP      | 90          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 21  | UDP      | 26          | 192.168.8.119  | 255.255.255.255 | 1947         | UNREPLIED      |
| 22  | TCP      | 77          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 23  | TCP      | 35          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 24  | TCP      | 74          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 25  | TCP      | 40          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 26  | TCP      | 3599        | 192.168.1.120  | 192.168.1.1     |              | 80 ESTABLISHED |
| 27  | TCP      | 74          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 28  | TCP      | 74          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 29  | TCP      | 4           | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |
| 30  | UDP      | 31          | 192.168.8.160  | 224.0.0.1       | 9166         | UNREPLIED      |
| 31  | TCP      | 74          | 192.168.1.120  | 192.168.1.1     |              | 80 TIME_WAIT   |

**Active IP Connections:** total active IP connections

**Protocol:** connection protocol

**Timeouts:** connection timeouts, unit is second

**Source Address:** source IP address

**Remote Address:** remote IP address

**Service Name:** connecting service port

**Status:** displayed status

### 3.3.11.2 WAN

Connection Type Automatic Configuration - DHCP

Connection Uptime Not available

**Connection Type:** disabled, static IP, automatic configuration-DHCP, PPPOE, PPTP, L2TP,



### 3G/UMTS

**Connection Uptime:** connecting uptime; If disconnect, display Not available

|             |         |
|-------------|---------|
| IP Address  | 0.0.0.0 |
| Subnet Mask | 0.0.0.0 |
| Gateway     | 0.0.0.0 |
| DNS 1       |         |
| DNS 2       |         |
| DNS 3       |         |

**IP Address:** IP address of router WAN

**Subnet Mask:** subnet mask of router WAN

**Gateway:** the gateway of router WAN

**DNS1, DNS2, DNS3:** DNS1/DNS2/DNS3 of router WAN

Remaining Lease Time 0 days 23:38:43

DHCP Release

DHCP Renew

**Remaining Lease Time:** remaining lease time of IP address in DHCP way

**DHCP Release:** release DHCP address

**DHCP Renew:** renew IP address in DHCP way, default is 1 day

Login Status

Disconnected

Connect

**Login Status:** connection status of WAN

**Disconnection:** disconnect

**Connection:** connect

Module Type

ZTE-EVDO MODULE



Signal Status

-79 dBm

Network

CDMA/HDR

**Module Type:** module type in 3G/UMTS way

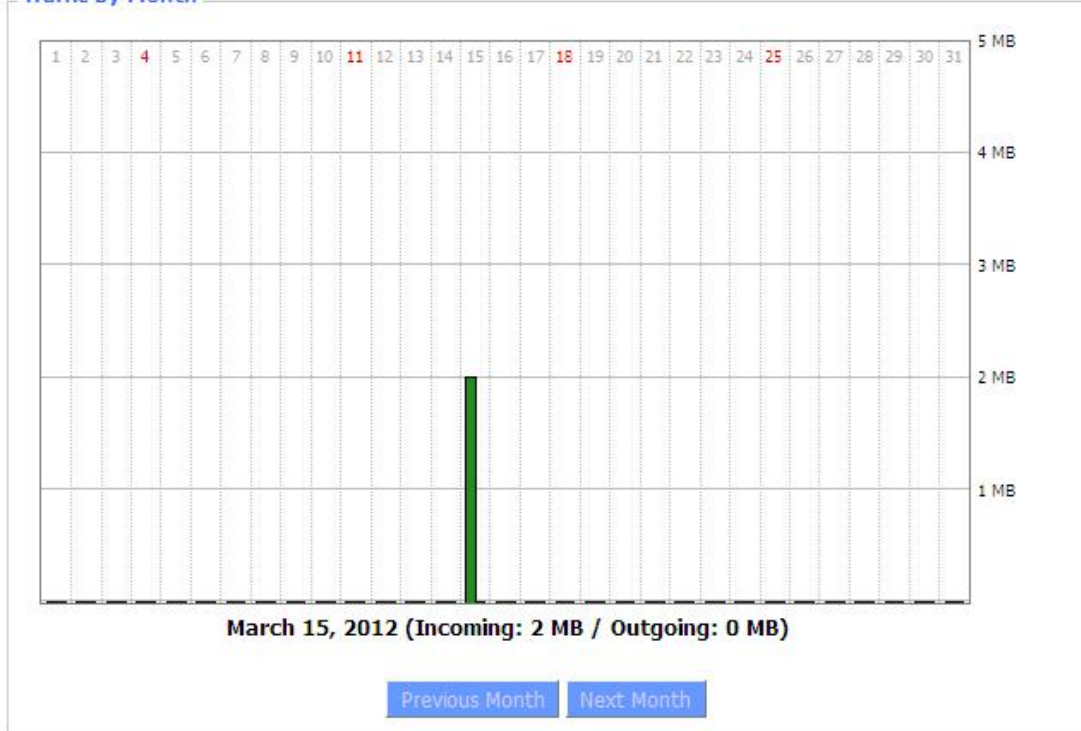
**Signal Status:** signal intensity of the module in 3G/UMTS way

