



M505

**ADSL/2/2+ Wireless Four Port Ethernet/USB
Modem**

User's Manual

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1. Introduction

Congratulations on becoming the owner of the Master series of ADSL2+ modem routers. You will now be able to access the Internet using your high-speed ADSL/2+ connection. The Master series of ADSL2+ modems has the following major features.

Features

- ADSL/2/2+ modem for high speed Internet access
- Network Address Translation (NAT) and IP filtering functions to provide network sharing and firewall protection for your computers
- Easy configuration via a web browser
- SPI firewall to protect you from outside intruders and attacks
- TR-069 compliant for automatic modem update through your high speed Internet access

This User's Manual will guide you through the installation and configuration of your M505 modem.

System Requirements

Before installing your M505 modem, make sure that you have the following:

- ADSL service up and running on your telephone line, with at least one public Internet address for your LAN
- Computer containing an Ethernet 10Base-T/100Base-T network interface card (NIC)
- Computer containing a USB port (M505 modems)

For system configuration, use the web-based (HTTP) user interface.

Note: Make sure that your computer has a web browser such as Internet Explorer v5.0 or later, or Netscape v4.7 or later.

2. Installation

In addition to this document, your M505 should arrive with the following:

- One power adapter and power cord
- One Ethernet cable with RJ-45 connector
- One USB A-B cable
- One Telephone cable with RJ-11 connector
- “Visionnet DSL” CD

Front Panel

The front panel LEDs indicates the status of the unit. (*Left to Right*)

M505

Label	Color	Function
Wireless	Green	Green – Wireless is activated on modem
		Flashing Green – Wireless activity is present
		Off - Modem off or no radio signal detected
USB	Green	Off - Power Off – or – No Device Detected
		Solid Green – Device connected including wake on LAN
		Flashing Green – LAN activity present for that port
Ethernet 1-4	Green	Off - Power Off – or – No Device Detected on any LAN port
		Solid Green – Device connected including wake on LAN on any LAN port
		Flashing Green – LAN activity present
Internet	Green	Solid Green – IP connected – no traffic passing Device has a public IP via either static/ DHCP/ or IPCP If PPP is used it has been authenticated If IP or PPPOE session is idle and dropped, light to remain green as long as ADSL is still present. Light to turn red if upon attempting new session it fails.
		Off – Modem Power Off. LED Should remain off if modem is in bridged mode
DSL	Green	Green – DSL Good Sync
		Off - Powered off
		Flashing Green - DSL Attempting sync
Power	Green	On – Solid Green
		Off – The Modem is Off
		Red – Power on self test/ Device Malfunction (not bootable) and device malfunction

		Malfunction is any state which would prevent syncing or passing of data
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Rear Panel

The connectors located at the rear panel have the following functions.

M505

Interface	Function
<i>Switch(Push Button)</i>	Power switch on/off
<i>Power</i>	Connects to the power adapter cable
<i>Reset</i>	Resets unit's configuration to factory default
<i>USB</i>	USB connection: Connects to your PC's USB 1.1/2.0 port
<i>Ethernet 1-4</i>	RJ-45 connector: Connects to your PC's Ethernet port, or to the uplink port on your LAN's hub/switch
<i>Line</i>	RJ-11 connector: Connects to your ADSL line

Connecting the Hardware

Connect the M505 to the phone jack, the power outlet, and your computer or network.



WARNING

Before you begin, turn the power off for all devices. These include your computer(s), your LAN hub/switch (if applicable), and the M505.

Step 1. Connect the ADSL cable and optional telephone

Connect one end of the phone cable to the RJ-11 connector on the rear panel of the M505. Connect the other end to the ADSL outlet provided by your service provider (normally MODEM port of the included splitter).

Step 2. Connect the Ethernet cable

Connect one end of the Ethernet cable to the RJ-45 connectors on the rear panel of the M505 and connect the other end to your PC's network adaptor (NIC). If you are connecting a LAN to the Master series, attach one end of the Ethernet cable to a regular hub port and the other end to the LAN port on the M505.

Step 3. Attach the power connector

Connect the AC power adapter to the power connector on the M505 and plug in the adapter to a wall outlet or power extension.

Step 4. Turn on the M505 and power up your systems

Press the Power switch on the back panel of the M505 to the ON position.
Boot up your computer(s) and any LAN devices such as hubs or switches.

Step 5. Configure the M505 through the WEB interface

Please refer to Chapter 3.

Step 6. Save the configurations and Reboot

Save the changes you made on the M505 and it will automatically reboot to make the settings permanent.

3. Configuration

3.1 - Setup

- Connect your M505 and PC with an RJ-45 Ethernet cable.
- Turn on the M505.
- The default IP address of M505 is 192.168.1.254.

3.2 - Establish the Connection

- Enter the IP address (default: 192.168.1.254) of M505 in the address line of your web browser.
- A Dialogue Box will pop up to request the user to login. (Figure 1)

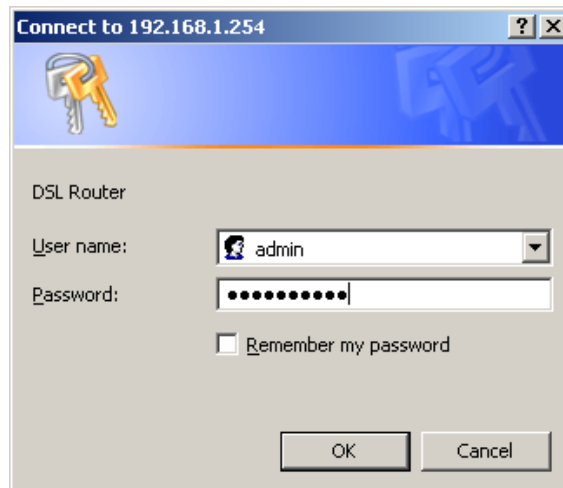


Figure 1. Login dialogue box

- Please enter the management username/password into the fields then click on the **OK** button (default username/password is: **admin** / **0123456789**).
- If the authentication is valid, the main page will be displayed on the screen. (Figure 2)

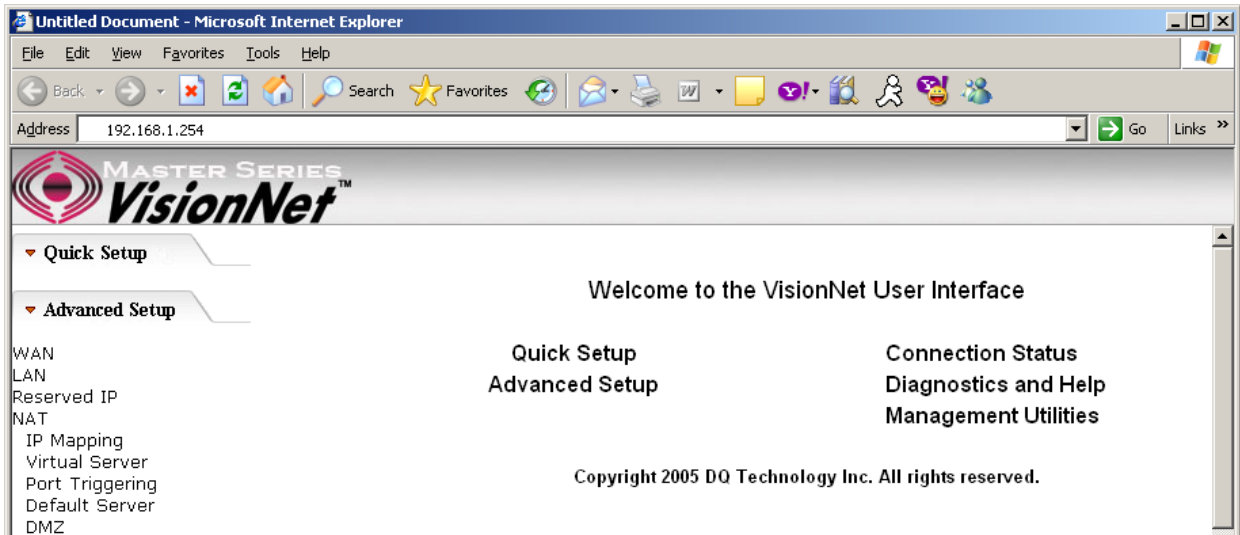


Figure 2. M505 Home Page

4. Quick Setup

The system administrator can configure the M505 remotely or locally via a Web Browser. Network configuration needs to be planned and decided before starting the configuration procedure.

Quick Setup allows system administrator to select the appropriate operation mode and configure the corresponding settings step by step to create a connection. The following operation modes are supported under Quick Setup:

- PPP over Ethernet (PPPoE)
- PPP over ATM (PPPoA)
- MER (MAC Encapsulation Routing)
- IPoA (IP over ATM)
- Bridging

4.1 - PPP over Ethernet (PPPoE) Configuration

Click on “Quick Setup” in the left frame and follow the steps below to create a PPP over Ethernet (PPPoE) connection.

Here you can either select DSL Autoconnect (Modem will attempt to find the correct VPI/VCI settings) or Uncheck the box to manually input the VPI/VCI settings.

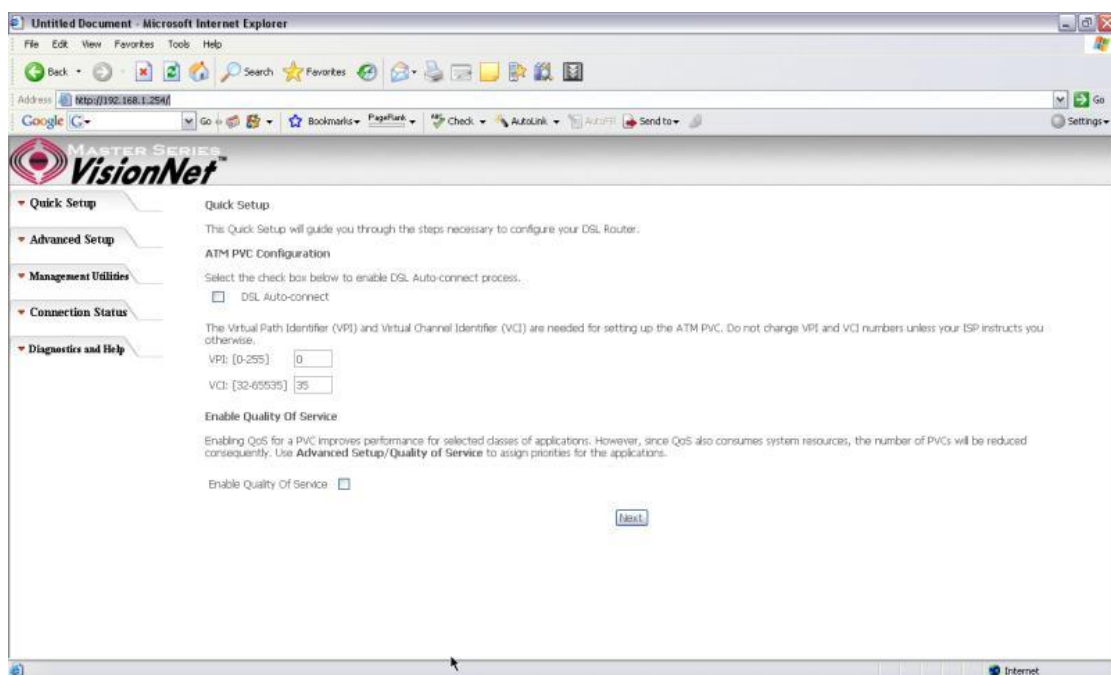


Figure 3. Quick Setup – ATM PVC

PPP Username and Password

This page is where you will enter the “PPP Username”, and “PPP Password”. Please contact you ISP for this information.

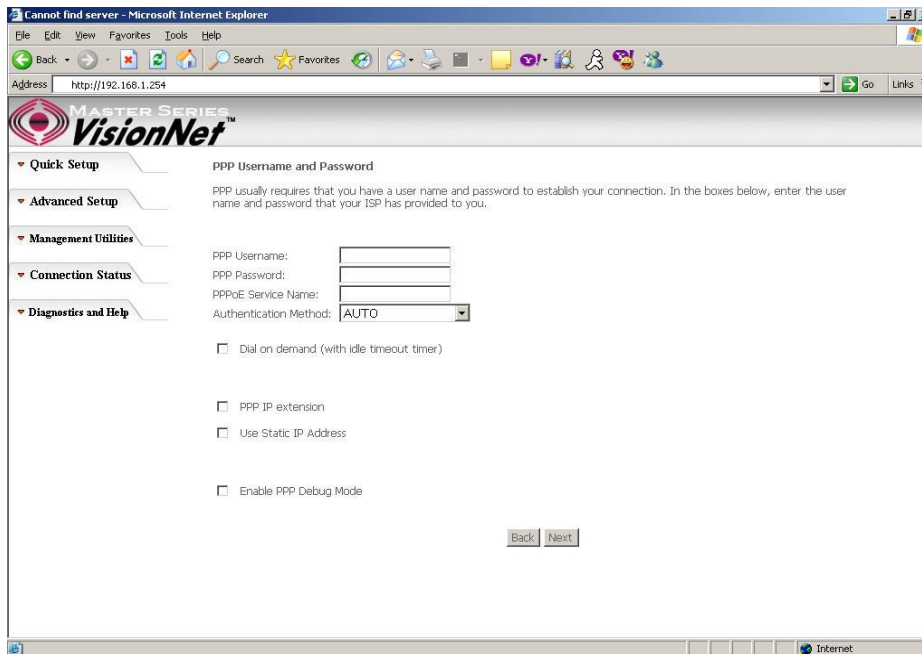


Figure 4. Quick Setup – Username, Password and option for IP extension and Static IP

WAN Setup – NAT and IGMP

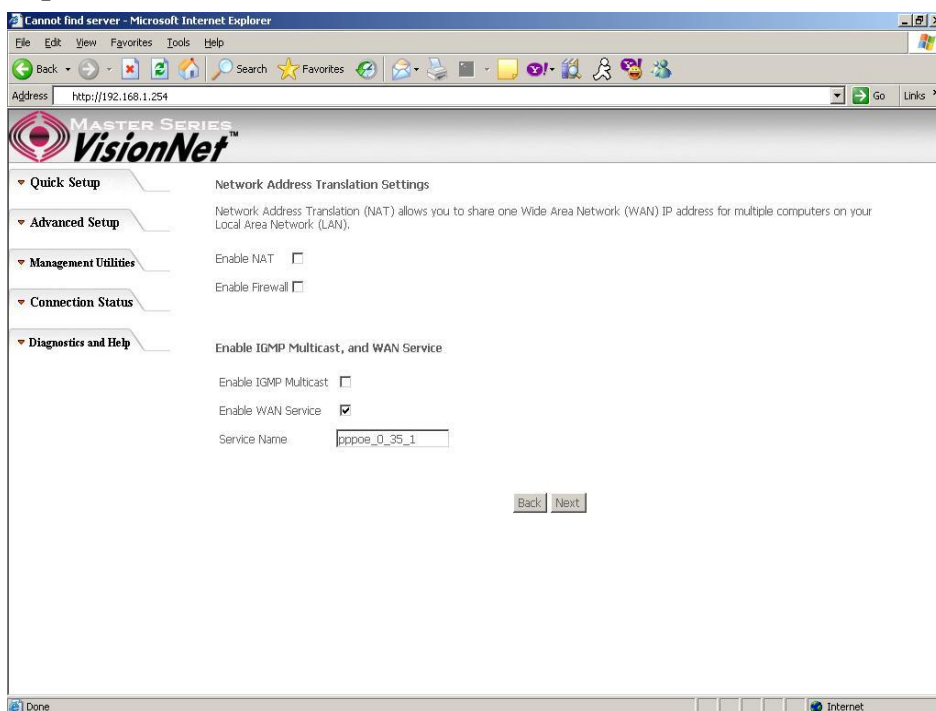


Figure 5. Quick Setup – WAN Setup – NAT, IGMP, and Firewall

Device Setup

This page is where you can configure the modem's IP address and Default DHCP server range. Default is 192.168.1.254

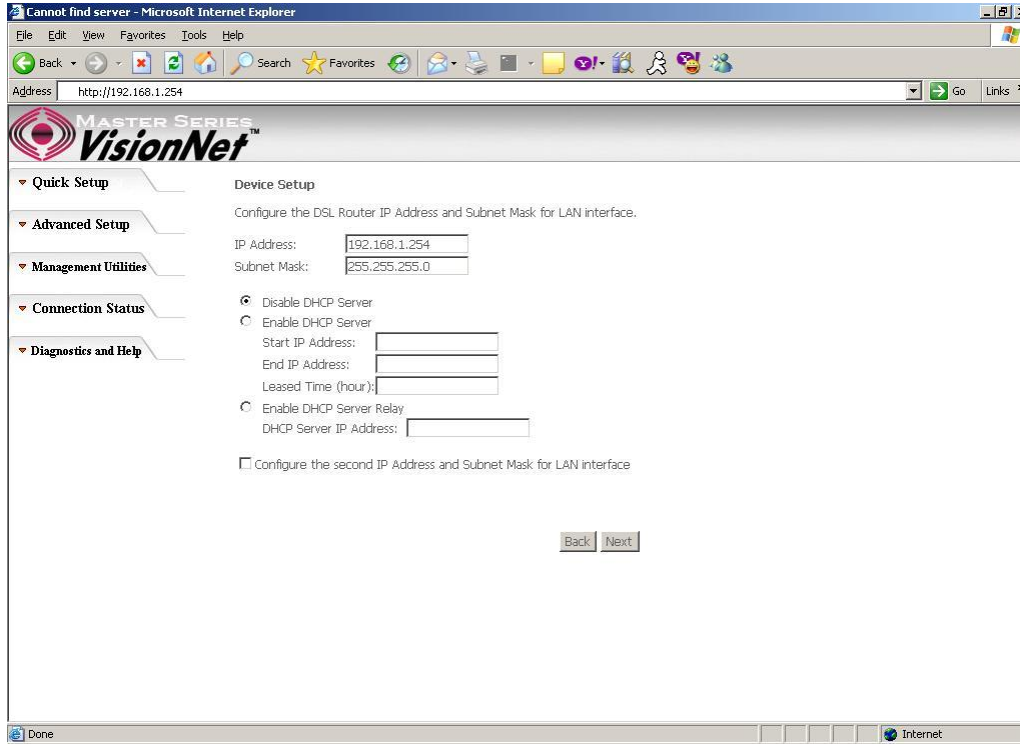


Figure 6. Quick Setup – Device Setup – LAN and DHCP Server

Summary

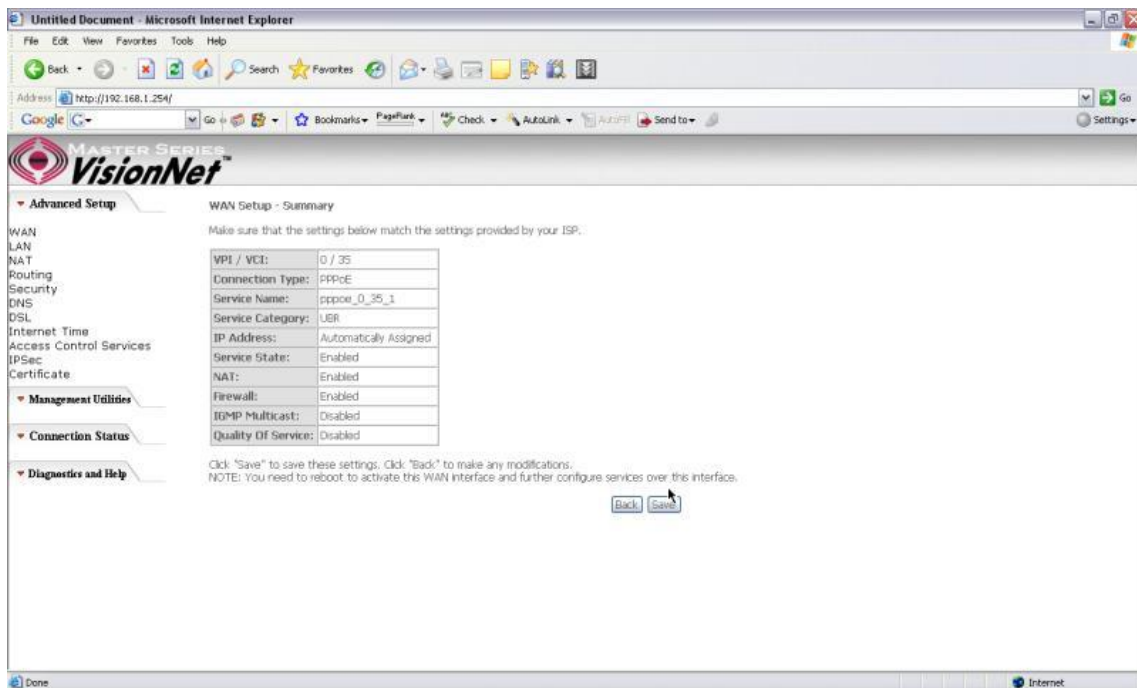


Figure 7. Quick Setup – WAN Setup – Summary

The last page displays a summary of your settings. Click on the “Save/Reboot” button to complete the configuration.

4.2 - PPP over ATM (PPPoA) Configuration

Configuration of PPPoA is similar to PPPoE. Select “PPP over ATM (PPPoA)” in “Connection Type”. Please refer to PPPoE settings (Section 4.1) for details.

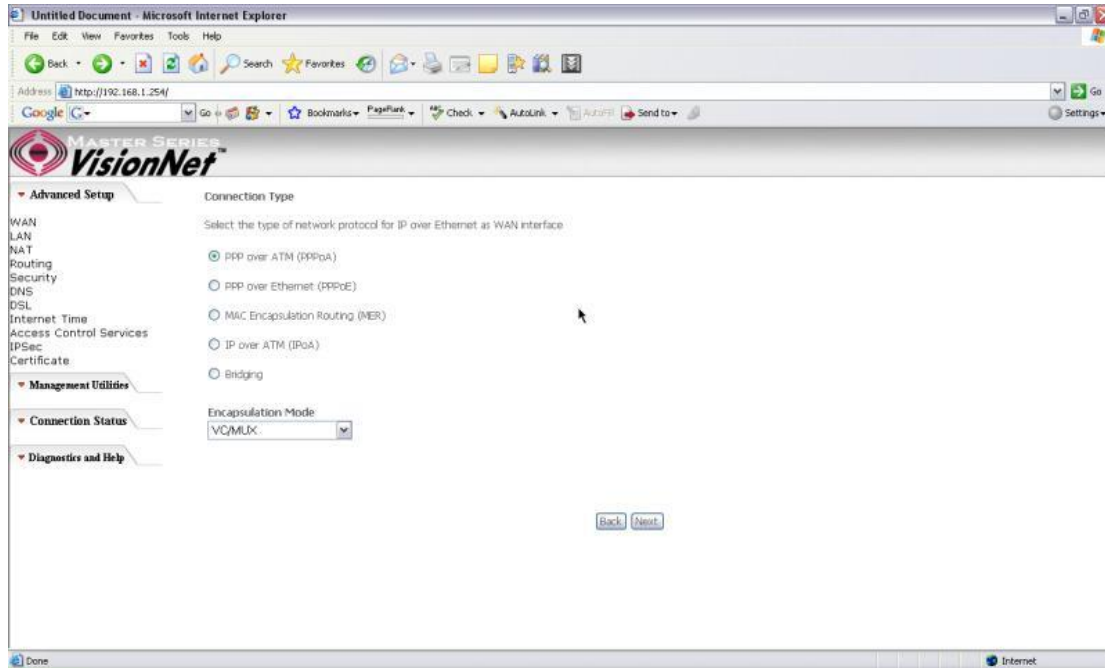


Figure 8. Quick Setup – Connection Type (PPPoA)

4.3 - MER (MAC Encapsulation Routing) Configuration

Click on “Quick Setup” in the left frame and follow the steps below to create a MER connection.

Here you can either select DSL Autoconnect (Modem will attempt to find the correct VPI/VCI settings) or Uncheck the box to manually input the VPI/VCI settings.

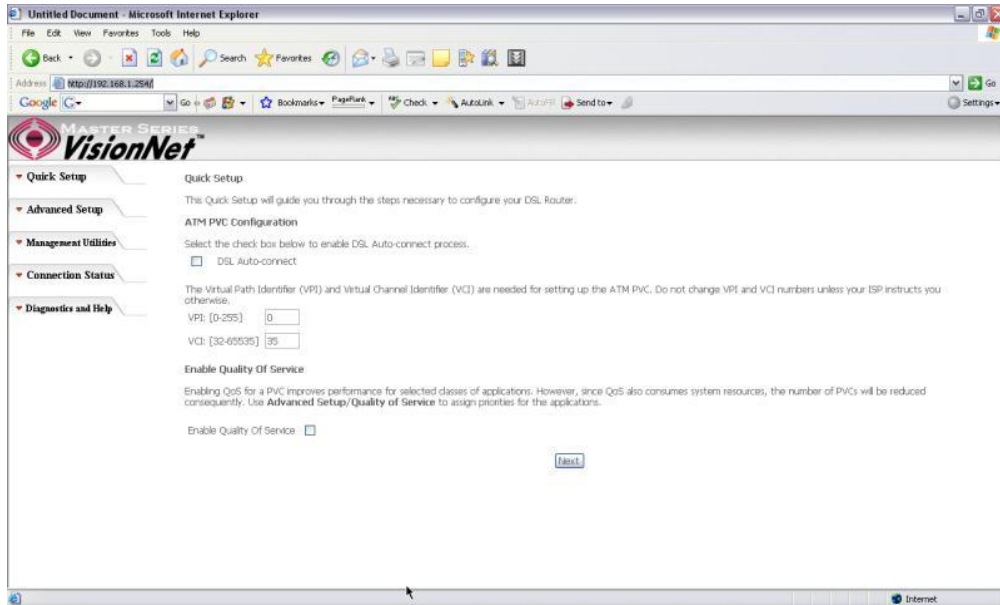


Figure 9. Quick Setup – ATM PVC Configuration (MER)

Quick Setup – Connection Type

This page is where you select MER (MAC Encapsulation Routing).

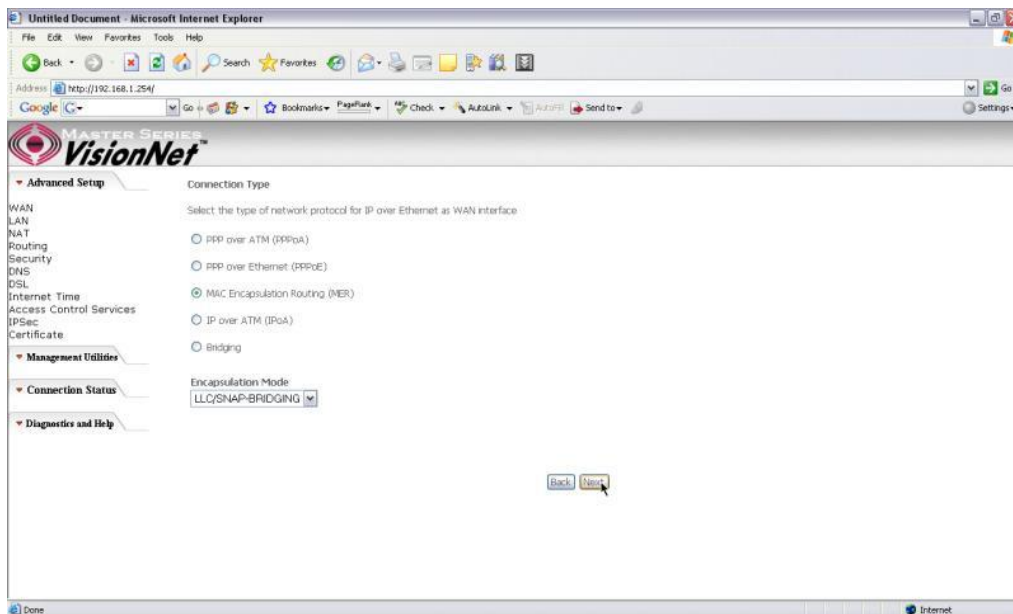


Figure 10. Quick Setup – Connection Type

Quick Setup – WAN IP Settings

This page is where you either select for the M505 to obtain the IP information automatically (sometime referred to as DHCP connection) or you can input the IP

address if Static IP's were assigned by your Internet Service Provider.

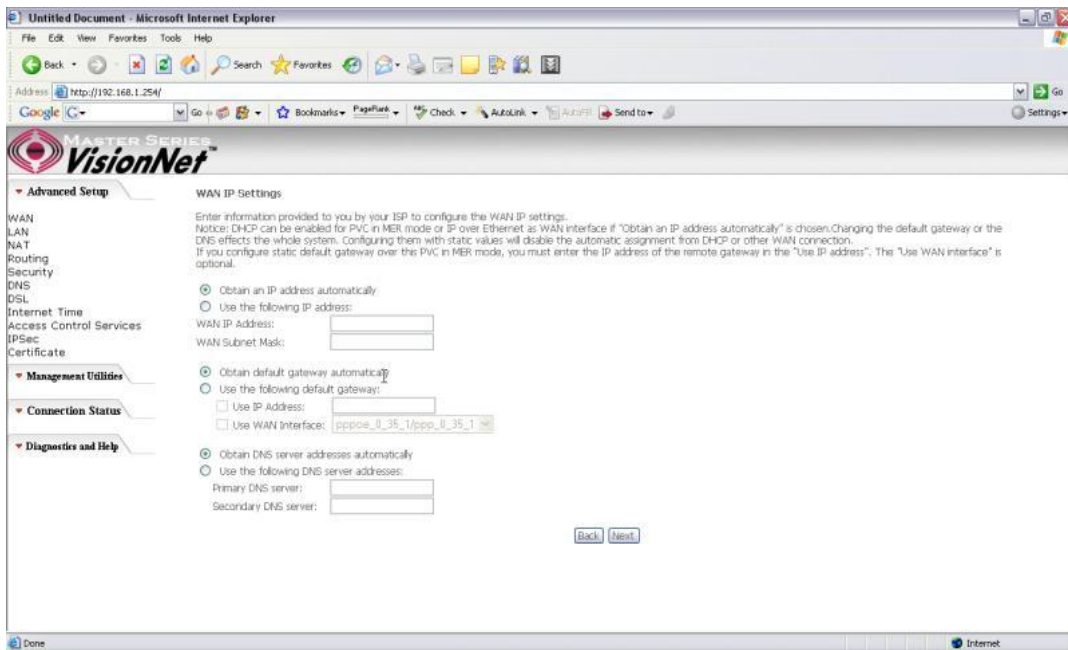


Figure 11. Quick Setup – WAN IP Settings

Quick Setup – Network Address Translation and IGMP

This page is where you either select to enable NAT (Please enable this option for the M511 to route private (Local) IP address to your LAN clients).

