AD7028 Cellular Router User Manual

Applicable Models：

Product Type	Model	Product Name
Standard	AD7028-W	WCDMA Cellular Router
	AD7028-E	EVDO Cellular Router
	AD7028-F	FDD-LTE Cellular Router
	AD7028-T	TDD-LTE Cellular Router
	AD7028-D	TDD/FDD-LTE Cellular Router
Dual SIM	AD7028-WS	WCDMA Dual SIM Cellular Router
	AD7028-ES	EVDO Dual SIM Cellular Router
	AD7028-FS	FDD-LTE Dual SIM Cellular Router
	AD7028-TS	TDD-LTE Dual SIM Cellular Router
	AD7028-DS	TDD/FDD-LTE Dual SIM Cellular Router

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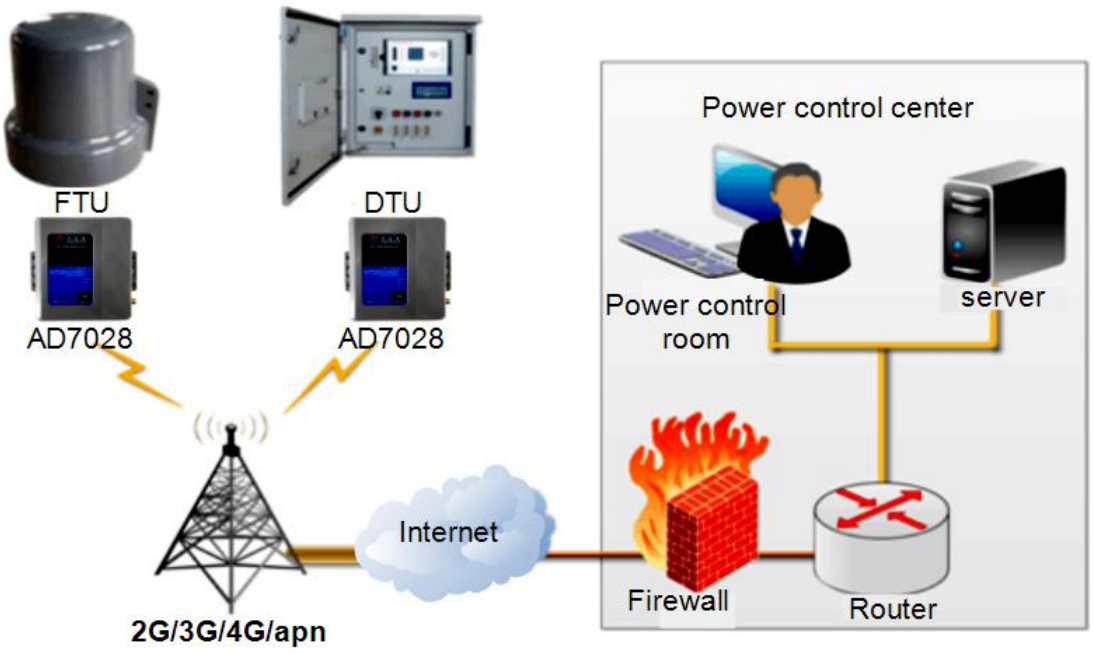
Contents

Chapter 1 Brief Introduction

1.1 General

AD7028 Cellular Router is a kind of cellular terminal device that developed based on 2G/3G/4G LTE connectivity, VPN client, among other features. It adopts high-powered industrial 32 bits CPU and embedded real time operating system. It supports 2 separate RS232 (or 1 RS232 and 1 RS485) and 1 LAN port that can conveniently and transparently connect one device to a cellular network. It support wide power range 5-60V DC. With a compact and robust design, it includes the necessary accessories for Mount kit or DIN rail.

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.



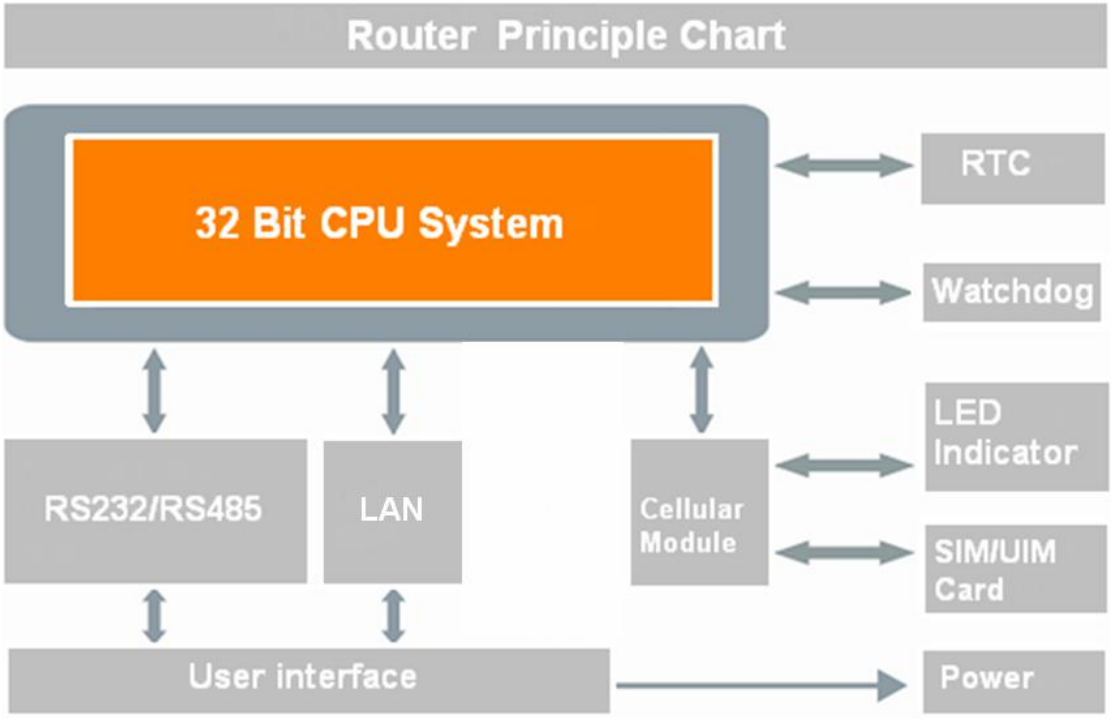
Application Topology

1.2 Product Feature

Items	Contents
Industrial	High-powered industrial cellular module

Design	High-powered industrial 32bits CPU
	Wide Operating Temperature(-35~+75ºC)
	Power range: DC 5~60V
High Reliability	Support hardware and software WDT
	Support auto recovery mechanism, including online detect, auto redial when offline to make it always online
	Ethernet port: 1.5KV magnetic isolation protection
	RS232/RS485 ports:15KV ESD protection
	SIM/UIM port: 15KV ESD protection
	Power port: reverse-voltage and over voltage protection
	large serial port data cache(10MB) ,ensure the data is not lost
	Antenna port: lightning protection(optional)
Standard and Convenience	Adopt terminal block interface, convenient for industrial application
	Support standard two RS232(or RS232 and RS485) and Ethernet ports that can connect to serial devices directly
	Support several work modes
	Support intellectual mode, enter into communication state automatically when powered
	Convenient configuration and maintenance interface
High-performance and Security	Support TCP server
	Support double data centers, one main and another backup
	Support multi data centers and it can support 5 data centers at the same time
	Support NTP, RTC embedded.
	Support MAC address cloning.
	Support dynamic domain name(DDNS) and IP access to data center
	Design with standard TCP/IP protocol stack
	Support APN/VPDN
	Support local log storage.
	Support dual SIM/UIM card (optional).
	Support hardware encryption/decryption (optional)

1.3 Block Diagram



1.4 Product SPEC

Items		Contents
Hardware System	CPU	Industrial 32 bits CPU
	FLASH	16MB (Extendable to 64MB)
	SDRAM	128MB
Interface	Serial	2 RS232 ports (or 1 RS232 and 1 RS485), 15KV ESD protection Serial port: 8PIN industrial terminal, 3.81mm pitch Data bits: 5, 6 ,7, 8 Stop bits: 1, 1.5(optional), 2 Parity: none, even, odd, space, mark Baud rate: 110~230400 bps Large serial port data cache:10MB
	LAN	1 10/100Mbps Ethernet ports(RJ45), auto MDI/MDIX, 1.5KV magnetic isolation protection
	Antenna	Standard SMA female interface, 50 ohm
	SIM/UIM	Standard 3V/1.8V user card interface, 15KV ESD

		protection
	Power	Terminal block interface, reverse-voltage and over voltage protection
	Reset	Inside the module. Press this key for 8 seconds to restore the module to its original factory default settings
	Indicator	“POWER”、”MODULE”、”SIM”、”STATUS”
Network	Wireless Network	GSM/GPRS/EDGE: 850/900/1800/1900MHz CDMA: 800/1900MHz WCDMA/HSUPA/HSPA+: 850/900/1900/2100MHz CDMA2000 1x/ EVDO Rev. A: 800/1900MHz TD-SCDMA: 1880-1920/2010-2025MHz(A/F) TDD-LTE:Band 38/39/40/41& Band 61/62 (Private Network) FDD-LTE:Band1/2/3/4/5/7/8/12/13/17/18/19/20/21/25/26/28/66
	PPP Protocol	Support PPP Protocol
	PPP Heartbeat	Maintaining links with the cellular network to prevent forced sleep, to ensure the stability of dial-up link.
	Network Authentication	Support CHAP/PAP Authentication
	TCP Heartbeat	Monitor the server connection
Power supply	Power range	DC 5~60V, Recommended 12VDC
	Communication Current	<410mA (@12VDC)
	Standby Current	<250mA（@12VDC）
Physical	Shell Material	ABS
	Dimensions	108.43x85x40.7mm
	Weight	126g
	Installation	Mount Kit or DIN Rail 35mm (optional)
Environmental Limits	Operating Temperature	-35~+75ºC (-31~+167℉)
	Storage Temperature	-40~+85ºC (-40~+185℉)
	Operating Humidity	95% (unfreezing)

1.5 Ordering Information

Model	Version	
	Network Abbreviation	**Function Extension**
AD7028	-W: WCDMA -E: EVDO -D: TDD/FDD-LTE -T: TDD-LTE -F: FDD-LTE	S: Dual SIM Card
Example	AD7028-FS: AD7028 FDD-LTE Router, Support Dual SIM Card.	