**Network:** network type of the module in 3G/UMTS way

**Total Traffic**

|                   |   |
|-------------------|---|
| Incoming (MBytes) | 0 |
| Outgoing (MBytes) | 0 |

**Traffic by Month**



**Total Flow:** flow from power-off last time until now statistics, download and upload direction

**Monthly Flow:** the flow of a month, unit is MB

**Last Month:** the flow of last month

**Next Month:** the flow of next month

**Data Administration**

Backup Restore Delete

**Backup:** backup data administration

**Restore:** restore data administration

**Delete:** delete data administration

### 3.3.11.3 LAN

#### LAN Status

|             |                          |
|-------------|--------------------------|
| MAC Address | <u>00:0C:43:30:52:77</u> |
| IP Address  | 192.168.1.1              |
| Subnet Mask | 255.255.255.0            |
| Gateway     | 0.0.0.0                  |
| Local DNS   | 0.0.0.0                  |

**MAC Address:** MAC Address of the LAN port ethernet

**IP Address:** IP Address of the LAN port

**Subnet Mask:** Subnet Mask of the LAN port

**Gateway:** Gateway of the LAN port

**Local DNS:** DNS of the LAN port

#### Active Clients

| Host Name | IP Address    | MAC Address              | Conn. Count | Ratio [4096] |
|-----------|---------------|--------------------------|-------------|--------------|
| *         | 192.168.1.120 | <u>10:78:D2:98:C9:46</u> | 57          | 1%           |

**Host Name:** host name of LAN client

**IP Address:** IP address of the client

**MAC Address:** MAC address of the client

**Conn. Count:** connection count caused by the client

**Ratio:** the ratio of 4096 connection

#### Dynamic Host Configuration Protocol

##### DHCP Status

|                   |               |
|-------------------|---------------|
| DHCP Server       | Enabled       |
| DHCP Daemon       | uDHCPd        |
| Start IP Address  | 192.168.1.100 |
| End IP Address    | 192.168.1.149 |
| Client Lease Time | 1440 minutes  |

**DHCP Server:** enable or disable the router work as a DHCP server



**DHCP Daemon:** the agreement allocated using DHCP including DNSMasq and uDHCPd

**Starting IP Address:** the starting IP Address of the DHCP server's Address pool

**Ending IP Address:** the ending IP Address of the DHCP server's Address pool

**Client Lease Time:** the lease time of DHCP client

##### DHCP Clients

| Host Name       | IP Address    | MAC Address              | Client Lease Time | Delete                                                                                |
|-----------------|---------------|--------------------------|-------------------|---------------------------------------------------------------------------------------|
| PC-201011161332 | 192.168.1.142 | <u>00:21:5C:33:4D:29</u> | 1 day 00:00:00    |  |
| jack-lincw      | 192.168.1.117 | <u>44:37:E6:3F:45:54</u> | 1 day 00:00:00    |  |
| *               | 192.168.1.149 | <u>00:0C:E7:00:00:00</u> | 1 day 00:00:00    |  |

**Host Name:** host name of LAN client


**IP Address:** IP address of the client

**MAC Address:** MAC address of the client

**Expires:** the expiry the client rents the IP address

**Delete:** click to delete DHCP client

**Connected PPPOE Clients**

| Interface | User Name | Local IP      | Delete                                                                              |
|-----------|-----------|---------------|-------------------------------------------------------------------------------------|
| ppp0      | hometest  | 192.168.10.10 |  |

**Interface:** the interface assigned by dial-up system

**User Name:** user name of PPPoE client

**Local IP:** IP address assigned by PPPoE client

**Delete:** click to delete PPPoE client

**Connected L2TP Server**

| Interface | Local IP    | Remote IP   | Delete                                                                              |
|-----------|-------------|-------------|-------------------------------------------------------------------------------------|
| ppp0      | 172.168.8.2 | 172.168.8.1 |  |


**Interface:** the interface assigned by dial-up system

**Local IP:** tunnel IP address of local L2TP

**Remote IP:** tunnel IP address of L2TP server

**Delete:** click to disconnect L2TP

**Connected L2TP Clients**

| Interface | User Name | Local IP     | Remote IP    | Delete                                                                                |
|-----------|-----------|--------------|--------------|---------------------------------------------------------------------------------------|
| ppp1      | hometest  | 192.168.50.2 | 120.42.46.98 |  |

**Interface:** the interface assigned by dial-up system


**User Name:** user name of the client

**Local IP:** tunnel IP address of L2TP client

**Remote IP:** IP address of L2TP client

**Delete:** click to delete L2TP client

**Connected PPTP Server**

| Interface | Local IP    | Remote IP   | Delete                                                                                |
|-----------|-------------|-------------|---------------------------------------------------------------------------------------|
| ppp0      | 172.168.8.2 | 172.168.8.1 |  |