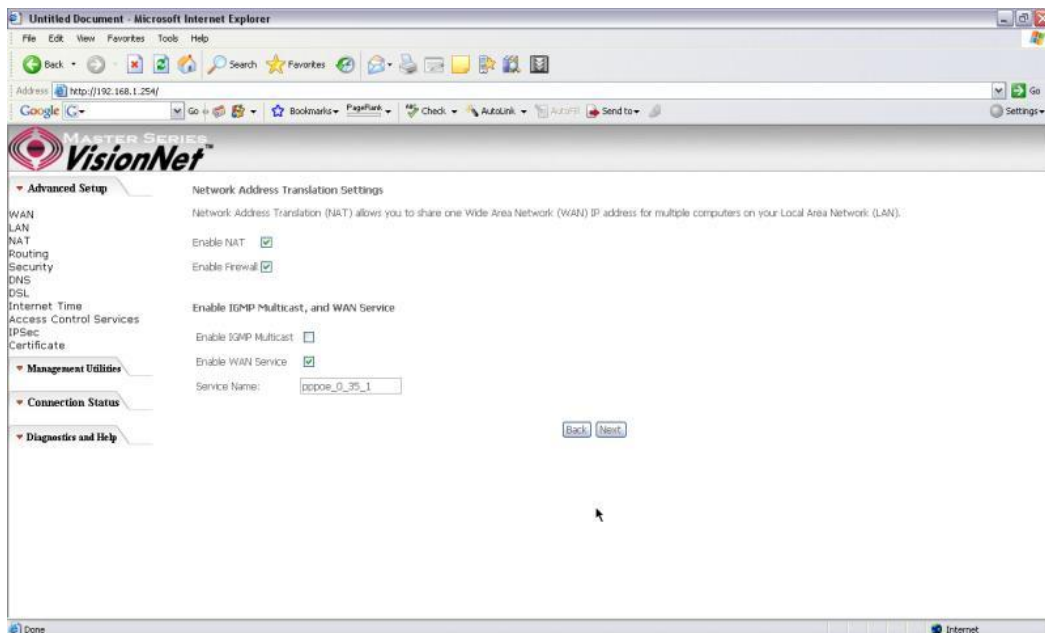


Figure 12. Quick Setup – Network Address Translation and IGMP

Quick Setup - Device Setup

This page is where you can configure the modem's IP address and Default DHCP server range. Default is 192.168.1.254

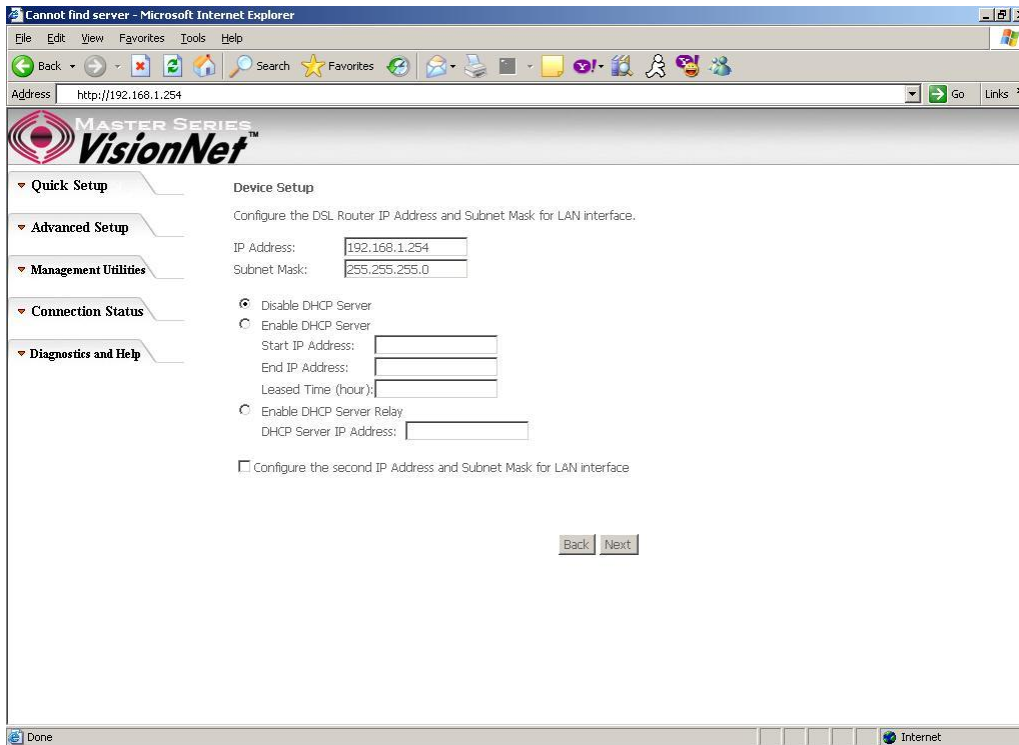


Figure 13. Quick Setup – Device Setup – LAN and DHCP Server

Quick Setup - Summary

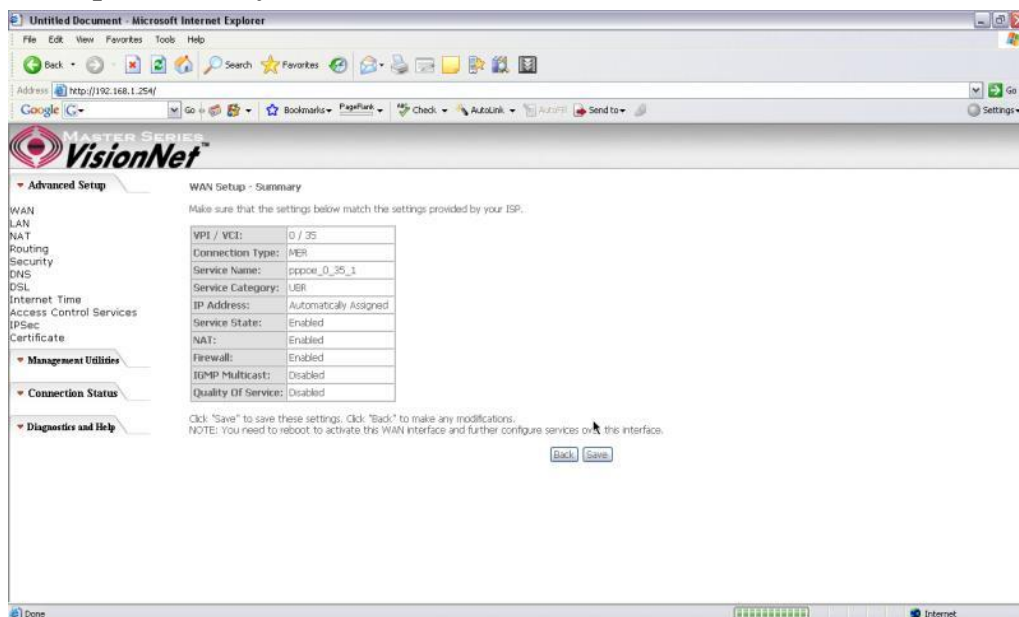


Figure 14. Quick Setup – WAN Setup – Summary

The last page displays a summary of your settings. You must click on the “Save” button to complete the configuration.

4.4 - IP over ATM (IPoA) Configuration

Click on “Quick Setup” in the left frame and follow the steps below to create an IPoA connection.

Here you can either select DSL Autoconnect (Modem will attempt to find the correct VPI/VCI settings) or Uncheck the box to manually input the VPI/VCI settings.

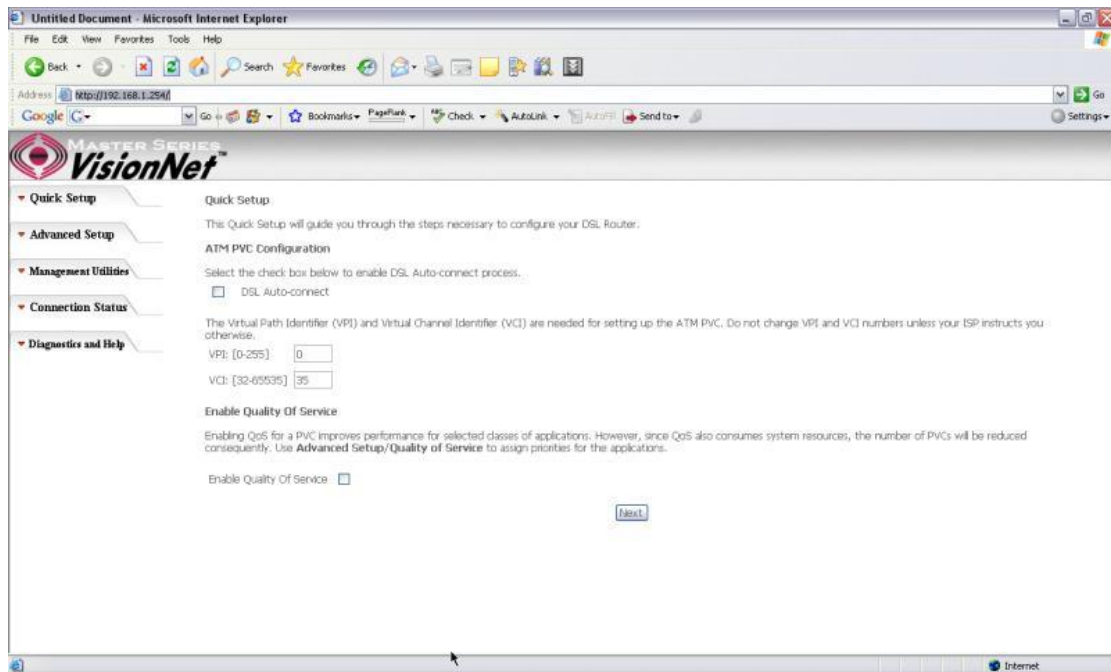


Figure 15. Quick Setup – ATM PVC

Quick Setup – Connection Type

This page is where you select IPoA (IP over ATM).

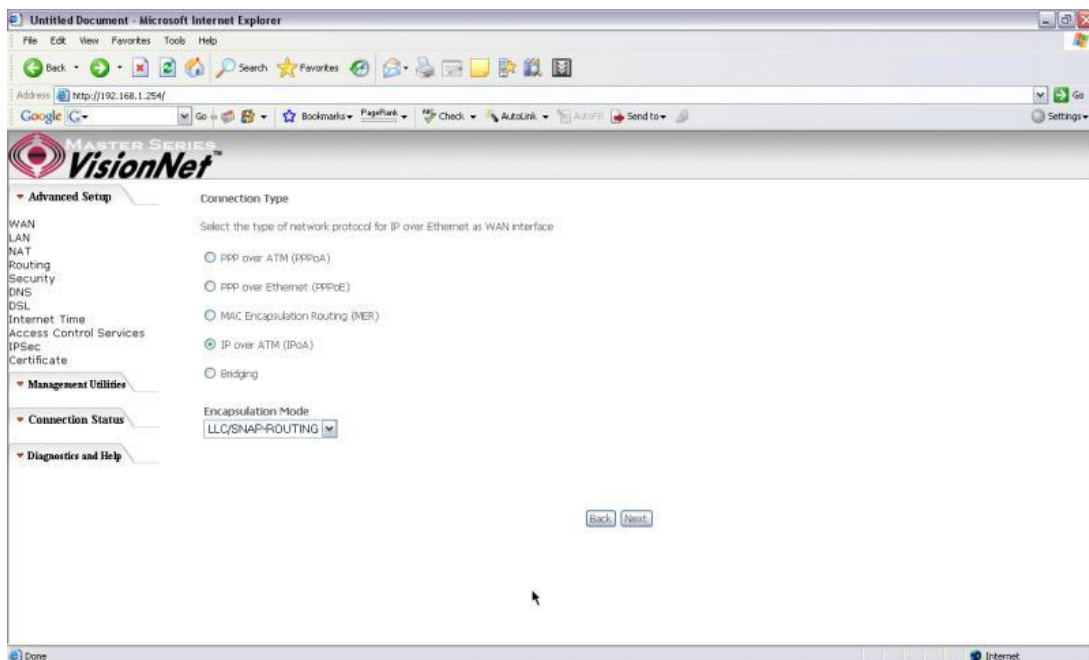


Figure 16. Quick Setup – Connection Type

Quick Setup – WAN IP Settings

This page is where you input the IP information provided by your ISP. This connection does not support DHCP (Where modem obtains IP information automatically)

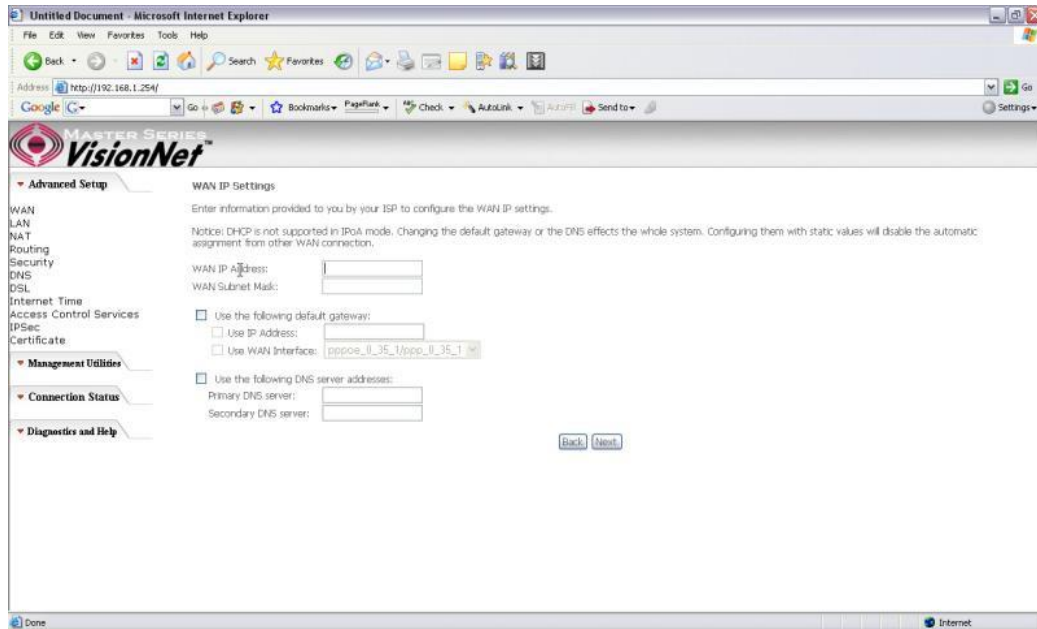


Figure 17. Quick Setup – WAN IP Settings

Quick Setup – Network Address Translation and IGMP

This page is where you either select to enable NAT (Please enable this option for the M505 to route private (Local) IP address to your LAN clients).

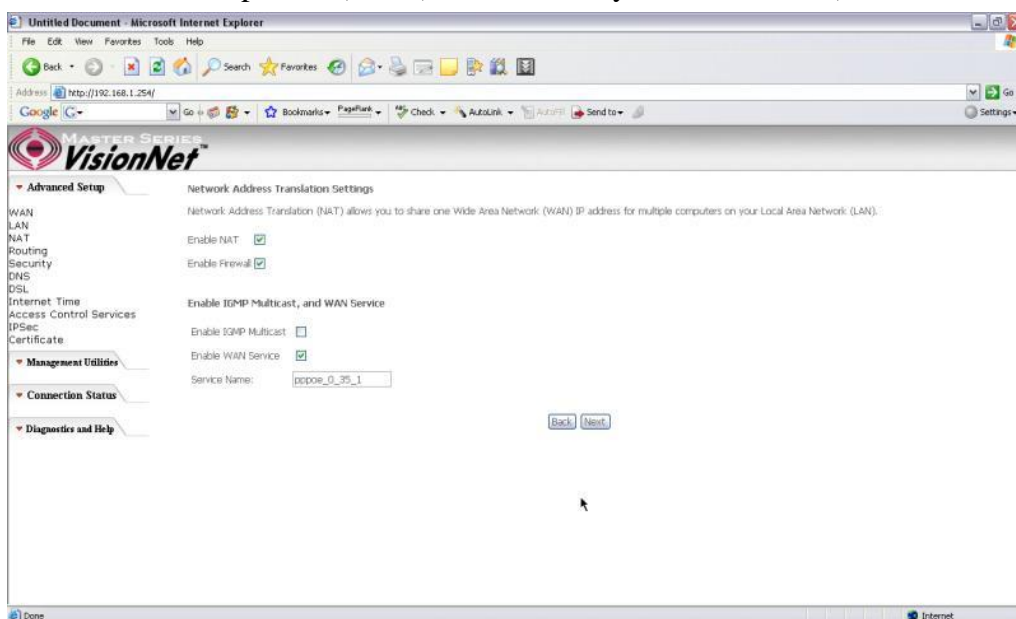


Figure 18. Quick Setup – Network Address Translation and IGMP

Quick Setup - Device Setup

This page is where you can configure the modem’s IP address and Default DHCP server range. Default is 192.168.1.254

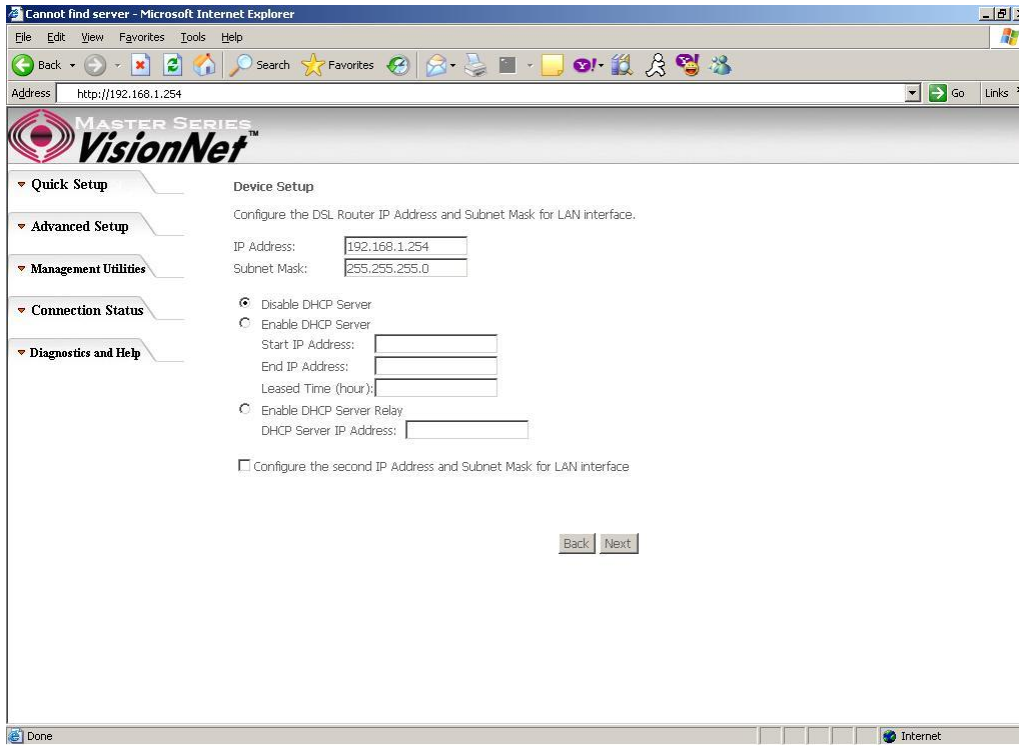


Figure 19. Quick Setup – Device Setup – LAN and DHCP Server

Quick Setup – Summary

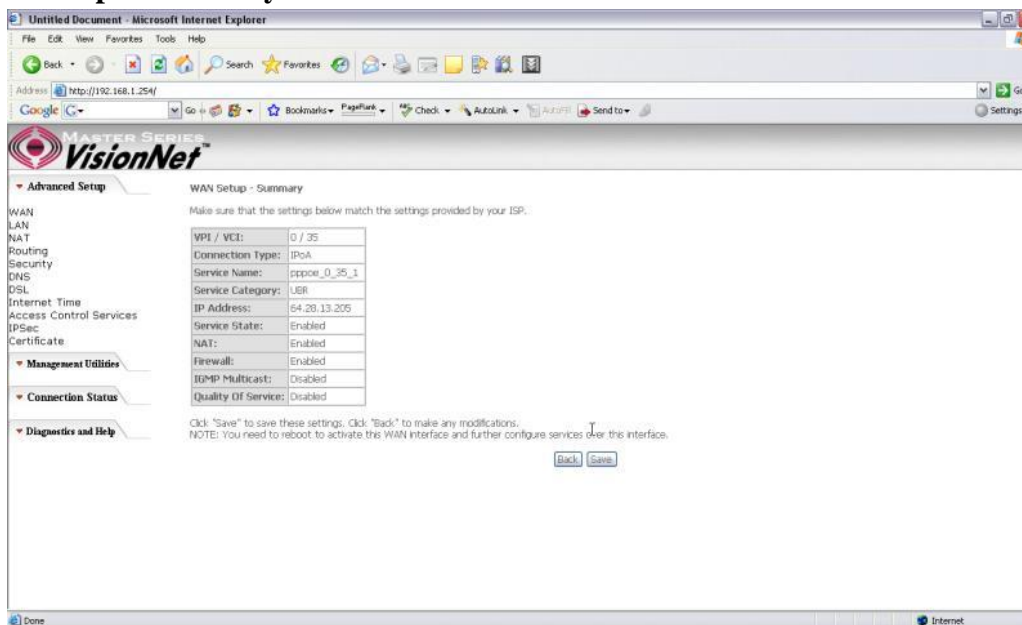


Figure 20. Quick Setup – WAN Setup – Summary

The last page displays a summary of your settings. Click on the “Save” button to complete the configuration.

4.5 - Bridging (Transparent/Pass-through) Configuration

Click on “Quick Setup” in the left frame and follow the steps below to create a Bridge connection.

Here you can either select DSL Autoconnect (Modem will attempt to find the correct VPI/VCI settings) or Uncheck the box to manually input the VPI/VCI settings.

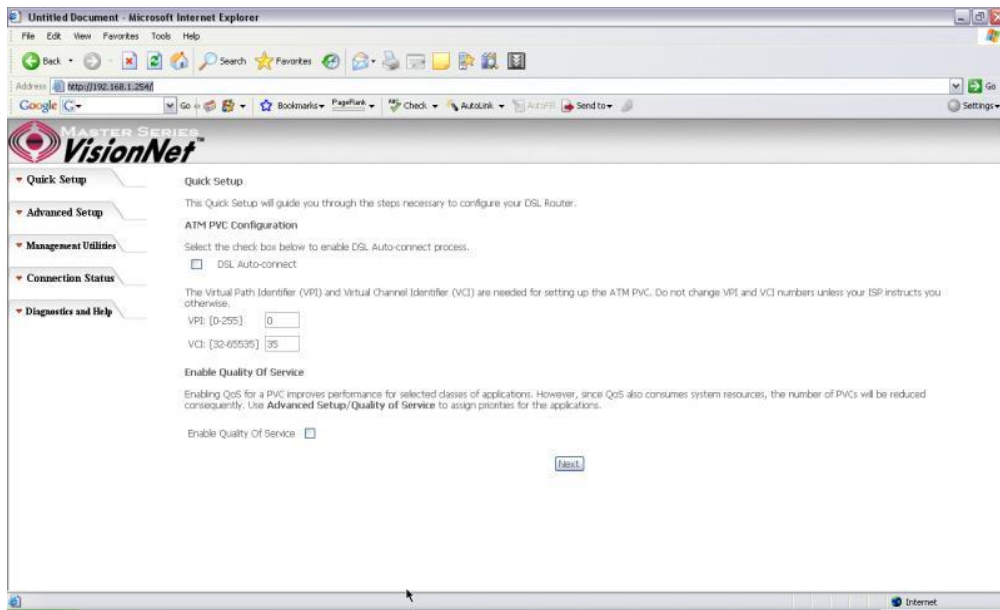


Figure 21. Quick Setup – ATM PVC Configuration

Quick Setup – Connection Type

This page is where you select Bridging (Last option).

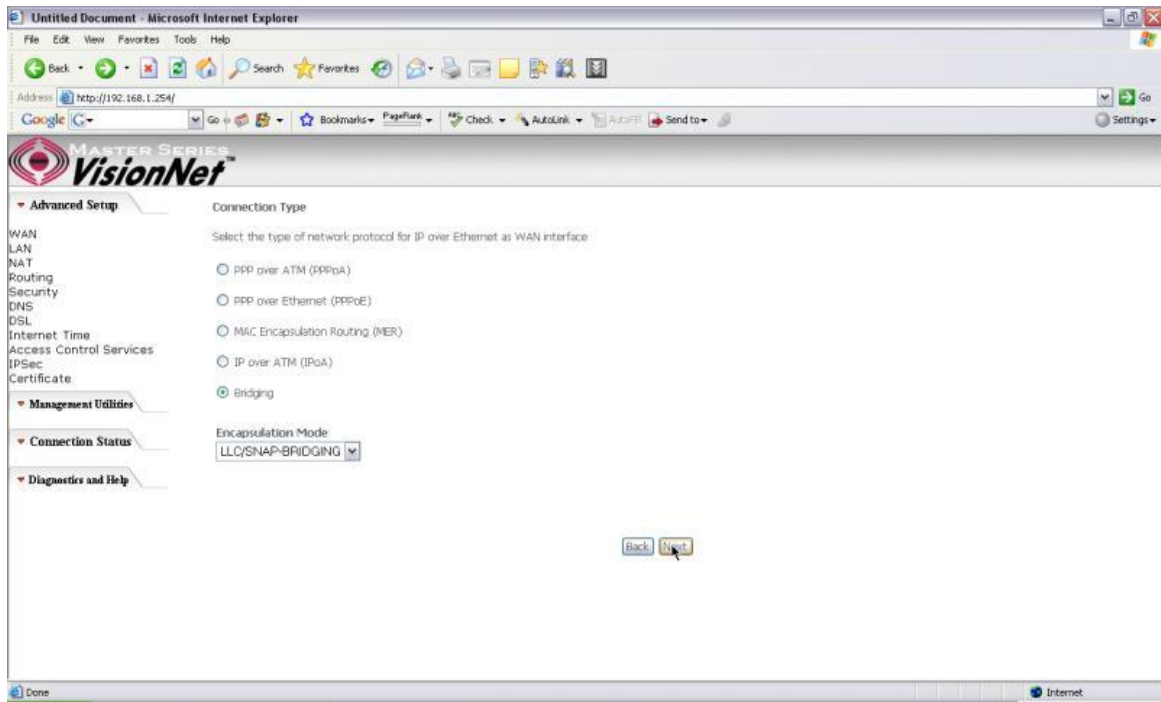


Figure 22. Quick Setup – Connection Type

Quick Setup – Enabling Bridge Mode

For this page, please check the box “Enabled Bridge Service” and click “Next”

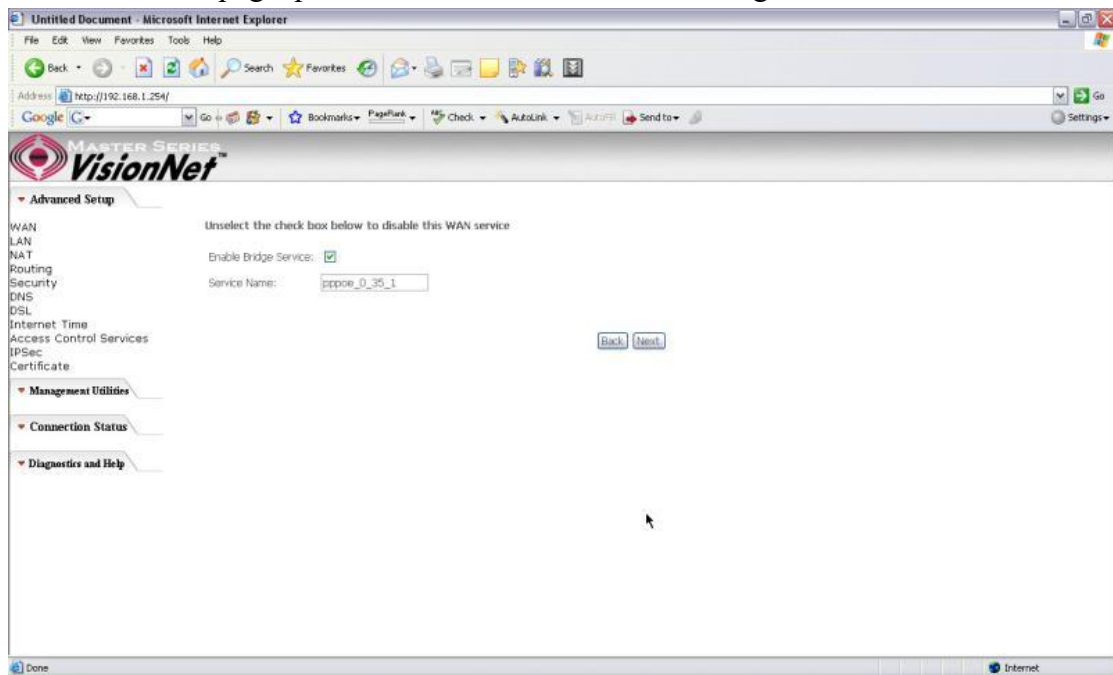


Figure 23. Quick Setup – Enabling Bridge Mode

Quick Setup – Summary

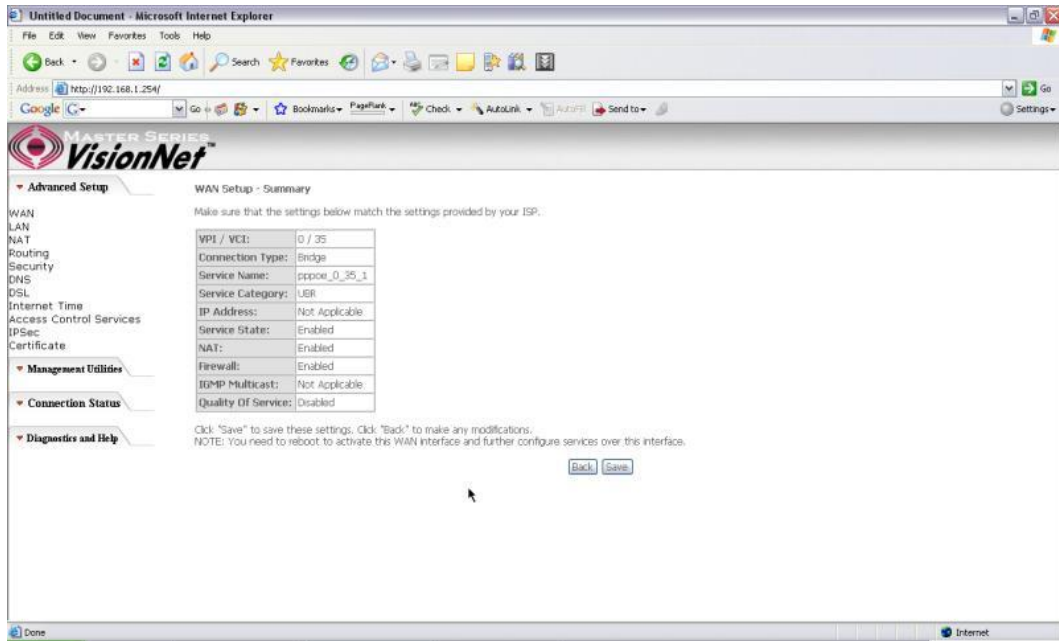


Figure 24. Quick Setup – WAN Setup – Summary

The last page displays a summary of your settings. Please click the “Save” button to complete the configuration process.

5. Advanced Setup

Advanced Setup allows system administrator to configure the following topics:

- WAN
- LAN
- NAT
- Routing
- Security
- DNS
- DSL
- Port Mapping
- Internet Time
- Access Control Services
- IPSec
- Certificates

5.1 - WAN

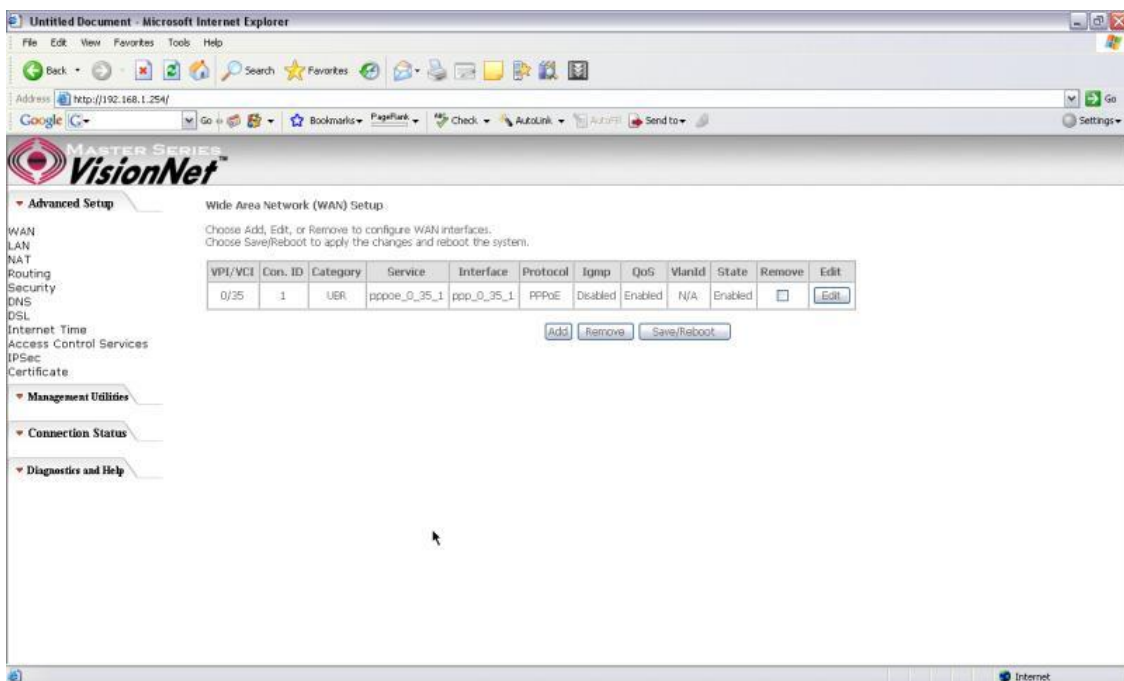


Figure 25. Advanced Setup – WAN

This page shows the current existing WAN interfaces in the system. User can choose to *Add*, *Edit*, or *Remove* WAN interfaces. Clicking the “Add” button will take the user to a wizard similar to the Quick Setup (Chapter 4) wizard, where additional WAN protocols can be configured.

Protocols supported:

PPPoE, PPPoA, IP over ATM (IPoA), Bridging, MAC Encapsulation Routing (MER).

Please refer to **Section 4** for additional information regarding creating WAN Connections.