Chapter 2 Installation Introduction

2.1 General

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

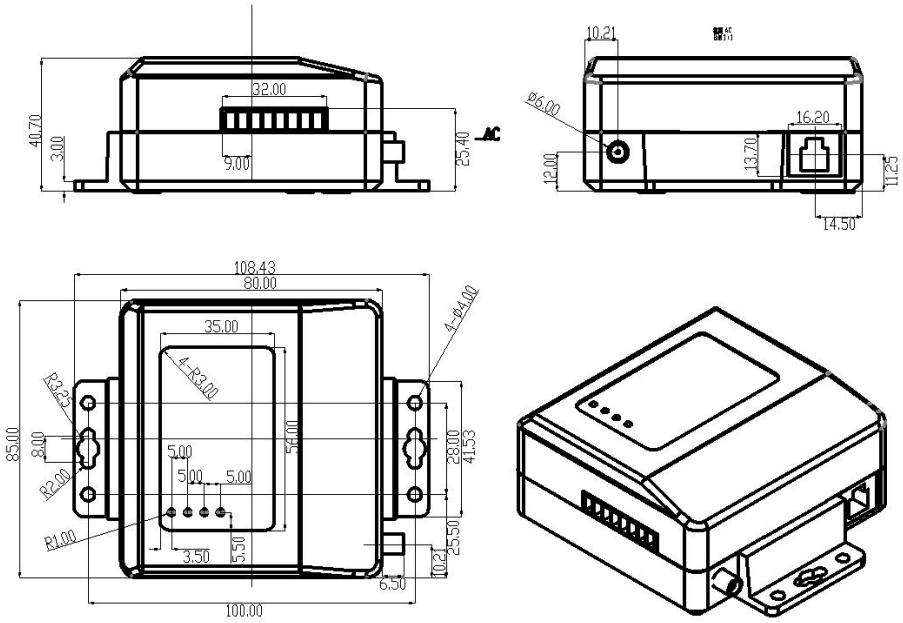
Warning: Forbid to install the router when powered!

2.2 Encasement List

Name	Quantity	Remark
Router host	1	
Cellular antenna (Male SMA)	1	
Network cable	1	
Certification card	1	
Maintenance card	1	
Power adapter	1	Optional
Manual CD	1	Optional
RS232 Console cable	1	Optional
RS485 Console cable	1	Optional
35mm Din Rail	1	Optional

2.3 Installation and Cable Connection

Dimension (The fixing piece is detachable): (Unit: mm)



Installation of antenna:

Cellular antenna (Standard)

Screw the SMA male pin of the cellular antenna to the female SMA interface of the router
Warning: The cellular antenna and the WIFI antenna cannot be connected wrongly. And the antennas must be screwed tightly, or the signal quality of antenna will be influenced!

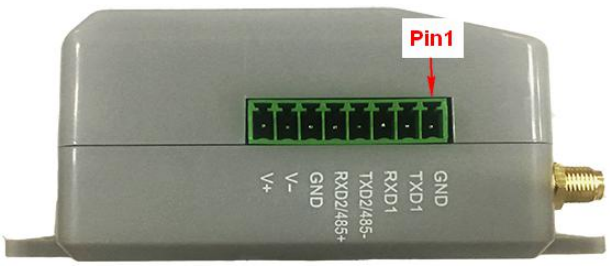
Installation of SIM/UIM card:

SIM/UIM Card Installation

The SIM/UIM card of the router is designed inside the device. When installing or removing the SIM/UIM card, first remove the cover. (Remove the cover method: press both sides with the fixed mounting ear of the upper cover) Then press the direction indicated on the SIM card holder ("OPEN" or "LOCK"), make sure that the metal contact surface of the SIM card is in full contact with the socket, and fasten it, and finally install the upper cover.

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

Communication interface definition:



8PIN industrial terminal defined as follows:

Pin	Signal Name	Description
1	GND	Ground
2	TXD1	RS232-1 Transmit
3	RXD1	RS232-1 Receiver
4	TXD2/485-	RS232-2 Transmit or RS485-(optional)
5	RXD2/485+	RS232-2 Receiver or RS485+(optional)
6	GND	Ground
7	V-	Negative power supply
8	V+	Positive power supply

Installation of cable:

Network Cable (Standard) **RS232 cable** (optional) **RS485 cable** (optional)

Insert one end of the network cable into router RJ-45 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
1	1
2	2
3	3
4	4

5	5
6	6
7	7
8	8

RS232 cable (one end is DB9F**)**

Cable color	DB9F pin number
Blue	2
Brown	3
Black	5

The signal definition of the DB9F serial communication interface is as follows:

RS485 cable:

Cable color	Signal definition
Red	RS485+ (A)
Black	RS485- (B)

2.4 Power

Power Adapter (Optional)

The power range of the router is DC 5~60V.

Warning: When we use other power, we should make sure that the power can supply power above 6W, and the power ripple less than 300mV.

2.5 Indicator Lights Introduction

Indicator status description：

Indicator				**Description**
POWER (Red)	MODULE (Blue)	SIM (Green)	STATUS (Green)	
ON	X	Alternate Fast Blink		Module is turned on in AT mode
ON	X	OFF	Slow Blink	Initialize the module
ON	Fast Blink	OFF	Slow Blink	The system is dialing
ON	X	Slow Blink	OFF	Waiting for activation
ON	X	Alternate Slow Blink		The system dials successfully, the module

			is in data mode but the centers are not connected.
ON	X	Sync Slow Blink	APP normal, MP normal, WMMP normal
Note: 1, ON: Indicator Keep on at least 3s without blink; 2, OFF: Indicator Keep off at least 3s without blink; 3, Slow Blink: Indicator blink frequency is about 1Hz; 4, Fast Blink: Indicator blink frequency is about 3Hz.			

2.6 Reset Button Introduction

There is a “Reset” button inside the module that to restore the module to its original factory default settings. When user press the “Reset” button for up to 8 seconds, the module will restore to its original factory default settings and restart automatically.

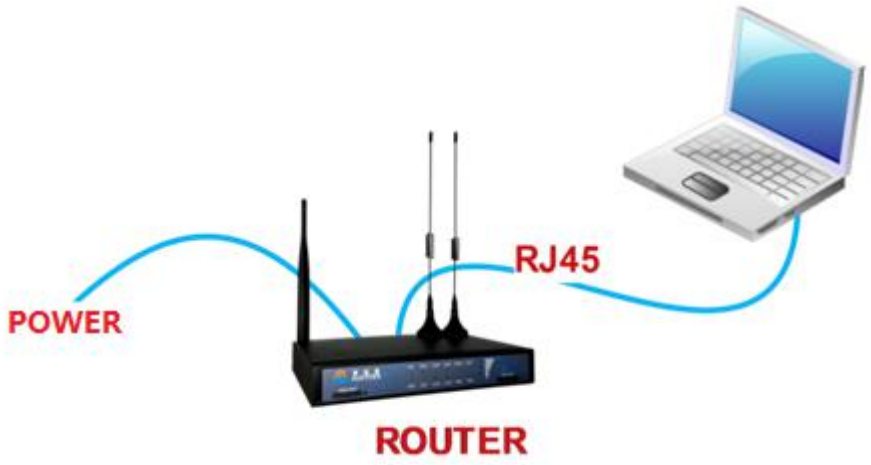
The auto-restart is as follows: The "POWER" indicator turns off for about 10 seconds and then functions normally.

