



M505N

ADSL2+ Ethernet Broadband Gateway

802.11b/g/n 4 Port Ethernet USB 2.0

End User Manual

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1. Introduction

Congratulations on becoming the owner of the VisionNet M505N 802.11N ADSL2+ Broadband Gateway. 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
- IEEE 802.11b/g/n wireless functionality
- USB Storage for Media share across your Local Network
- 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 End User Manual will guide you through the installation and configuration of your M505N modem.

System Requirements

Before installing your M505N 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)

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

<p>Note: Make sure that your computer has a web browser such as Internet Explorer v7.0 or later, or Firefox v3.0 or later.</p>

2. Installation

In addition to this document, your M505N should arrive with the following:

- One power adapter
- One Ethernet cable with RJ-45 connector
- One Telephone cable with RJ-11 connector
- Product Installation CD
- Installation Guide

Front Panel

The Front panel LED light indicates the status of the unit. *(Left to Right)*

M505N

Label	Color	Function
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
DSL	Green	Green – DSL Good Sync
		Off - Powered off
		Flashing Green - DSL Attempting sync
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
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
Wireless	Green	Green – Wireless is activated on modem
		Flashing Green – Wireless activity is present
		Off - Modem off or no radio signal detected
WPS	Green	Off - WPS function not active
		Solid Green – Device

		Flashing Green – Attempting WPS association
DLNA	Green	Green – USB storage connected Off - No device detected

Rear Panel

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

M505N

Interface	Function
<i>Switch(Push Button)</i>	Power switch on/off
<i>Power</i>	Connects to the power adapter cable
<i>Reset Button</i>	Resets unit's configuration to factory default
<i>DLNA</i>	USB 2.0/1.1 connection: Connects external storage device to gateway
<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>ADSL</i>	RJ-11 connector: Connects to your ADSL line
<i>WPS</i>	Activate the WPS security function
<i>Wireless</i>	Enable/Disable Wireless functionality

Connecting the Hardware

Connect the M505N to the phone jack, the power outlet, and your computer or network.



Before you begin, turn the power off for all devices. These include your computer(s), your LAN hub/switch (if applicable), and the M505N.

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 M505N. 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 M505N and

connect the other end to your PCs 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 M505N.

Step 3. Attach the power connector

Connect the AC power adapter to the power connector on the M505N and plug in the adapter to a wall outlet or power extension.

Step 4. Turn on the M505N and power up your systems

Press the Power switch on the back panel of the M505N to the ON position.
Boot up your computer(s) and any LAN devices such as hubs or switches.

Step 5. Configure the M505N through the WEB interface

Please refer to Chapter 3.

Step 6. Save the configurations and Reboot

Save the changes you made on the M505N and it will automatically reboot to make the settings permanent.

3. Configuration

3.1 - Setup

- Connect your M505N and PC with an RJ-45 Ethernet cable.
- Turn on the M505N.
- The default IP address of M505N is 192.168.1.254.

3.2 - Establish the Connection

- Enter the IP address (default: 192.168.1.254) of M505N 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 (Please contact your ISP for login information).

4. Quick View

Quick View allows you to view all the major statistics and information of your VisionNet M505N Gateway from one easy location on the WEB interface.

The following information is provided:

1. Device Info – Information such as Software revision and Driver version
2. DSL Status – Sync Rate (DSL Connection speed for Downstream and Upstream)
3. WAN Overview – WAN service information
4. ARP – Client connected to the VisionNet M505N Gateway

Device Info

Board ID:	96328ang
Build Timestamp:	101108_0927
Manufacturer:	DQ Technology, Inc.
ProductClass:	M505N
SerialNumber:	021018632810
Software Version:	R4B010
Bootloader (CFE) Version:	1.0.37-106.5
DSL PHY and Driver Version:	A2pD030h.d22j
Wireless Driver Version:	5.60.104.0.cpe4.406.

This information reflects the current status of your WAN connection.

Line Rate - Upstream (Kbps):	1269
Line Rate - Downstream (Kbps):	27973
LAN IPv4 Address:	192.168.1.254
Default Gateway:	atm0
Primary DNS Server:	8.8.4.4
Secondary DNS Server:	76.204.21.182
LAN IPv6 Address:	
Default IPv6 Gateway:	

Line Rate - Upstream (Kbps):	1269
Line Rate - Downstream (Kbps):	27973
LAN IPv4 Address:	192.168.1.254
Default Gateway:	atm0
Primary DNS Server:	8.8.4.4
Secondary DNS Server:	76.204.21.182
LAN IPv6 Address:	
Default IPv6 Gateway:	