5.2 - LAN

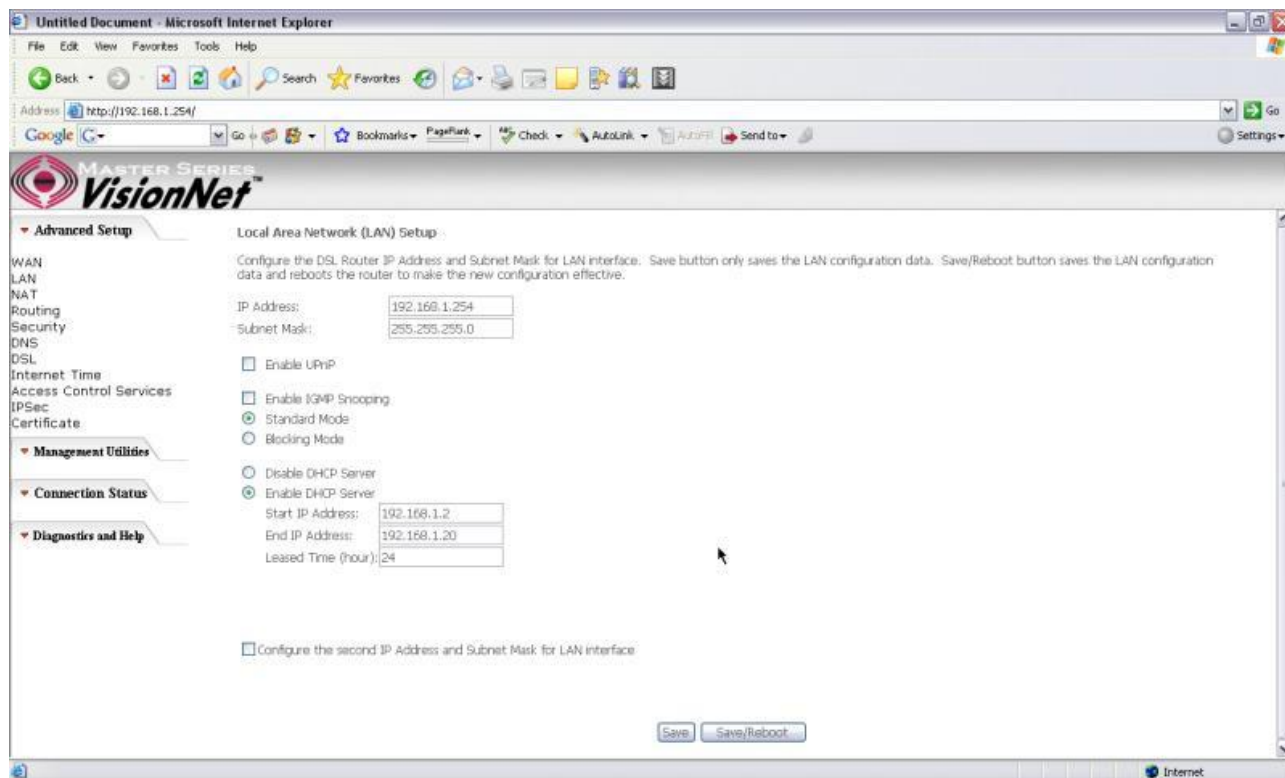


Figure 26. LAN Setup page

Input the IP Address and Subnet Mask of your M505. (Default: 192.168.1.254)

Check the box if you want to enable UPnP and/or IGMP Snooping.

Disable/Enable DHCP Server, and change the starting and ending IP address of your server pool if needed.

Check the “Configure the second IP Address and Subnet Mask for LAN interface” if a

second IP address is used.

5.3 - NAT

Three functions are supported in NAT: Virtual Servers, Port Triggering, and DMZ Host.

Virtual Servers

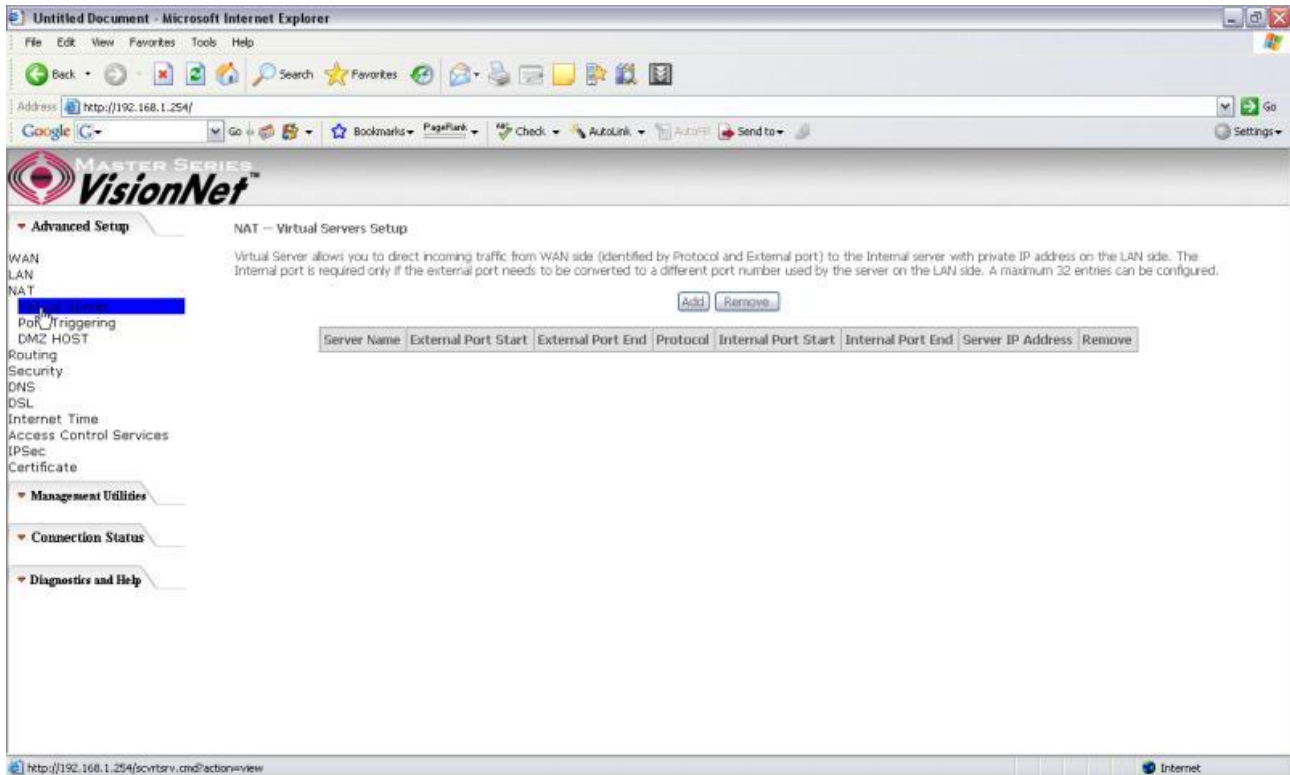


Figure 27. Advanced Setup – NAT

Virtual Server allows you to direct incoming traffic from WAN side (identified by Protocol and External port) to the Internal server with private IP address on the LAN side. The Internal port is required only if the external port needs to be converted to a different port number used by the server on the LAN side. A maximum of 32 entries can be configured.

Click on “Add” to enter configuration page to add your own rule(s). Some common used servers (Web, FTP, Mail, ...etc.) are already pre-defined for the M505. User can simply select the desired server from the pull-down menu and assign the IP address of the local PC.

To delete the configured rule(s), check the “Remove” box of the specific rule(s) and click on “Remove”.

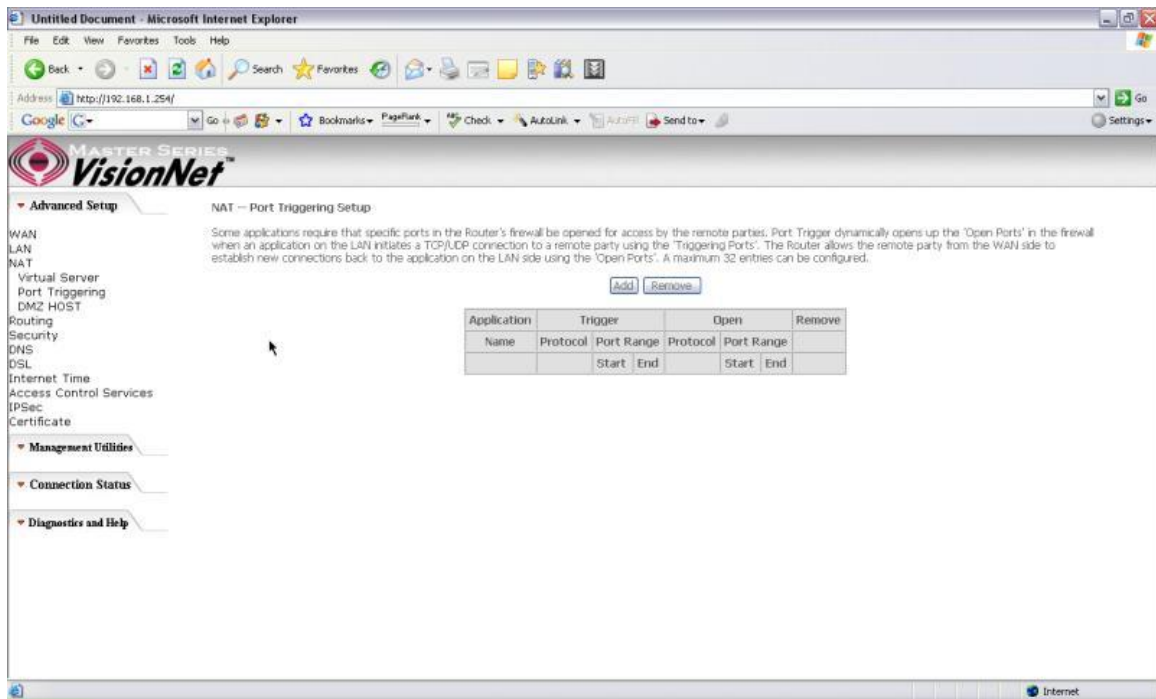


Figure 29. Advanced Setup – NAT – Port Triggering

Click on “Add” to enter the configuration page to add your own rule(s). Some games, video conferencing, remote access applications and other software might require that specific ports in the Router's firewall be opened for access. You can configure the port settings from this screen by selecting an existing application or creating your own (Custom application) and click “Save/Apply” to add it.

To delete the configured rule(s), check the “Remove” box of the specific rule(s) and click on “Remove”.

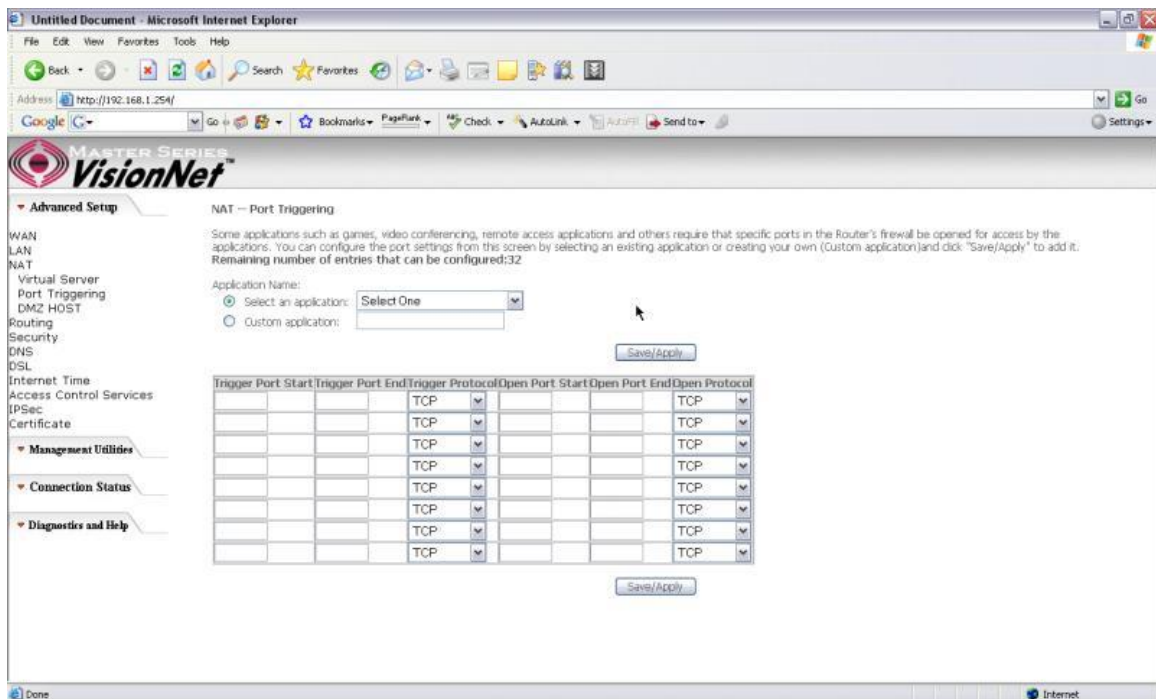


Figure 30. Advanced Setup – NAT – Add Port Triggering

DMZ Host

The DSL router will forward IP packets from the WAN that do not belong to any of the applications configured in the Virtual Servers table to the DMZ host computer.

Enter the computer's IP address and click “Save/Apply” to activate the DMZ host.

Clear the IP address field and click “Save/Apply” to deactivate the DMZ host.

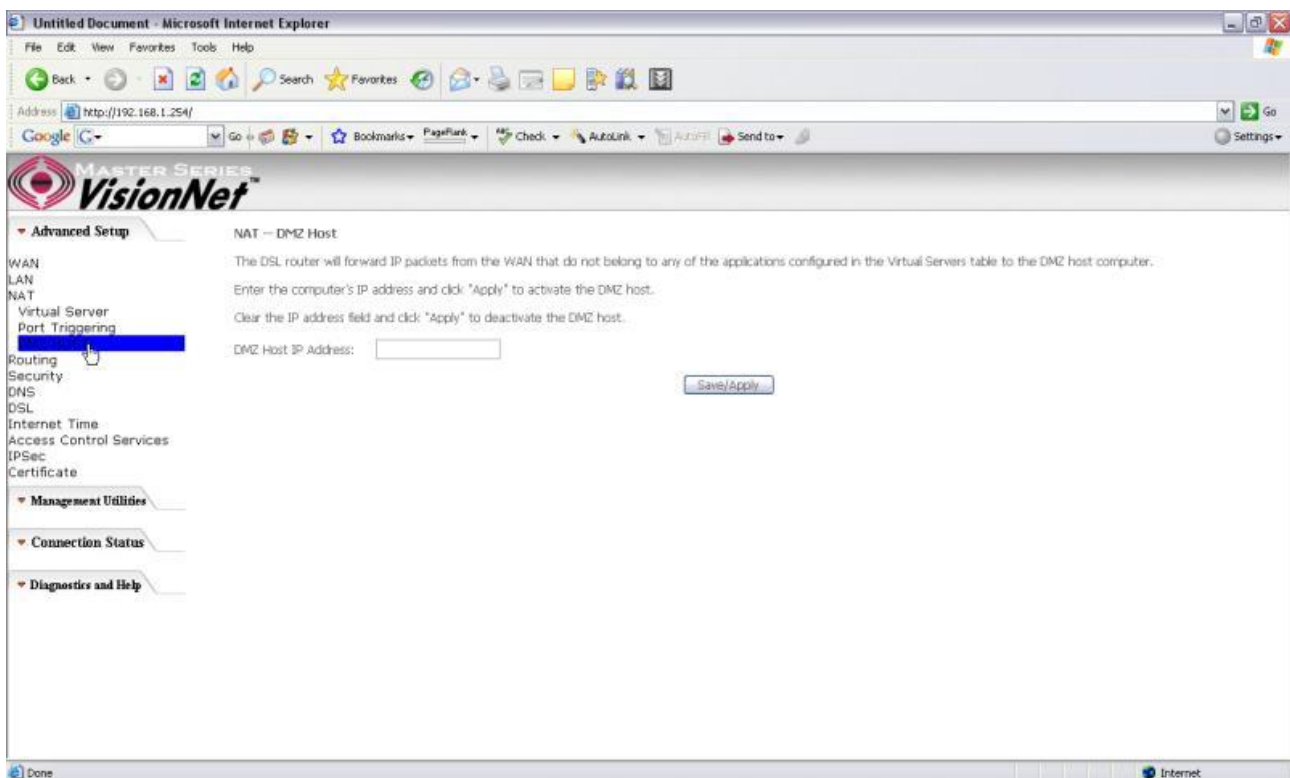


Figure 31. Advanced Setup – NAT – DMZ Host

5.4 - Routing

There are three routing related settings:

Routing – Default Gateway

If the “Enable Automatic Assigned Default Gateway” checkbox is selected, the M505 will accept the first received default gateway assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s). If the checkbox is not selected, enter the static default gateway AND/OR a WAN interface. Click the “Save/Apply” button to save it.

NOTE: If changing the “Enable Automatic Assigned Default Gateway” from unselected to selected, you must reboot your M505 to activate the automatically assigned default gateway.

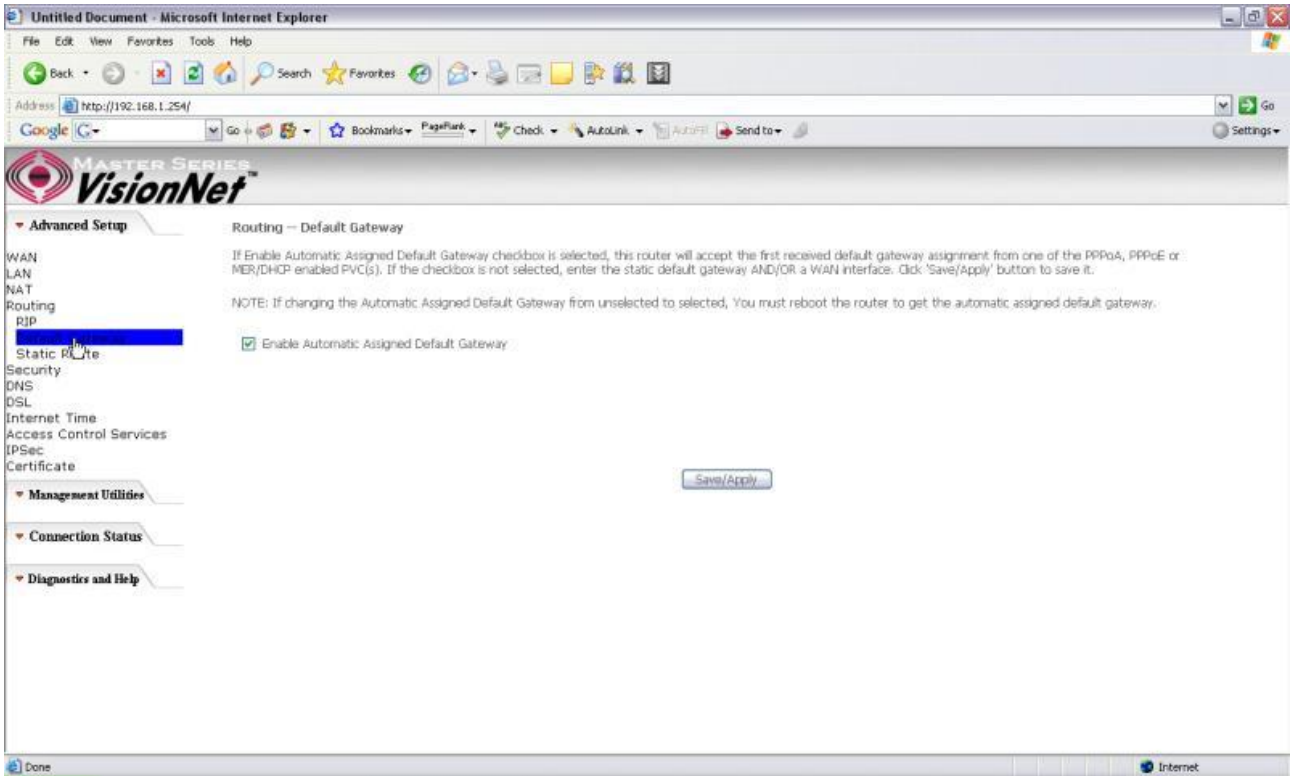


Figure 32. Advanced Setup – Routing – Default Gateway

Routing – Static Route

Click on “Add” to create a new Static Route. Up to 32 entries can be configured.

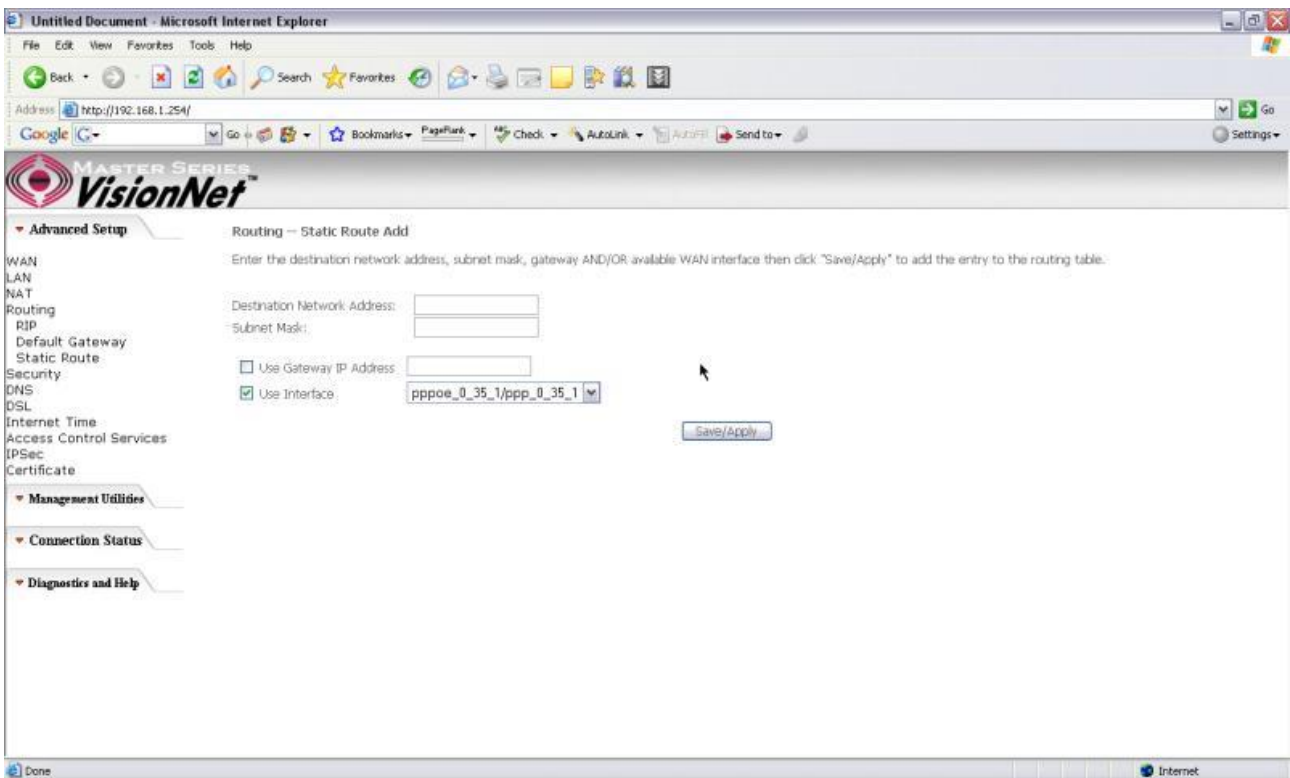


Figure 33. Advanced Setup – Routing – Add New Static Route

Enter the destination network address, subnet mask, gateway AND/OR available WAN interface, then click “Save/Apply” to add the entry to the routing table.

Routing – RIP

The Routing Information Protocol (RIP) is designed for exchanging routing information within a small to medium-size network.

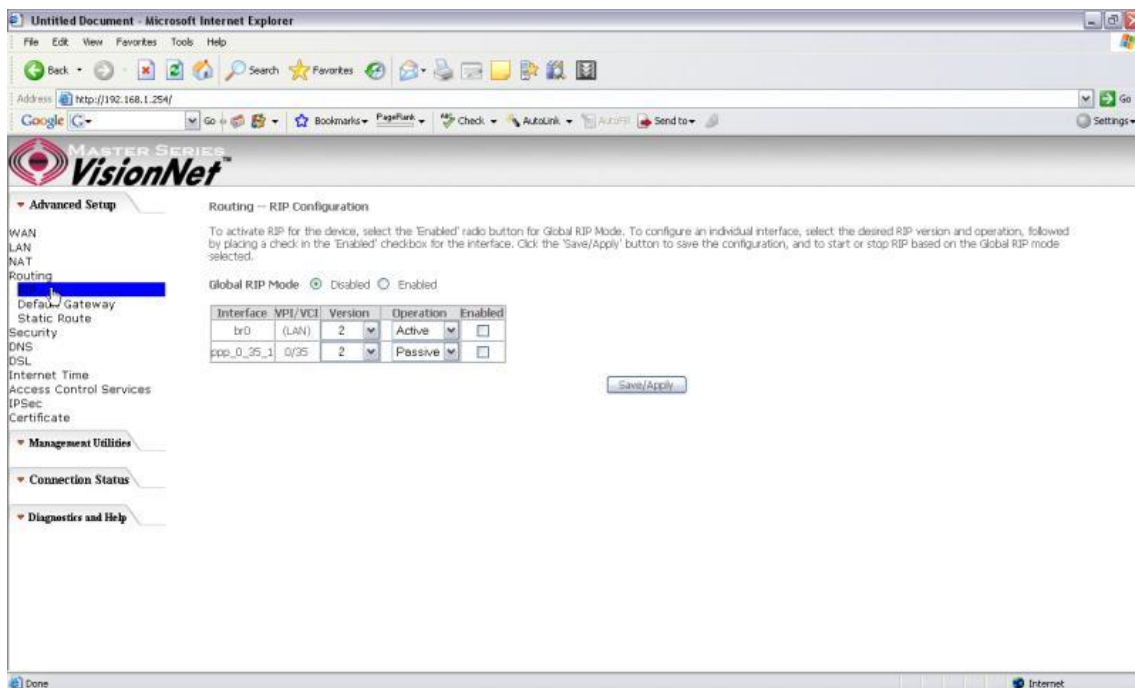


Figure 34. Advanced Setup – Routing – RIP

To configure an individual interface, select the desired RIP version and operation:

RIP Version 1: Class-based IP network.

RIP Version 2: Classless IP network.

Operation Active: Broadcast and listen to other RIP enabled devices.

Operation Passive: Listen only.

Place a check in the “Enabled” checkbox next to the interface to complete the configuration. Click the “Save/Apply” button to save the configuration. To start/stop RIP for the M505, select the “Enabled/Disabled” radio button for “Global RIP Mode”.

5.5 - Security

Two functions are supported in Firewall: Outgoing IP Filtering and MAC Filtering.

Firewall – Outgoing IP Filtering

By default, all outgoing IP traffic from LAN is allowed, but some IP traffic can be **BLOCKED** by setting up filters. Choose “Add” to configure outgoing IP filters. To remove, check the item and click “Remove”.

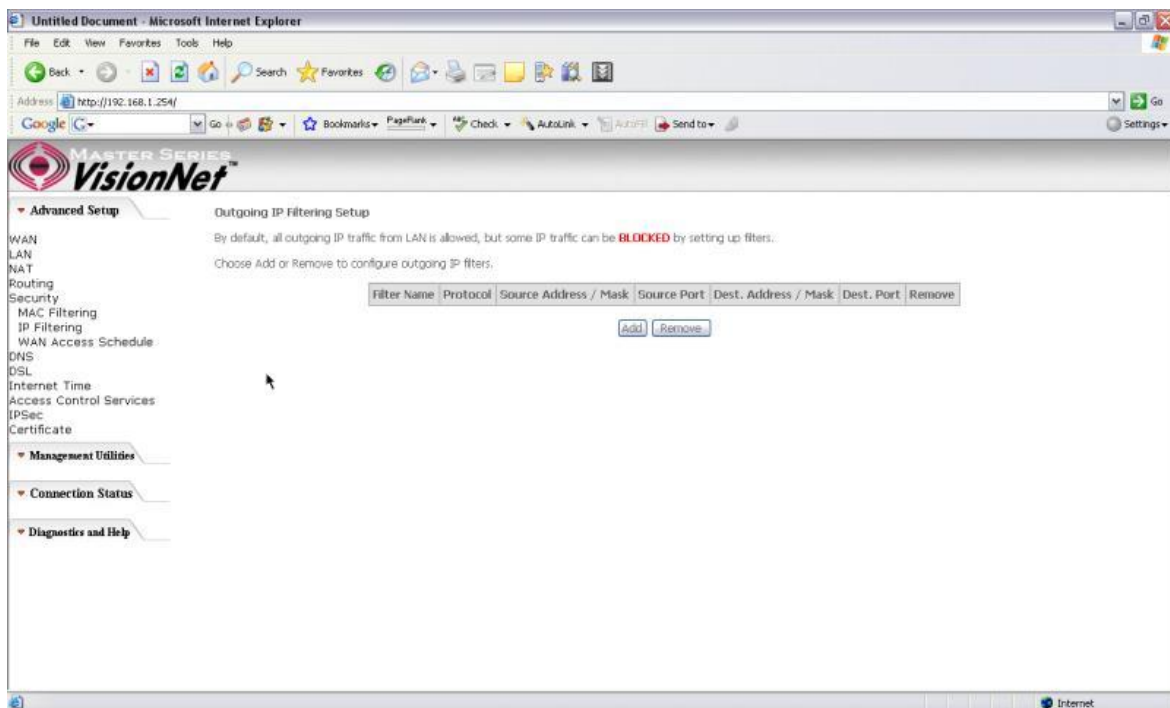


Figure 35. Advanced Setup – Security – Outgoing IP Filtering Setup

The screen allows you to create a filter rule to identify outgoing IP traffic by specifying a filter name and at least one of the conditions below. All of the specified conditions in this filter rule must be satisfied for the rule to take effect. Click “Save/Apply” to save and activate the filter.

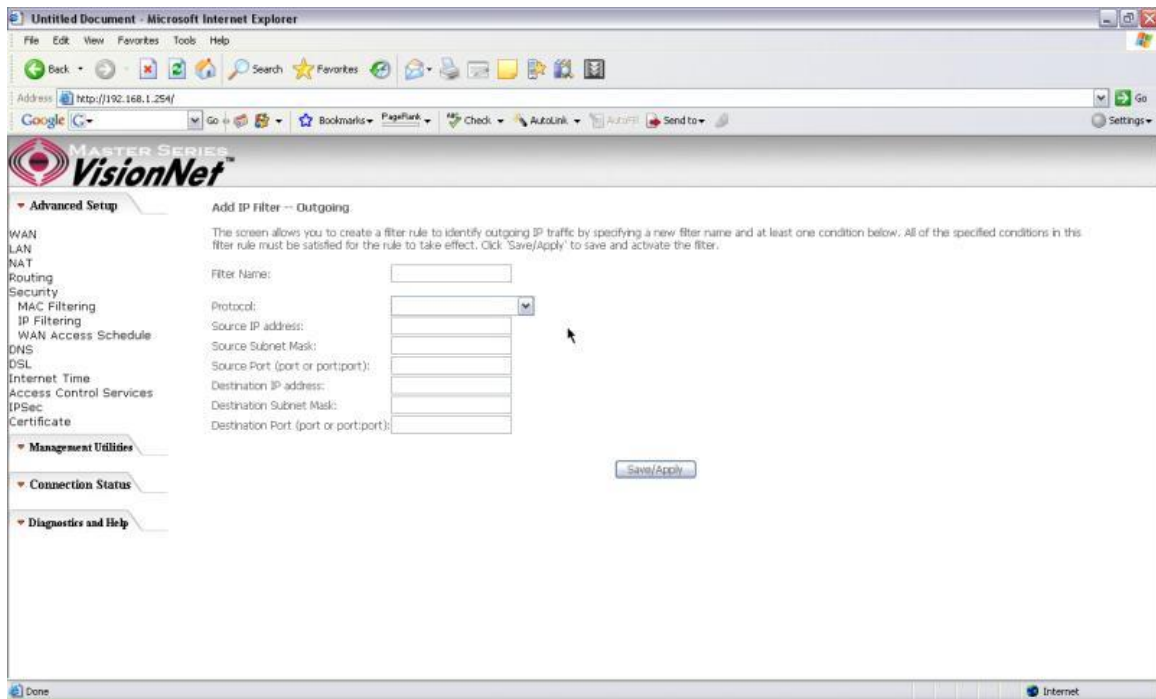


Figure 36. Advanced Setup – Security – Add new Outgoing IP Filter

Security – WAN Access Control

WAN Access Control allows users to create time of day restrictions to a specific LAN device connected to the Router. Click “Add” to configure restriction rules. To remove, check the item and click “Remove”. Up to 16 entries can be configured and used.