**Interface:** the interface assigned by dial-up system

**Local IP:** tunnel IP address of local PPTP

**Remote IP:** tunnel IP address of PPTP server

**Delete:** click to disconnect PPTP

Connected PPTP Clients

| Interface | User Name | Local IP    | Remote IP    | Delete                                                                              |
|-----------|-----------|-------------|--------------|-------------------------------------------------------------------------------------|
| ppp1      | hometest  | 192.168.5.1 | 120.42.46.98 |  |

**Interface:** the interface assigned by dial-up system

**User Name:** user name of the client

**Local IP:** tunnel IP address of PPTP client

**Remote IP:** IP address of PPTP client

**Delete:** click to delete PPTP client

### 3.3.11.4 Wireless

Wireless Status

|                            |                   |
|----------------------------|-------------------|
| MAC Address                | 00:0C:43:30:52:79 |
| Radio                      | Radio is On       |
| Mode                       | AP                |
| Network                    | Mixed             |
| SSID                       | four-faith        |
| Channel                    | 6 (2437 MHz)      |
| TX Power                   | 71 mW             |
| Rate                       | 72 Mb/s           |
| Encryption - Interface w10 | Disabled          |
| PPTP Status                | Disconnected      |

**MAC Address:** MAC address of wireless client

**Radio:** display whether radio is on or not

**Mode:** wireless mode

**Network:** wireless network mode

**SSID:** wireless network name

**Channel:** wireless network channel

**TX Power:** reflection power of wireless network

**Rate:** reflection rate of wireless network

**Encryption-Interface w10:** enable or diasbal Encryption-Interface w10

**PPTP Status:** show wireless pptp status

Wireless Packet Info

|                  |                    |                                                                                       |
|------------------|--------------------|---------------------------------------------------------------------------------------|
| Received (RX)    | 91125 OK, no error |  |
| Transmitted (TX) | 11957 OK, no error |  |

**Received (RX):** received data packet

**Transmitted (TX):** transmitted data packet

**Wireless Nodes**

Clients

| MAC Address | Interface | Uptime | TX Rate | RX Rate | Signal | Noise | SNR | Signal Quality |
|-------------|-----------|--------|---------|---------|--------|-------|-----|----------------|
| - None -    |           |        |         |         |        |       |     |                |

**MAC Address:** MAC address of wireless client

**Interface:** interface of wireless client

**Uptime:** connecting uptime of wireless client

**TX Rate:** transmit rate of wireless client

**RX Rate:** receive rate of wireless client

**Signal:** the signal of wireless client

**Noise:** the noise of wireless client

**SNR:** the signal to noise ratio of wireless client

**Signal Quality:** signal quality of wireless client

**Neighbor's Wireless Networks**

| SSID       | Mode    | MAC Address                       | Channel | Rssi | Noise | beacon | Open | dtim | Rate       | Join Site            |
|------------|---------|-----------------------------------|---------|------|-------|--------|------|------|------------|----------------------|
| tzt-3g     | Unknown | <a href="#">00:aa:bb:cc:dd:14</a> | 2       | -5   | -95   | 0      | No   | 0    | 54(b/g)    | <a href="#">Join</a> |
| four-faith | Unknown | <a href="#">00:0c:43:30:52:79</a> | 6       | -24  | -95   | 0      | No   | 0    | 300(b/g/n) | <a href="#">Join</a> |
| ff-old     | AP      | <a href="#">00:13:10:09:56:92</a> | 6       | -55  | -95   | 0      | No   | 0    | 54(b/g)    | <a href="#">Join</a> |