Overview -- WAN

View	Interface	Identifier	PVC	VLAN	Type	NAT	Firewall	Status	IP Address
	atm0	ipoe_0_0_35	0/35	Disable	IPoE	Enable	Enable	Connected	76.204.21.177

Device Info -- ARP

IP address	Flags	HW Address	Device
76.204.21.182	Complete	00:1e:e3:c9:c3:87	atm0
192.168.1.65	Complete	00:02:3f:94:d5:6e	br0
192.168.1.64	Complete	00:10:dc:d1:65:a7	br0

5. LAN

The LAN (Local Area Network) section allows the following settings to be configured on the VisionNet M505N Gateway:

- LAN Setup
- IPv6 LAN Settings

5.1 - LAN

Local Area Network (LAN) Setup

Configure the Broadband Router IP Address and Subnet Mask for LAN interface. GroupName Default ▼

IP Address:
Subnet Mask:

Enable IGMP Snooping

Standard Mode

Blocking Mode

Enable LAN side firewall

Disable DHCP Server

Enable DHCP Server

Start IP Address:

End IP Address:

Leased Time (hour):

Static IP Lease List: (A maximum 32 entries can be configured)

<input type="button" value="Edit DHCP Option"/>	<input type="button" value="Edit DHCP Option 60"/>	<input type="button" value="DHCP Advance setup"/>
MAC Address	IP Address	Remove
<input type="button" value="Add Entries"/>	<input type="button" value="Remove Entries"/>	

Input the IP Address and Subnet Mask of your M505N. (Default: 192.168.1..254)

Check the box if you want to enable IGMP Snooping.

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

5.1.2 – Static IP Leasing

DHCP Static IP Lease

Enter the Mac address and Static IP address then click Apply/Save .

MAC Address:

IP Address:

Apply/Save

This function allows you to reserve an IP Address for clients connected to the gateway via the client's MAC address.

Click the “Add new entries” Form, enter the MAC address of the client you wish to reserve an IP address to.

Enter the IP Address that you wish to assign to the client

Click on the “Apply/Save” button to add the new entry.

Warm Reboot the Gateway for the function to take affect. Please see Management Section for instruction on how to Warm Reboot the modem.

6. Security

The Security section allows the following setting to be configured on the VisionNet M505N Gateway:

- IP Filtering Rules
- URL Filtering
- Port Forwarding
- Port Triggering
- DMZ Host
- WAN Access Control

6.1 – IP Filtering Rules

Two functions are supported in the IP Filter function of the M505N Gateway: Outgoing IP Filtering and Incoming Filtering.

Incoming IP Filtering

When the firewall option is enabled on a WAN or LAN interface, all incoming IP traffic from the WAN is BLOCKED. However, incoming IP filter rules can be allowed by setting up filtering rules. Choose “Add” to configure incoming IP filters. To remove, check the item and click “Remove”.

Incoming IP Filtering

When the firewall is enabled on a WAN or LAN interface, all incoming IP traffic is BLOCKED. However, some IP traffic can be ACCEPTED by setting up filters.

Filter Name	Interfaces	Protocol	Source Address / Mask	Source Port	Destination Address / Mask	Destination Port	Remove
-------------	------------	----------	-----------------------	-------------	----------------------------	------------------	--------

Create New Rule

Remove Selected Rules

The screen allows you to create a filter rule to identify incoming 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.

Add IP Filter -- Incoming

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

Filter Name:

IP Version:

Protocol:

Source Ip Address(scope): -

Source Netmask:

Source Port (port or port:port):

Destination Ip Address(scope): -

Destination Netmask:

Destination Port (port or port:port):

WAN Interfaces (Configured in Routing mode and with firewall enabled) and LAN Interfaces

Select one or more WAN/LAN interfaces displayed below to apply this rule.

- Select All
- ipoe_0_0_35/atm0
- br0/br0

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”.

Outgoing IP Filtering

By default, all outgoing IP traffic from LAN is allowed, but some IP traffic can be BLOCKED by setting up filters.

Filter Name	Protocol	Source Address / Mask	Source Port	Destination Address / Mask	Destination Port	Remove
-------------	----------	-----------------------	-------------	----------------------------	------------------	--------

Create New Rule

Remove Selected Rules

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.