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 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 PC's Ethernet port.
The connection diagram is as following:

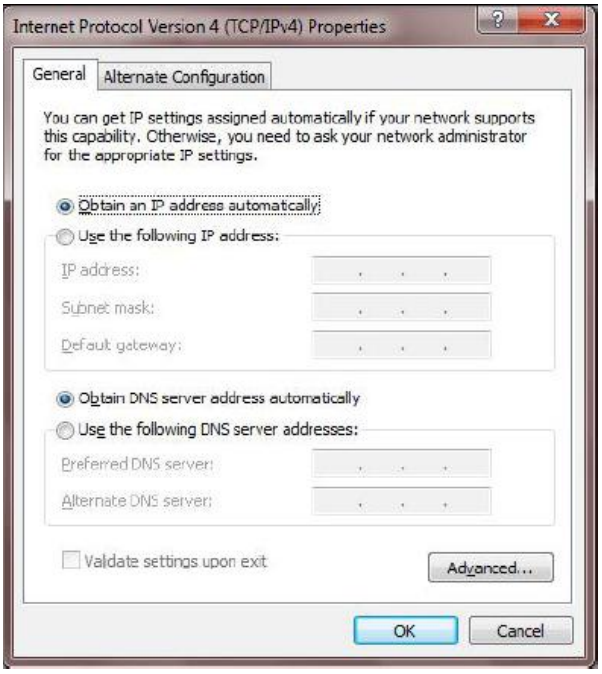


Please modify the IP address of PC the same as network segment address of the router, for instance, 192.168.1.9. Modify the mask code of PC as 255.255.255.0 and set the default gateway of PC as the router's IP address (192.168.1.1).

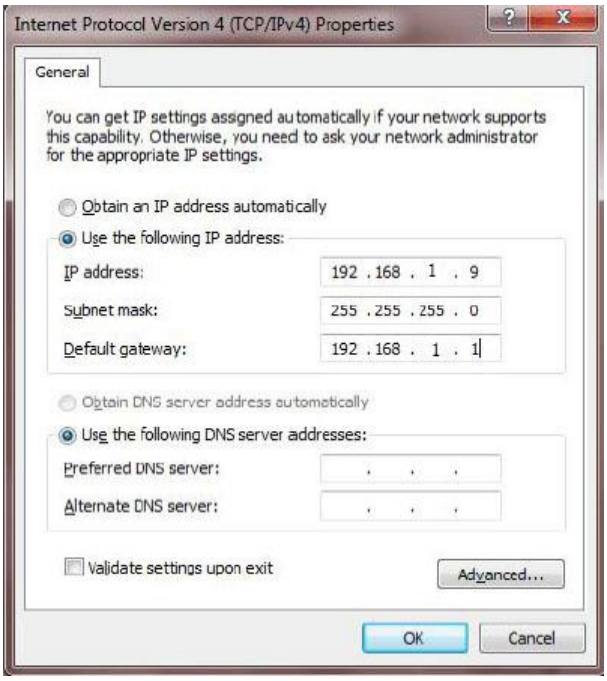
3.2 Access the Configuration Web Page

3.2.1 IP Address Setting

IP Address - DHCP



IP Address - Static. Set the IP PC address to 192.168.1.9. Set the subnet mask to 255.255.255.0. Set the default gateway to 192.168.1.1.



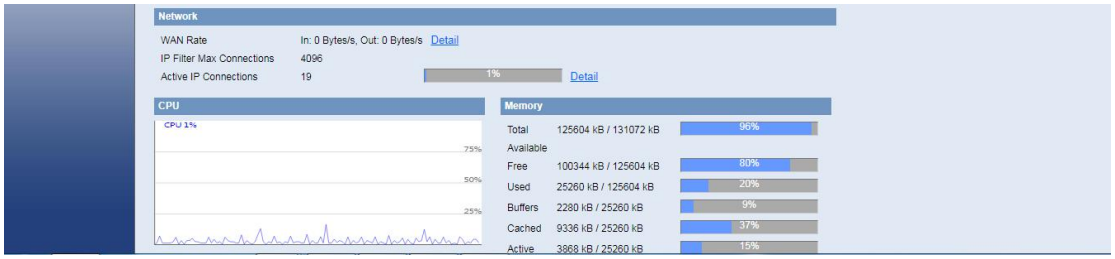
3.2.2 Access the Configuration Web Page

The chapter is to present main functions of each page. Users visit page tool via web browser after connect users' PC to the router.

Start a web browser and type 192.168.1.1 in the Address (URL) field (The Default IP Address of the Ethernet port is 192.168.1.1). It will prompt the Web management tool of

the router. The users login in the web page, there will display a page shows as blow. Users have to click "Continue" to make it work if they modify language.

After access to the information main page.



The operation data and state of each module can be completely observed in the information main page, which including basic information of routing, WAN, LAN, wireless, network, CPU, memory and other basic information.

Access other pages. It will prompt a login page. The default username and password are both “admin”. Please input the username and password login to access the configuration pages.

Input correct user name and password to visit relevant menu page.

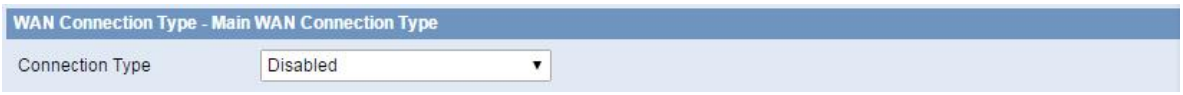
3.3 Basic

3.3.1 WAN

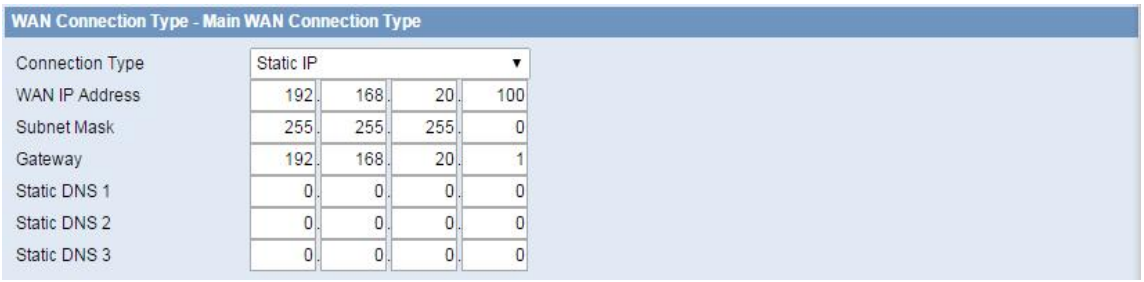
Select the appropriate wide area networking mode according to different requirements. Set the corresponding parameters according to different connection modes.

Dual Both Online: WAN and Bkup WAN are both online.The system will automatically switch back to the main chain when the main link is available if enabled.
Link Fail to Restart: Time of restart system for all link fail.

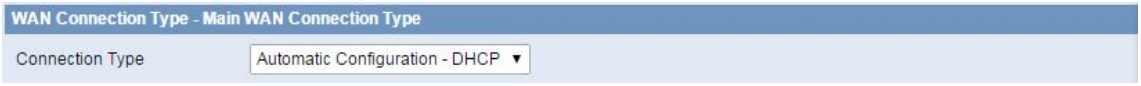
Disable WAN connection



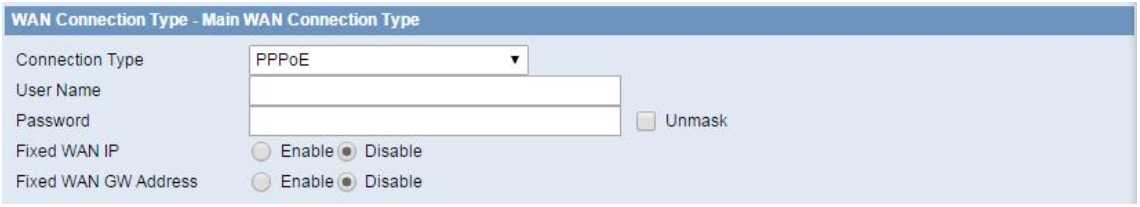
Put in the IP address, subnet mask, default gateway, and DNS Server(optional) assigned by the provider.



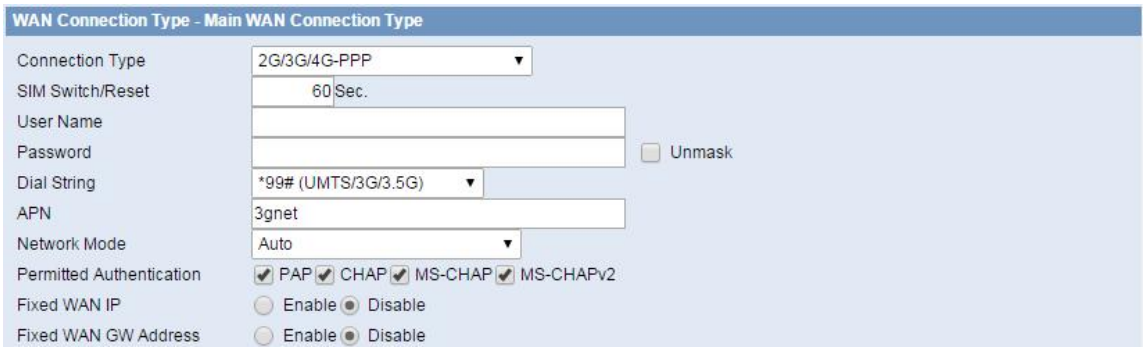
Normally, The Internet IP Address of the router is allocated by the ISP automatically.