**Neighbor's Wireless Network:** display other networks nearby

**SSID:** the name of wireless network nearby

**Mode:** operating mode of wireless network nearby

**MAC Address:** MAC address of the wireless nearby

**Channel:** the channel of the wireless nearby

**Rssi:** signal intensity of the wireless nearby

**Noise:** the noise of the wireless nearby

**Beacon:** signal beacon of the wireless nearby

**Open:** the wireless nearby is open or not

**Dtim:** delivery traffic indication message of the wireless nearby

**Rate:** speed rate of the wireless nearby

**Join Site:** click to join wireless network nearby

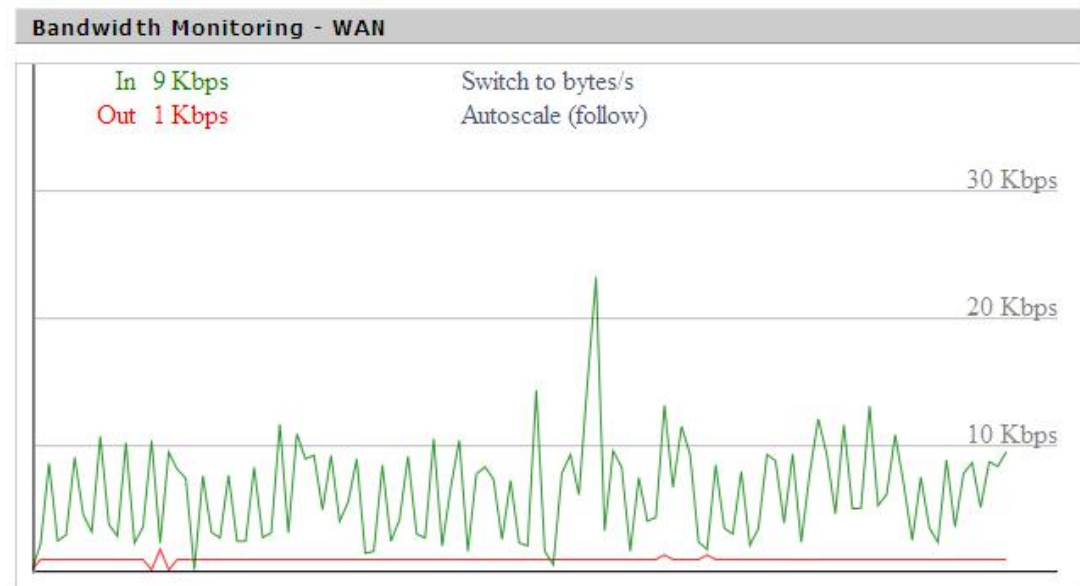
### 3.3.11.5 Bandwidth



Bandwidth Monitoring-LAN Graph

**abscissa axis:** time

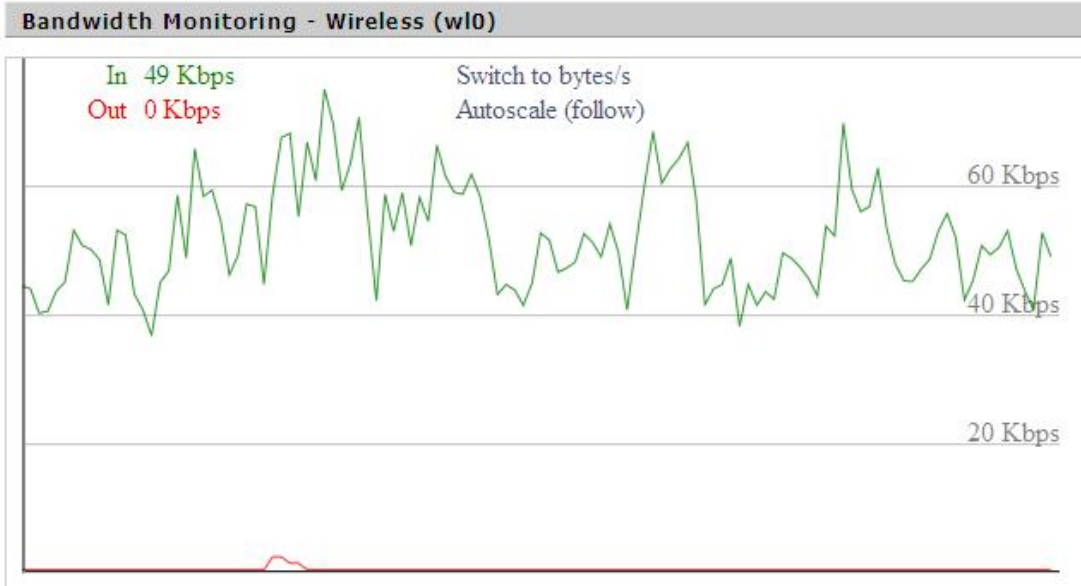
**vertical axis:** speed rate



Bandwidth Monitoring-WAN Graph

**abscissa axis:** time

**vertical axis:** speed rate



Bandwidth Monitoring-Wireless (W10) Graph

**abscissa axis:** time

**vertical axis:** speed rate

### 3.3.11.6 Sys-Info

| Router       |                          |
|--------------|--------------------------|
| Router Name  | Four-Faith               |
| Router Model | Four-Faith Router        |
| LAN MAC      | <u>00:0C:43:30:52:77</u> |
| WAN MAC      | <u>00:0C:43:30:52:78</u> |
| Wireless MAC | <u>00:0C:43:30:52:79</u> |
| WAN IP       | 10.34.107.156            |
| LAN IP       | 192.168.1.1              |

**Router Name:** the name of the router

**Router Model:** the model of the router

**LAN MAC:** MAC address of LAN port

**WAN MAC:** MAC address of WAN port

**Wireless MAC:** MAC address of the wireless

**WAN IP:** IP address of WAN port

**LAN IP:** IP address of LAN port



| Wireless |              |
|----------|--------------|
| Radio    | Radio is On  |
| Mode     | AP           |
| Network  | Mixed        |
| SSID     | four-faith   |
| Channel  | 6 (2437 MHz) |
| TX Power | 71 mW        |
| Rate     | 72 Mb/s      |

**Radio:** display whether radio is on or not

**Mode:** wireless mode

**Network:** wireless network mode

**SSID:** wireless network name

**Channel:** wireless network channel

**TX Power:** reflection power of wireless network

**Rate:** reflection rate of wireless network

| Wireless Packet Info |                   |
|----------------------|-------------------|
| Received (RX)        | 6982 OK, no error |
| Transmitted (TX)     | 1498 OK, no error |