Add IP Filter -- Outgoing

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

Filter Name:	<input type="text"/>
IP Version:	<input type="text" value="IPv4"/>
Protocol	<input type="text"/>
Source IP address(scope)	<input type="text"/> - <input type="text"/>
Source Netmask	<input type="text"/>
Source Port (port or port:port):	<input type="text"/>
Destination IP address(scope)	<input type="text"/> - <input type="text"/>
Destination Netmask	<input type="text"/>
Destination Port (port or port:port):	<input type="text"/>

6.2 – URL Filtering Rules

The M505N Gateway allow user to block or allow access to specific URL for clients connected. Setup the URL filters by: Choose “Create New Rule” to add URL (Web Address)

URL Filter -- Please select the list type first then configure the list entries. Maximum 100 entries can be configured.

URL List Type: Exclude Include

Address	Port	Remove
<input type="text"/>	<input type="text"/>	<input type="button" value="Remove"/>

Parental Control -- URL Filter Add

Enter the URL address and port number then click 'Apply/Save' to add the entry to the URL filter.

URL Address:
 Port Number: (Default 80 will be applied if leave blank.)

Apply/Save

6.3 – Port Forwarding

Port Forwarding 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.

Port Forwarding



Server Name	External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End	Server IP Address	WAN Interface	Remove
-------------	---------------------	-------------------	----------	---------------------	-------------------	-------------------	---------------	--------

Create New Rule

Click on “**Create New Rule**” to enter configuration page to add your own rule(s). Some common used servers (Web, FTP, Mail, etc.) are already pre-defined for the M505N. User can simply select the desired pre-defined application from the pull-down menu and assign the IP address of the local PC for the ports to be forwarded to.

NAT -- Virtual Servers

Select the service name, and enter the server IP address and click "Apply/Save" to forward IP packets for this service to the specified server.

NOTE: The "Internal Port End" cannot be modified directly. Normally, it is set to the same value as "External Port End". However, if you modify "Internal Port Start", then "Internal Port End" will be set to the same value as "Internal Port Start".

Remaining number of entries that can be configured:32

Use Interface:

Service Name:

Select a Service:

Custom Service:

Server IP Address:

Apply/Save

External Port Start	External Port End	Protocol	Internal Port Start	Internal Port End
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	TCP	<input type="text"/>	<input type="text"/>

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

6.4 – Port Triggering

Some applications require that specific ports in the Router's firewall be opened for access by the remote parties. Port Trigger dynamically opens up the "Open Ports" in the firewall when an application on the LAN initiates a TCP/UDP connection to a remote party using the "Triggering Ports". The Router allows the remote party from the WAN side to establish new connections back to the application on the LAN side using the "Open Ports". A maximum of 32 entries can be configured.

Port Triggering ?

Application Name	Trigger				Open			WAN Interface	Remove
	Protocol	Port Range		Protocol	Port Range				
		Start	End		Start	End			
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	

Create New Rule

Click on “Create New Rule” to enter the configuration page to add your own rule(s). 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”.

NAT -- Port Triggering

Some applications such as games, video conferencing, remote access applications and others require that specific ports in the Router's firewall be opened for access by the applications. 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.

Remaining number of entries that can be configured:32

Use Interface:

Application Name:

Select an application:

Custom application:

Trigger Port Start	Trigger Port End	Trigger Protocol	Open Port Start	Open Port End	Open Protocol
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP
		TCP			TCP

6.5 – DMZ Host

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

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

Click on the “Clear/Deactivate DMZ Host” button to disable the DMZ Host function.

NAT -- DMZ Host

The Broadband 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 'Apply' to activate the DMZ host.

Clear the IP address field and click 'Apply' to deactivate the DMZ host.

DMZ Host IP Address:

Apply/Save

6.6 – WAN Access Control

WAN Access Control allows users to create time of day restrictions to a specific LAN device connected to the Router. Click “Create New Rule” to configure restriction rules. To remove, check the item and click “Remove”.

WAN Access Control

The WAN Access Control table provides global WAN blocking, to LAN hosts, of WAN services (Internet).

This application is particularly useful for public work-stations, kiosks, internal file servers, network troubleshooting, and parental restrictions.

#	Rule	MAC	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Remove
---	------	-----	-----	-----	-----	-----	-----	-----	-----	--------

Create New Rule

Access Time Restriction

This page adds time of day restriction to a special LAN device connected to the Router. The 'Browser's MAC Address' automatically displays the MAC address of the LAN device where the browser is running. To restrict other LAN device, click the 'Other MAC Address' button and enter the MAC address of the other LAN device. To find out the MAC address of a Windows based PC, go to command window and type 'ipconfig /all'.