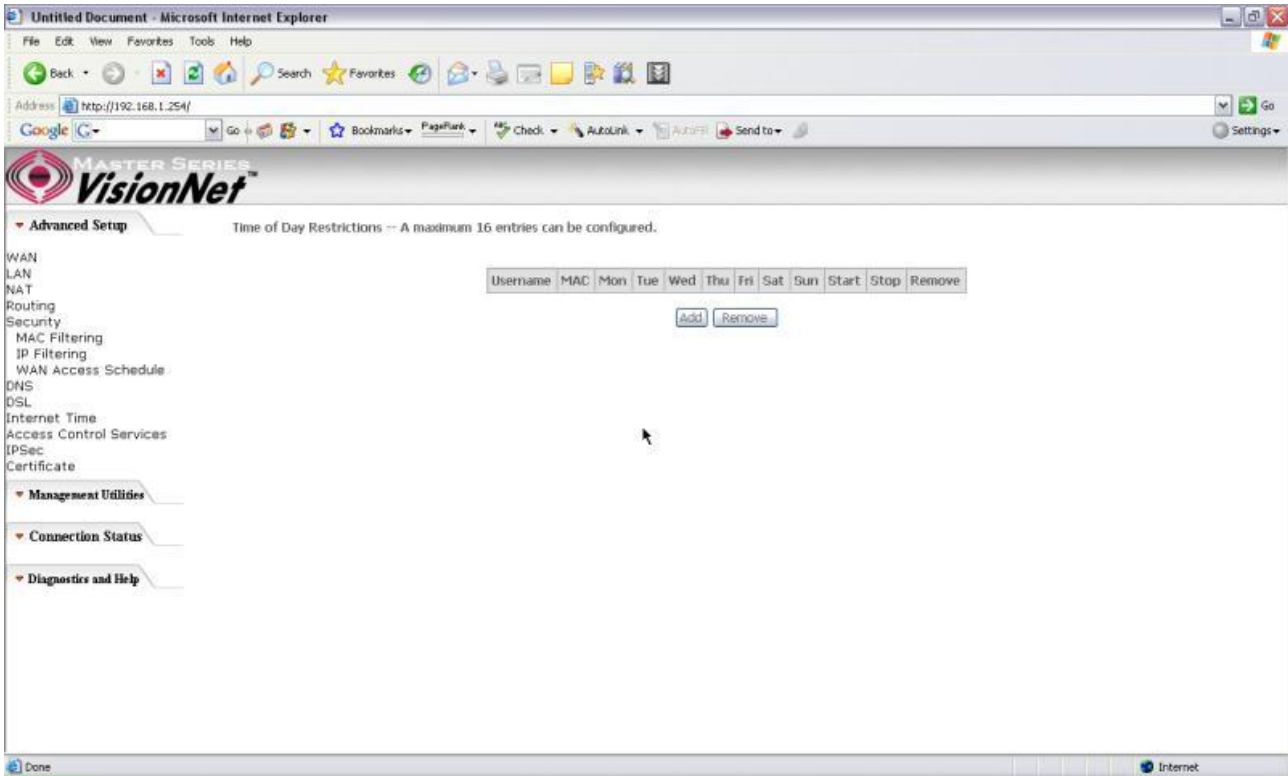


Figure 37. Advanced Setup – Security – WAN Access Control

The MAC Address of the current “browser” will automatically display on the “Browser’s MAC Address” box. To restrict another LAN device, click the “Other MAC Address” button and enter the MAC address of that LAN device.

To find out the MAC address of a Windows-based PC, go to the command prompt window and type “ipconfig /all”. Click “Save/Apply” to save and activate the restriction rule.

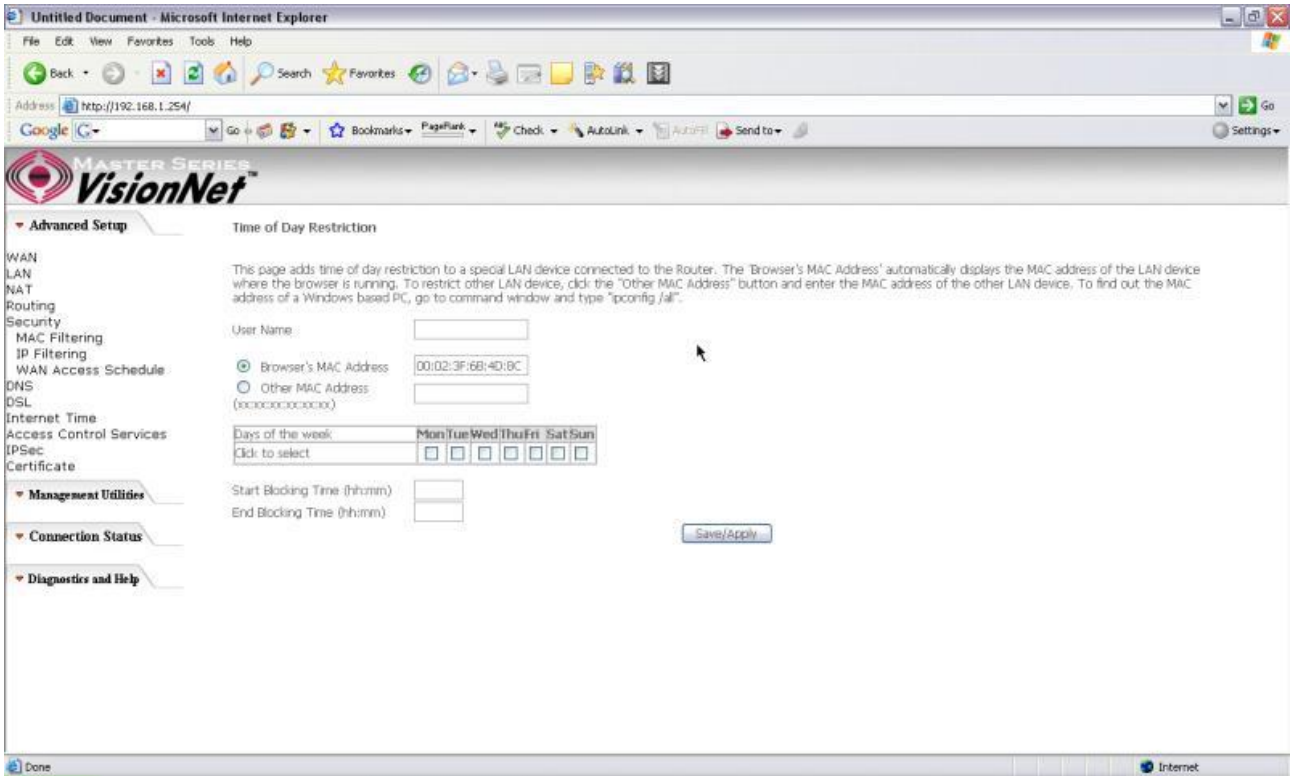


Figure 38. Advanced Setup – Security – Add new Parental Control restriction

5.6 - DNS

DNS Server

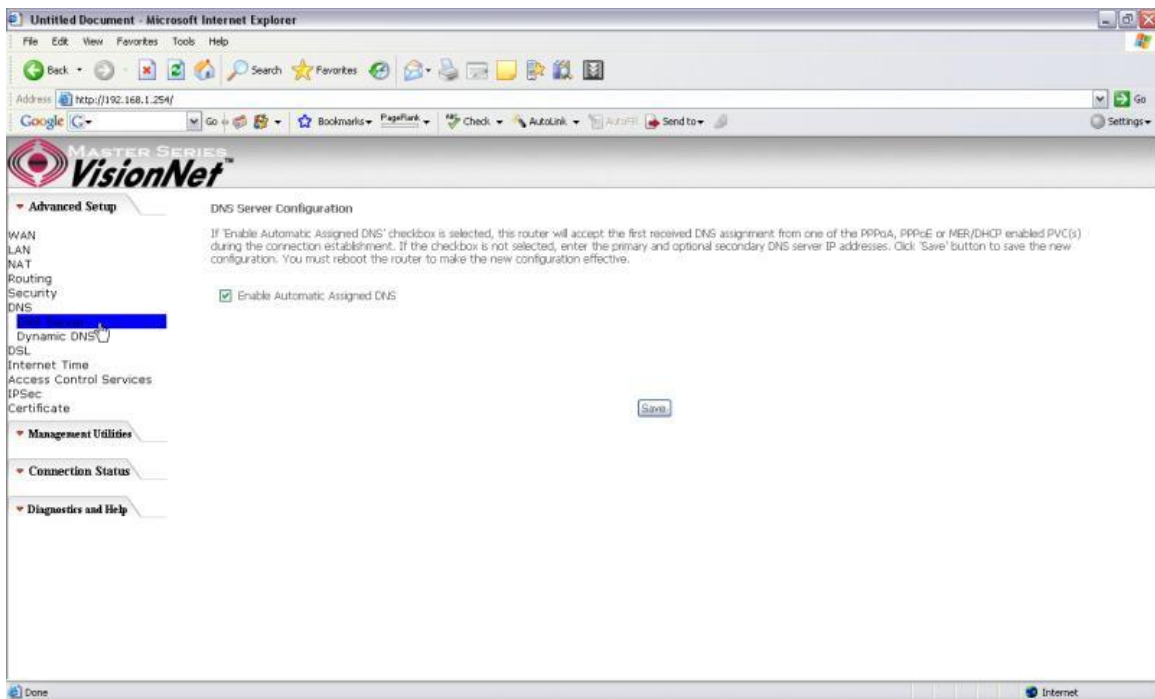


Figure 39. Advanced Setup – DNS Server

If “Enable Automatic Assigned DNS” checkbox is selected, the M505 will accept the first received DNS assignment from one of the PPPoA, PPPoE or MER/DHCP enabled PVC(s) during the connection establishment. If the checkbox is not selected, enter the primary and optional secondary DNS server IP addresses. Click the “Save” button to save it.

NOTE: If changing from unselected “Enable Automatic Assigned DNS” to selected, you must reboot the M505 to get the automatic assigned DNS addresses.

Dynamic DNS

The Dynamic DNS service allows you to give a dynamic IP address a static hostname in any of the domains. This function allows your M505 to be more easily accessible from various locations of the Internet.

Choose “Add” to configure Dynamic DNS.

Before you proceed, please visit one of these two websites to receive your own Dynamic DNS service: www.dyndns.org or www.tzo.com.

To remove, check the item and click “Remove”

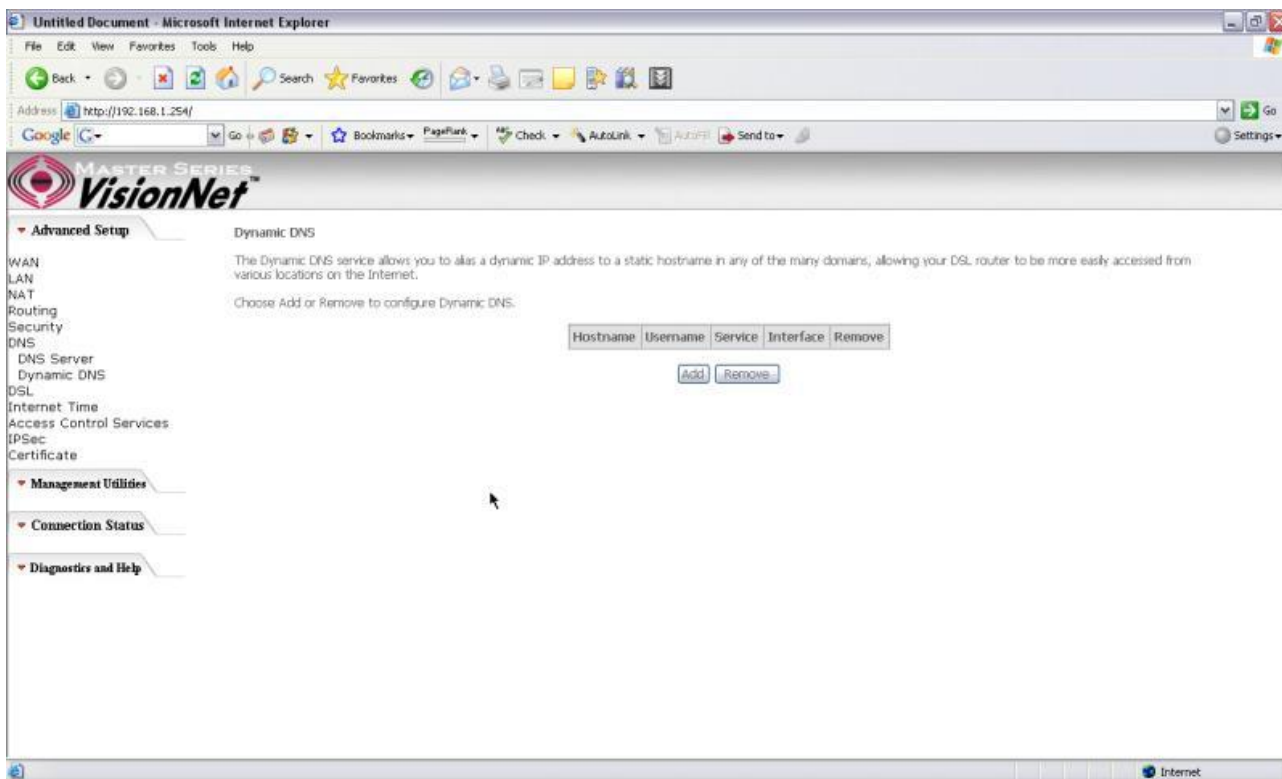


Figure 40. Advanced Setup – DNS – Dynamic DNS

Select your Dynamic DNS service provider from 'D-DNS provider', and enter your registration information. Click "Save/Apply" to save the configuration.

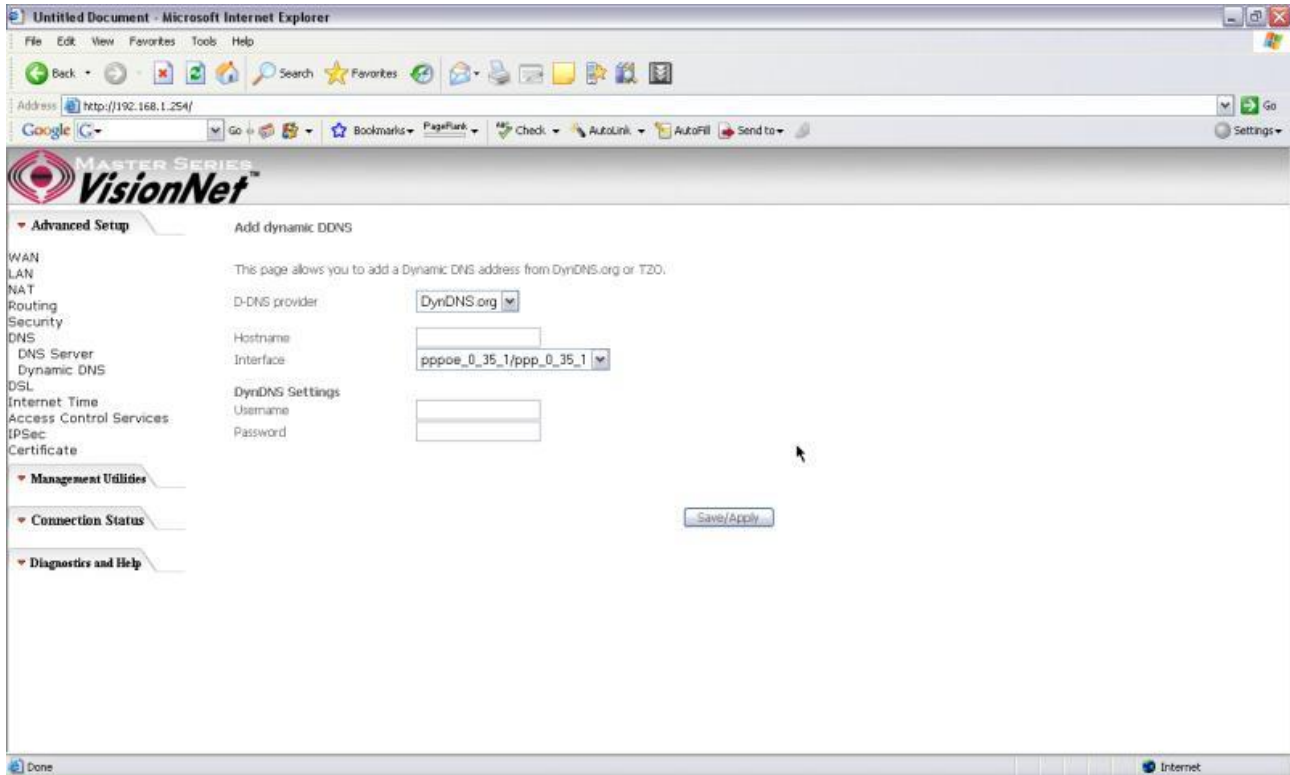


Figure 41. Advanced Setup – DNS – Add Dynamic DNS

5.7 - DSL

This page allows you to choose which handshake protocols you want your M505 to look through when training. Uncheck any of the listed protocols that have "Enabled" at the end of it to have the modem skip that protocol when synchronizing with your ADSL line. Leave it checked if you would like the modem to cycle through those settings.

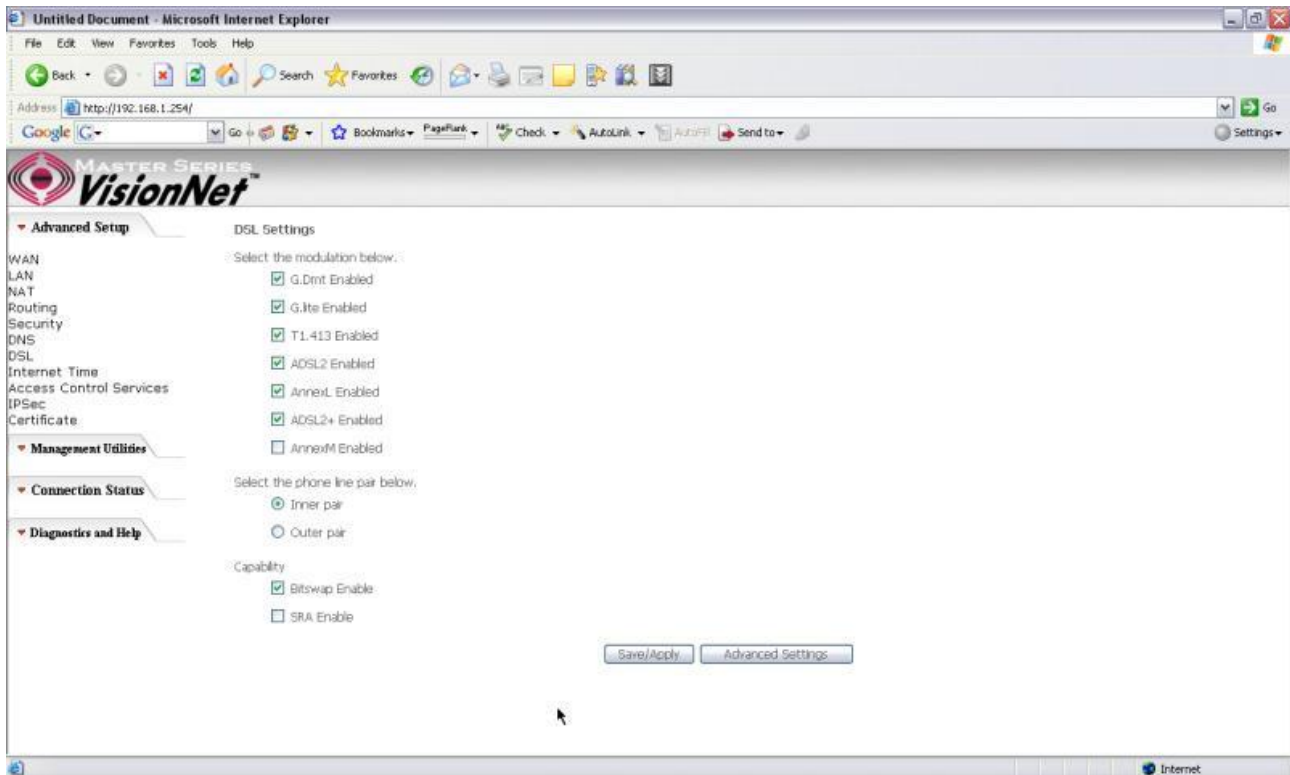


Figure 42. Advanced Setup – DSL Settings

5.8 – Port Mapping

Use this page to set up Port Mapping and Virtual Port groups. These are used when ISPs or Telcos are running different PVCs (or connection profiles) on the same DSL line. This is commonly used when receiving MPEG1/2 video streams and Internet at the same time. VLAN groups allow you to hook up a PC on one or more Ethernet ports of the router for broadband Internet and connect an IP set top box to the other ports to watch TV on the same line simultaneously.

By default all LAN ports and wireless will be grouped and mapped to one WAN interface.

To enable virtual ports on the physical LAN ports, check the “Enable virtual ports on:” checkbox and click on the Add button to create a new mapping group.

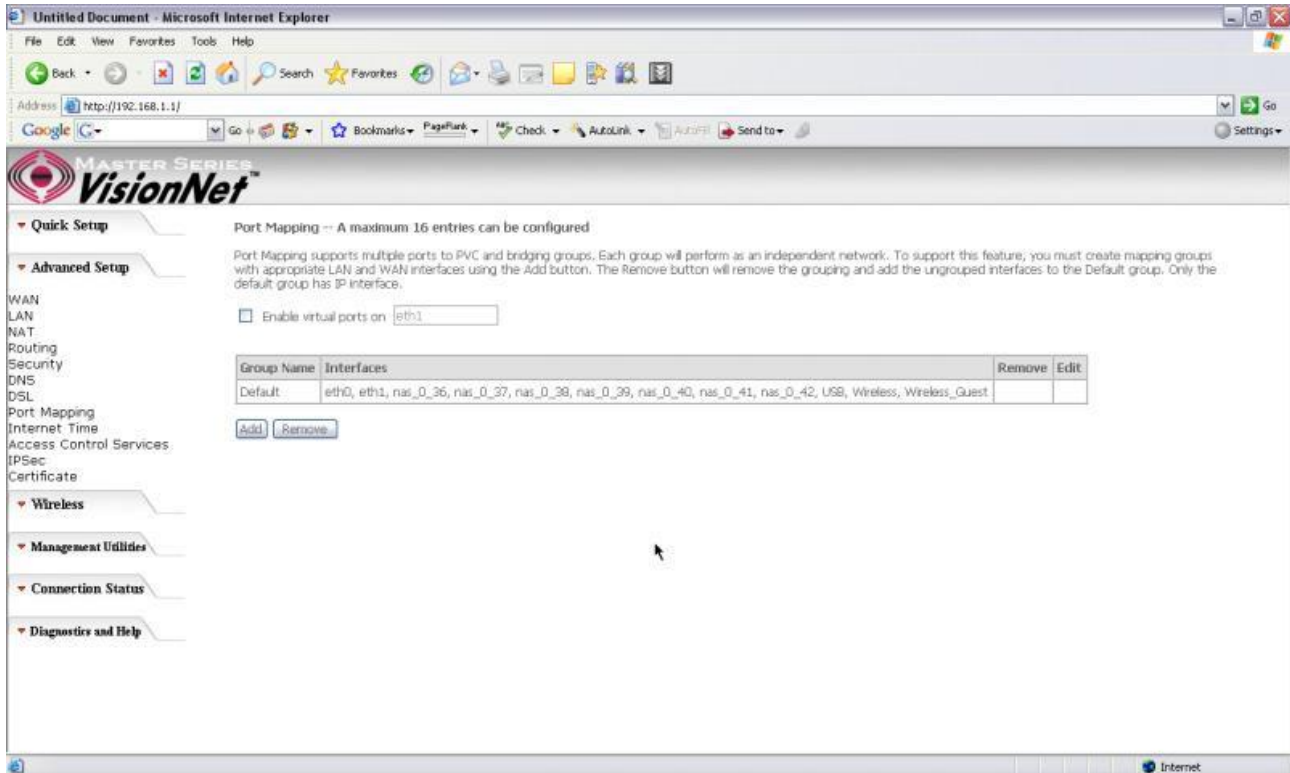


Figure 43. Advanced Setup – Port Mapping

To properly configure a new port mapping, follow the instructions provided on screen.

It is recommended that an experienced telephone company technician configure these settings for you. In most cases, this will already be configured for you, so no change or modification is necessary.

Once you have mapped your ports to the desired interfaces, click on the “Save/Apply” button to save these settings.

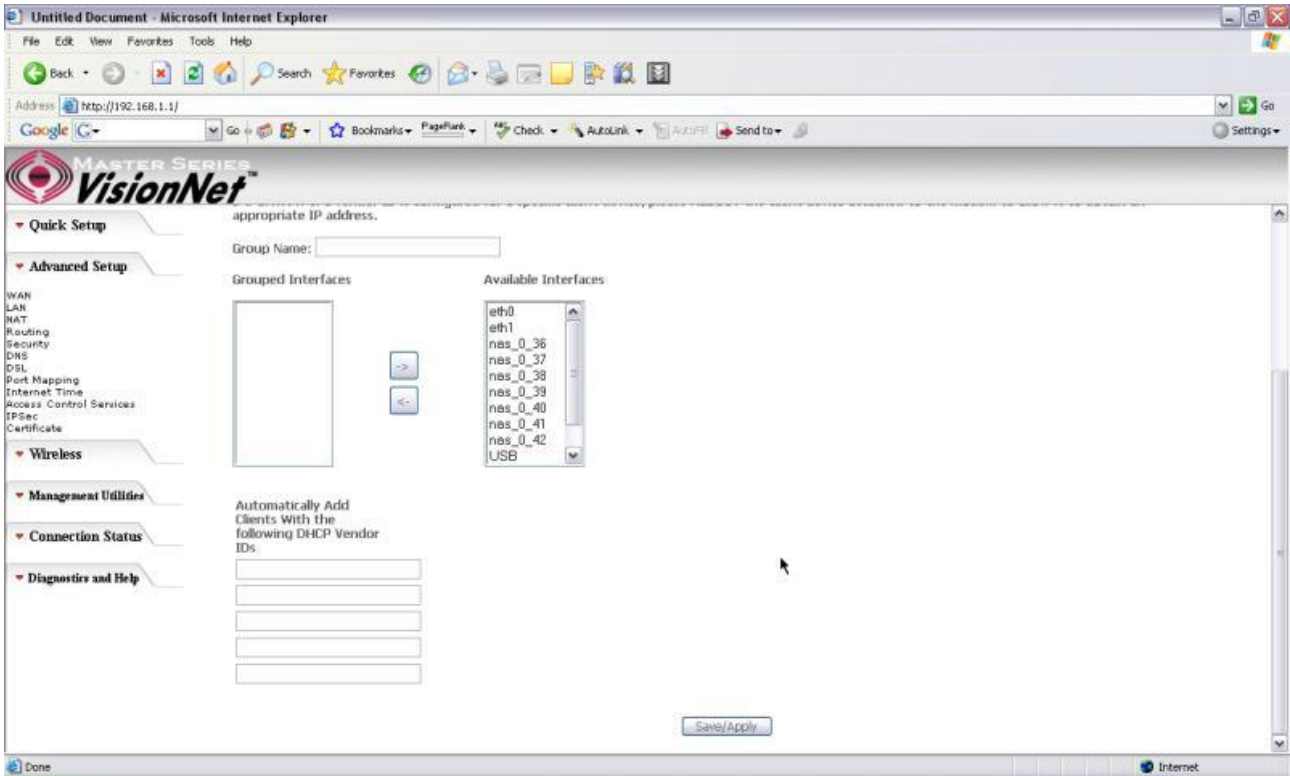


Figure 44. Advanced Setup – Port Mapping – Add new port map

5.8 - Internet Time

The M505 can synchronize its internal time with an Internet time server when available. To enable this function, check “Automatically synchronize with Internet time servers”. Select First and Second NTP time server from the pull down menu. Or select “Other” and define your preferred NTP server. Choose the time zone from “Time zone offset”. Click on “Save/Apply” to save the configuration.

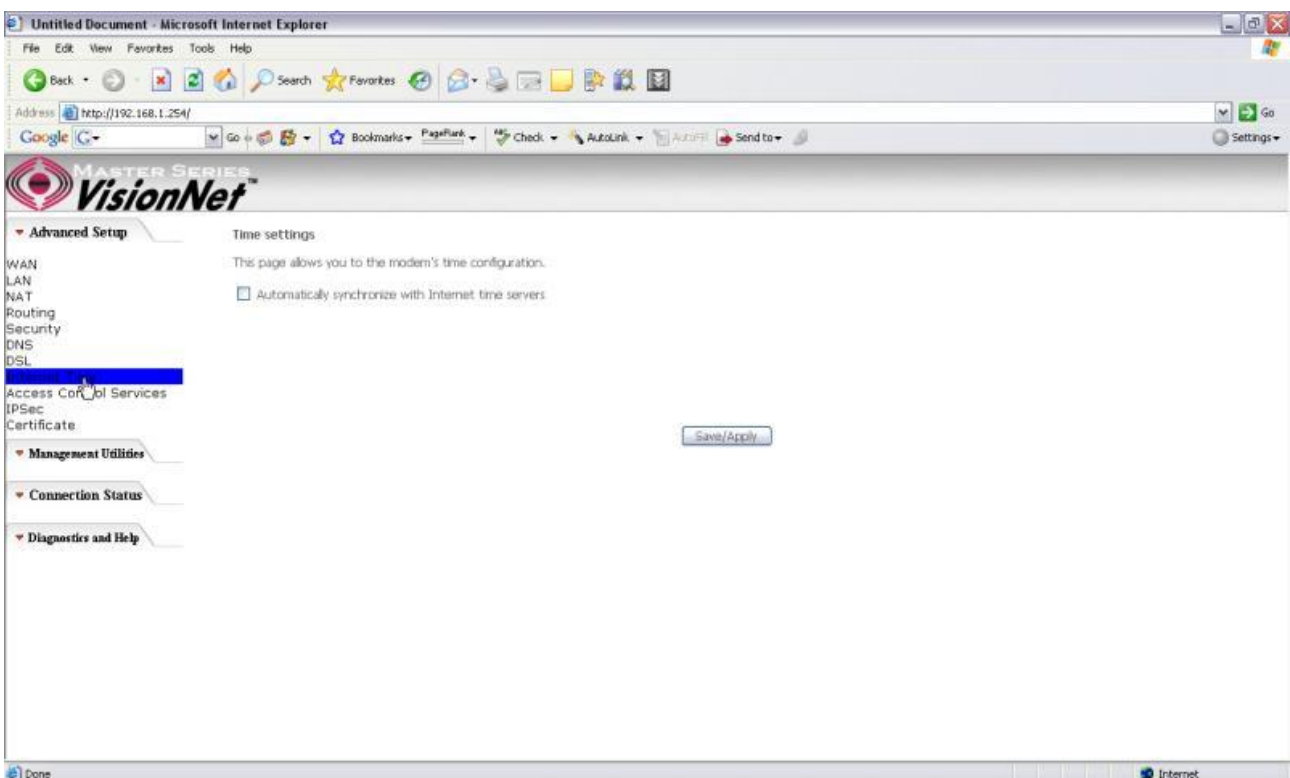


Figure 45. Advanced Setup - Internet Time

5.9 - Access Control Services

The M505 browser management tool is protected by three categories: Services, IP addresses, and Passwords. All three must be matched (if configured) to gain access to the management tool.

All services are enabled from LAN side and disabled from WAN side by default.