**Received (RX):** received data packet

**Transmitted (TX):** transmitted data packet

| Wireless    |           |        |         |         |        |       |     |                |
|-------------|-----------|--------|---------|---------|--------|-------|-----|----------------|
| Clients     |           |        |         |         |        |       |     |                |
| MAC Address | Interface | Uptime | TX Rate | RX Rate | Signal | Noise | SNR | Signal Quality |
| - None -    |           |        |         |         |        |       |     |                |

**MAC Address:** MAC address of wireless client

**Interface:** interface of wireless client

**Uptime:** connecting uptime of wireless client

**TX Rate:** transmit rate of wireless client

**RX Rate:** receive rate of wireless client

**Signal:** the signal of wireless client

**Noise:** the noise of wireless client

**SNR:** the signal to noise ratio of wireless client

**Signal Quality:** signal quality of wireless client

**Services**

|             |          |
|-------------|----------|
| DHCP Server | Enabled  |
| ff-radauth  | Disabled |
| USB Support | Disabled |

**DHCP Server:** enabled or disabled

**ff-radauth:** enabled or disabled

**USB Support:** enabled or disabled

**Memory**

|                 |                   |
|-----------------|-------------------|
| Total Available | 28.2 MB / 32.0 MB |
| Free            | 11.2 MB / 28.2 MB |
| Used            | 17.0 MB / 28.2 MB |
| Buffers         | 1.8 MB / 17.0 MB  |
| Cached          | 6.3 MB / 17.0 MB  |
| Active          | 1.5 MB / 17.0 MB  |
| Inactive        | 0.8 MB / 17.0 MB  |

**Total Available:** the room for total available of RAM (that is physical memory minus some reserve and the kernel of binary code bytes)

**Free:** free memory, the router will reboot if the memory is less than 500kB

**Used:** used memory, total available memory minus free memory

**Buffers:** used memory for buffers, total available memory minus allocated memory

**Cached:** the memory used by high-speed cache memory

**Active:** Active use of buffer or cache memory page file size

**Inactive:** Not often used in a buffer or cache memory page file size

**DHCP Clients**

| Host Name | IP Address | MAC Address | Client Lease Time |
|-----------|------------|-------------|-------------------|
| - None -  |            |             |                   |

**Host Name:** host name of LAN client

**IP Address:** IP address of the client

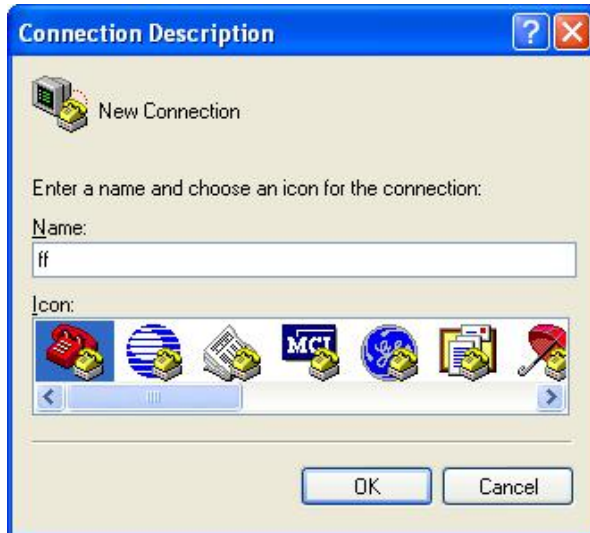
**MAC Address:** MAC address of he client

**Client lease time:** the expiry the client rents the IP address

## Appendix A Hyperterminal Use

The following steps describe how to setup 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 connects to modem, choose “OK”