User Name

Browser's MAC Address

Other MAC Address
(xx:xx:xx:xx:xx:xx)

Days of the week

Mon	Tue	Wed	Thu	Fri	Sat	Sun
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Start Blocking Time (hh:mm)

End Blocking Time (hh:mm)

Apply/Save

To create a new WAN Access Control Rule:

1. Give the rule a name that can be easily be identified
2. The “Browser’s MAC Address” will show the MAC address of the client currently connected to the gateway WEB Interface. Either select this option if you want the rules to apply to the PC in use or check the Other MAC address radio box and enter the MAC address of the client you wish for the rules to apply to
3. Check the “Block” box and enter the Time of Day (24hour format) of when you would like the Rules to begin and end.
4. Click on the “Save/Apply” button to apply the new WAN Access Control Rule

7. DNS

7.1 – 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 M505N to be more easily accessible from various locations on the Internet.

Choose “Create New Client Service” 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”

Dynamic DNS

The Dynamic DNS service allows you to alias a dynamic IP address to a static hostname in any of the many domains, allowing your Broadband Router to be more easily accessed from various locations on the Internet.

Choose Add or Remove to configure Dynamic DNS.

Hostname	Username	Service	Interface	Remove
<input type="button" value="Add"/> <input type="button" value="Remove"/>				

Select your Dynamic DNS service provider from ‘D-DNS provider’, and enter your registration information. Click “Submit Dynamic DNS Service” to save the configuration.

Dynamic DNS Client - Create DNS Service

Dynamic DNS Provider:	<input type="text" value="DynDNS.org"/>
DNS Properties:	
Hostname:	<input type="text"/>
WAN Interface:	<input type="text" value="ipoe_0_0_35/atm0"/>
DNS Provider Settings:	
Username / Email:	<input type="text"/>
Password / Key:	<input type="text"/>
<input type="button" value="Submit Dynamic DNS Service"/>	

8. Network Access Storage (DLNA)

The M505N have the ability to share content of an USB storage device to Windows based PC's connected on the LAN.

To utilize this function: connect a USB storage device (External Hard drive, USB Thumb Drive, etc.) to the USB port of the M505N gateway.

The M505N will recognize the device after a few seconds and the USB storage information will appear in the WEB interface.

To browse the content of the storage device, select the “Browse” link located on the page. An Explorer window will open and list the directories/files currently in the storage device.

USB Storage

This page show the USB mass storage!



usb1_1

247Mb(0Mb
Free)

[Browse](#)

9. IPSEC

The M505N 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. Click on the “Create New Tunnel” to create new IPSEC connection

IP Sec VPN Tunnel

Manage IP SEC VPN Tunnel Connections to route communication between remote networks.

Connection Name	Remote Gateway	Local Addresses	Remote Addresses	Remove
<input type="button" value="Create New Tunnel"/>		<input type="button" value="Remove Tunnel"/>		

Enter the following critical information in the VPN Tunnel Settings:

1. Enter a name for this IPSec connection.
2. Enter the Public IP address of the remote gateway in the next field.
3. Select “**Subnet**” for Tunnel access from local IP addresses.
4. Enter the network address for the “IP address for VPN” field. (If your IP is X.X.X.X the network address is usually X.X.X.0 for class C addresses)
5. Enter the local subnet mask in the field.
6. Select “**Subnet**” for Tunnel access from local IP addresses.
7. Enter the network address for the “**IP address for VPN**” field. (Note: *you can not have the same network address for both local and remote networks.*)
8. Enter the remote subnet mask in the next field.
9. Set the **Key Exchange Method** to “**Auto(IKE)**”
10. Select “**Pre-Shared Key**” for authentication method.
11. Enter a key for the “**Pre-Shared Key**” field.
12. Select Disable for “**Perfect Forwarded Security**”
13. Click “**Save/Apply**” to save this connection.
14. Click the **Enable** check box to activate this connection.
15. Configure the remote IPSec gateway in the same manner. However, the local ip parameters will be remote ip parameters.
16. Once established, you can connect to clients in the remote network using their local IPs.

IP Sec VPN Tunnel

VPN Tunnel Settings	
VPN Tunnel Name:	<input type="text" value="new connection"/>
Auto Reconnect / Keep Alive	<input type="checkbox"/>
Remote Location (IP or URL):	<input type="text" value="0.0.0.0"/>
Local Tunnel Access:	<input type="text" value="Subnet"/> ▼
IP Address or Network:	<input type="text" value="0.0.0.0"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Remote Tunnel Access:	<input type="text" value="Subnet"/> ▼
IP Address or Network:	<input type="text" value="0.0.0.0"/>
Subnet Mask:	<input type="text" value="255.255.255.0"/>
Key Exchange Method	<input type="text" value="Auto(IKE)"/> ▼
Authentication Method:	<input type="text" value="Pre-Shared Key"/> ▼
Pre-Shared Key:	<input type="text" value="key"/>
Certificates	<input type="text" value=""/> ▼
Perfect Forward Secrecy:	<input type="text" value="Disable"/> ▼
Advanced IKE Settings	<input type="button" value="Show Advanced Settings"/>

10. Wireless

Some basic understanding of 802.11b/g/n 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 802.11n, 802.11g and/or 802.11b can communicate with the M505N Wireless LAN environment. However, be aware that only 802.11n compliant wireless clients are able to gain full benefit of the 270Mb/s (Max) bandwidth delivered by the M505N. It is highly recommended to use only wireless client adapters that are Wi-Fi™ certified to ensure smooth interoperability with the M505N's Wireless functionality.