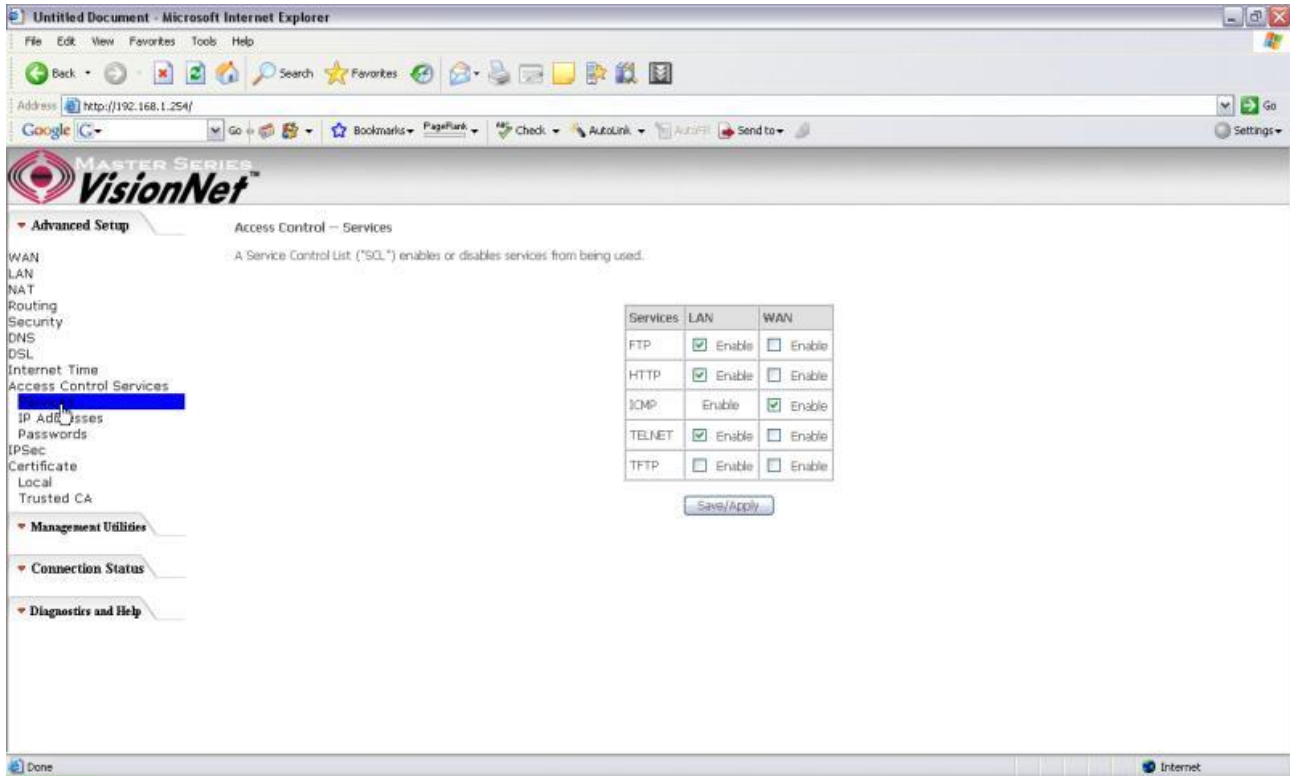


Figure 46. Advanced Setup - Access Control - Service

IP Addresses

The IP Address Access Control mode, if enabled, permits access to local management services from IP addresses contained in the Access Control List. If the Access Control mode is disabled, the system will not validate IP addresses for incoming packets. The services are the system applications listed in the Service Control List.

Click "Add" to add an IP address to the Access Control List. To remove, mark the Remove option of the specified IP address, then click "Remove" to remove the IP address from the Access Control List. Up to 16 hosts can be configured here.

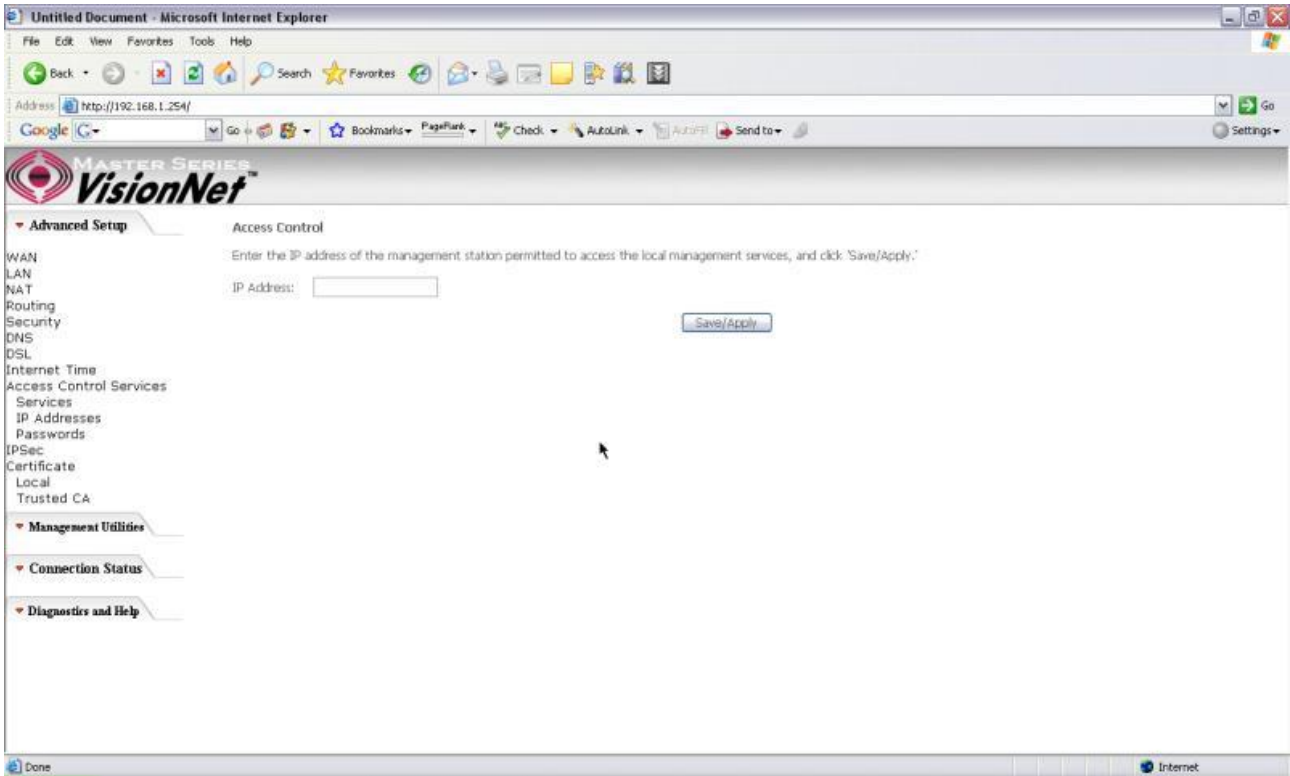


Figure 47. Advanced Setup - Access Control – IP Addresses

Passwords

Access to your router is controlled through three user accounts: **admin**, **support**, and **user**.

admin: has unrestricted access to change and view the M505 configuration.

support: is used to allow an ISP technician to access the M505 for maintenance and to run diagnostics.

user: can access the M505 to view configuration settings and statistics, as well as, update the M505 software.

Use the fields below to enter up to 16 characters and click “Save/Apply” to change or create passwords.

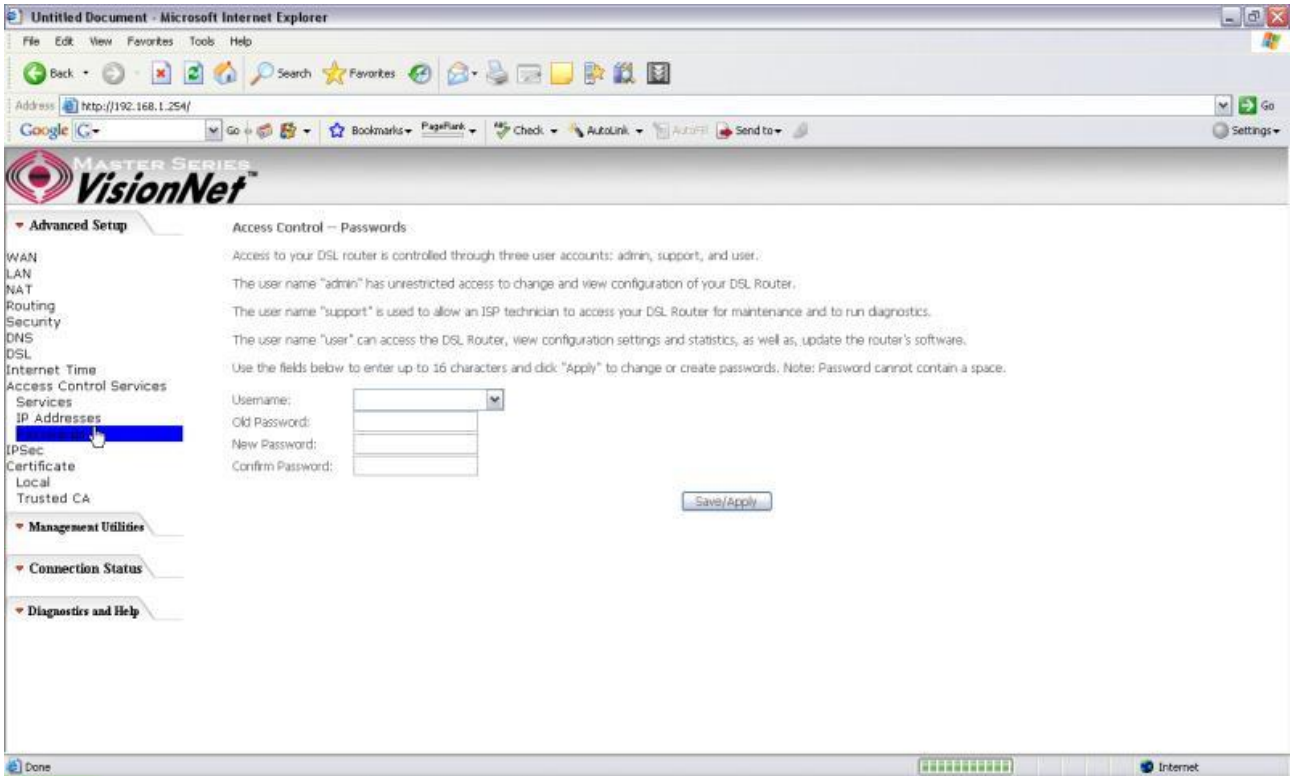


Figure 48. Advanced Setup - Access Control – Passwords

5.10 - IPSec

The M505 also have the ability to create a VPN (Virtual Private Network) tunnel using IPSec as the security measure. VPN allows user to remotely connect to a network using their Broadband connection. Please refer to your ISP and Network Administrator for detail settings regarding VPN IPSec.

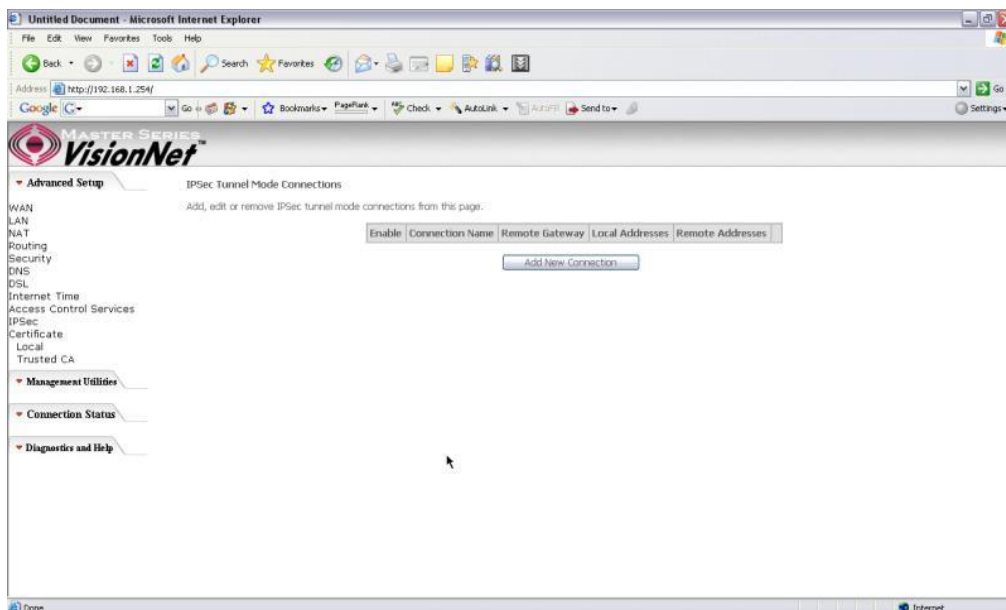


Figure 49. Advanced Setup – IPSec

Click the “Add” button create a new VPN connection

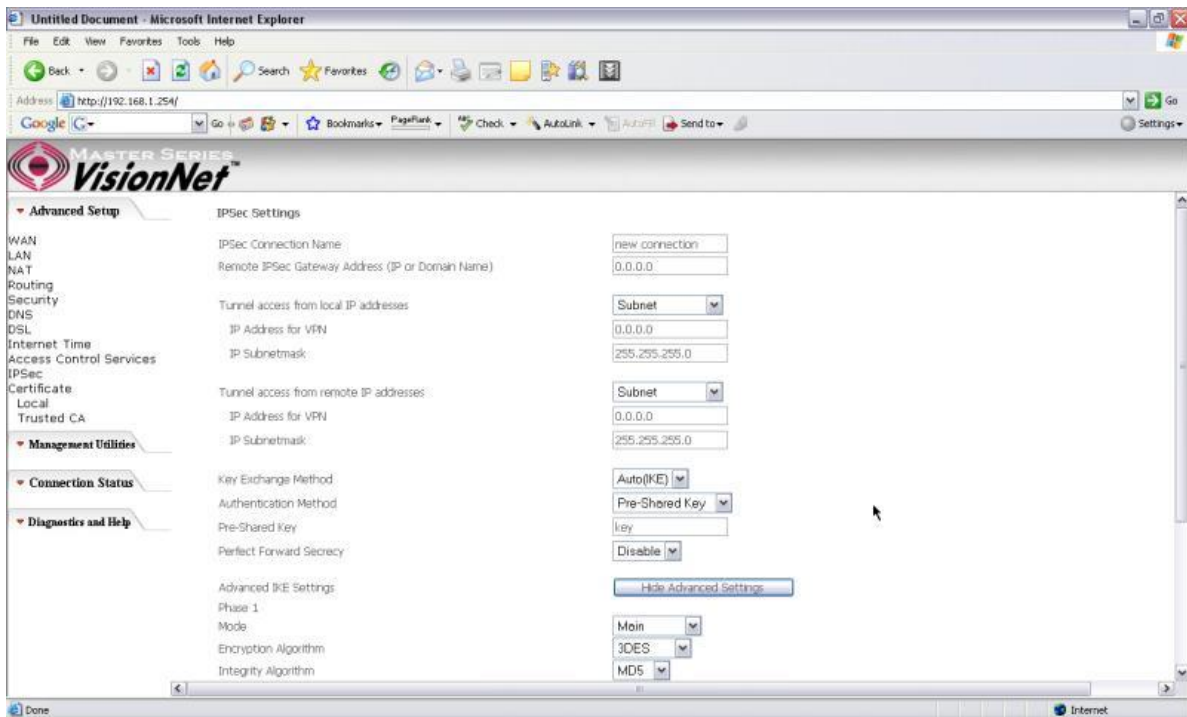


Figure 50. Advanced Setup – IPsec Add

5.11 - Certificate

This page allows user to authenticate their VPN session using certificate. Some VPN network requires this. There are two sections: Local and Trusted CA.

LOCAL option: A maximum of 4 certificates are supported. You can either import or send a request for certificates.

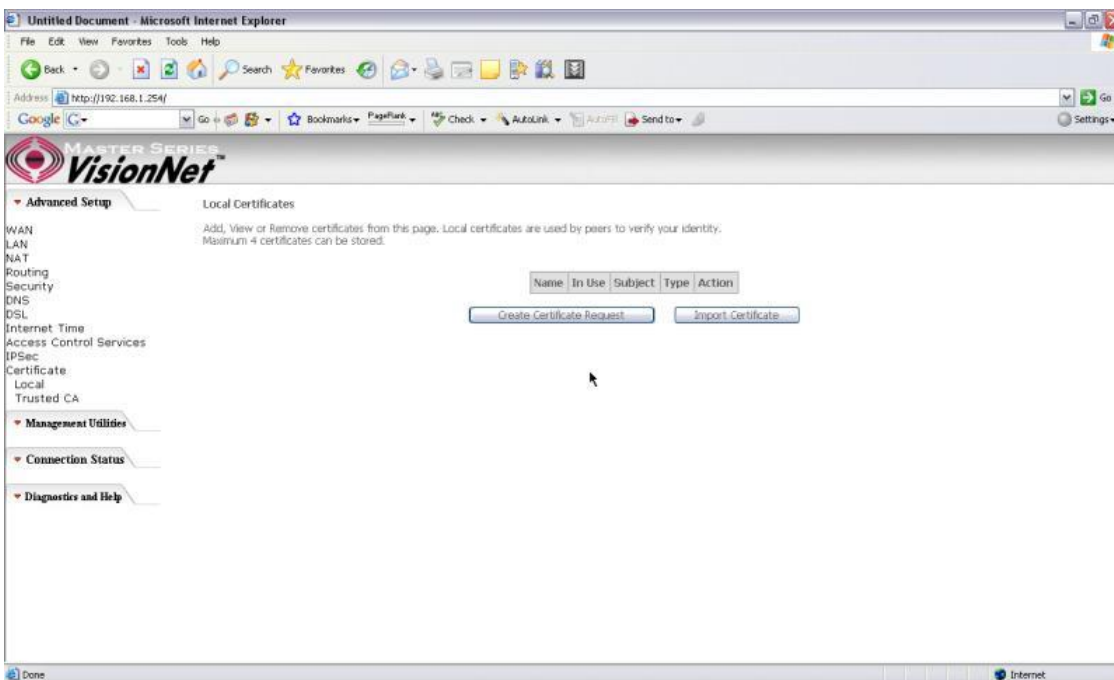


Figure 51. Advanced Setup - Certificates

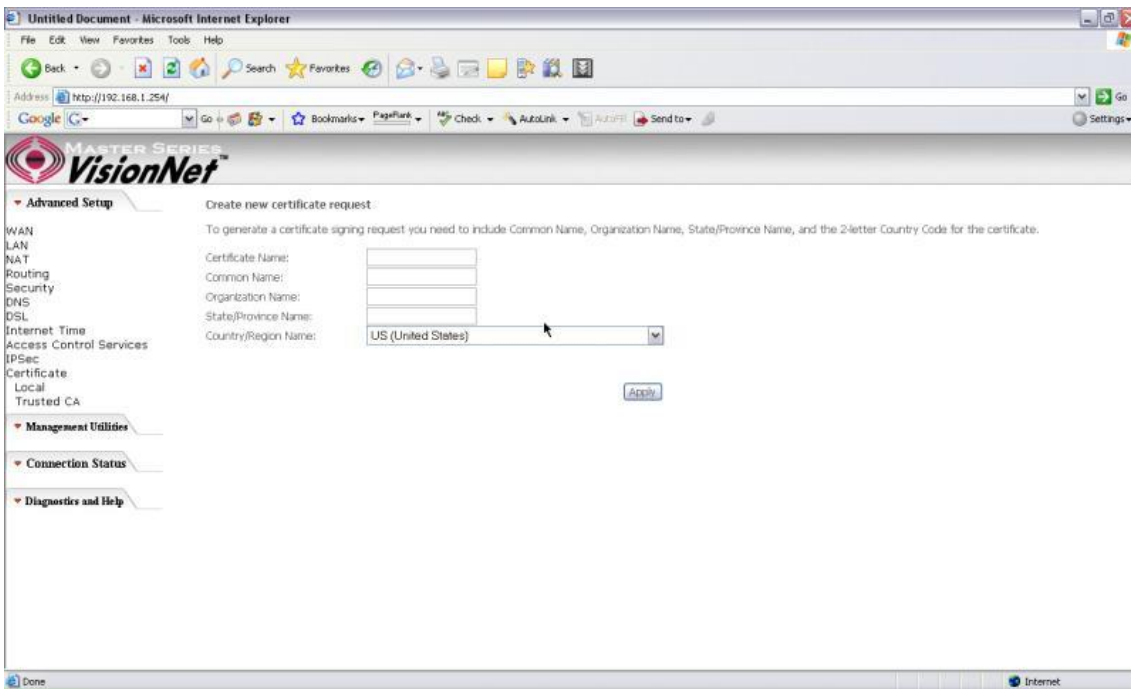


Figure 52. Advanced Setup – Local – Create Certificate

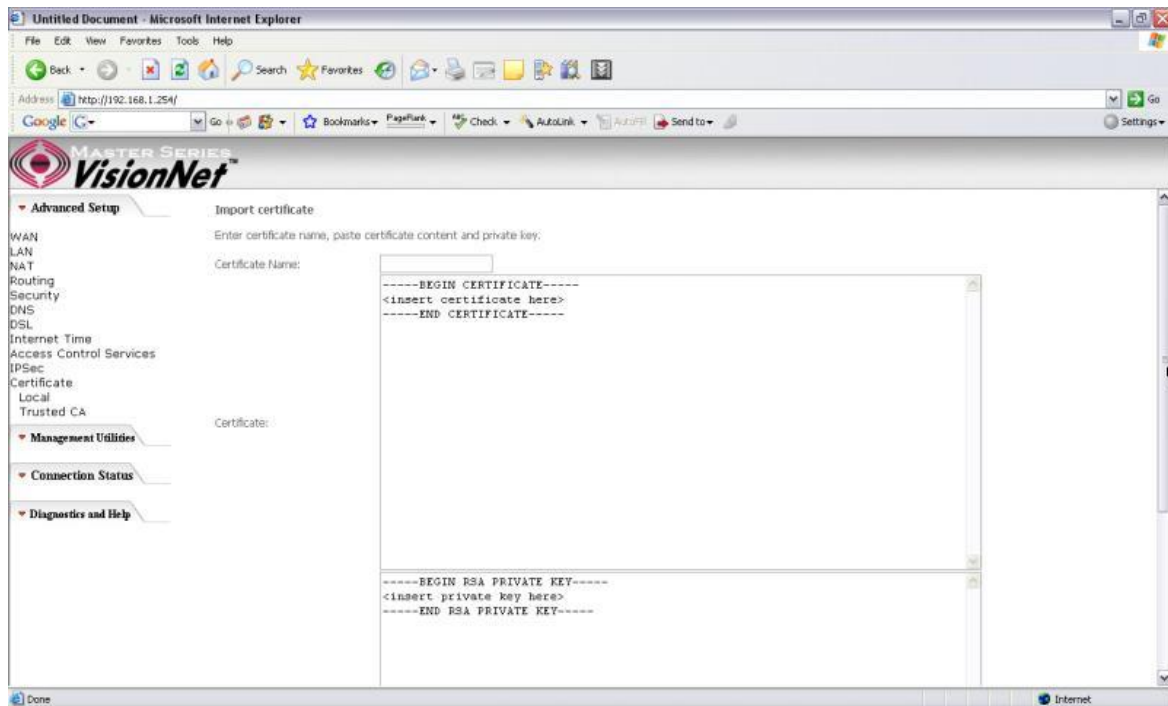


Figure 53. Advance Setup – Certificates – Local Import

Trusted CA option: This is used to verify peer certificates. Please click on “Import Certificate” to proceed.

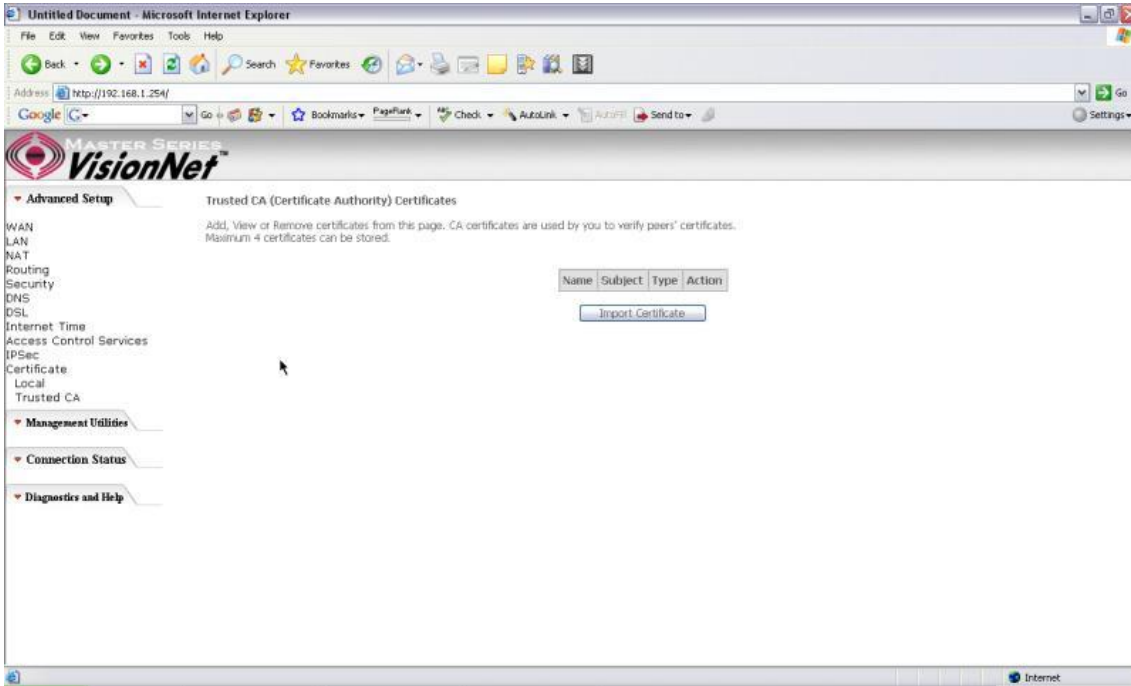


Figure 54. Advanced Setup – Certificates- Trusted CA

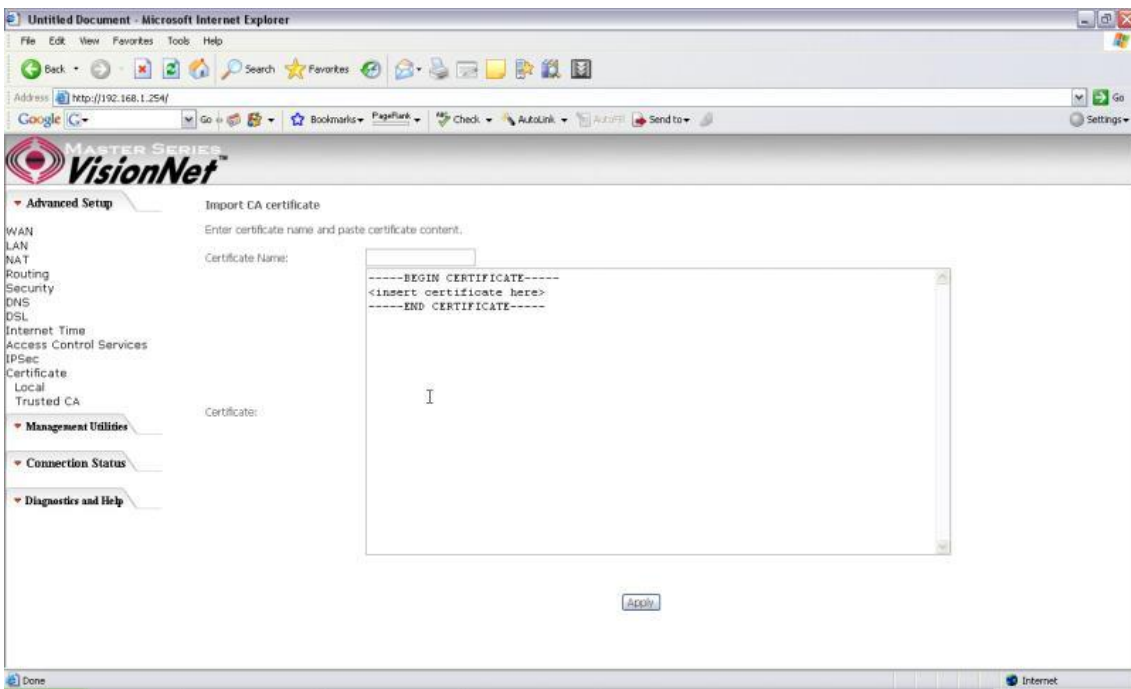


Figure 55. Advanced Setup – Certificates - Trusted CA – Import Certificate

6. Wireless Setup

Some basic understanding of 802.11b/g wireless technology and terminology is useful when you are setting up the Router or any wireless access point. If you are not familiar with wireless networks please take a few minutes to learn the basics.

Wireless client requirements

All wireless client adapters compliant to 802.11g and/or 802.11b can communicate with the M505 LAN environment. However, be aware that only 802.11g compliant wireless clients are able to gain full profit of the 54 Mb/s (Max) bandwidth delivered by the M505. It is highly recommended to use only wireless client adapters that are Wi-Fi™ certified to ensure smooth interoperability with the M505's WLAN.

Radio Transmission

Wireless LAN or WLAN devices use electromagnetic waves within a broad, unlicensed range of the radio spectrum to transmit and receive radio signals. When a wireless access point is present, it becomes a base station for the WLAN nodes in its broadcast range. WLAN nodes transmit digital data using FM (frequency modulation) radio signals. WLAN devices generate a carrier wave and modulate this signal using various techniques. Digital data is superimposed onto the carrier signal. This radio signal carries data to WLAN devices within range of the transmitting device. The antennae of WLAN devices listen for and receive the signal. The signal is demodulated and the transmitted data extracted. The transmission method used by the access point is called Direct Sequence Spread Spectrum (DSSS) and operates in a range of the radio spectrum between 2.4GHz and 2.5GHz for transmission.

Antennas

Direct the external antenna to allow optimization of the wireless link. If for example the antenna is erect, wireless links in the horizontal plane are favored. Please note that the antenna characteristics are influenced by the environment that is by reflections of the radio signal against walls or ceilings. It is advisable to use the received signal strength as indicated by the wireless client manager to optimize the antenna position for the link to a given client. Concrete walls weaken the radio signal and thus affect the connection.

Wireless Range

Range should not be a problem in most homes or small offices. If you experience low or no signal strength in some areas, consider positioning the Router in a location between the WLAN devices that maintains a roughly equal straight-line distance to all devices that need to access the Router through the wireless interface. Adding more 802.11g access points to rooms where the signal is weak can improve signal strength. Read the section about placement of the Router titled Location in the next chapter, Hardware Installation, for more information.

SSID

Wireless networks use an SSID (Service Set Identifier) to allow wireless devices to roam within the range of the network. Wireless devices that wish to communicate with each other must use the same SSID. Several access points can be set up using the same SSID so that wireless stations can move from one location to another without losing connection to the wireless network. The M505 operates in Infrastructure mode. It controls network access on the wireless interface in its broadcast area. It will allow access to the wireless network to devices using the correct SSID after a negotiation process takes place.

By default the M505 broadcasts its SSID so that any wireless station in range can learn the SSID and ask permission to associate with it. Many wireless adapters are able to survey or scan the wireless environment for access points. An access point in Infrastructure mode allows wireless devices to survey that network and select an access point with which to associate. You may disable SSID broadcasting in the web manager's wireless menu.

Radio channels

The 802.11g standard allows several WLAN networks using different radio channels to be co-located. The M505 supports multiple radio channels and is able to select the best radio channel at each startup. You can choose to set the channels automatically or manually.

The different channels overlap. To avoid interference with another access point, make sure that the separation (in terms of frequency) is as high as possible. It is recommended to keep at least 3 channels between 2 different access points.

The M505 supports all channels allowed for wireless networking. However, depending on local regulations, the number of channels actually allowed to be used may be additionally restricted, as shown in the table below.

Regulatory Domain	Allowed Radio Channels
China	1 to 13
Europe	1 to 13
Israel	5 to 8
Japan	1 to 14
Jordan	10 to 13
Thailand	1 to 14
USA / Canada	1 to 11

Wireless Security

Various security options are available on the M505 including open or WEP, 802.1x, WPA, WPA-PSK, WPA2 and WPA2-PSK. Authentication may use an open system or a shared key. For details on these methods and how to use them, please read the wireless LAN configuration information in Section 3.5.3 (Wireless Security Configuration).

About 802.11g Wireless

802.11b is an IEEE standard, operating at 2.4 GHz at a speed of up to 11 Mb/s. 802.11g, a newer IEEE standard also operating at 2.4 GHz, gives you up to 54 Mb/s speed, more security and better performance.

Today's 11-megabits-per-second 802.11b wireless networks are fine for broadband Internet access (which typically tops out at about 1 mbps) but rather slow for large internal file transfers or streaming video. However, 54-mbps, corporate-oriented 802.11a is expensive and because its radio uses the 5-GHz band and 802.11b uses the 2.4-GHz band, upgrading to an 802.11a network means either scrapping 802.11b gear or buying even-pricier hardware that can support both standards. But 802.11g promises the same speed as 802.11a and the ability to coexist with 802.11b equipment on one network, since it too uses the 2.4-GHz band. 802.11g is an extension to 802.11b, the basis of many wireless LANs in existence today. 802.11g will broaden 802.11b's data rates to 54 Mbps within the 2.4 GHz band using OFDM (orthogonal frequency division multiplexing) technology. Because of backward compatibility, an 802.11b radio card will interface directly with an 802.11g access point (and vice versa) at 11 Mbps or lower depending on range.

6.1 - Basic

This page allows you to configure basic features of the wireless LAN interface. You can enable or disable the wireless LAN interface, hide the network from active scans (no broadcasting of your network name), set the wireless network name (also known as SSID), and restrict the channels based on nation's requirements.