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

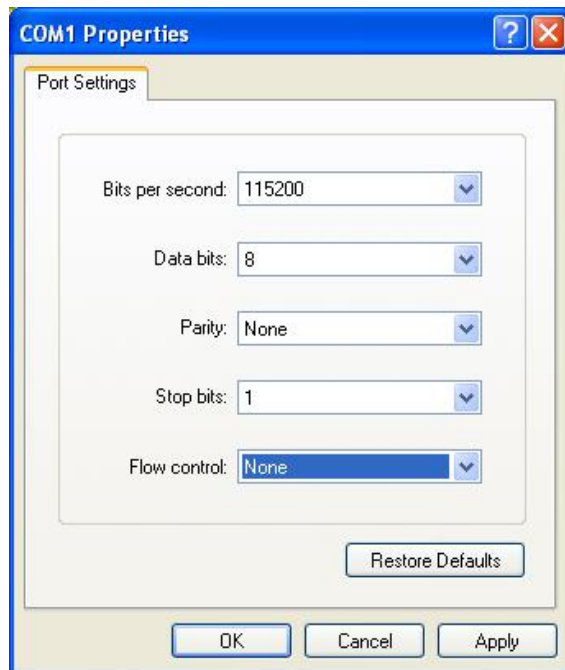
Bits per second: 115200

Data bits: 8

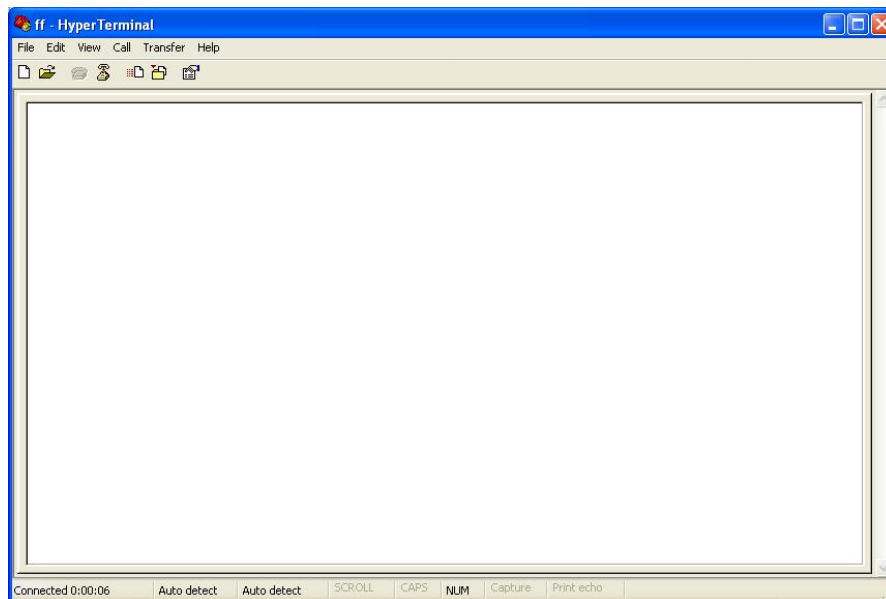
Parity: None

Stop bits: 1

Flow control: None



5. Complete Hyper Terminal operation, It runs as following



## Appendix B API Accord Format

API operation requires that communication with the module be done through a structured interface (data is communicated in frames in a defined order). The API specifies how commands, command responses and module status messages are sent and received from the module using a UART Data Frame.

To enter API mode :

- In the transparent mode, send the 3-character command sequence“= =”twice through serial port.

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 receiver XORs all the received data bytes as indicated above and then XORs the received FCS field. If the sum is not equal to zero, the received packet is in error.

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

### 4.4.3.1 data send command

SREQ:

| 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     |

SRSP:

| Fields  | Sub field | Offset | Example | Description                     |
|---------|-----------|--------|---------|---------------------------------|
| SOF     |           | 1      | FE      | 0xFE                            |
| Length  |           | 1      | 01      | The length of data              |
| Command | Send      | 2      | 64 5F   | Fixed to 64 5F                  |
| Data    | State     | 1      | 00      | 00 = success,<br>Others = error |
| FCS     |           | 1      | 3A      | Frame check sequence            |

AREQ:

| Fields  | Sub field | Offset | Example | Description                     |
|---------|-----------|--------|---------|---------------------------------|
| SOF     |           | 1      | FE      | 0xFE                            |
| Length  |           | 1      | 03      | The length of data              |
| Command | Send      | 2      | 44 80   | Fixed to 44 80                  |
| Data    | State     | 1      | 00      | 00 = success,<br>Others = error |
|         |           | 2      | 0B 00   | Fixed to 0B 00                  |
| FCS     |           | 1      | CC      | Frame check sequence            |

#### 4.4.3.2 data recive command

AREQ

| Fields  | Sub field | Offset | Example     | Description                                  |
|---------|-----------|--------|-------------|----------------------------------------------|
| SOF     |           | 1      | FE          | 0xFE                                         |
| Length  |           | 1      | 06          | The length of data                           |
| Command | Recive    | 2      | 44 5F       | Fixed to 24 5F                               |
| Data    | Source    | 2      | 10 0E       | The sender node<br>address ( little-endian ) |
|         | Content   | <80    | 41 41 41 41 | The content to be<br>recived                 |
| FCS     |           | 1      | 03          | Frame check sequence                         |

#### 4.4.3.3 Set the node current operating mode

SREQ :

| Fields  | Sub field | Offset | Example | Description                                                       |
|---------|-----------|--------|---------|-------------------------------------------------------------------|
| SOF     |           | 1      | FE      | 0xFE                                                              |
| Length  |           | 1      | 01      | The length of data                                                |
| Command | Set       | 2      | 21 2A   | Fixed to 21 2A                                                    |
| Data    | Mode      | 1      | 00      | 00 = transparent mode<br>01 = AT command<br>mode<br>02 = API mode |
| FCS     |           | 1      | 0A      | Frame check sequence                                              |

SRSP

| Fields  | Sub field | Offset | Example | Description                     |
|---------|-----------|--------|---------|---------------------------------|
| SOF     |           | 1      | FE      | 0xFE                            |
| Length  |           | 1      | 01      | The length of data              |
| Command | Set       | 2      | 61 2A   | Fixed to 61 2A                  |
| Data    | State     | 1      | 00      | 00 = success,<br>Others = error |
| FCS     |           | 1      | 4A      | Frame check sequence            |