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.

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 M505N 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 M505N 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 802.11b/g/n standard allows several WLAN networks using different radio channels to be co-located. The M505N 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 M505N 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 M505N including open or WEP, 802.1x, WPA, WPA-PSK, WPA2 and WPA2-PSK. Authentication may use an open system or a shared key. Please see section 10.2 for more information.

10.1 - SSID

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.

Wireless SSID

This page will define operating SSIDs and their basic characteristics.

Primary SSID							
ID	Enable	SSID	SSID Broadcast	Client Isolation	WMM Advertise	Wireless Multicast Forwarding	Max Clients
SSID_Main	Enabled ▾	m505n_AP	Broadcast ▾	Disabled ▾	Enabled ▾	Disabled ▾	16

10.2 – Security Settings

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.

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.

Wireless Security ?

Select SSID:	m505n_AP ▼
Network Authentication:	Open ▼
WEP Encryption:	Enabled ▼
Encryption Strength:	128-bit ▼
Current Network Key:	1 ▼
Network Key 1:	1234567890123
Network Key 2:	1234567890123
Network Key 3:	1234567890123
Network Key 4:	1234567890123

- 64 bit encryption: Network Key is either 5 ASCII characters or 10 hexadecimal characters.
- 128 bit encryption: Network Key is either 13 ASCII characters or 26 hexadecimal characters.

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.



Select SSID:	m505n_AP ▼
Network Authentication:	802.1X ▼
RADIUS Server IP Address:	0.0.0.0
RADIUS Port:	1812
RADIUS Key:	
WEP Encryption:	Enabled ▼
Encryption Strength:	128-bit ▼
Current Network Key:	2 ▼
Network Key 1:	1234567890123
Network Key 2:	1234567890123
Network Key 3:	1234567890123
Network Key 4:	1234567890123
<small>- 64 bit encryption: Network Key is either 5 ASCII characters or 10 hexadecimal characters. - 128 bit encryption: Network Key is either 13 ASCII characters or 26 hexadecimal characters.</small>	

WPA/WPA2

WPA (Wi-Fi Protected Access) is the strongest wireless security provided by the M505N. 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.

Wireless Security



Select SSID:	m505n_AP ▼
Network Authentication:	WPA2 ▼
WPA2 Preauthentication:	Disabled ▼
Network Re-auth Interval:	36000
WPA Group Rekey Interval:	0
RADIUS Server IP Address:	0.0.0.0
RADIUS Port:	1812
RADIUS Key:	
WPA Encryption:	AES ▼

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.

Wireless Security



Select SSID:	m505n_AP	▼
Network Authentication:	WPA-PSK	▼
WPA Pre-Shared Key:	<input type="text"/>	Click here to display
WPA Group Rekey Interval:	0	
WPA Encryption:	TKIP	▼

Discard Changes

Apply / Save

10.3 – WPS (Wireless Security Settings)

This page is used to configure the settings for WPS (Wi-Fi Protected Setup). It uses a push-button or a 4- or 8-digit personal identification number (PIN) to simplify the secure network setup.

With WPS, M505N can automatically set the SSID or network name as part of the setup process and provide strong encryption keys to client devices. You do not need to configure SSID, wireless security setting, etc., in the client software. In order to use WPS, the wireless client software must also support WPS.

WPS Setup

Enable **WPS**

Add **Client** (This feature is available only when WPA-PSK, WPA2 PSK or OPEN mode is configured)

 Push-Button PIN
 [Help](#)

Set **WPS AP Mode**

Setup **AP** (Configure all security settings with an external registrar)

 Push-Button PIN

Device **PIN**

 [Help](#)

10.4 – 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 M505N. If you select “Deny” in “MAC Restrict Mode”, every device can access the M505N 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 M505N. Click “Save/Apply” to save the configuration. To “delete” the entry, select the entry and click “Remove”.

Wireless -- MAC Filter

Select SSID: TW_DLNA ▼

MAC Restrict Mode: Disabled Allow Deny

MAC Address Remove

Add Remove

10.5 – Wireless Bridging

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 M505N will scan available AP for you to select.