Check "Enable Wireless" to enable wireless radio; or uncheck to disable.

"SSID" is the network name shared among all devices in a wireless network.

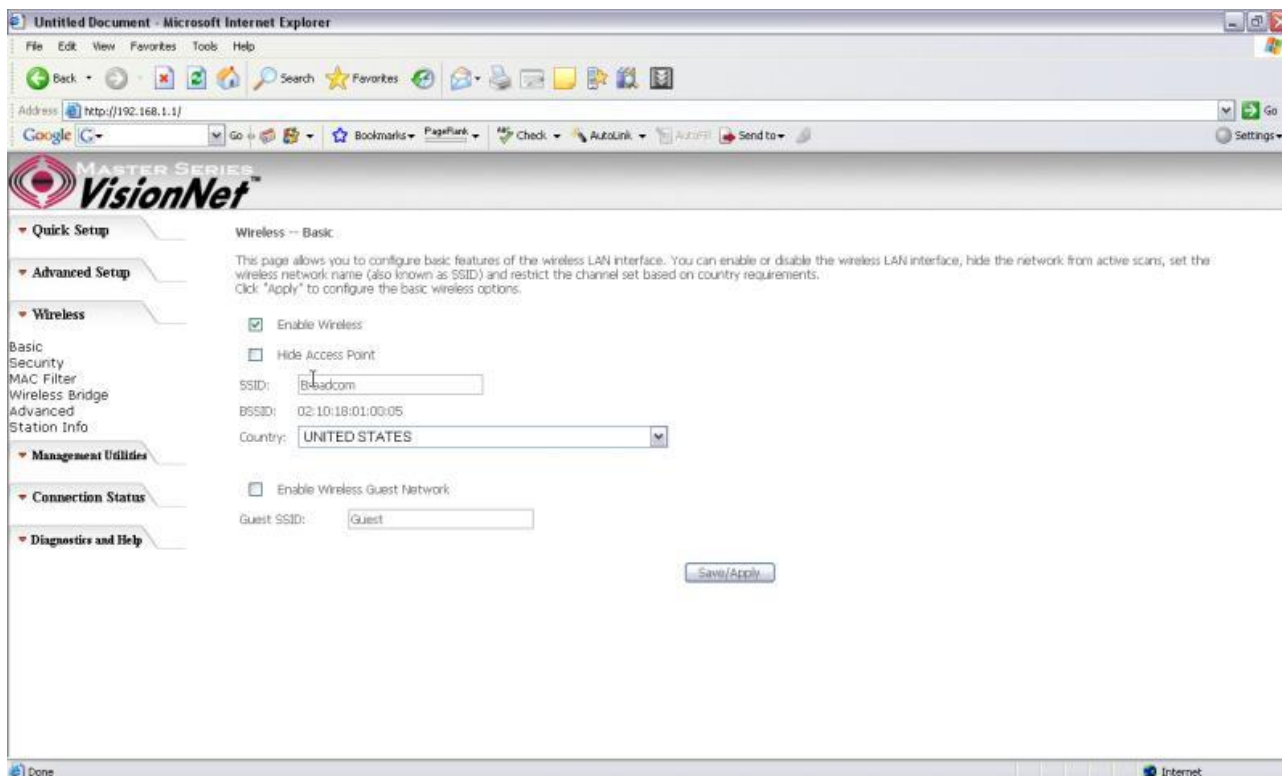


Figure 56. Wireless Setup - Basic

6.2 – Security

Four types of wireless security are provided: Shared (WEP), 802.1x, WPA/WPA2, and WPA/WPA2-PSK.

WEP

WEP (**W**ired **E**quivalent **P**rivacy) provides security by encrypting data over radio waves when data is transmitted from one end point to another. WEP is the weakest security method but the easiest one to configure. To enable WEP, select the following items step by step:

Network Authentication: Shared

Data Encryption: Enabled

Encryption Strength: 128-bit (recommended for better security) or 64-bit

Click “Set Encryption Key” to enter your WEP keys.

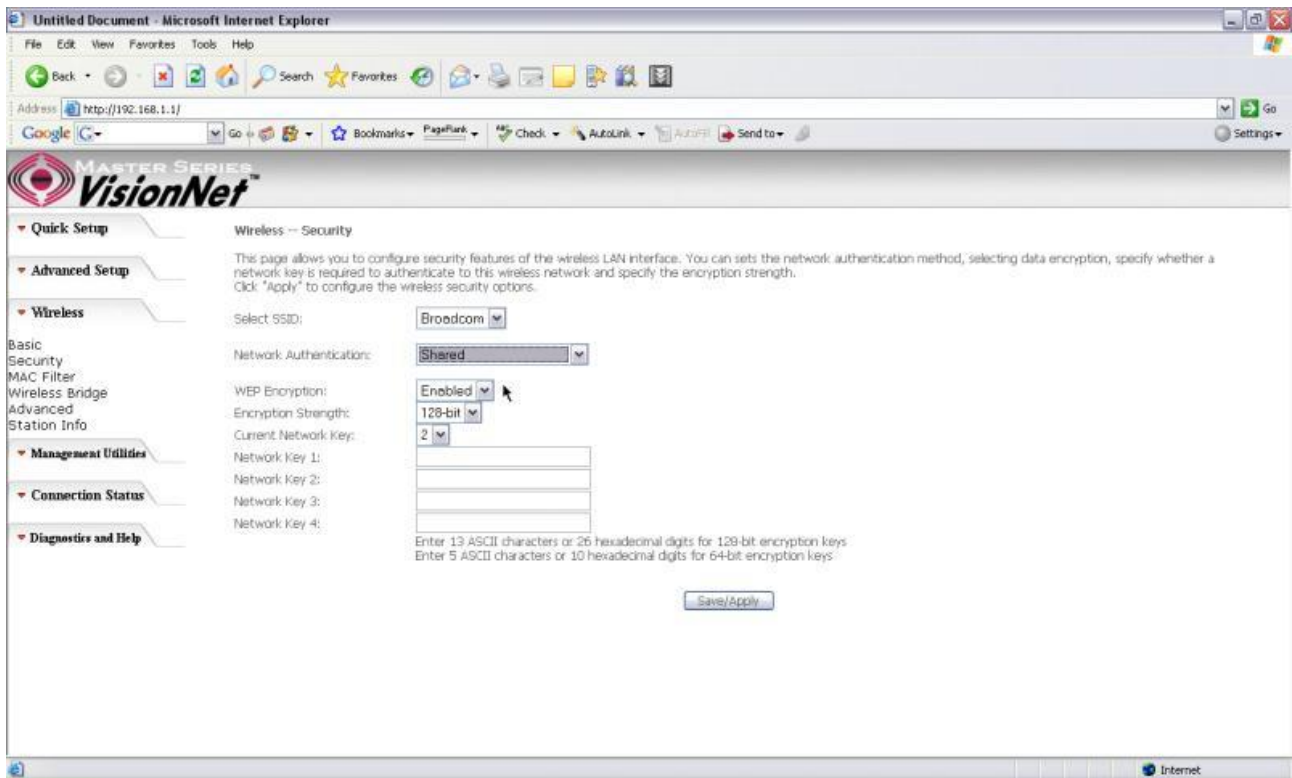


Figure 57. Wireless Setup – Security – WEP

Four keys for both encryption strengths can be stored here. Enter 13 ASCII characters or 26 hexadecimal digits for 128-bit encryption keys. Enter 5 ASCII characters or 10 hexadecimal digits for 64-bit encryption keys. Select which key (1 ~ 4) to use from “Current Network Key”. Click “Save/Apply” to save the configuration.

802.1X

802.1X addresses the WEP weakness by adding user authentication, via RADIUS server. So you need to have your RADIUS server up and running before using 802.1X. To enable 802.1X, select “802.1X” in “Network Authentication”. Enter your RADIUS server IP address, port number (default: **1812**), and key. Follow the WEP security section to configure your WEP key and select “Save/Apply” to save your configuration.

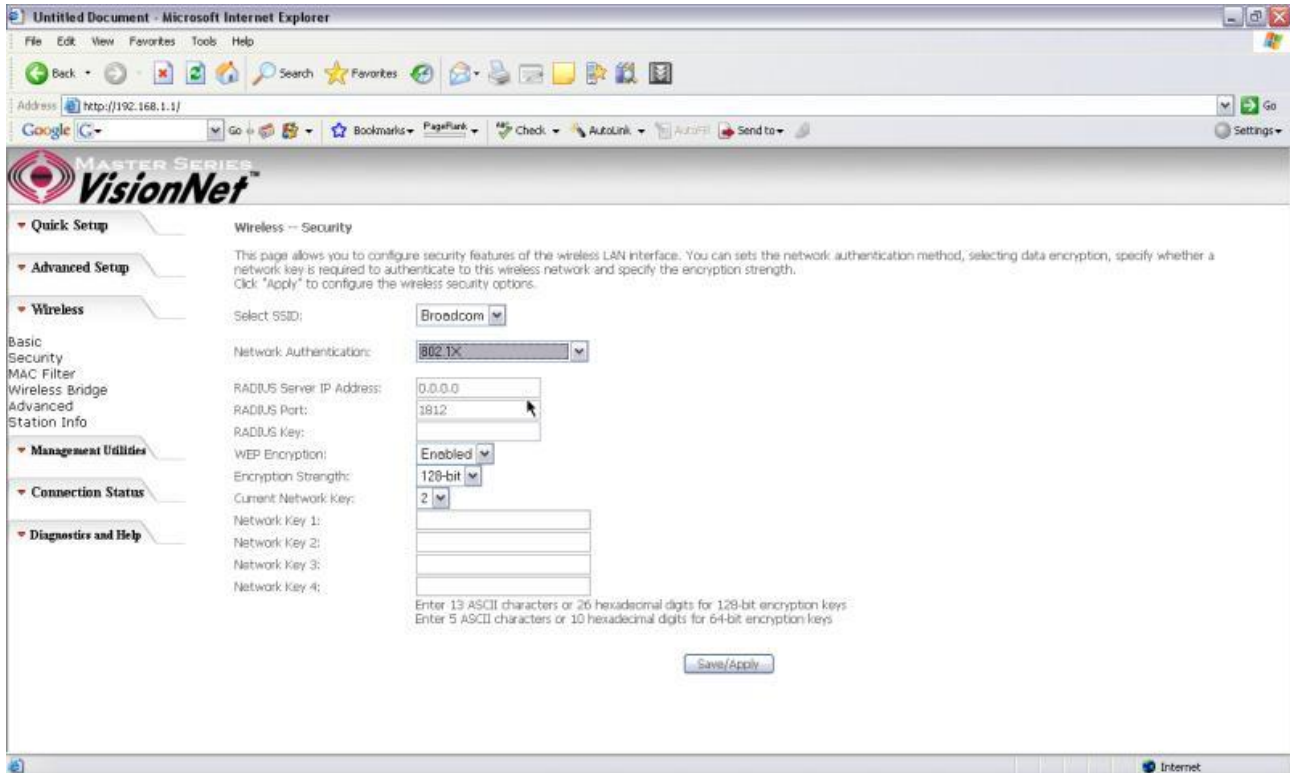


Figure 58. Wireless Setup – Security – 802.1X

WPA/WPA2

WPA (Wi-Fi Protected Access) is the strongest wireless security provided by the M505. Like 802.1X, WPA must co-work with RADIUS server as well. To enable WPA, select the following items step by step:

Network Authentication: WPA/WPA2

WPA Group Rekey Interval: in seconds. Default: **0** (no re-keying).

RADIUS Server IP Address/Port/Key: must match your RADIUS server.

WPA Encryption: TKIP (select AES or TKIP+AES for WPA2).

Check your supplicant capability before you decide which one to use.

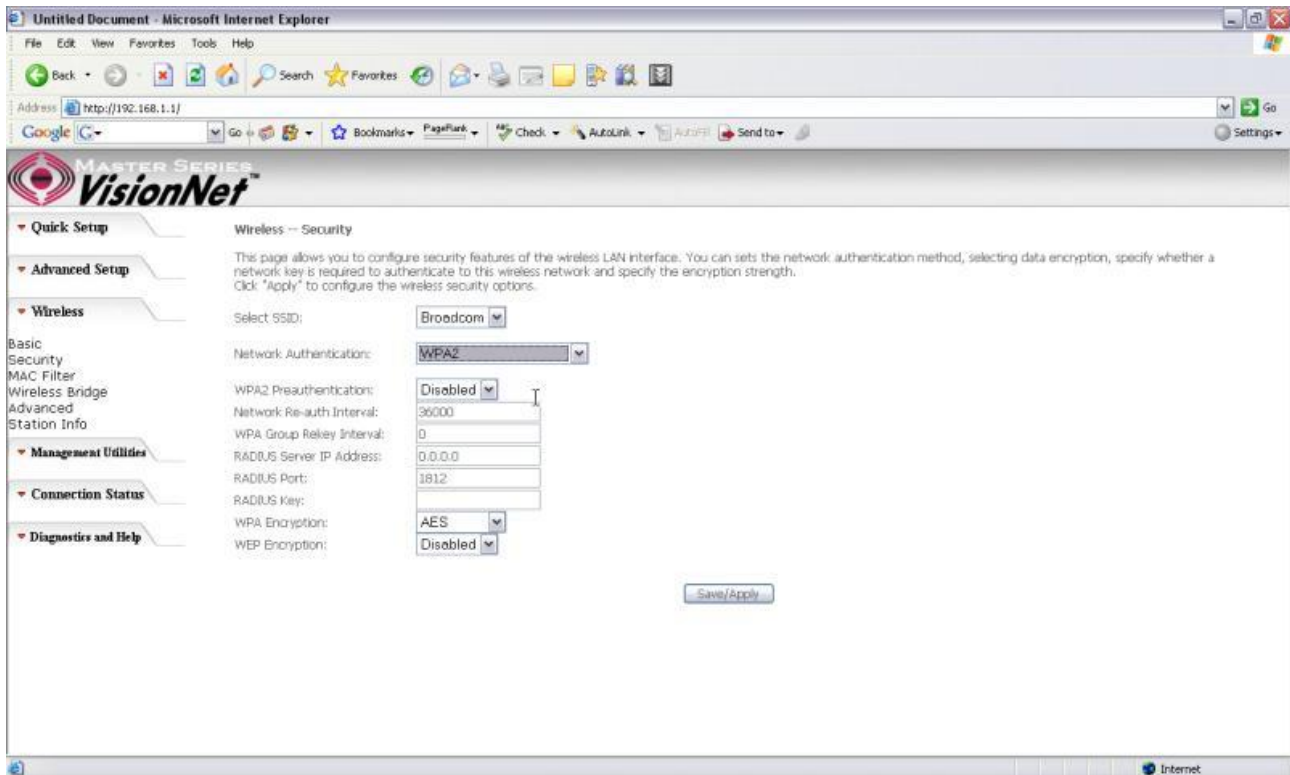


Figure 59. Wireless Setup – Security – WPA

WPA/WPA2-PSK

WPA-PSK lets you take advantage of WPA without the hassle of setting up your own RADIUS server. To enable WPA-PSK, select “WPA-PSK” in “Network Authentication”. Enter 8 to 63 ASCII codes or 64 hexadecimal (0~9, A~F) digits in “WPA Pre-Shared Key”. Click “Save/Apply” to save the configuration.

*Note – You must also input the WPA Pre-Shared Key on the client side (i.e. Wireless Laptop, Desktop, Game Consoles, etc.) to be able to connect to the modem. Please contact the manufacturer of your device for more information.

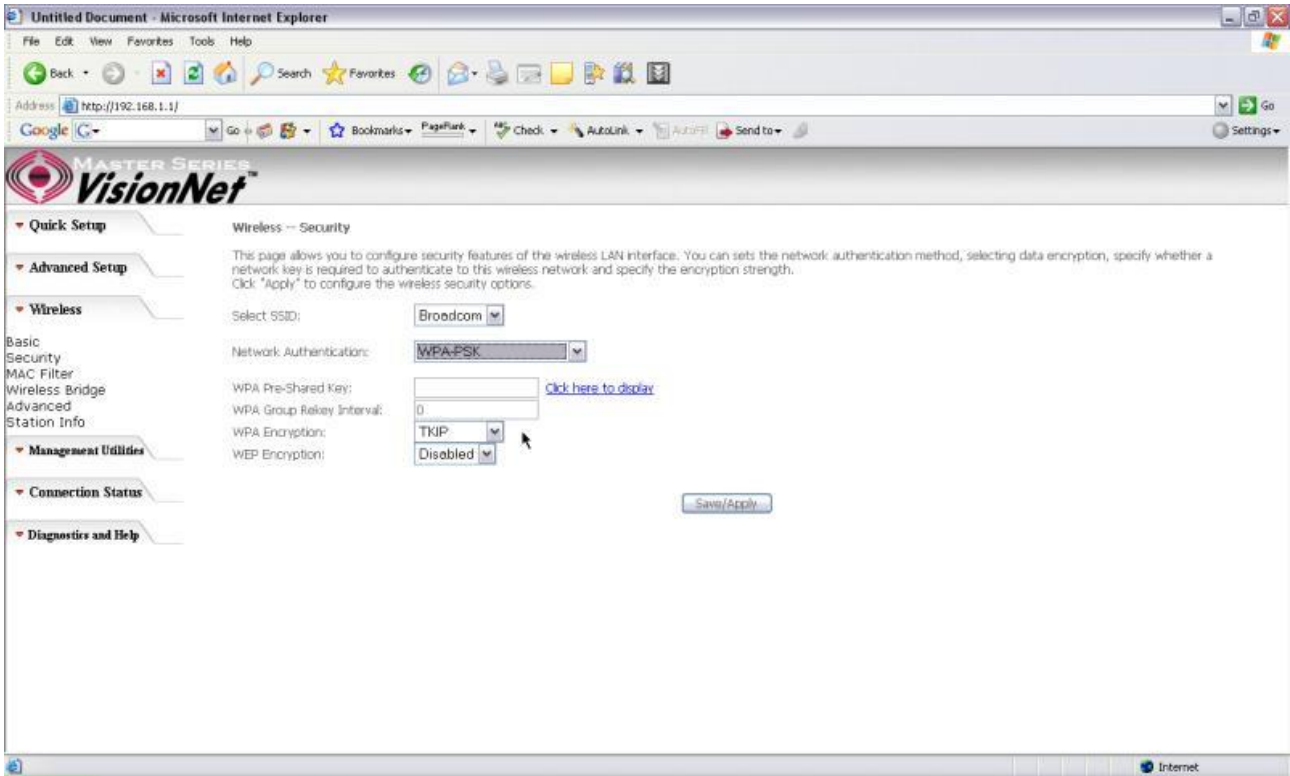


Figure 60. Wireless Setup – Security – WPA-PSK

6.3 – MAC Filter

Wireless MAC filter allows you to implement access control based on device's MAC address.

When you select “Allow” in “MAC Restrict Mode”, only data from devices with matching MAC addresses in filter table can access the M505. If you select “Deny” in “MAC Restrict Mode”, every device can access the M505 except those which have matching MAC addresses in the filter table. To add filter entry, click on “Add” and enter the MAC address of the M505. Click “Save/Apply” to save the configuration. To “delete” the entry, select the entry and click “Remove”.

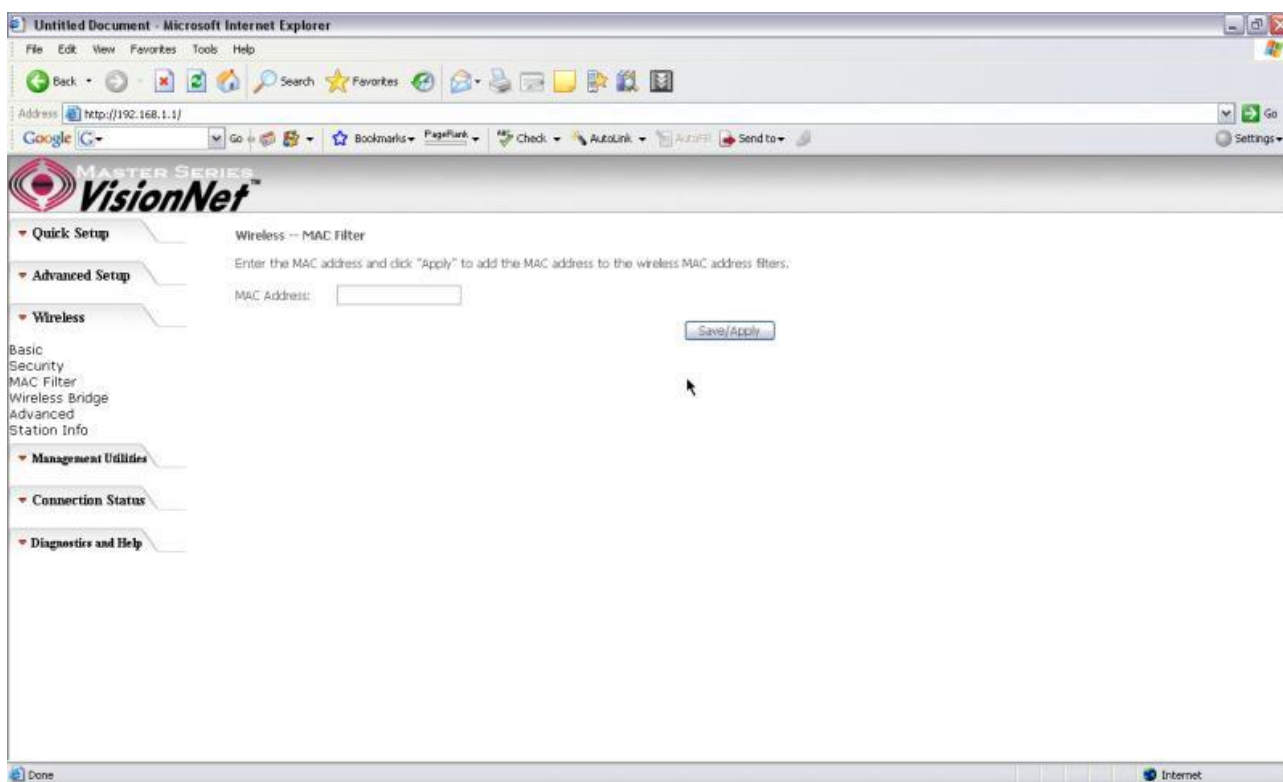


Figure 61. Wireless Setup – MAC Filter

6.4 – Wireless Bridge

Wireless Bridge (also known as Wireless Distribution System) can bridge data between two APs, which is particularly useful while wired cabling is not available.

Note: only APs in same channel can be bridged.

AP Mode: Wireless Bridge- listens and answers other APs only

Access Point- Wireless Bridge also with AP functionality

Bridge Restrict: Disabled- any AP will be granted access

Enabled- only selected APs (Max. 4) with specified MAC address will be granted access

Enabled (Scan)- as above, but the M505 will scan available AP for you to select.

Refresh: re-scan the available AP

Save/Apply: save the configuration

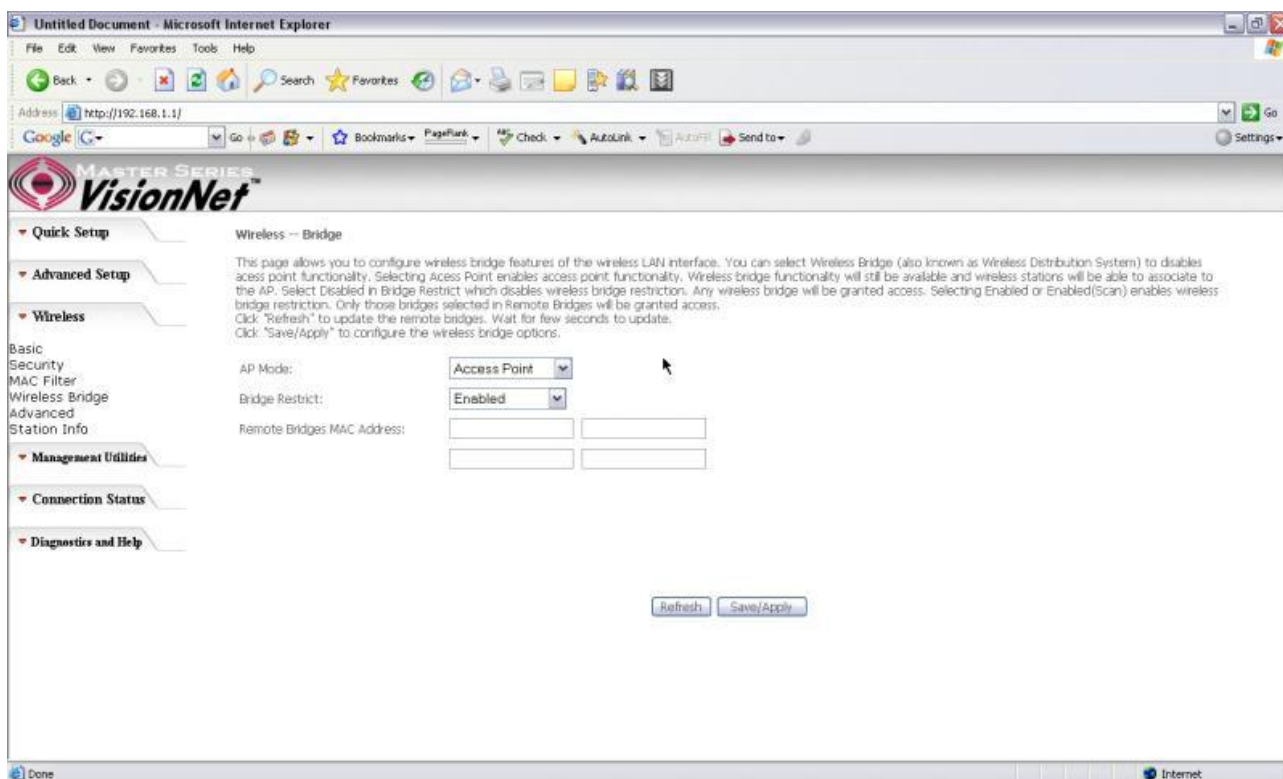


Figure 62. Wireless – Wireless Bridge

6.5 - Advanced

System In most cases, M505 work well with wireless default settings. Modification is not recommended unless you are very familiar with these parameters.

Channel: Select the appropriate channel from the provided list to correspond with your network settings. All devices in your wireless network must use the same channel in order to function correctly. Default: **11**.

Rate: The range is from 1 to 54Mbps. The data transmission rate should be set according to the speed of your wireless network. You can set one transmission speed, or

keep the default setting “Auto” to have the router automatically detect the fastest possible data rate.

Basic Rate Set: Select the basic rate that wireless clients must support.

Fragmentation: This value should remain at its default setting of **2346**. The range is 256-2346 bytes. This value specifies the maximum packet size before data is fragmented into multiple packets. If you experience a high packet error rate, you may slightly lower the Fragmentation value. Setting the Fragmentation too low may result in poor network performance. Only slight adjustment of this value is recommended.

RTS Threshold: This value should remain at its default setting of **2347**. The range is 0-2347 bytes. Should you encounter inconsistent data flow, only slight adjustment of this value is recommended. If a network packet is smaller than the preset RTS threshold size, the RTS/CTS mechanism will not be enabled. M505 sends Request to Send (RTS) frames to a particular receiving station and negotiates the transmission of a data frame. After receiving an RTS, the wireless station responds with a Clear to Send (CTS) frame to acknowledge the right to begin transmission.

DTIM Interval: This value, between 1 and 255 milliseconds, indicates the interval of the Delivery Traffic Indication Message (DTIM). A DTIM interval is a countdown field which is used to inform clients about the next window for listening to broadcast and multicast messages. When M505 has buffered broadcast or multicast for associated clients, it sends the next DTIM with a DTIM Interval value. Its clients hear the beacons and awaken to receive the broadcast and multicast message. Default: **3**.

Beacon Interval: Enter a value between 1 and 65535 milliseconds. The Beacon Interval indicates the frequency interval of the beacon. A beacon is a packet broadcast by M505 to synchronize the wireless network. Default: **100**.

54g Mode: There are 3 selections. Select **54g Auto** for the widest compatibility. Select **54g Performance** for the fastest performance. Select **54g LRS** if you are experiencing difficulty with legacy 802.11b equipment.

54g protection: In **Auto** mode, M505 will use RTS/CTS to improve 802.11g performance in mixed 802.11g/802.11b network. Turn **off** protection to maximize 802.11g throughput under most conditions.

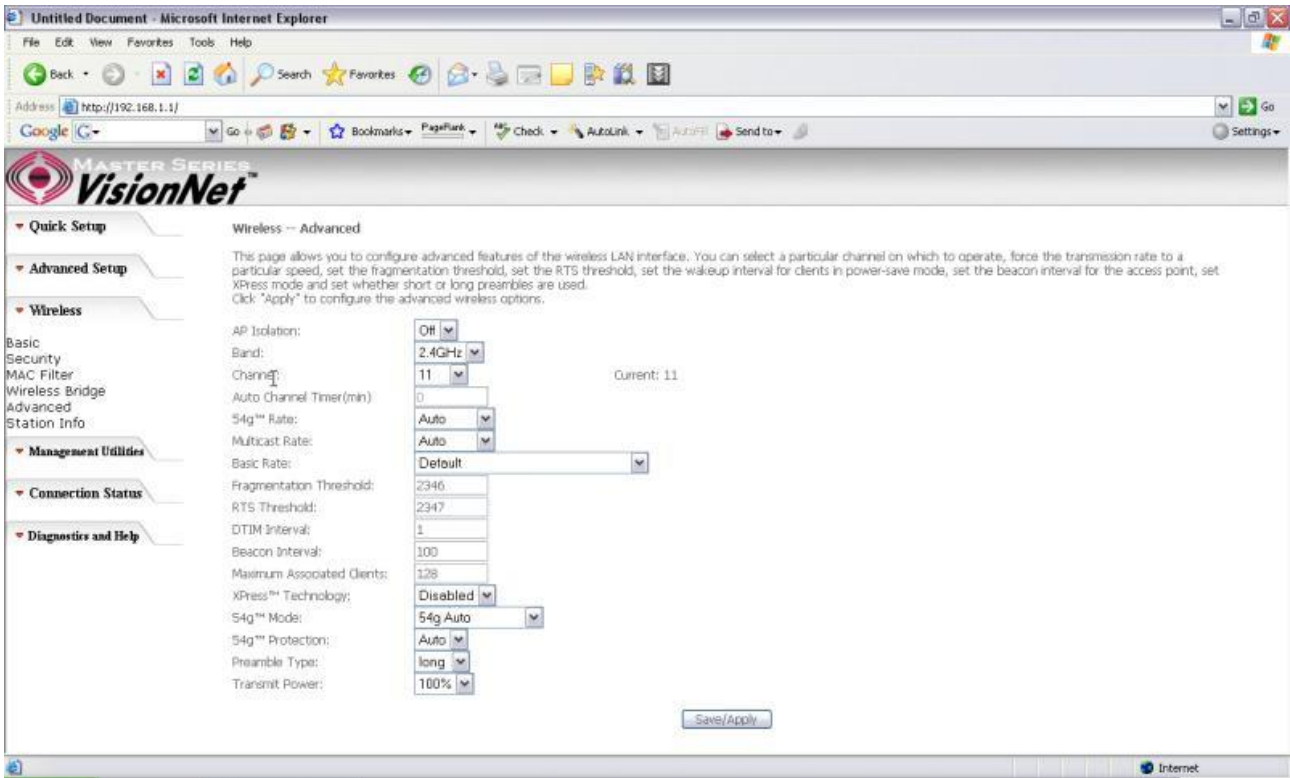
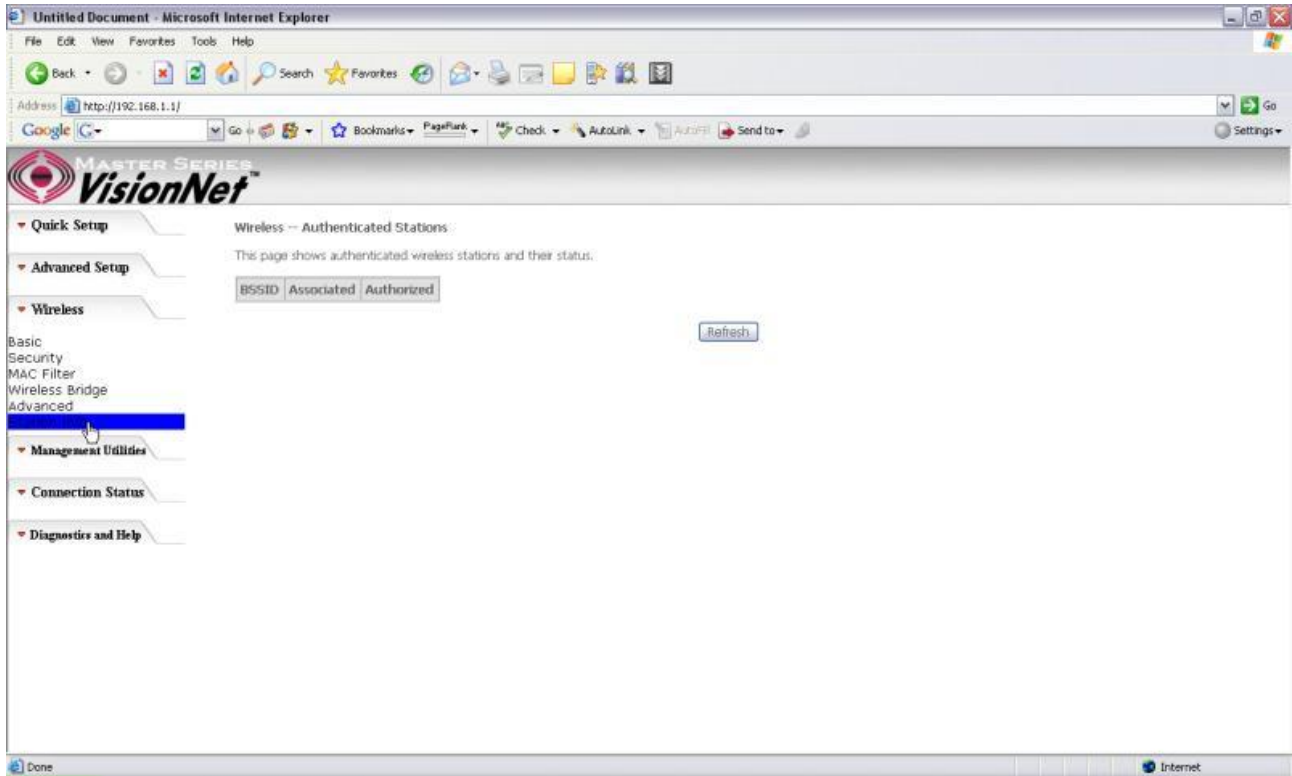


Figure 63. Wireless Setup – Advanced

6.6 – Station Info

This page shows authenticated wireless stations and their status.