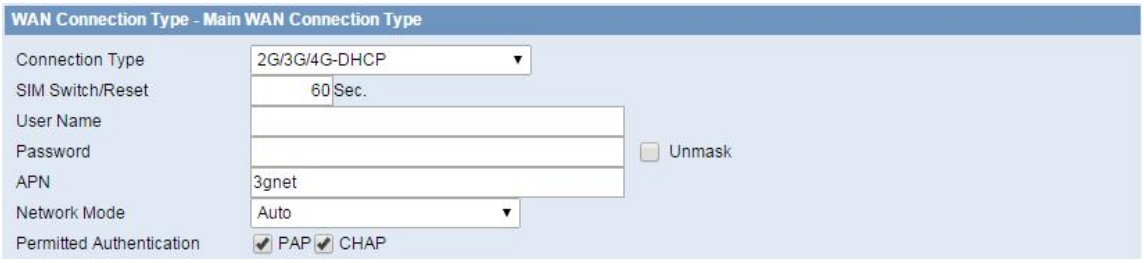
You may choose "PPPoE" if you connect the WAN port to a PPPoE server. Input the correct username and password provided by ISP or administrator.



If you want to access to 2G/3G/4G network, you can choose "2G/3G/4G-PPP" or "2G/3G/4G-DHCP" mode.



SIM Switch/Reset: Time of restart SIM card for dial fail.
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
Network Mode: Select the appropriate network model according to the environment.
Permitted Authentication: Select the authentication protocol according to the requirements.



Refer to 2G/3G/4G-PPP mode.

Force reconnect: Reset the connection according to the set time.
Connect Fail: Switch to Backup WAN after link failure times.
Dial Fail to Restart: Time of restart system for this link fail.
Keep Alive: This function is used to detect whether the Internet connection is active. It will redial to users' ISP immediately to make the connection active if users set it and when the router detect the connection is inactive. Specifies how many seconds to wait before reconnect the link after it terminates.
None: do not set this function
Ping: Send ping packet to detect the connection, when choose this method. Users should also configure "Keep Alive Interval", "Keep Alive Server IP" and "Keep Alive Server IP2" items.
Route: Detect connection with route method, when choose this method. Users should also configure "Keep Alive Interval", "Keep Alive Server IP" and "Keep Alive Server IP2" items.
PPP: Detect connection with PPP method, when choose this method. Users should also configure "Detection Interval" item.
Keep Alive Fail: Switch to Backup WAN after keep alive fail times.

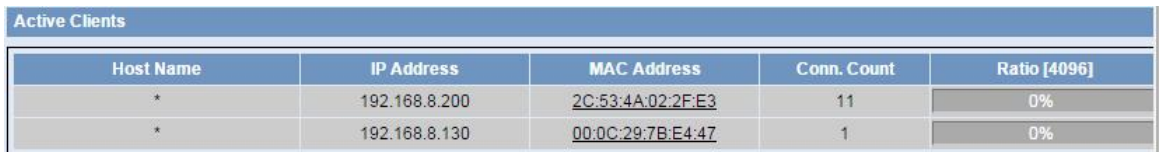
Note: When users choose the “Route” or “Ping” method, it’s quite important to make sure that the "Keep Alive Server IP" and "Keep Alive Server IP2" are usable and stable, because they have to response the detection packet frequently.

3.3.2 WAN Status

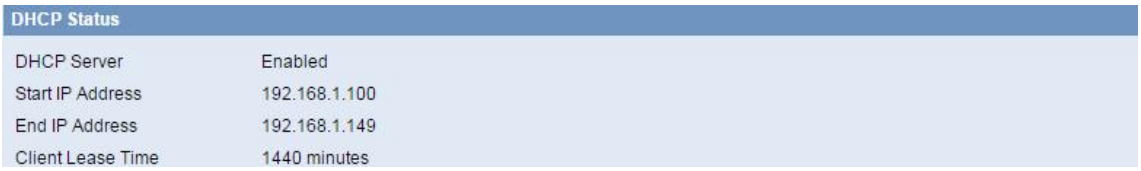
The page show the specific connection details, including module information, network operators, as well as the connection of the IP address and DNS, etc.., according to the different connection types.

3.3.3 LAN Status

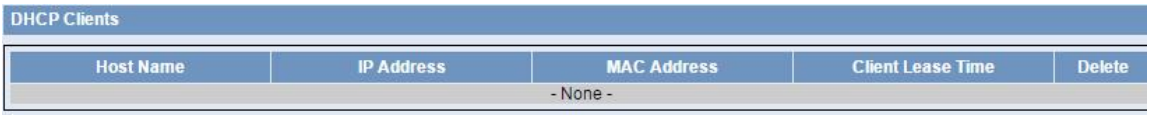
LAN port MAC, IP and DNS and other information.



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.



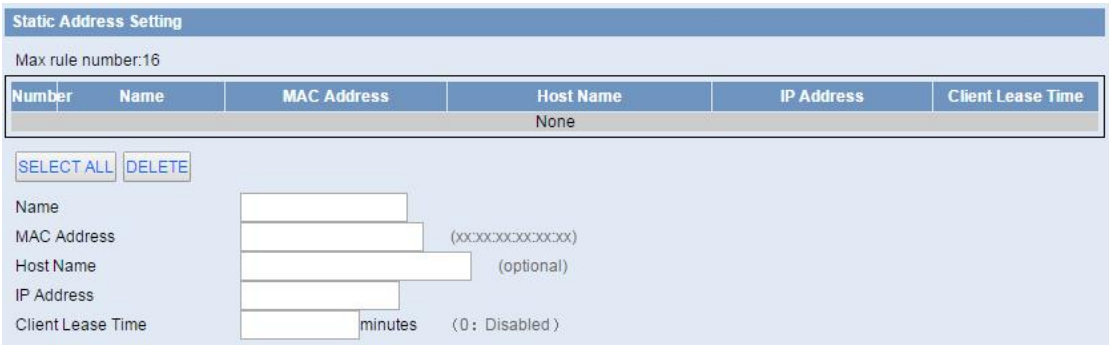
DNCP Server: Enable or disable the router work as a DHCP server.
Starting IP Address: The starting IP Address of the DHCP server's Address pool.
Ending IP Address: The ending IP Address of the DHCP server's Address pool.
Client Lease Time: The lease time of DHCP client.



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.

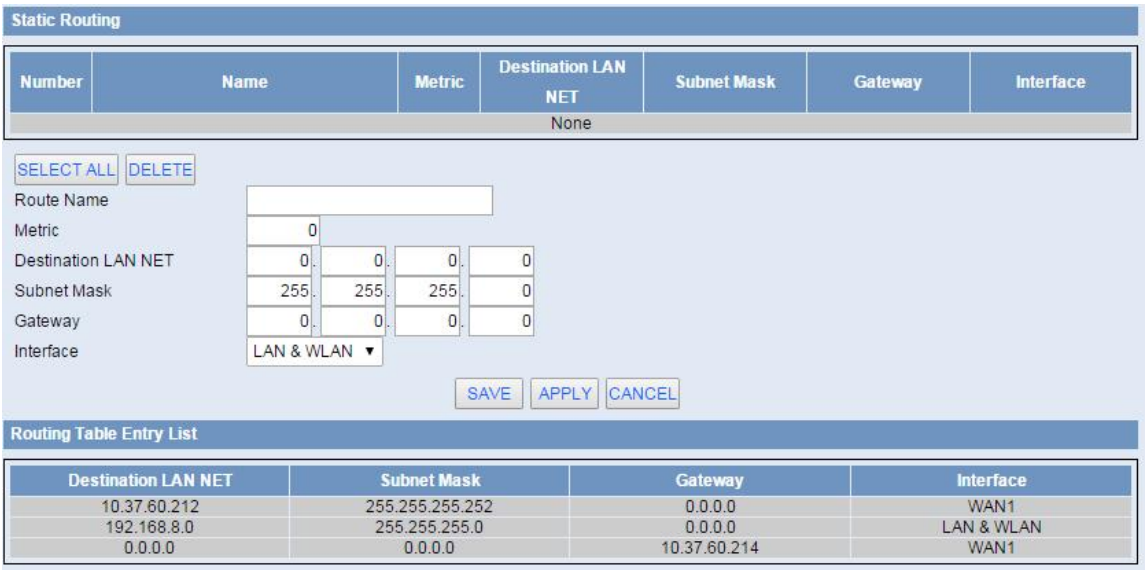
3.4 Advanced

3.4.1 Statically Assigned



Statically Assigned: Assign the static IP address to the specified client according to MAC address.

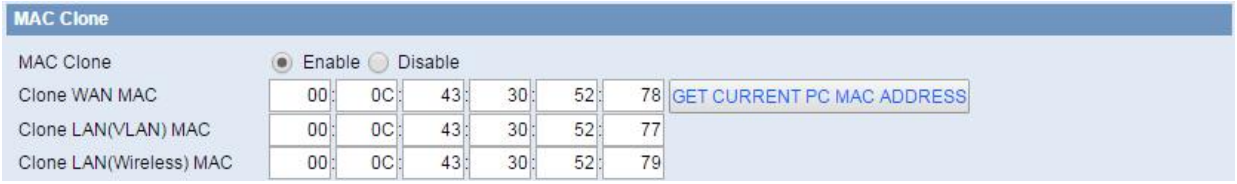
3.4.2 Advanced Router



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).