Refresh: re-scan the available AP

Save/Apply: save the configuration

Wireless -- Bridge

This page allows you to configure wireless bridge features of the wireless LAN interface. You can select Wireless Bridge (also known as Wireless Distribution System) to disable access point functionality. Selecting Access Point enables access point functionality. Wireless bridge functionality will still be available and wireless stations will be able to associate to the AP. Select Disabled in Bridge Restrict which disables wireless bridge restriction. Any wireless bridge will be granted access. Selecting Enabled enables wireless bridge restriction. Only those bridges selected in Remote Bridges will be granted access.

Click "Refresh" to update the remote bridges. Wait for few seconds to update.

Click "Apply/Save" to configure the wireless bridge options.

AP Mode:	<input type="text" value="Access Point"/>
Bridge Restrict:	<input type="text" value="Enabled"/>
Remote Bridges MAC Address:	<input type="text"/> <input type="text"/>
	<input type="text"/> <input type="text"/>

10.6 – Global Settings

System In most cases, M505N 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**.

Wireless -- Advanced

This page allows you to configure advanced features of the wireless LAN interface. You can select a particular channel on which to operate, force the transmission rate to a particular speed, set the fragmentation threshold, set the RTS threshold, set the wakeup interval for clients in power-save mode, set the beacon interval for the access point, set XPress mode and set whether short or long preambles are used.

Click 'Apply/Save' to configure the advanced wireless options.

Band:	2.4GHz	
Channel:	1	Current: 1 (interference: severe)
Auto Channel Timer(min)	0	
802.11n/EWC:	Auto	
Bandwidth:	20MHz in 2.4G Band and 40MHz in 5G Band	Current: 20MHz
Control Sideband:	Lower	Current: None
802.11n Rate:	Auto	
802.11n Protection:	Auto	
Support 802.11n Client Only:	Off	
RIFS Advertisement:	Off	
OBSS Co-Existence:	Disable	
RX Chain Power Save:	Enable	
RX Chain Power Save Quiet Time:	10	
RX Chain Power Save PPS:	10	
Radio Power Save:	Disable	
Radio Power Save Quiet Time:	10	

11. System Diagnostic

The System Diagnostic section allows the tools for troubleshooting purpose

- System Diagnostic
- Inbound Toolkit
- Outbound Toolkit

11.1 – System Diagnostic

The System Diagnostic function will run a test for Physical Port connectivity, DSL status, and Internet WAN connection status.

The test takes a few second to complete. Once it is completed the results will be shown in each category. In case of failure, rerun the test to ensure that the results are consistent.

Click on the Help link next to the test categories to get more information for troubleshooting.

ipoe_0_0_35 Diagnostics

Your modem is capable of testing your DSL connection. The individual tests are listed below. If a test displays a fail status, click "Rerun Diagnostic Tests" at the bottom of this page to make sure the fail status is consistent. If the test continues to fail, click "Help" and follow the troubleshooting procedures.

Test the connection to your local network

Test your ENET(1-4) Connection:	PASS	Help
Test your ENET1 Connection:	PASS	Help
Test your ENET2 Connection:	PASS	Help
Test your eth1 Connection:	FAIL	Help
Test your ENET3 Connection:	FAIL	Help
Test your ENET4 Connection:	FAIL	Help
Test your Wireless Connection:	PASS	Help

Test the connection to your DSL service provider

Test xDSL Synchronization:	PASS	Help
Test ATM OAM F5 segment ping:	FAIL	Help
Test ATM OAM F5 end-to-end ping:	FAIL	Help

Test the connection to your Internet service provider

Ping default gateway:	PASS	Help
Ping primary Domain Name Server:	FAIL	Help

11.2 – Inbound Toolkit

This function allows you to ping device locally in your network. Type in the URL or IP address of the device you would like to ping. If there is a Ping reply, that verify that the connection is up and not block.

Inbound Diagnostics

This diagnostic toolkit allows remote support providers to "peer into" the Local Area Network and confirm communication with local hosts. This tool may also be used to confirm IPSec VPN Tunnel operation.

Test Inbound DNS or IP Addresses		
<input type="text" value="www.dqusa.com"/>	<input type="button" value="Ping Request"/>	<input type="button" value="Trace Route"/>

11.3 – Outbound Toolkit

This function allows you to ping devices on the WAN side. Type in the URL or IP address of the device you would like to ping. If there is a Ping reply, that verify that the connection is up and not block.