7. Management Utilities

7.1 - Backup Settings

System Administrator can do the M505 settings backup, update, and restore default here. The settings can be saved from M505 to PC. The saved setting file can also be loaded from PC to M505. These 2 functions can help the system administrator to manage large amount of M505 efficiently. Restore Default would set the M505 with the factory default configuration.

To backup the current configurations, click on “Backup Settings”, and a File Download window will pop up.

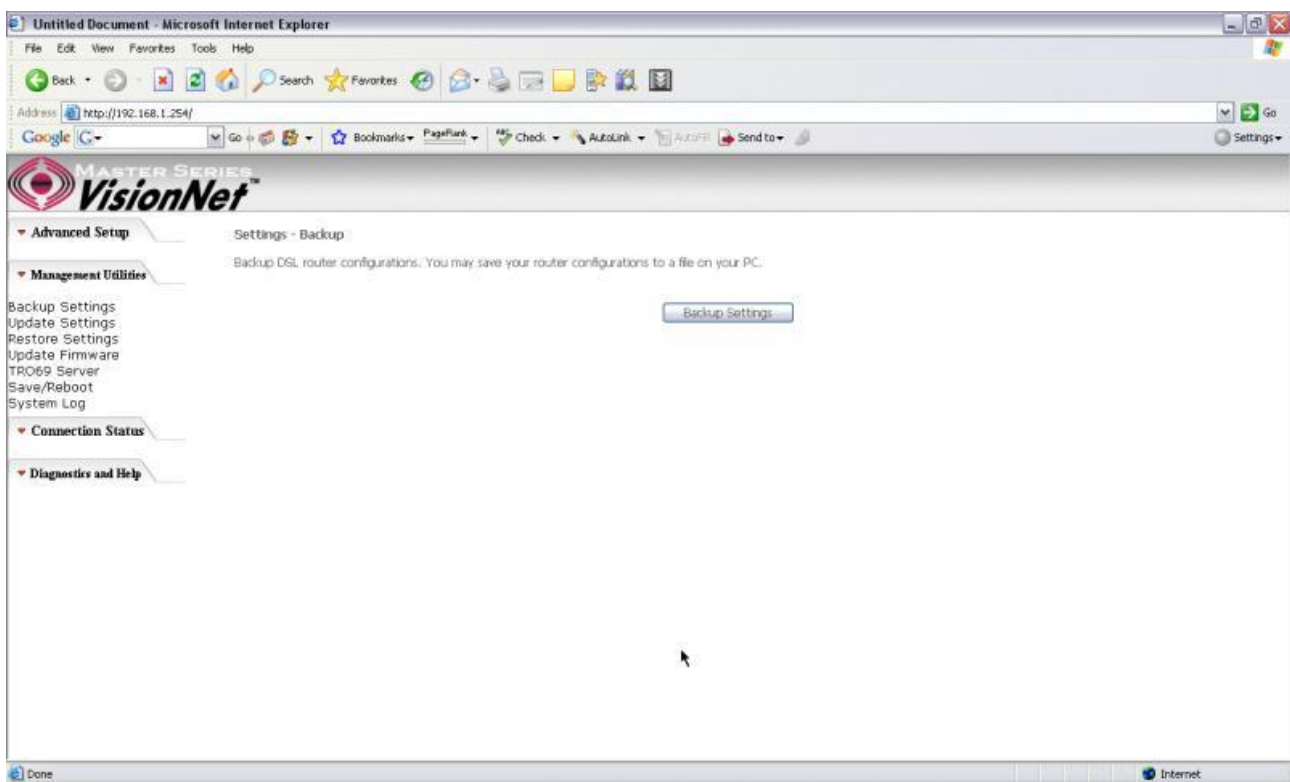


Figure 64. Management Utilities – Backup Settings

Click on “Save” and select the destination of the backup file (backupsettings.cfg) in your local PC. Click on “Save” again to save your backup file.



Figure 65. Management Utilities – Backup Settings – File Download

7.2 - Update Backup Settings

To update the configuration, click on “Browse” and a Choose-File-window will pop up. Locate the saved file and click on “Update Backup Settings”. The M505 will modify its settings based on the update file.

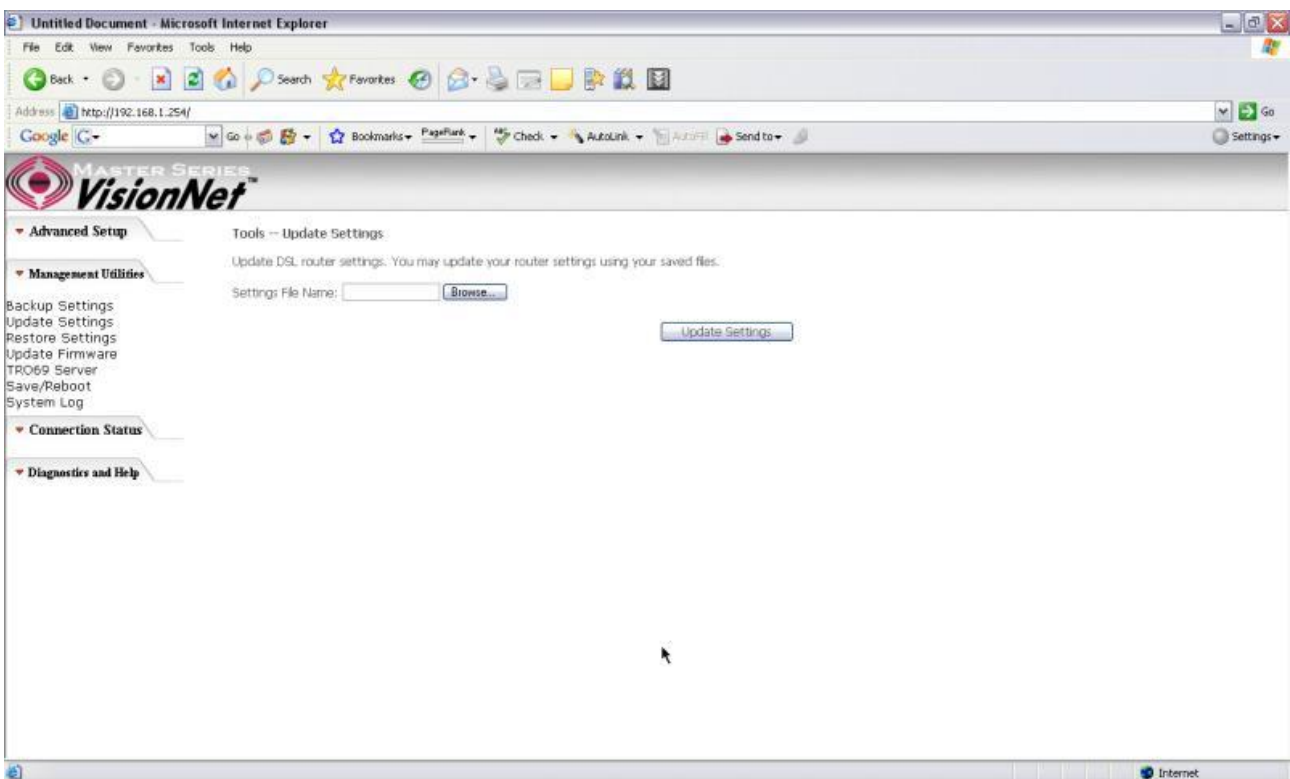


Figure 66. Management Utilities – Update Settings

7.3 - Restore Settings

To restore the router to its factory default settings, click on “Restore Default Settings”.

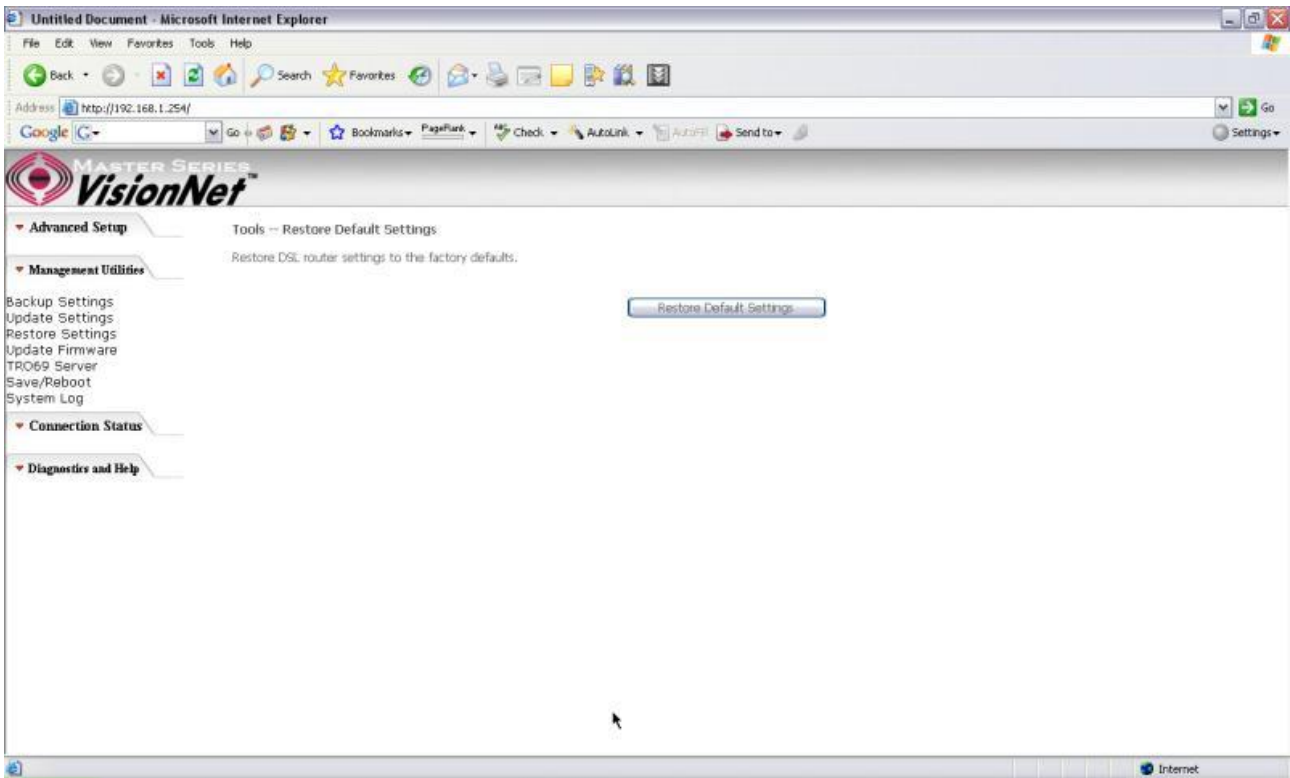


Figure 67. Management Utilities– Restore Default Settings

7.4 - Update Firmware

The new software could be updated from the Local PC connected to M505 via Ethernet cable. Click on “Browse” to locate the new software image file in the PC. And then Click on “Update Software” to proceed with the software update.

Note: The update process takes about 2 minutes to complete, and your M505 will reboot automatically.

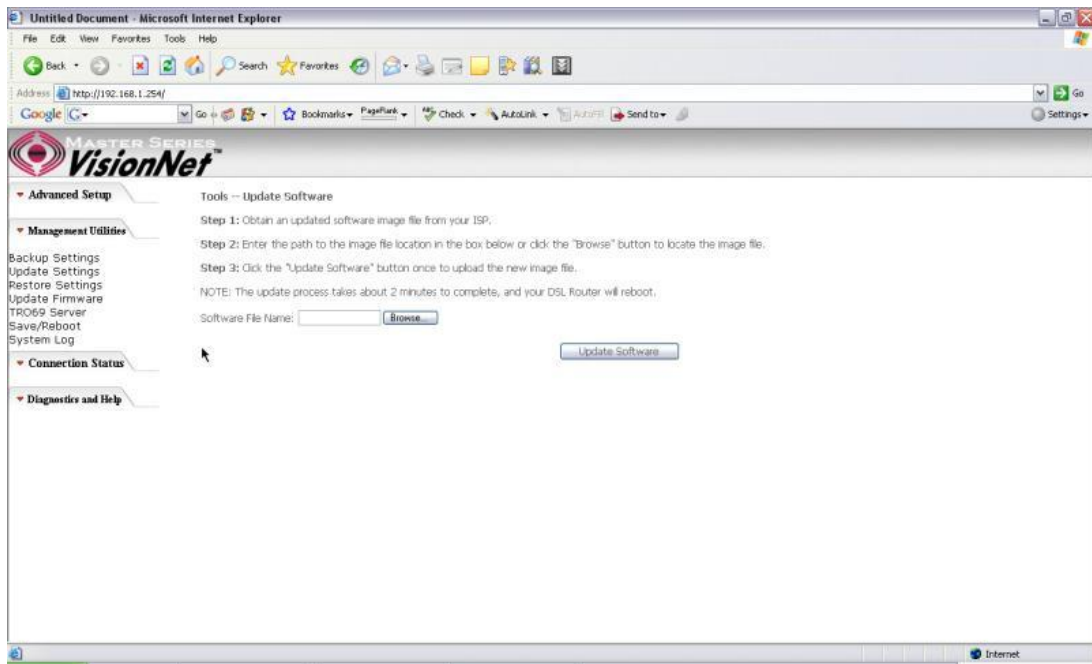


Figure 68. Management Utilities – Update Software

7.5 - TR069 Server

This feature allows your Internet Service Provider’s ACS (Auto Configuration Server) to provision your M505 remotely. Actions such as configuring the modem settings, diagnostic, and collecting data can be accomplish with this feature. The information for the settings to be entered in the fields must be provided by your Internet Service Provider.

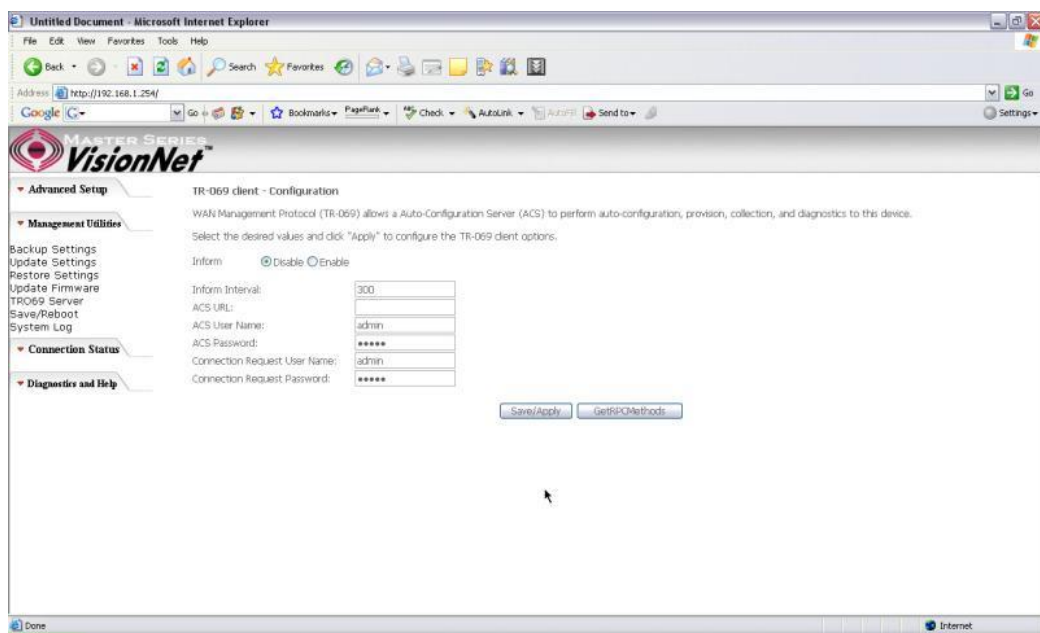


Figure 69. Management Utilities – TR069 Server

7.6 - Save/Reboot

Click “Reboot Router” to reboot M505. The M505 would automatically save the configuration before reboot, so that modified settings would take effect after reboot.

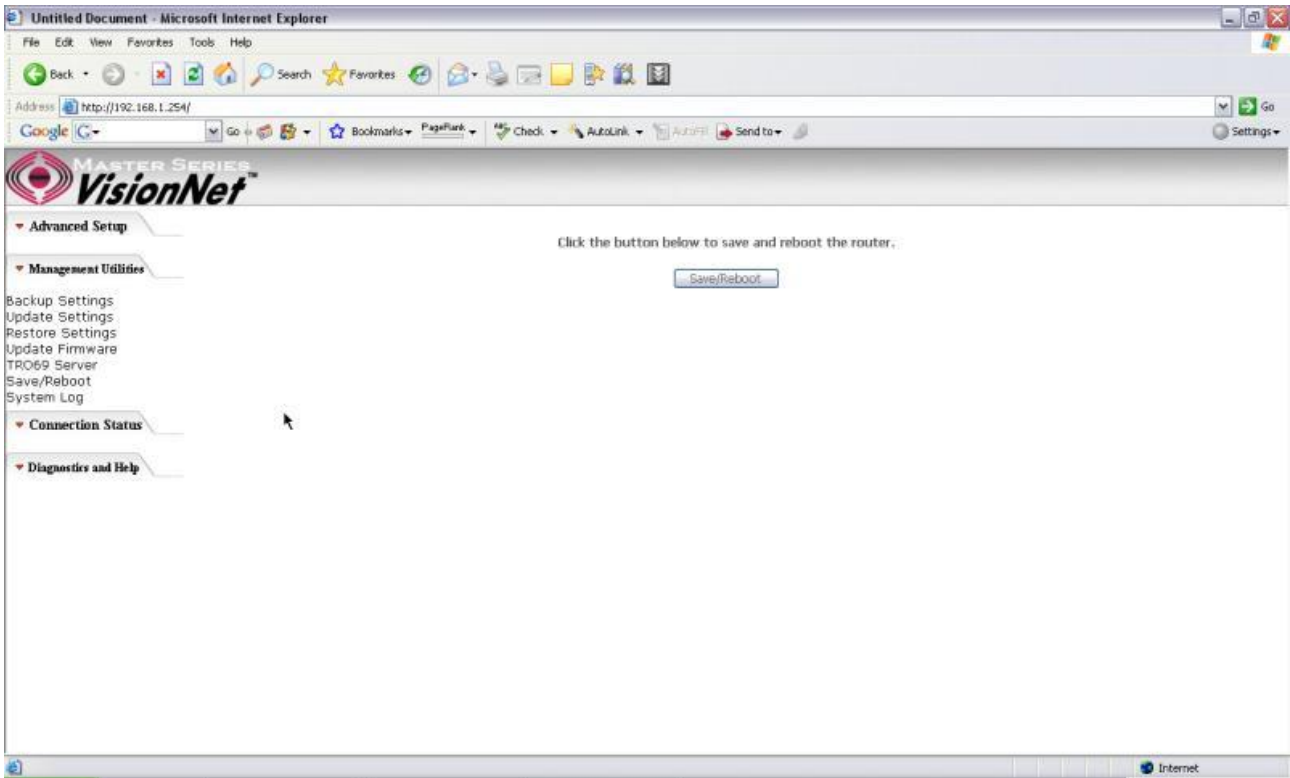


Figure 70. Management Utilities – Save / Reboot

7.7 - System Log

This allows System Administrator to view the System Log and configure the System Log options.

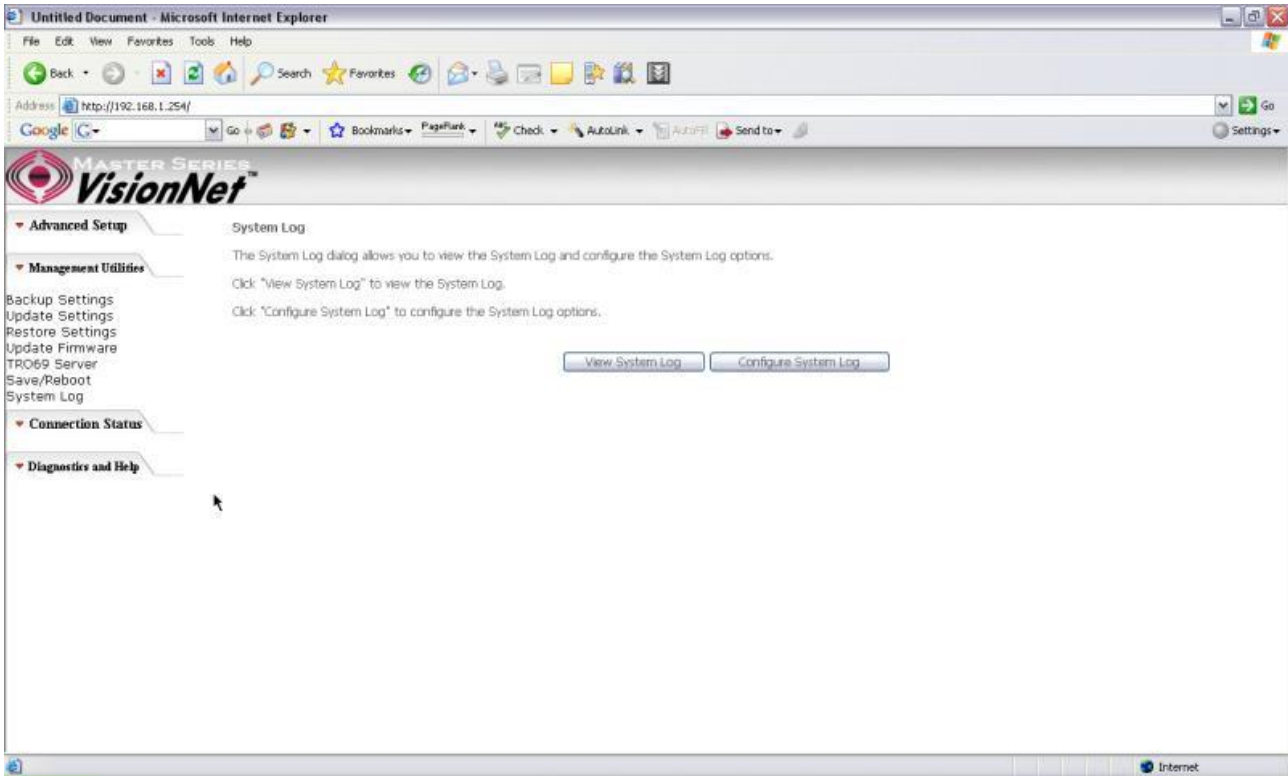


Figure 71. Management Utilities – System Log

Click on “Configure System Log” to configure the log options. There are 8 events of “Log Level” and “Display Level”: **Emergency, Alert, Critical, Error, Warning, Notice, Informational, and Debugging**. If the log mode is enabled, the system will begin to log all the selected events. For the Log Level, all events above or equal to the selected level will be logged. For the Display Level, all logged events above or equal to the selected level will be displayed.

If the selected mode is “Remote” or “Both”, events will be sent to the specified IP address and UDP port of the remote syslog server. If the selected mode is “Local” or “Both”, events will be recorded in the local memory. Click on “Save/Apply” to save the configuration.

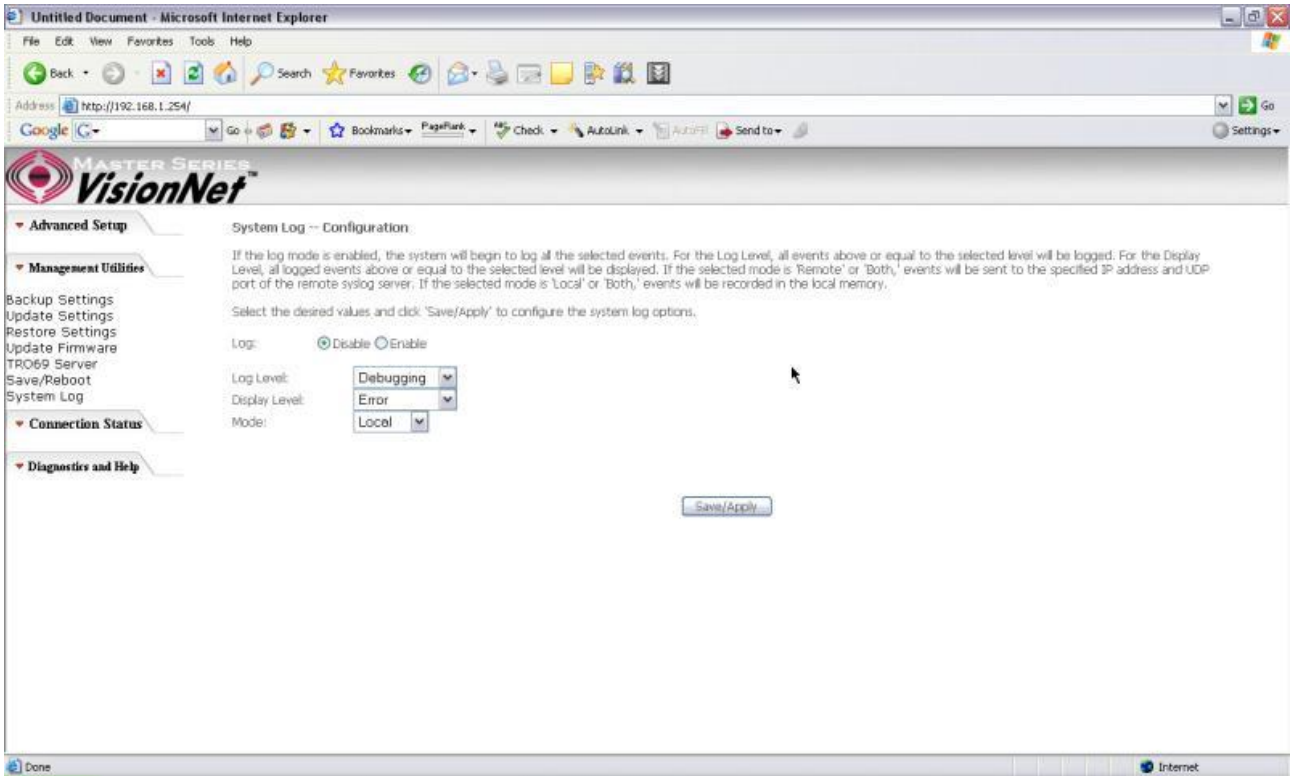


Figure 72. Management Utilities – System Log Configuration

Click on “View System Log” to see the router log based on your configuration

8. Connection Status

8.1 - LAN

This page displays the status of packets transmitted and received on the M505 LAN interfaces.

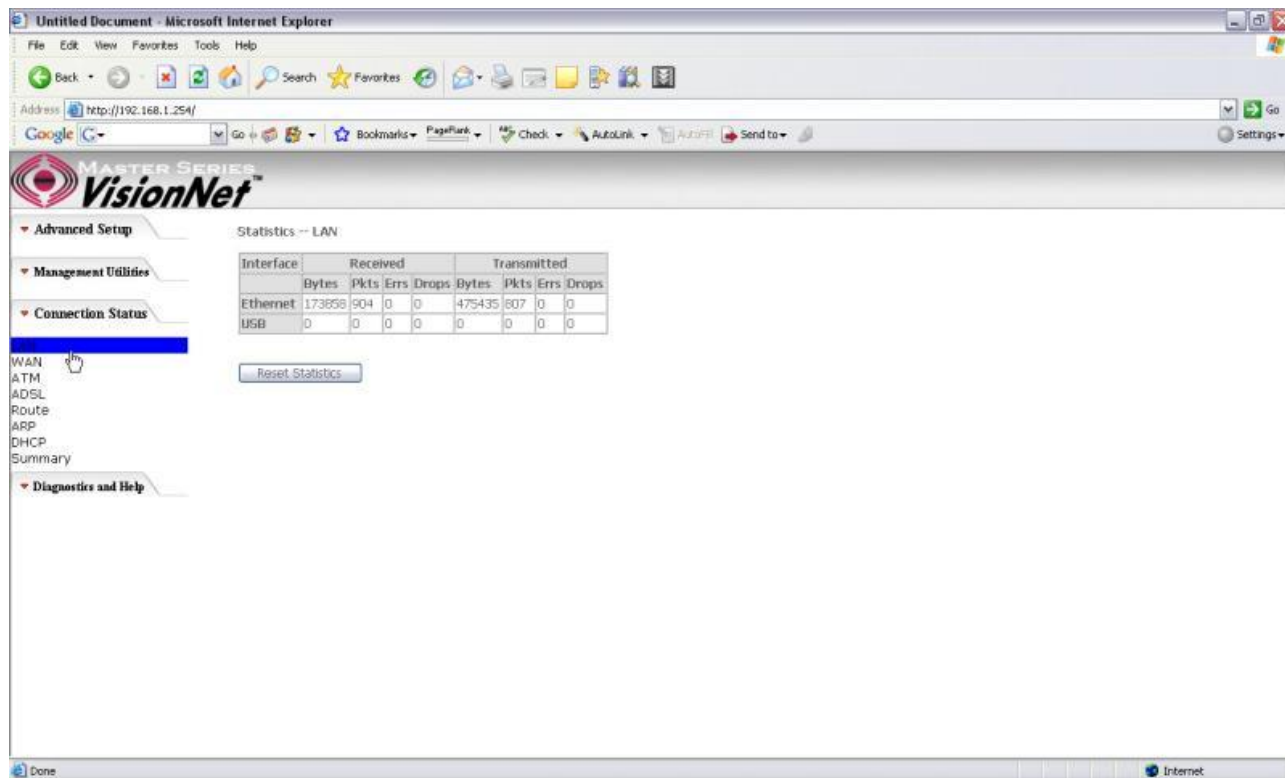


Figure 73. Connection Status – LAN

8.2 - WAN

The WAN Connection Status is broken into 2 parts:

1. Connection – Information concerning the WAN protocol currently in used by the M505 to connect to the Internet. In the figure below: The modem is currently in PPPoE mode, IGMP option is disabled, No Quality of Service is used, the PPPoE connection is Up and the WAN IP address that the modem receives from the Internet Service Provider Equipment.
2. Status – Information concerning Packets Received and Transmitted on the WAN side based on the Protocol used by the M505 (example shows PPPoE connection).