3.4.3 MAC Address Clone

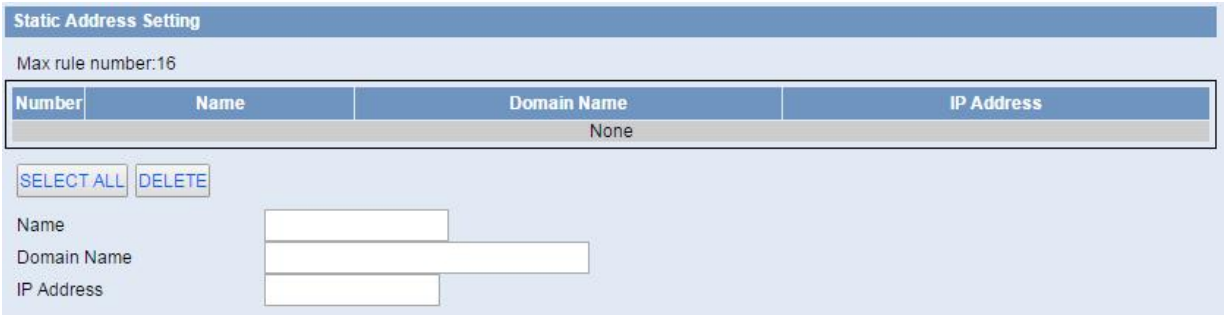
Some ISP need the users to register their MAC address. The users can clone the router MAC address to their MAC address registered in ISP if they do not want to re-register their MAC address.



Clone MAC address: It can clone three parts: Clone LAN MAC, Clone WAN MAC, Clone Wireless MAC.
Noted: One MAC address is 48 characteristic. MAC address 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.

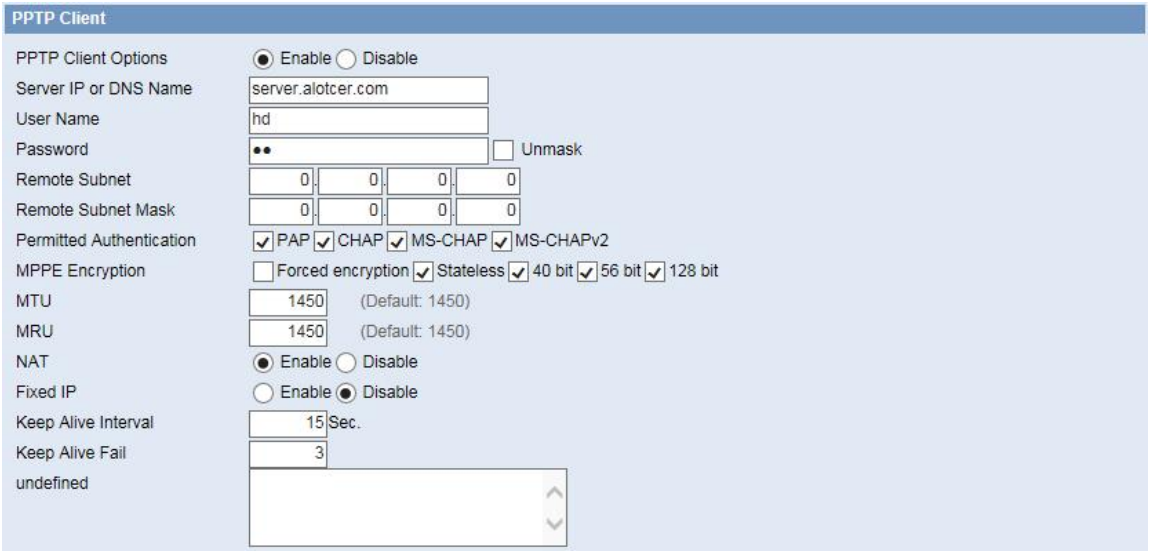
3.4.4 SDNS



When users host their domain names on free or commercial servers, they usually get a static IP (non-changeable IP) address for their websites, which involves the use of static name servers, or static DNS, as well. Static DNS settings will never update on their own and will remain the same, until you decide to update them. Static DNS settings are very useful, since they provide a stable service with no interruptions, and can increase the overall speed of the website.

3.5 VPN

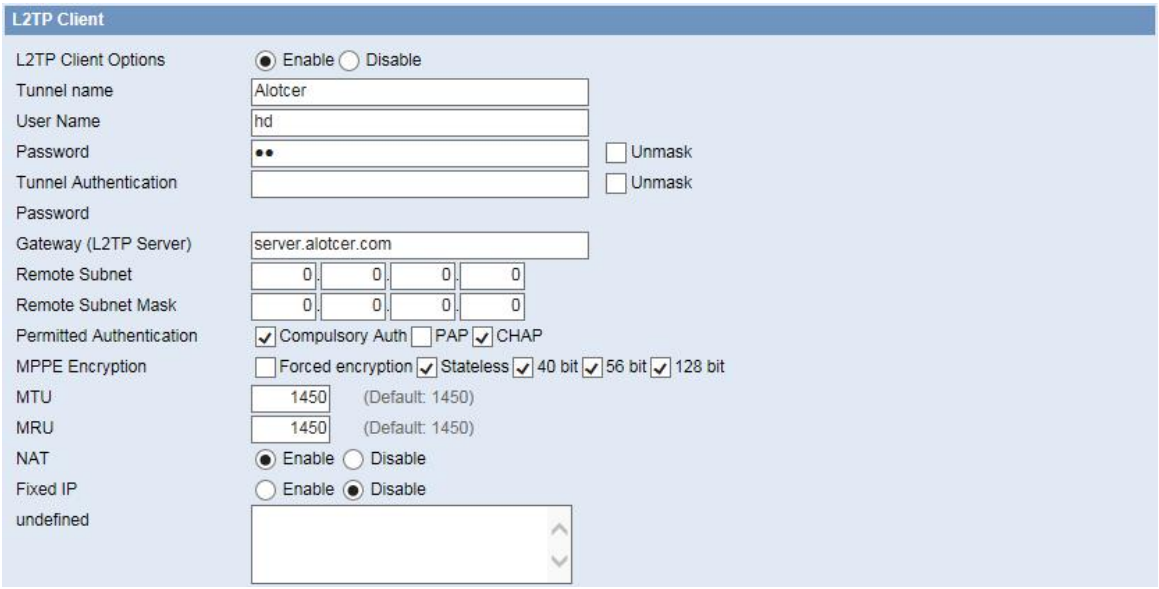
3.5.1 PPTP



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

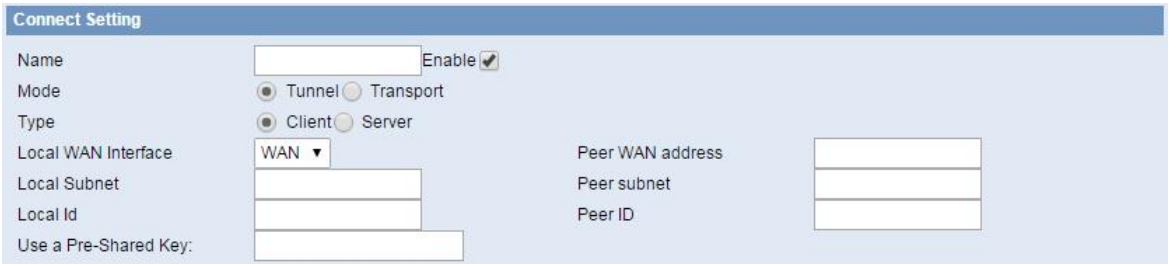
Remote Subnet: The network of the remote PPTP server.
Remote Subnet Mask: Subnet mask of remote PPTP server.
Permitted Authentication: Select permitted authentication.
MPPE Encryption: Enable or disable Microsoft Point-to-Point Encryption.
MTU: Maximum Transmission Unit.
MRU: Maximum Receive Unit.
NAT: Network Address Translation.
User Name: User name to login PPTP Server.
Password: Password to log into PPTP Server.

3.5.2 L2TP

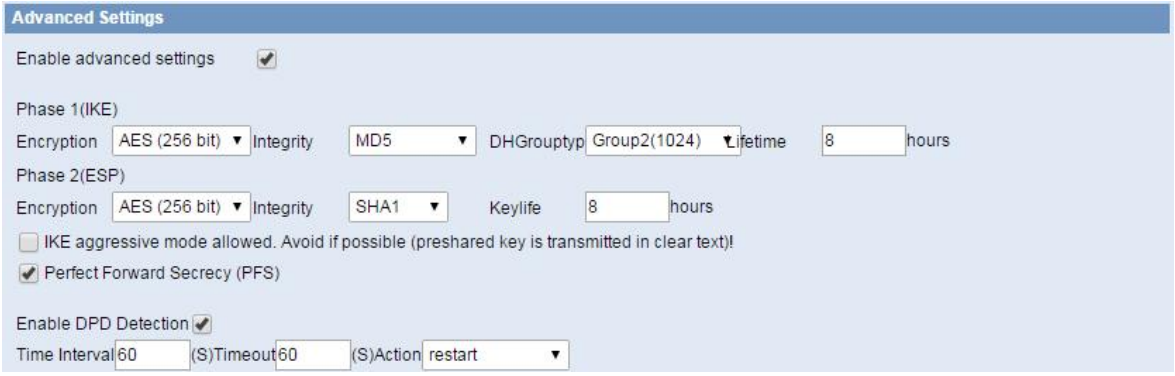


User Name: User name to login L2TP Server.
Password: Password to login L2TP Server.
Gateway(L2TP Server): L2TP server's IP Address or DNS Name.
Remote Subnet: The network of remote PPTP server.
Remote Subnet Mask: Subnet mask of remote PPTP server.
Permitted Authentication: Select permitted authentication.
MPPE Encryption: Enable or disable Microsoft Point-to-Point Encryption.
MTU: Maximum transmission unit.
MRU: Maximum receive unit.
NAT: Network address translation.