Outbound Diagnostics

This diagnostic toolkit allows remote support providers, and local users, to "peer out of" the gateway and confirm WAN side communication.

Test Outbound DNS or IP Addresses		
<input type="text" value="www.dqusa.com"/>	<input type="button" value="Ping Request"/>	<input type="button" value="Trace Route"/>

12. Gateway Statistics

The Gateway Statistics section allows viewing of the following category statistics:

- xDSL
- ATM
- WAN
- LAN
- Host
- Wireless Clients
- Route Table
- DHCP

12.1 – xDSL

This will display all DSL statistics of the modem.

Statistics -- xDSL

Synchronized Time:		
Number of Synchronizations:	0	
Mode:		
Traffic Type:		
Status:	Disabled	
Link Power State:		
	Downstream	Upstream
Line Coding (Trellis):		
SNR Margin (0.1 dB):		
Attenuation (0.1 dB):		
Output Power (0.1 dBm):		
Attainable Rate (Kbps):		
Rate (Kbps):		

Super Frames:		
Super Frame Errors:		
RS Words:		
RS Correctable Errors:		
RS Uncorrectable Errors:		
HEC Errors:		
OCD Errors:		
LCD Errors:		
Total Cells:		
Data Cells:		
Bit Errors:		
Total ES:		
Total SES:		
Total UAS:		

12.2 – ATM

This will display ATM statistics of the current active WAN connection:

Interface Statistics										
Port Number	In Octets	Out Octets	In Packets	Out Packets	In OAM Cells	Out OAM Cells	In ASM Cells	Out ASM Cells	In Packet Errors	In Cell Errors

Reset


12.3 – WAN Statistics

The WAN Statistics page is broken into 2 parts:

1. WAN Overview – Information concerning the WAN protocol currently in used by the M505N to connect to the Internet. In the figure below: The modem is currently in IPoE mode, IGMP option is disabled, PVC 0/35, the connection is Up and the WAN IP address that the modem receives from the Internet Service Provider Equipment.
2. Packet Statistics –Information concerning Packets Received and Transmitted on the WAN side based on the Protocol used by the M505N (example shows IPoE connection).

WAN Statistics

WAN Overview

	Interface	Identifier	PVC	VLAN	Type	Group	NAT	Firewall	Status	IP Address
	atm0	ipoe_0_0_35	0.0.35	-1	IPoE	br0	1	1	Connected	172.168.1.4

Packet Statistics

Interface	Description	Received				Transmitted			
		Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
atm0	ipoe_0_0_35	17274296	42587	0	11569	2705873	22065	0	76563

Reset

12.4 – LAN

This will display all LAN statistics of the M505N:

Statistics -- LAN

Interface	Received				Transmitted			
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Errs	Drops
eth0	0	0	0	0	32953	269	0	0
eth1	0	0	0	0	32953	269	0	0
eth2	0	0	0	0	32953	269	0	0
eth3	711388	6139	0	0	5721230	6525	0	0
wlan	0	0	2	0	0	0	0	0

Reset Statistics

12.5 – Host

This will display all Host/ARP statistics of the M505N:

Device Info -- ARP

IP address	Flags	HW Address	Device
192.168.1.65	Complete	00:02:3f:94:d5:6e	br0

12.6 – Wireless Clients

This will display all devices that it currently connected to the M505N via the Wireless connection.

Wireless Clients

#	Associated	Authorized	MAC Address	SSID	Interface
---	------------	------------	-------------	------	-----------

12.7 – Route table

This will display all current Route table of the M505N:

Device Info -- Route

Flags: U - up, ! - reject, G - gateway, H - host, R - reinstate

D - dynamic (redirect), M - modified (redirect).

Destination	Destination	Subnet Mask	Flag	Metric	Service	Interface
192.168.1.0	0.0.0.0	255.255.255.0	U	0		br0

12.8 – DHCP

This will display all DHCP Clients connected to the M505N

Device Info -- DHCP Leases

Hostname	MAC Address	IP Address	Expires In
engineer	00:02:3f:94:d5:6e	192.168.1.65	23 hours, 42 seconds

13. Management

13.1 – Settings

This page allows backup the current configuration, restore the modems from a configuration file or restore the modem to its default configuration.

Backup Settings

Backup Broadband Router configurations. You may save your router configurations to a file on your PC.

Backup Settings

Update Settings

Update Broadband Router settings. You may update your router settings using your saved files.

Settings File Name:

Update Settings

Restore Default Settings

Restore Broadband Router settings to the factory defaults.

Restore Default Settings

If you wish to erase the running the configuration from the gateway and revert back to the modem default settings: click on the “Restore Default Settings”.