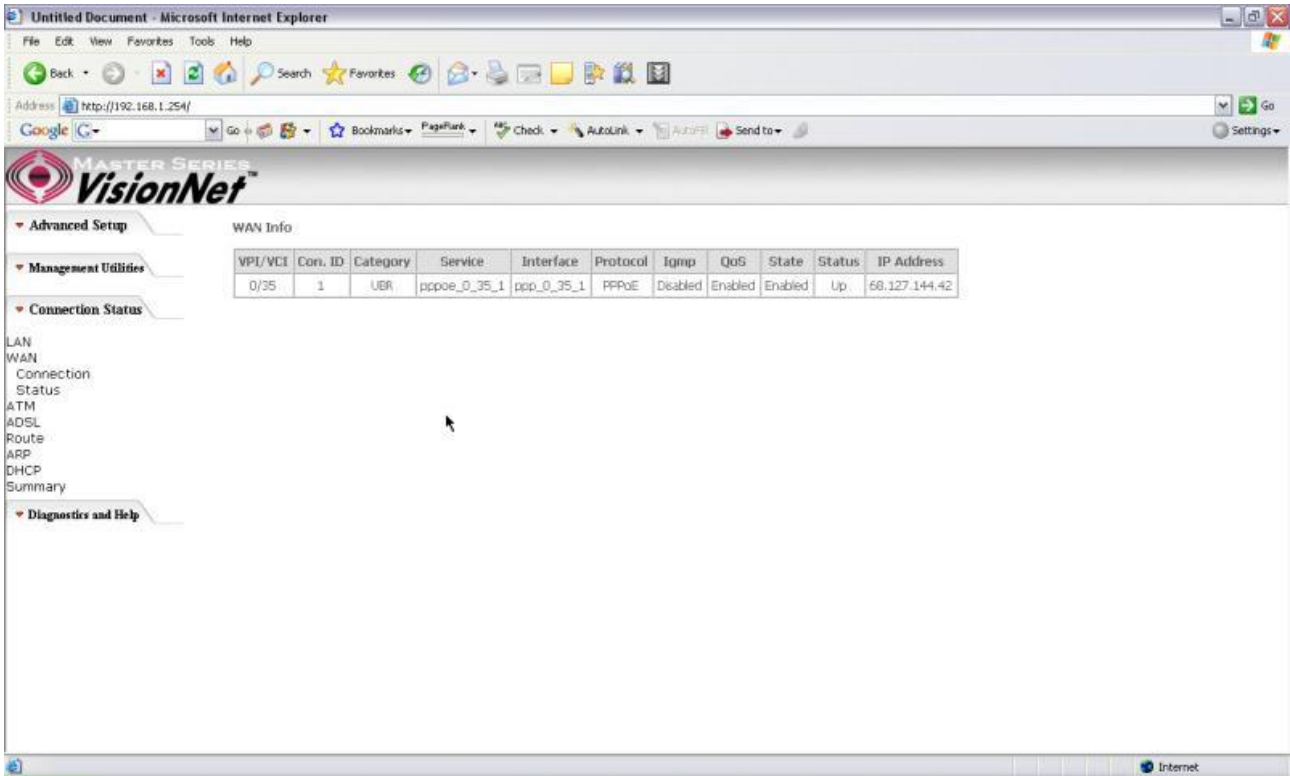


Figure 74. Connection Status – WAN Connection

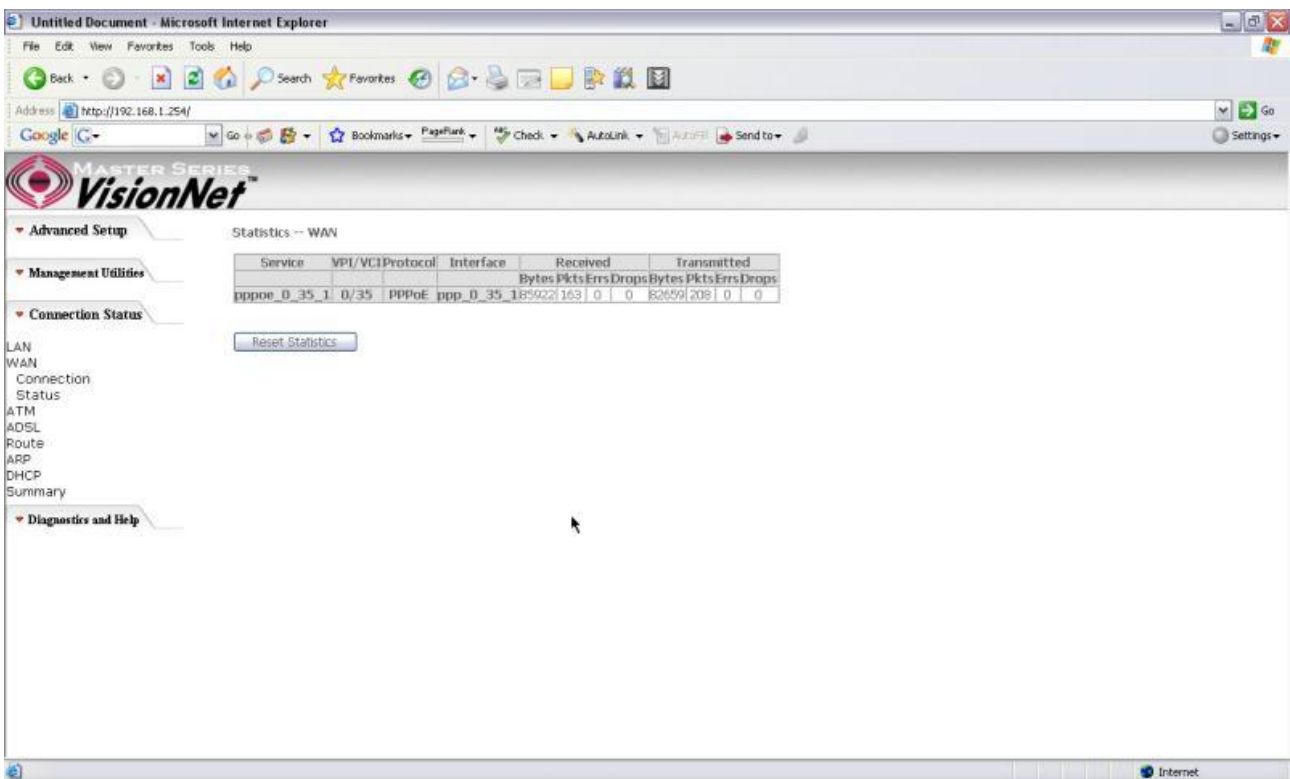


Figure 75. Connection Status – WAN Status

8.3 - ATM

This page displays the statistics of M505 ATM interface (including AAL5).

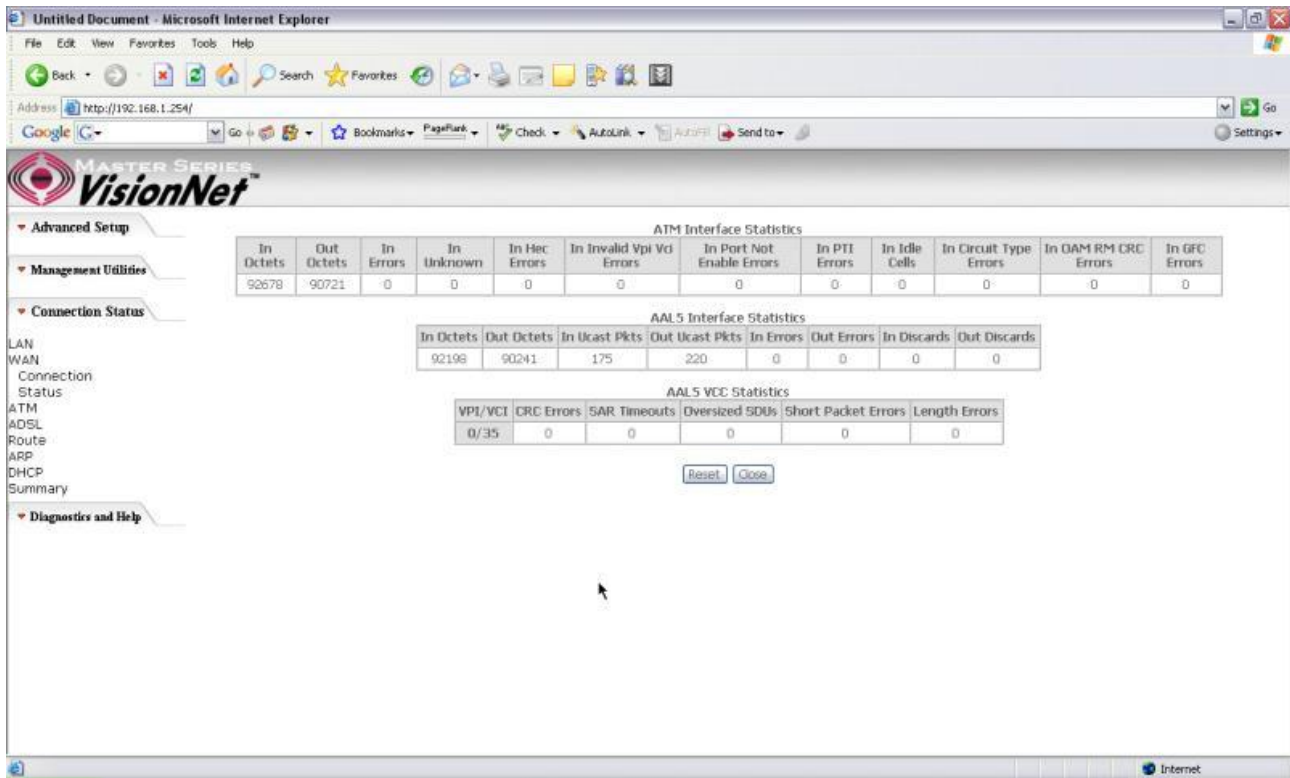


Figure 76. Connection Status – ATM

8.4 - ADSL

This page displays the M505 ADSL connection information and status, such as Rate (Kbps), SNR, ES (Error Second)...etc. This information is useful when there are problems with your ADSL connection (The M505 DSL LED light does not stay solid for example)

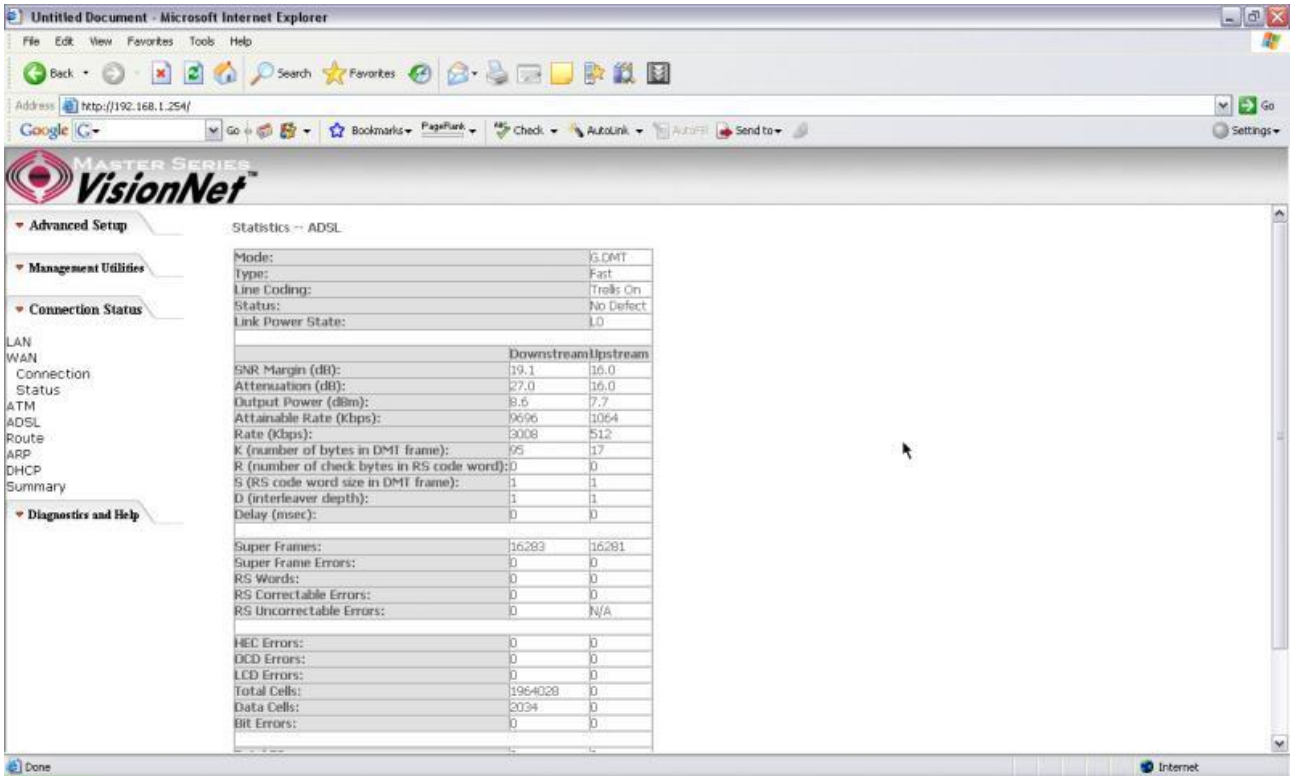


Figure 77. Connection Status – ADSL

8.5 - Route

This page displays the M505 routing table.

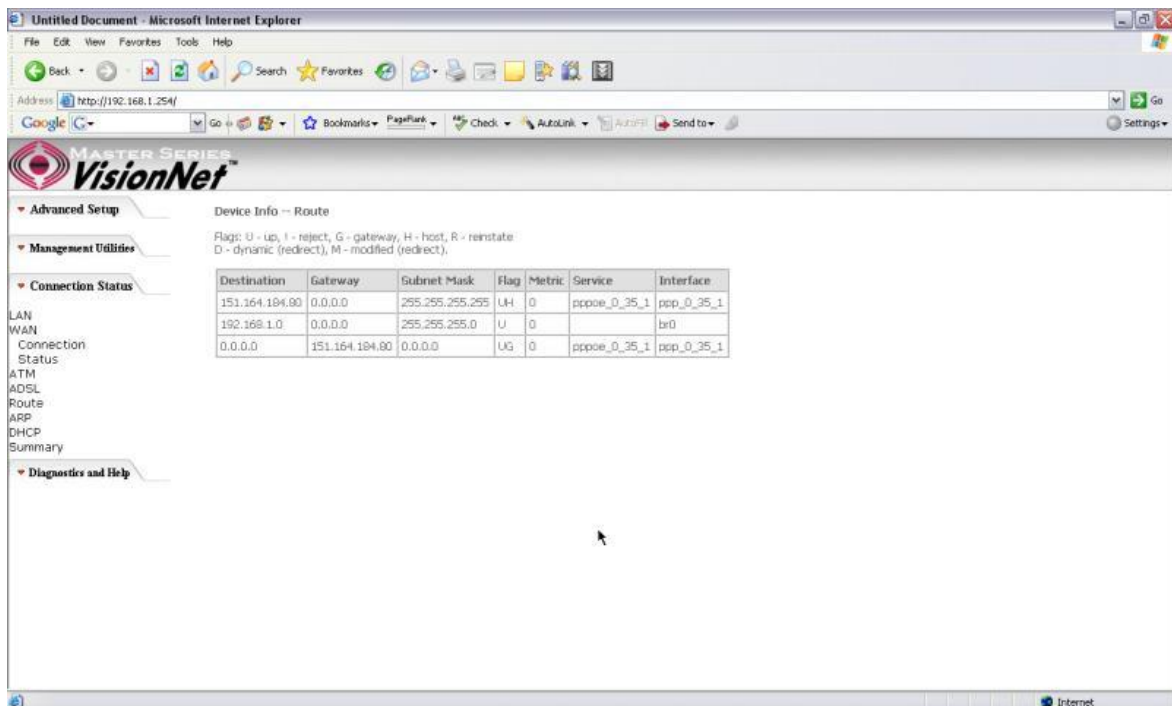


Figure 78. Connection Status – Route

8.6 - ARP (Address Resolution Protocol)

This page displays the M505 ARP table.

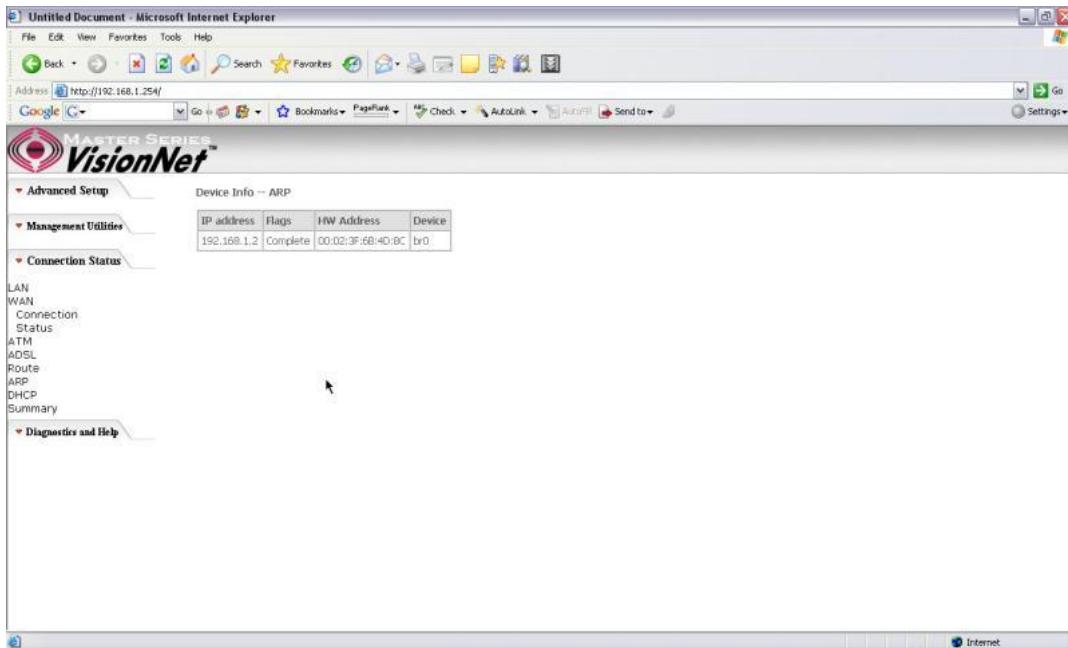


Figure 79. Connection Status – ARP

8.7 - DHCP

This page displays the lease time for PC's or devices connected to the router

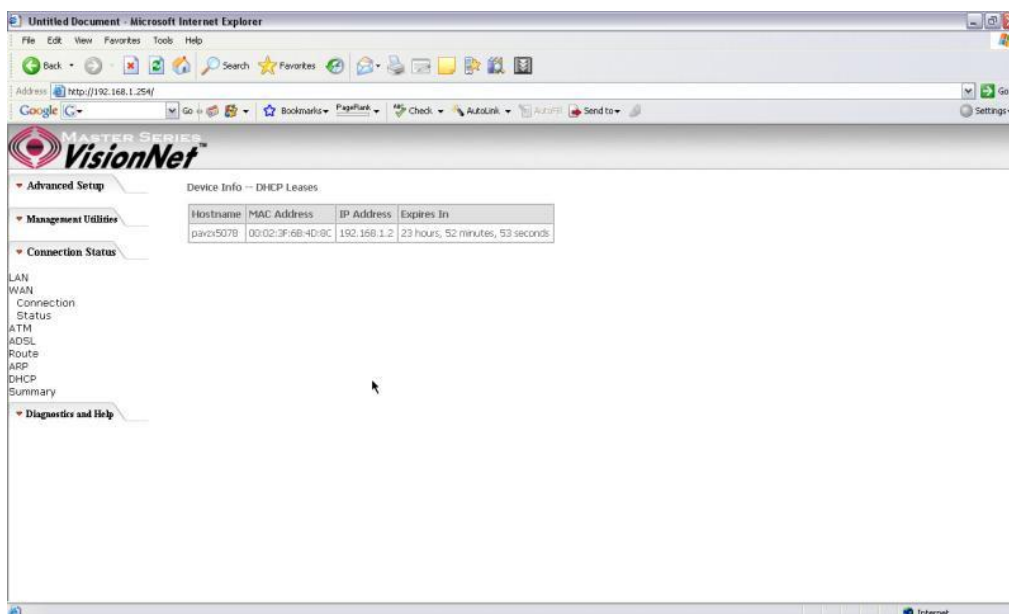
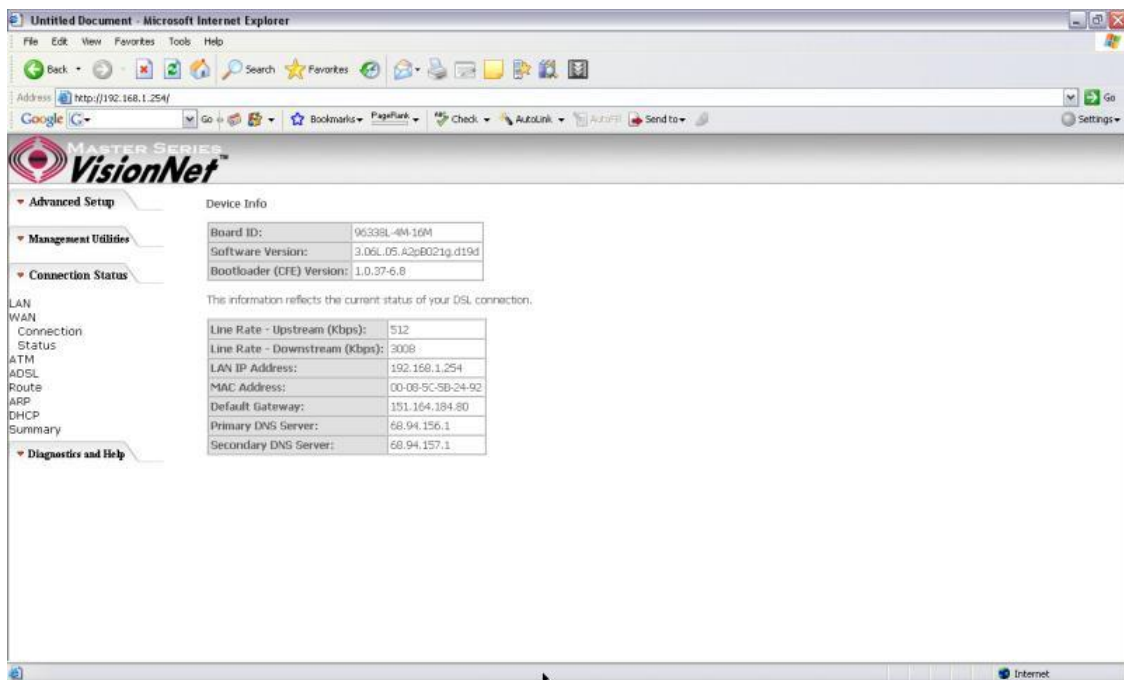


Figure 80. Connection Status - DHCP

8.8 - Summary

This page displays the summary of the M505 hardware, software and connection information. Line Rate shows the speed that you are currently connected to your ISP. In the figure below the M511 is currently connected at a Download speed of 3000 Kbps or 3 Mbps with an Upload speed of 512 Kbps or 0.5 Mbps. MAC address and LAN IP address of the M505. Gateway and DNS information is also shown.



The screenshot shows the VisionNet web interface in Microsoft Internet Explorer. The address bar displays <http://192.168.1.254/>. The page title is "VisionNet" and the navigation menu on the left includes: LAN, WAN, Connection, Status, ATM, ADSL, Route, ARP, DHCP, Summary, and Diagnostics and Help. The "Connection Status" section is expanded, showing the following information:

Device Info	
Board ID:	06338L-4M-16M
Software Version:	3.06L_05_A2cE021g_d19d
Bootloader (CFE) Version:	1.0.37-6.8

This information reflects the current status of your DSL connection.

Line Rate - Upstream (Kbps):	512
Line Rate - Downstream (Kbps):	3008
LAN IP Address:	192.168.1.254
MAC Address:	00-09-5C-5B-24-92
Default Gateway:	151.164.184.80
Primary DNS Server:	68.94.156.1
Secondary DNS Server:	68.94.157.1

Figure 81. Connection Status - Summary

9. Diagnostics and Help

This page allows users to test the Ethernet port connection, DSL port connection, and connection to the Internet Service Provider. If a test displays a fail status, click “Return Diagnostic Tests” at the bottom of the page to make sure the fail status is consistent. If the test continues to show fail, click “Help” to go to through the troubleshooting procedures.

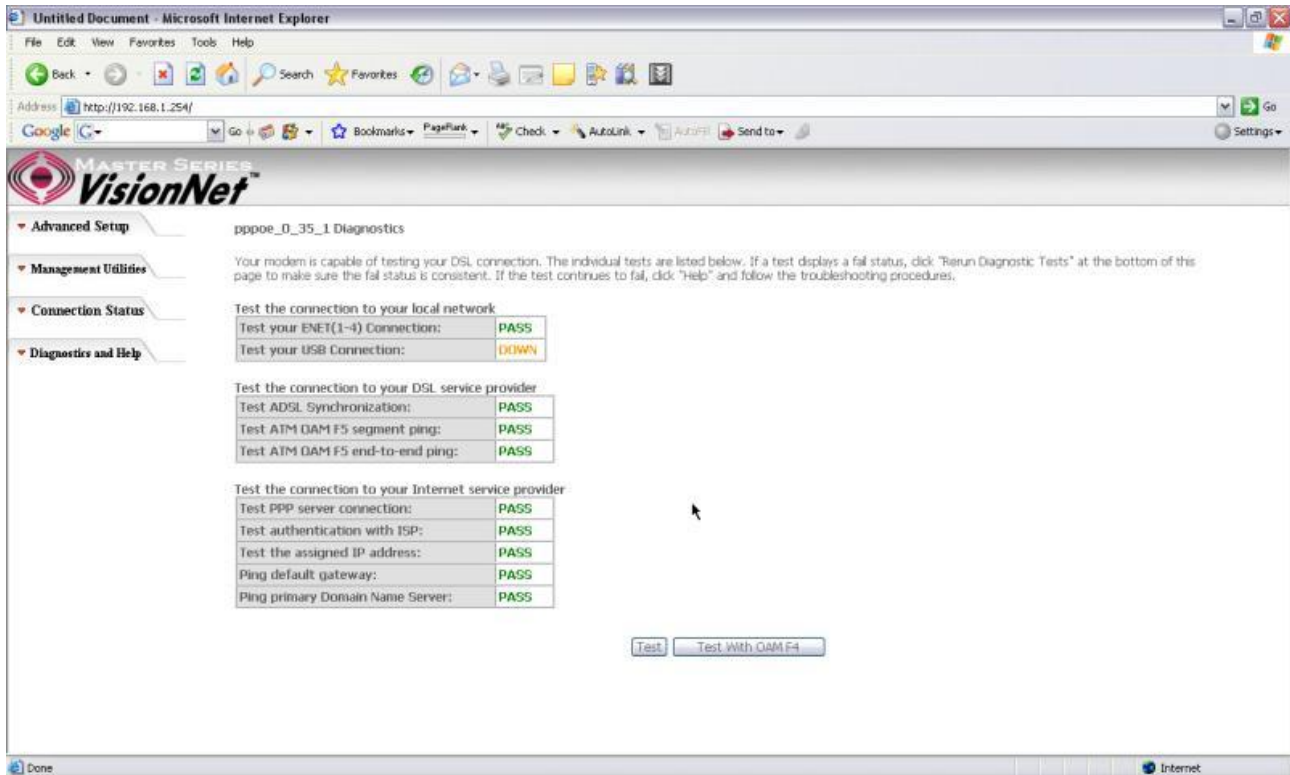


Figure 82. Diagnostics and Help

10. Appendix A – Specifications

A1. Hardware Specifications

- Local Interface
 - Four 10/100BaseT Ethernet port (IEEE 802.3, RJ-45 connector)
 - One USB 1.1 port (M505 only)
 - Wireless Antenna (Supports both B/G mode)
- WAN ADSL Line Interface
 - Complies with G.dmt (G.992.1) Annex A
 - Complies with G.lite (G.992.2) and T1.413
 - Complies with ADSL2 (G.992.3)
 - Complies with ADSL2+ (G.992.5)
 - Connector: RJ-11
- OAM&P
 - Remote: Telnet or Web browser
- Environment
 - Operation Temperature: 0°C ~ 40°C
 - Operation Humidity: 10% ~ 95%
 - Storage Temperature: -20 ~ 70°C
 - Storage Humidity: 5%~95%
- Power
 - AC Adapter :Input 100-240V AC50/60Hz; Output 12VDC 2A
- Certificates
 - FCC Part 68 and 15 Class B, UL

A2. Software Specifications

- ATM
 - ATM Cell over ADSL, AAL5
 - Supports UBR, CBR & VBR-nrt
 - VPI Range (0-255) and VCI range (1-65535)
 - Supports up to 8 PVCs
 - Supports OAM F4/F5, and loop back cells
 - Payload Encapsulation --
 - RFC2684 (RFC1483), multi-protocol over ATM
 - RFC2364, PPP over ATM (CHAP and PAP supported)
 - RFC2516, PPPoE (PPP over Ethernet) over ATM
- Bridging
 - Transparent Bridging (IEEE 802.1D)
 - RFC2684 (RFC1483) Bridged
 - Spanning Tree Protocol (IEEE 802.1D)
 - Bridge Filtering
- Routing
 - IP Address Forwarding
 - MAC Encapsulated Routing
 - Routing Information Protocol (RIP) v1, v2
 - DHCP Client (to the DSL network)
 - DHCP relay agent
 - NAT/PAT – RFC1631 (basic Firewall support)
 - Support Point-to-Point Protocol (PPP)
 - PAP for user authentication

- RFC2684 (RFC1483) Routed
- DNS relay
- UPnP
- IGMP-Proxy
- Configuration and Network Management
 - DHCP server for IP management
 - HTTP (Web Server) for configuration and firmware upgrade
 - TFTP Server
 - FTP Server
- Firewall
 - NAT ALGs
 - IPSEC pass-through
 - Ping of Death
 - SYN Flood LAND
 - Protection against IP and MAC address spoofing
 - Packet Filtering
 - Stateful Packet Inspection (SPI)
 - UPnP NAT Traversal

11. Appendix B – Warranties

B1. Limited Warranty

This guarantee is not transferable and does not include service, repair, or replacement to correct any damage caused by improper installation or maintenance, improper connection with any peripheral, external electrical fault, accident, disaster, misuse, abuse, or modifications to the DSL modem not approved in writing by DQ Technology.

For a period of two (2) years from the date of purchase, DQ Technology guarantees that all VisionNet DSL Customer Premises Equipment products are free from defective material and workmanship, and during the guaranty period, subject to the conditions set forth below, agrees to repair or replace any part of a product that proves defective by reason of improper workmanship or materials without charge for parts and labor. Repair parts or replacement products will be furnished on an exchange basis and will be either new or refurbished to be functionally equivalent to new.

Refunds are not offered for any product.

In no event will DQ Technology's liability exceed the price paid for the product from consequential, incidental direct, indirect or special damages arising from the purchase, use, or inability to use this product or accompanying software and documentation, even if DQ Technology has been advised of the possibility of such damages.

You must call DQ Technology's customer support center to receive an RMA number prior to returning the product. The product should be shipped to a service center location provided by your customer support representative along with a copy of your sales slip, the product serial number, and a detailed description of the problem(s) you are experiencing.

DQ Technology makes no warranty or representation, expressed, implied, or statutory, with respect to its products or the contents or use of this documentation, accompanying software, and specifically disclaims its quality, performance, merchantability, or fitness for any particular purpose.

DQ Technology reserves the right to modify its products, software, or documentation without obligation to notify any individual or entity.

For more information on return procedures, please visit: www.dqusa.com

If you experience any difficulty during installation or subsequent use of Products, please contact your service provider or DQ Technology's Support Center at 1-866-286-XDSL or email techctr@dqusa.com.

12. Appendix C – Regulations

C1. FCC Part 15 Notice

Warning: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 to the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is unlikely to cause harmful interference. But if it does, the user will be required to correct the interference at his or her own expense. The authority to operate this equipment is conditioned by the requirement that no modifications will be made to the equipment unless DQ Technology expressly approves the changes or modifications.

C2. UL Safety Regulations

- ▶ Disconnect TNV circuit connector or before removing cover or equivalent.
- ▶ Disconnect TNV circuit connector(s) before disconnecting power.
- ▶ Do not use this product near water for example, near a bathtub, washbowl, and kitchen sink or laundry tub, in a wet basement, or near a swimming pool.
- ▶ Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightening.
- ▶ Do not use the telephone to report a gas leak in the vicinity of the leak.
- ▶ Use only the power cord batteries indicated in this manual. Do not dispose of batteries in a fire, as they may explode. Check with local codes for possible special disposal instructions.

No. 26 AWG Telephone Line Cord shall either be provided with the equipment or shall be described in the safety instruction. If fuse (F1) is not present, see the caution statement listed below:

CAUTION: To reduce the risk of fire, use only No. 26 AWG or larger UL Listed or CSA Certified Telecommunication Line Cord.

Contact Information

You can help us to serve you better by sending us your comments and feedback. Listed below are the addresses, and telephone and fax numbers of our offices. You can also visit us on the World Wide Web at www.dqusa.com for more information. We look forward to hearing from you!

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