#### 4.4.3.4 OTA IO pin data acquisition

SREQ

| Fields  | Sub field      | Offset | Example | Description              |
|---------|----------------|--------|---------|--------------------------|
| SOF     |                | 1      | FE      | 0xFE                     |
| Length  |                | 1      | 04      | The length of data       |
| Command | Send           | 2      | 24 5E   | Fixed to 24 5E           |
| Data    | Destination    | 2      | 10 0E   | Destination node address |
|         | Read command   | 1      | 00      | Fixed to 00              |
|         | IO pin address | 1      | 02      | IO pin address(00 - 02)  |
| FCS     |                | 1      | 62      | Frame check sequence     |

SRSP

| Fields  | Sub field | Offset | Example | Description                     |
|---------|-----------|--------|---------|---------------------------------|
| SOF     |           | 1      | FE      | 0xFE                            |
| Length  |           | 1      | 01      | The length of data              |
| Command | Send      | 2      | 64 5E   | Fixed to 64 5E                  |
| Data    | State     | 1      | 00      | 00 = success,<br>Others = error |
| FCS     |           | 1      | 3B      | Frame check sequence            |

AREQ:

| Fields  | Sub field      | Offset | Example | Description                                                        |
|---------|----------------|--------|---------|--------------------------------------------------------------------|
| SOF     |                | 1      | FE      | 0xFE                                                               |
| Length  |                | 1      | 06      | The length of data                                                 |
| Command | send           | 2      | 44 5E   | Fixed to 44 5E                                                     |
| Data    | State          | 1      | 00      | 00 = success,<br>Others = error                                    |
|         | Destination    | 2      | 10 0E   | Destination node address                                           |
|         | IO pin address | 1      | 02      | IO pin address                                                     |
|         | Pin value      | n      | 00 00   | Attention : it shows little-endian, such as 12 34, equal to 0x3412 |

|     |  |   |    |                      |
|-----|--|---|----|----------------------|
| FCS |  | 1 | 00 | Frame check sequence |
|-----|--|---|----|----------------------|

#### 4.4.3.5 OTA Set remote node IO pin value

**Attention : IO pin is set digital output mode.**

SREQ:

| Fields  | Sub field      | Offset | Example | Description                                                        |
|---------|----------------|--------|---------|--------------------------------------------------------------------|
| SOF     |                | 1      | FE      | 0xFE                                                               |
| Length  |                | 1      | 06      | The length of data                                                 |
| Command | Send           | 2      | 24 60   | Fixed to 24 60                                                     |
| Data    | Destination    | 2      | 10 0E   | Destination node address                                           |
|         | Write          | 1      | 01      | Fixed to 01                                                        |
|         | IO pin address | 1      | 02      | IO pin address(00 - 02)                                            |
|         | Pin value      | 1      | 01 00   | Attention : it shows little-endian, such as 01 00, equal to 0x0001 |
| FCS     |                | 1      | 5E      | Frame check sequence                                               |

SRSP

| Fields  | Sub field | Offset | Example | Description                  |
|---------|-----------|--------|---------|------------------------------|
| SOF     |           | 1      | FE      | 0xFE                         |
| Length  |           | 1      | 01      | The length of data           |
| Command | Send      | 2      | 64 60   | Fixed to 64 60               |
| Data    | State     | 1      | 00      | 00 = success, Others = error |
| FCS     |           | 1      | 05      | Frame check sequence         |

AREQ:

| Fields  | Sub field      | Offset | Example | Description                  |
|---------|----------------|--------|---------|------------------------------|
| SOF     |                | 1      | FE      | 0xFE                         |
| Length  |                | 1      | 05      | The length of data           |
| Command | Send           | 2      | 44 60   | Fixed to 44 60               |
| Data    | Send state     | 1      | 00      | 00 = success, Others = error |
|         | Destination    | 2      | 10 0E   | Destination node address     |
|         | IO pin address | 1      | 02      | IO pin address(00 - 02)      |
|         | Set state      | 1      | 00      | 00 = success, Others = error |
| FCS     |                | 1      | 3D      | Frame check sequence         |



#### 4.4.3.6 OTA Query MAC address

SREQ

| Fields  | Sub field     | Offset | Example | Description              |
|---------|---------------|--------|---------|--------------------------|
| SOF     |               | 1      | FE      | 0xFE                     |
| Length  |               | 1      | 03      | The length of data       |
| Command | Send          | 2      | 24 5D   | Fixed to 24 5D           |
| Data    | Destination   | 2      | 10 0E   | Destination node address |
|         | Query command | 1      | 02      | Fixed to 02              |
| FCS     |               | 1      | 66      | Frame check sequence     |