13.2 – NTP Client

This option allows you to configure the NTP (Network Time Protocol) of the Gateway.

NTP Client

This client will synchronize the internal timestamp with the specified servers

Automatically synchronize with Internet time servers

Primary NTP Server:

Secondary NTP Server:

Tertiary NTP Server:

Quaternary NTP Server:

Quinary NTP Server:

Time zone offset:

Apply/Save

Select the Check box “Automatically synchronize with Internet time server” box.

Choose the NTP Server from the dropdown list

Finally, select the Timezone from the dropdown list.

Click the “Apply/Save” button for apply this function.

13.3 – Management Account

This page allows you to modify the log-in password to the management interface of the gateway.

Management Accounts

Gateway management accounts are listed below

admin: local administration; allows for modification of all gateway parameters.

support: remote administration; allows for modification of all gateway parameters.

techsupport: remote administration; provides statistic and diagnostic access, but limited modification privileges

enduser: local administration; provides limited modification privileges to prevent end user error.

Username:

Old Password:

New Password:

Confirm Password:

13.4 – Warm Reboot

Click “Warm Reboot” button to reboot M505N.

Warm Reboot

Select "Warm Reboot" to restart your modem without a manual power cycle

14. Appendix A – Specifications

A1. Hardware Specifications

- Local Interface
 - Four 10/100BaseT Ethernet port (IEEE 802.3, RJ-45 connector)
 - Two Removable External Wireless Antenna (Supports B/G/N mode)
 - USB 2.0 Type A Interface
- 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, SSH 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 1A
- 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 ALG
 - 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

15. Appendix B – Warranties

DQ Technology adheres to the strictest Quality Assurance processes to ensure that our products are free from defects prior to shipping. DQ Technology provides a standard 1 year limited warranty for all products and provides an extended warranty option for North American customers.

Please note that standard warranty terms apply to all equipment sold by DQ Technology unless an extended warranty has been purchased.

The 1 year limited warranty offered by DQ Technology Inc. is non-transferrable. End Users who purchased equipment from a Service Provider, or other source, should contact the company from whom they purchased the equipment for all warranty and returns.

This warranty 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. All implied warranties are hereby limited to a One (1) year term. DQ Technology hereby disclaims all express warranties not included in these terms.

DQ Technology warrants that all products are free from defective material and workmanship and, subject to the conditions set forth below, agrees to repair or replace any part of a product, which proves defective by reason of improper workmanship or materials without charge for parts and labor.

If a Product does not perform as warranted herein, owner's sole remedy shall be repair or replacement as provided below. In no event will DQ Technology be liable for damages, lost revenue, lost wages, lost savings, or any other incidental or consequential damages arising from purchase, use, or inability to use this product, even if DQ Technology has been advised of the possibility of such damages. Any defective Product should be returned to the address above unless otherwise instructed by this notice, along with a copy of your sales slip, the product serial number (if applicable), and a detailed description of the problem(s) you are experiencing.

No express or implied warranty is made for DQ Technology Products damaged by accident of use, misuse, natural or personal disaster or any unauthorized disassembly, repair or modification.

DQ Technology's Warranty covers only repair or replacement of defective Products

DQ Technology is not liable for, and does not cover under Warranty, any costs associated with servicing or installation of Products.

If you experience any difficulty during installation or subsequent use of Products, please contact Technical Support at 1-866-286-XDSL or email rma@dqusa.com.

DQ Technology warrants that all solid-state memory products are free from defect in material and workmanship. Subject to the conditions and limitations set forth below, DQ Technology will repair or replace any part of a Product that proves defective by reason of improper workmanship or materials.

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.

Appendix C – Regulations

C1. FCC Part 68 Statement

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the back of this equipment is a label that contains, among other information, a product identifier in the format US: DQ1DL01BM505N. If requested, this number must be provided to the telephone company.

The REN is used to determine the number of devices that may be connected to a telephone line. Excessive RENs on a telephone line may result in the devices not ringing in response to an incoming call. In most but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. For products approved after July 23, 2001, the REN for this product is part of the product identifier that has the format US: DQ1DL01BM505N. The digits represented by 01 are the REN without a decimal point (e.g., 03 is a REN of 0.3). For earlier products, the REN is separately shown on the label.

If your equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC. Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with this telephone equipment, please contact the following address and phone number for information on obtaining service or repairs.

The telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

Company: DQ Technology, Inc.

Address: 5111 Johnson Drive, Pleasanton, CA, 94588

Tel no.: +1 925 730 3940

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. See installation instructions for details.

C2. FCC Part 15 Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

C3. 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 lightning.
- ▶ 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:

C4. IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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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