3.5.3 IPSEC



Name: 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.
Use a Pre-Shared Key: Choose use share encryption option.

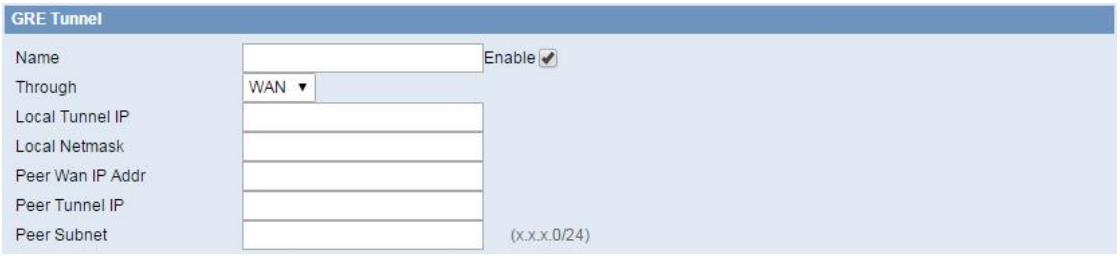


Enable Advanced Settings: Enable to configure 1st and 2nd phase information, otherwise it will auto negotiation according to opposite end.
Phase 1(IKE)
Encryption: IKE phased encryption mode.
Integrity: IKE phased integrity solution.
DHGrouptype: DH exchange algorithm.
Lifetime: Set IKE lifetime, current unit is hour, the default is 0.
Phase 2(ESP)
Encryption: ESP encryption type.
Integrity: ESP integrity solution.
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 Forward Secrecy: Tick to enable PFS, non-tick to disable PFS.
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.

3.5.4 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).

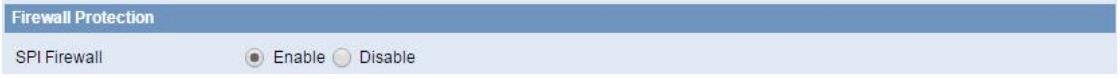


Name：GRE tunnel name.
Through：The GRE packet transmit interface.
Local Tunnel IP：The local tunnel ip address.
Local Netmask：Netmask of local network.
Peer Wan IP Addr：The remote WAN address.
Peer Tunnel IP：The remote tunnel ip address.
Peer Subnet：The remote gateway local subnet, eg: 192.168.1.0/24.

3.6 Security

3.6.1 Firewall

You can enable or disable the firewall, filter specific Internet data types, and prevent anonymous Internet requests, ultimately enhance network security.



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.

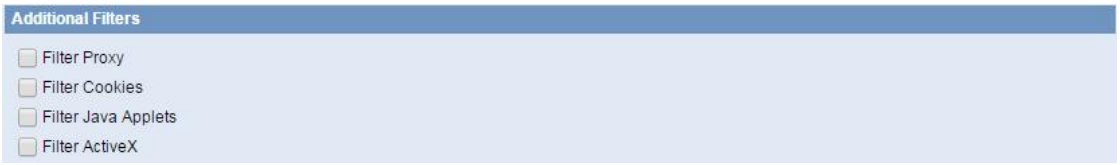
Block Anonymous WAN Requests (ping): By selecting "Block Anonymous WAN Requests (ping)" box to enable this feature, you can prevent your network from the Ping or detection of other Internet users. so that make More difficult to break into your network. The default state of this feature is enabled ,choose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

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.



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.

3.6.2 Access Restriction

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.

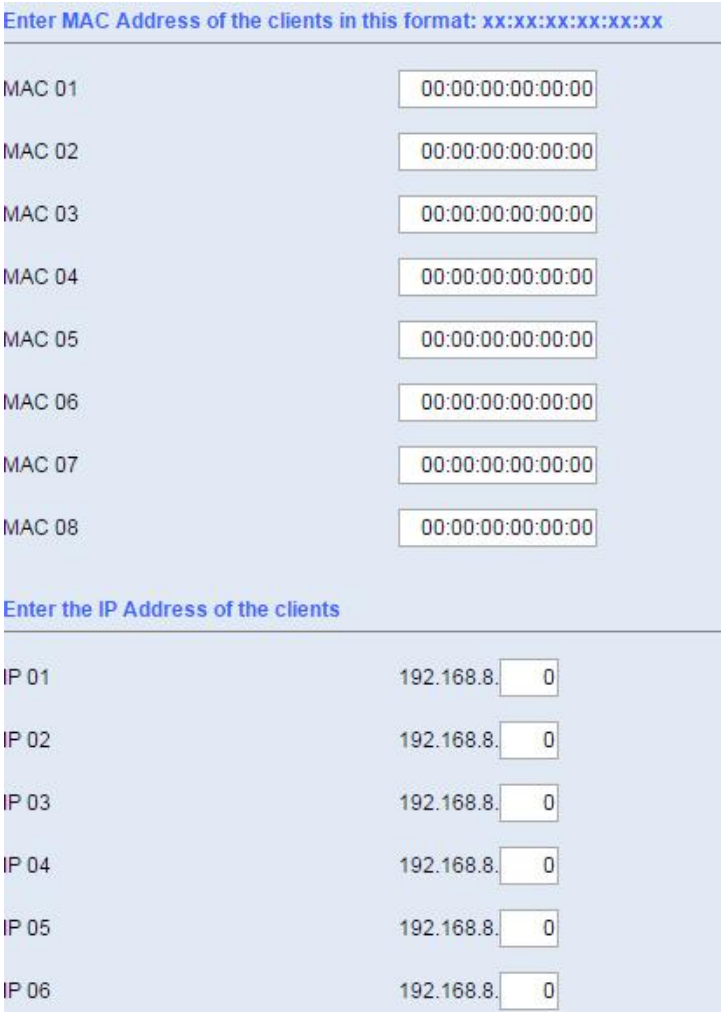
Two options in the default policy rules: "Filter" and "reject". If select "Deny", will deny specific computers to access any Internet service at a particular time period. If choose "filter", it will block specific computers to access the specific sites at a specific time period. You can set up 10 Internet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

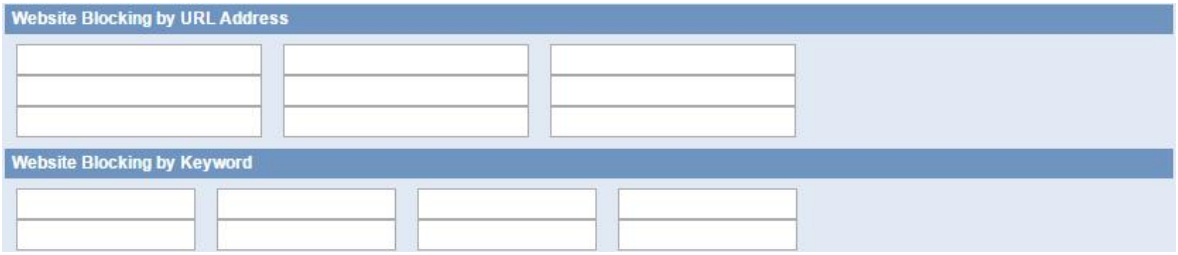
Policy Name: You may assign a name to your policy.

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



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.



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

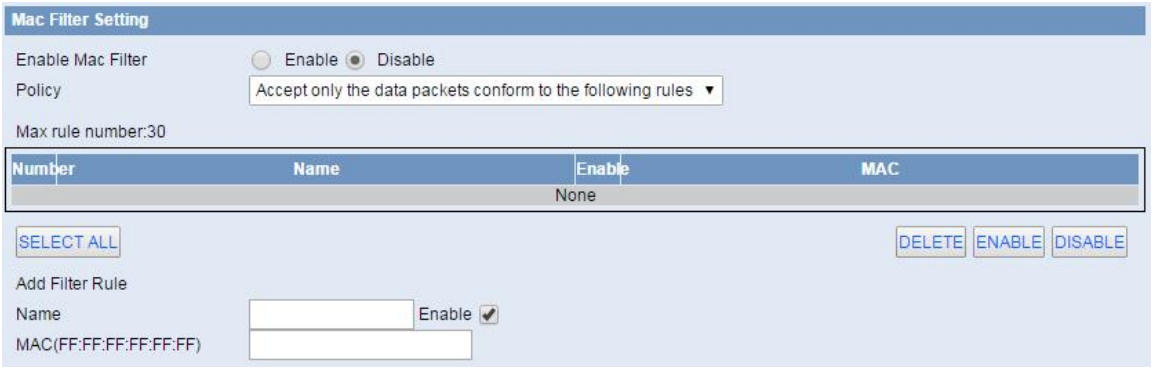
Website Blocking by Keyword: You can block access to certain website by the keywords contained in the web page.

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, please keep the original number.

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 ensure the correct implementation of the relevant period control function.