SRSP

| Fields  | Sub field | Offset | Example | Description                     |
|---------|-----------|--------|---------|---------------------------------|
| SOF     |           | 1      | FE      | 0xFE                            |
| Length  |           | 1      | 01      | The length of data              |
| Command | Send      | 2      | 64 5D   | Fixed to 64 5D                  |
| Data    | State     | 1      | 00      | 00 = success,<br>Others = error |
| FCS     |           | 1      | 38      | Frame check sequence            |

AREQ:

| Fields  | Sub field   | Offset | Example                       | Description                                  |
|---------|-------------|--------|-------------------------------|----------------------------------------------|
| SOF     |             | 1      | FE                            | 0xFE                                         |
| Length  |             | 1      | 0C                            | The length of data                           |
| Command | Send        | 2      | 44 5D                         | Fixed to 44 5D                               |
| Data    | State       | 1      | 00                            | 00 = success,<br>Others = error              |
|         | Destination | 2      | 10 0E                         | Destination node address                     |
|         | MAC address | 8      | 8B D9 D1<br>01<br>00 4B 12 00 | Low byte come first                          |
|         | Node type   | 1      | 01                            | 00=coordinator<br>01=router<br>02=end device |
| FCS     |             | 1      | D1                            | Frame check sequence                         |

#### 4.4.3.7 OTA Query node address

SREQ

| Fields  | Sub field | Offset | Example | Description        |
|---------|-----------|--------|---------|--------------------|
| SOF     |           | 1      | FE      | 0xFE               |
| Length  |           | 1      | 09      | The length of data |
| Command | Send      | 2      | 24 5C   | Fixed to 24 5C     |

|      |               |   |                            |                      |
|------|---------------|---|----------------------------|----------------------|
| Data | Query command | 1 | 03                         | Fixed to 03          |
|      | MAC address   | 8 | 8B D9 D1 01<br>00 4B 12 00 | Low byte come first  |
| FCS  |               | 1 | A9                         | Frame check sequence |

SRSP:

| Fields  | Sub field | Offset | Example | Description                     |
|---------|-----------|--------|---------|---------------------------------|
| SOF     |           | 1      | FE      | 0xFE                            |
| Length  |           | 1      | 01      | The length of data              |
| Command | Send      | 2      | 64 5C   | Fixed to 64 5C                  |
| Data    | State     | 1      | 00      | 00 = success,<br>Others = error |
| FCS     |           | 1      | 39      | Frame check sequence            |

AREQ:

| Fields  | Sub field   | Offset | Example                       | Description                                  |
|---------|-------------|--------|-------------------------------|----------------------------------------------|
| SOF     |             | 1      | FE                            | 0xFE                                         |
| Length  |             | 1      | 0C                            | The length of data                           |
| Command | Send        | 2      | 44 5D                         | Fixed to 44 5D                               |
| Data    | State       | 1      | 00                            | 00 = success,<br>Others = error              |
|         | Destination | 2      | 10 0E                         | Destination node address                     |
|         | MAC address | 8      | 8B D9 D1<br>01<br>00 4B 12 00 | Low byte come first                          |
|         | Node type   | 1      | 01                            | 00=coordinator<br>01=router<br>02=end device |
| FCS     |             | 1      | D1                            | Frame check sequence                         |

#### 4.4.3.8 OTA Query all node address and MAC address

SREQ:

| Fields  | Sub field     | Offset | Example | Description          |
|---------|---------------|--------|---------|----------------------|
| SOF     |               | 1      | FE      | 0xFE                 |
| Length  |               | 1      | 01      | The length of data   |
| Command | Send          | 2      | 24 5B   | Fixed to 24 5B       |
| Data    | Query command | 1      | 01      | Fixed to 01          |
| FCS     |               | 1      | 7F      | Frame check sequence |

SRSP:

| Fields | Sub field | Offset | Example | Description |
|--------|-----------|--------|---------|-------------|
| SOF    |           | 1      | FE      | 0xFE        |

|         |       |   |       |                                 |
|---------|-------|---|-------|---------------------------------|
| Length  |       | 1 | 01    | The length of data              |
| Command | Send  | 2 | 64 5B | Fixed to 64 5B                  |
| Data    | State | 1 | 00    | 00 = success,<br>Others = error |
| FCS     |       | 1 | 3E    | Frame check sequence            |

AREQ:

| Fields  | Sub field   | Offset | Example                          | Description                                  |
|---------|-------------|--------|----------------------------------|----------------------------------------------|
| SOF     |             | 1      | FE                               | 0xFE                                         |
| Length  |             | 1      | 0C                               | The length of data                           |
| Command | Send        | 2      | 44 5D                            | Fixed to 44 5D                               |
| Data    | State       | 1      | 00                               | 00 = success,<br>Others = error              |
|         | Destination | 2      | 10 0E                            | Destination node address                     |
|         | MAC address | 8      | 8B D9 D1<br>01<br>00 4B 12<br>00 | Low byte come first                          |
|         | Node type   | 1      | 01                               | 00=coordinator<br>01=router<br>02=end device |
| FCS     |             | 1      | D1                               | Frame check sequence                         |