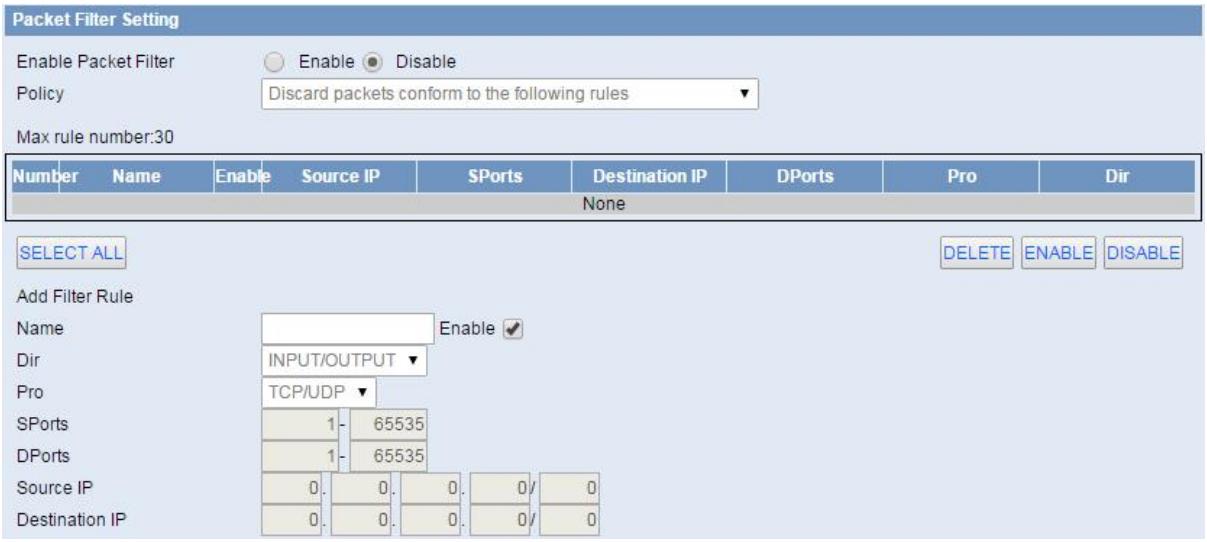
3.6.3 MAC Filter



Using MAC address for data filtering.

3.6.4 Packet Filter

This page can create firewall rules to protect your network from malicious attacks on Internet network viruses.



Packet filter: Enable or disable packet filtering.

Policy: Select the action of the data package that does not conform to the setting rules.

Accept only the data packets conform to the following rules: Only access to match the address.

Discard packets conform to the following rules: Only receive the network address that complies with the custom rules, and drop all other addresses.

Note: Add filter matching rules. Source port, destination port, source address, destination address must be filled in at least one item.

INPUT: Data packets from WAN port to LAN port.

OUTPUT: Data packets from the LAN port to the WAN port.

Pro: Protocol type for a data packet.

Sport: The source port of the data package.
Dport: Port of destination.
Source IP: The source IP address of the data package.
Destination IP: Destination IP address.

3.7 Forwarding

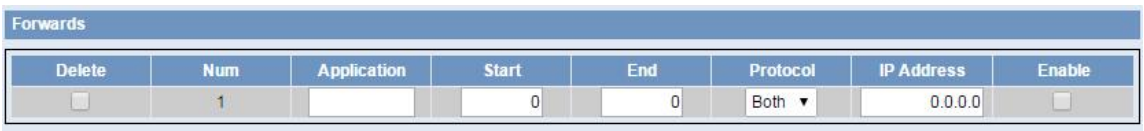
3.7.1 Port Forwarding

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.

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 check box to enable port forwarding for the application.

3.7.2 Port Range

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.



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 check box to enable port forwarding for the application.

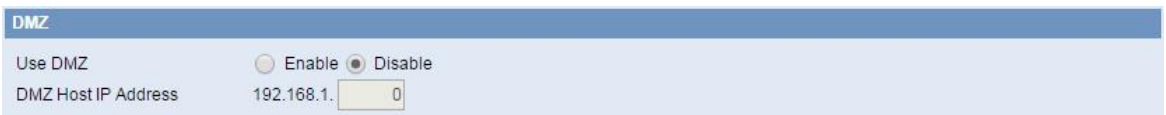
3.7.3 Port Triggering

Port Triggering allows you to do port forwarding without setting a fixed PC. By setting Port Triggering rules, you can allow inbound traffic to arrive at a specific LAN host, using ports different than those used for the outbound traffic. This is called port triggering since the outbound traffic triggers to which ports inbound traffic is directed.

Application: Enter the name of the application in the field provided.
Triggered Port Range: Enter the number of the first and the last port of the range, which should be triggered. If a PC sends outbound traffic from those ports, incoming traffic on the Forwarded Range will be forwarded to that PC.
Forwarded Port Range: Enter the number of the first and the last port of the range, which should be forwarded from the Internet to the PC, which has triggered the Triggered Range.
Enable : Click the Enable check box to enable port triggering for the application.

3.7.4 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.

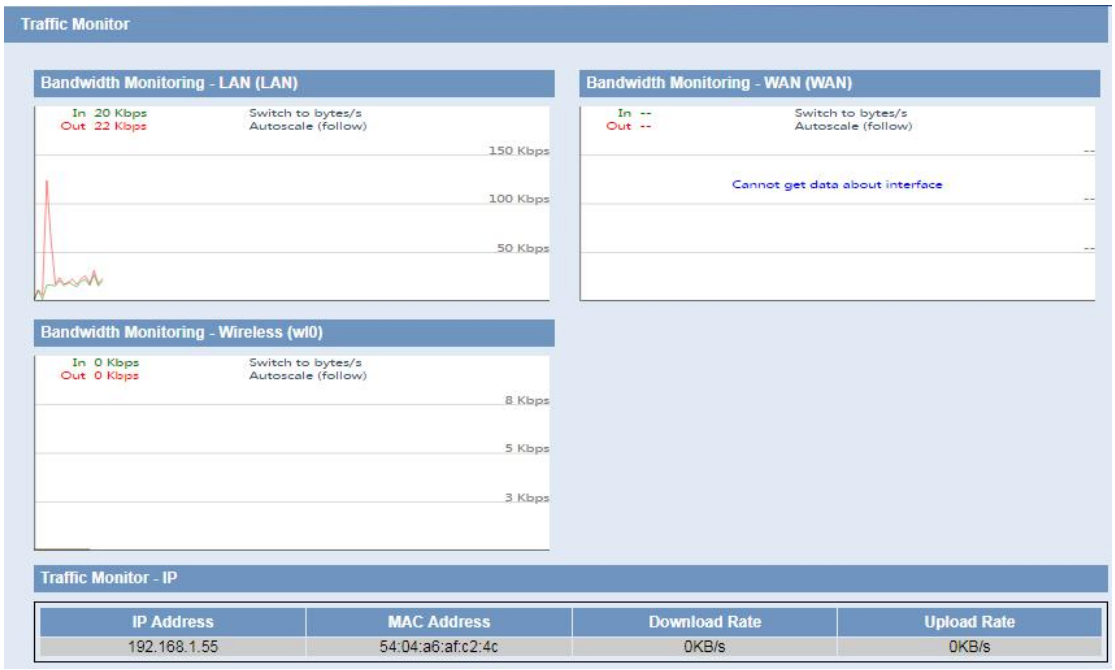


Any PC whose port is being forwarded must should have a new static IP address assigned to it because its IP address may change when using the DHCP function.

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.

3.8 QoS Setting

3.8.1 Traffic monitoring

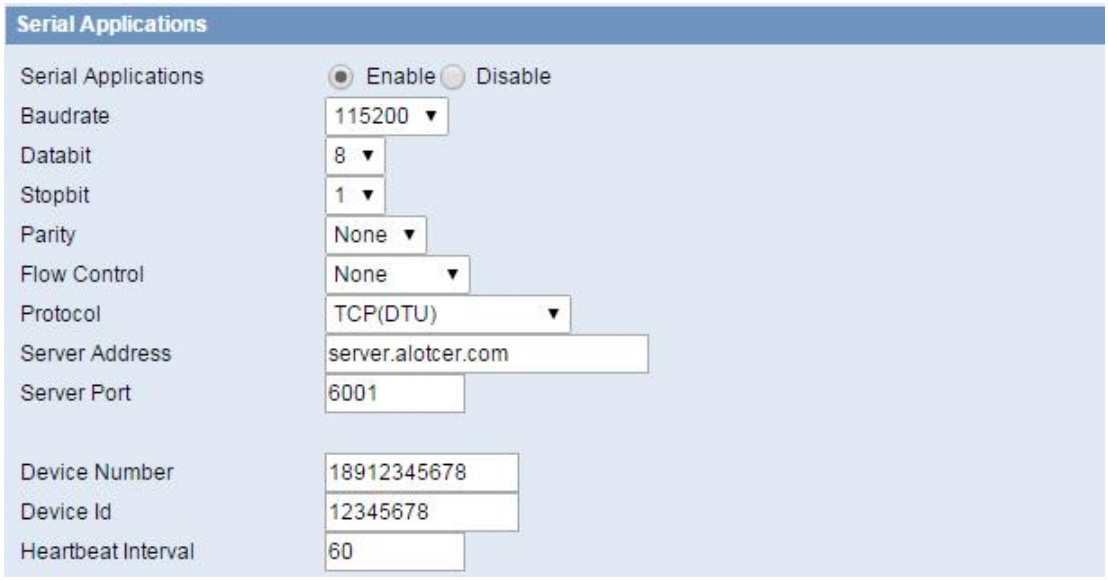


Show the bandwidth of WAN, LAN, WIFI.
Abscissa axis: Time.
Vertical axis: Speed rate.

3.9 M2M

3.9.1 Serial

There is a console port on the router. Normally, this port is used to debug. This port can also be used for serial transmission. 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 IP Modem.



Baudrate: The serial port's baud rate.
Databit: The serial port's data bit.
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 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 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.
Modbus TCP Server: MODBUS TCP and MODBUS RTU conversion.
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".

3.10 Administration

3.10.1 Language and Reboot

The upper right corner of the page provides the language switch button and reset button to set the WEB configuration page.

3.10.2 Password

Set the user name and password, to support the input of 32 characters.

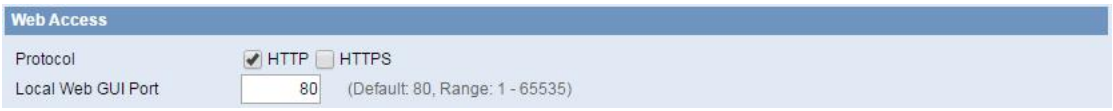
The new password must not exceed 32 characters in length and must not include any spaces. Enter the new password a second time to confirm it.

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.

3.10.3 Management

Configure WEB server parameters.



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

Local Web GUI port: Set the access port of the WEB server. For example, when the gateway address is 192.168.1.1 and set the server port 1010, you will enter the address bar in the http://192.168.1.1:1010 to access the WEB configuration page. The default port for the server is 80.

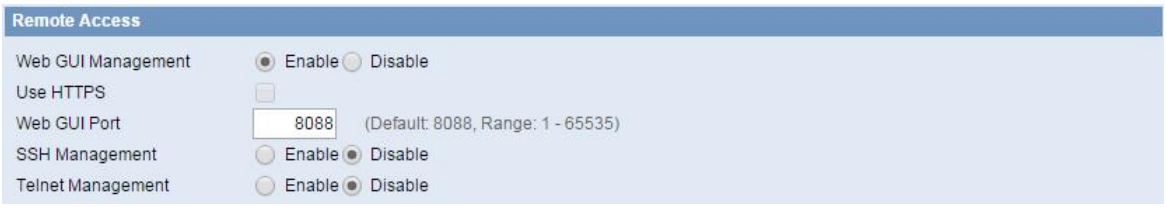
Telnet： Enable or disable Telnet server.

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).



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, if you haven't . 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 web browser's address field. You will be asked for the router's password.

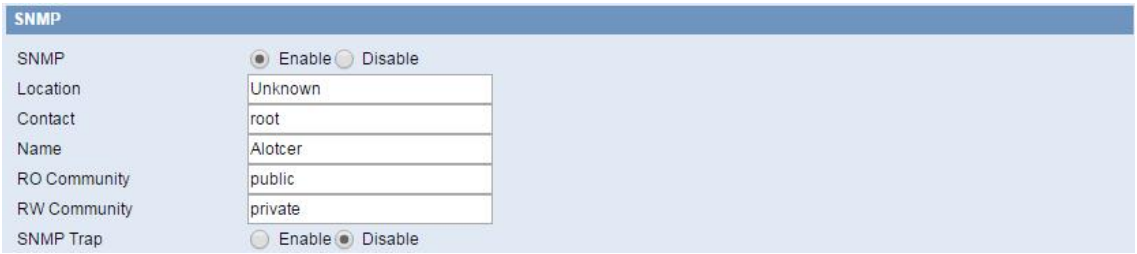
If use https, need to specify the url as https://xxx.xxx.xxx.xxx:8080 (not all firmwares does support this without rebuilding with SSL support).

SSH Management： Enable SSH to remotely access the router by Secure Shell.

Telnet Management: Enable SSH to remotely access the router.

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.



Location: Equipment location.

Contact: Contact this equipment management.

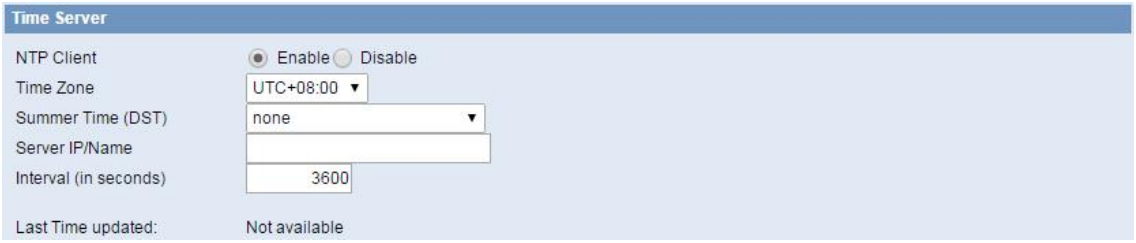
Name: Device name.

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.

3.10.4 System Time

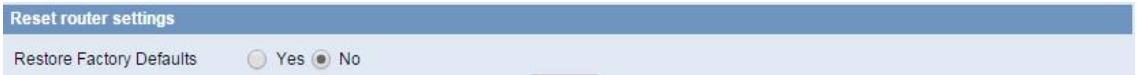
Select time zone of your location. To use local time, leave the check mark in the box next to Use local time.

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.



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.

3.10.5 Configure



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.

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.

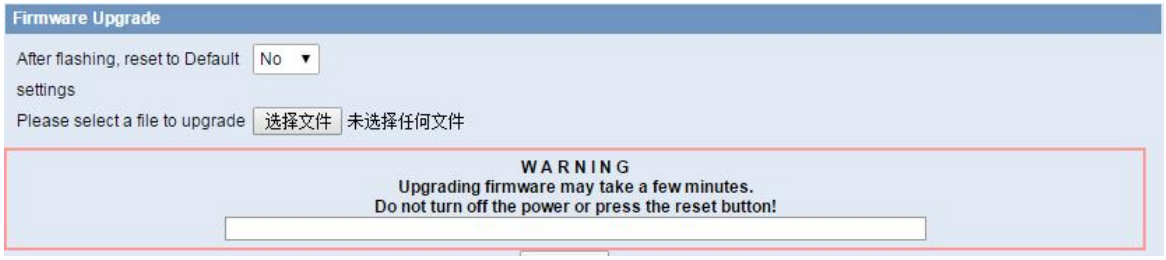
Restore Settings：Click the Browse button to browse for a configuration file that is currently saved on your PC.Click the Restore button to overwrite all current configurations with the ones in the configuration file.

Note：

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

3.10.6 Upgrade

Update software to get new features.



Firmware Upgrade：Contact us for New firmware versions. 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.
2. Click the Browse... button and chose the firmware upgrade file.
3. Click the Upgrade button and wait until the upgrade is finished.

Note：

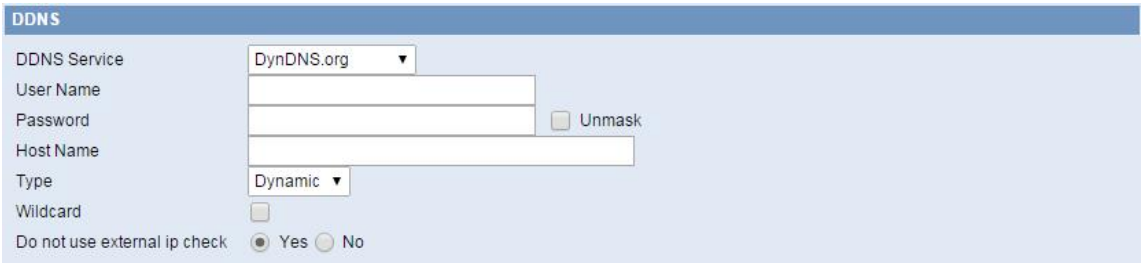
Upgrading firmware may take a few minutes.

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

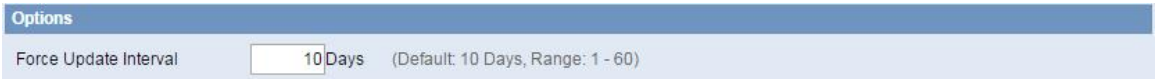
After flashing, reset to default： If you want to reset the router to the default settings for the firmware version you are upgrading to, click the YES option.

3.10.7 DDNS

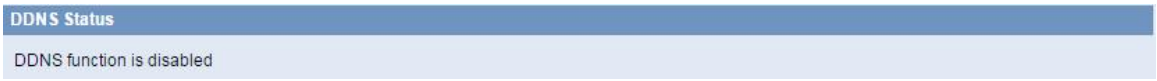
If user's network has a permanently assigned IP address, users can register a domain name and have that name linked with their IP address by public Domain Name Servers (DNS). However, if their Internet account uses a dynamically assigned IP address, users will not know in advance what their IP address 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.



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: Unit is day, try forcing the update dynamic DNS to the server by settled days.



DDNS Status shows connection log information.

3.10.8 Syslog

Enable Syslogd to capture system messages. To send them to another system, enter the IP address of a remote syslog server.

Syslog Out Mode: 3 mode options.

Net: The log information output to a syslog server.

Console: The log information output to console port. (The log from the console is the most detailed, so if need to debug, could run serial port software to read and save the log).

Web: The log information output to local web page.

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