## ADSL2+ 4-Port Switch Wired/Wireless Router FREEWAY DSL User's Manual

Revision 0.2 February 2008

### **FCCInformation**

### **Federal Communication Commission Interference Statement**

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.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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

### **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.

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### 1. Introduction

The FREEWAY DSL is an ADSL2+ router which integrates a 4-port Fast Ethernet Switch and Wireless AP (wirelsss model only). The FREEWAY DSL provides high speed ADSL2+ broadband connection and sharing it with up to four computers via the LAN ports and 32 computers via the WLAN (wireless model only). The FREEWAY DSL is compatible with ADSL, ADSL2, and ADSL2+ lines for worldwide ADSL deployment. Not only supports versatile router features, the FREEWAY DSL supports robust QoS and IGMP features to ensure high quality triple play.

The FREEWAY DSL adopts easy to use web-GUI management interface. Its user friendly interface will amaze you with total difference experience. The FREEWAY DSL also supports TR-069 (CPE WAN Management Protocol) which enables central management from the central offices and benefits the ISP much.

### 1.1 Features

- Comply with ITU ADSL, ADSL 2 and ADSL2+ standards
- Comply with IEEE802.3/802.3u 10/100 BASE-T standards
- Comply with IEEE802.11b/g Wireless LAN standards (wireless model only)
- Integrate ADSL router and wireless AP (Access Point) together (wireless model only)
- Enables sharing of broadband Internet connection
- Works with both PCs and Macintosh computers
- Connects four computers/devices through the LAN ports
- Connects 32 computer/devices wirelessly (wireless model only)
- Operates on 2.4 frequency band including all 802.11b/g mode (wireless model only)
- Security supports WPA/WPA2-PSK, & 64/128-bit WEP Encryption (wireless model only)
- Double firewalls: NAT and SPI
- Built-in DHCP server
- MAC address filtering
- VPN pass-through
- Web-based advanced user interface
- Universal Plug and Play (UPnP)
- Remote / Local configuration & management through Web / Telnet configuration & management

### **1.2 System Requirement**

In order to use the FREEWAY DSL, you must have the following:

- ADSL service up and running on your telephone line
- One or more computers each containing an Ethernet network interface card (NIC)
- For system configuration using the supplied web-based program: a web browser such as Internet Explorer v 5.0 or later, or Netscape v 6.1 or later.

### 2. FREEWAY DSL Overview

Your FREEWAY DSL has many ports, switches and LEDs. The features are listed below.

### 2.1 LED Description



LED	Status	Description
Internet	On	The device is successfully connected to Internet.
	Fast Blinking	The device is sending/receiving data from Internet.
	Off	The WAN port is not connected to Internet.
DSL	On	The device is successfully linked with ADSL line (DSLAM).
	Fast Blinking	The device is trying to link with ADSL line (DSLAM).
	Off	The device is not linked with ADSL line (DSLAM).
WLAN	On	The device is ready for wireless clients to connect.
(wireless	Fast Blinking	The data is sending/receiving via wireless.
model only)	Off	The device is not ready for wireless clients to connect.
LAN1-4	On	The LAN port is connected to Ethernet device.
	Fast Blinking	The data is sending/receiving via this LAN port.
	Off	The LAN port is not connected to Ethernet device.
POWER	On	The device is power on.
	Off	The device is power off.
WPS	On	A wireless client is joined the network successfully.
(wireless	Slow Blinking	The device is in wireless configuration process. (2 minutes
model only)	Slow Blinking	maximum)
	Off	The device is not process any wireless configuration.

### 2.2 Ports and Buttons

The rear panel contains the ports for the FREEWAY DSL's data and power connections.



#### Wired Model Rear Panel

**DSL:** Connecter for accessing the Internet through ADSL line.

LAN1-4: Connector for Ethernet network devices, such as a PC, hub, switch or router.

**POWER:** Connecter for a power adapter. Using a power supply with a different voltage rating will damage this product. Make sure to observe the proper power requirements. The requirement of adapter is 12 AC/ 1A.

**ON/OFF:** Power on/off your FREEWAY DSL.

**Reset:** Restore the default settings. You may need to place the FREEWAY DSL into its factory defaults if the configuration is changed, you loose the ability to enter the FREEWAY DSL via the web interface, or following a software upgrade, and you loose the ability to enter the FREEWAY DSL. To reset the FREEWAY DSL, simply press the reset button for more than 3 seconds. The FREEWAY DSL will be reset to its factory defaults and after about 30 seconds the FREEWAY DSL will become operational again.

### 2.3 Installing your FREEWAY DSL

- 1. Locate an optimum location for the FREEWAY DSL.
- 2. For connections to the Ethernet and DSL interfaces, refer to the Quick Start Guide.
- **3.** Connect the Power Adapter. Depending upon the type of network, you may want to put the power supply on an uninterruptible supply. Only use the power adapter supplied with the FREEWAY DSL. A different adapter may damage the product.

Now that the hardware installation is complete, continue on to set up your FREEWAY DSL.

### 3. Setting up Your FREEWAY DSL

This section guides you through configuring your FREEWAY DSL. You should have your computers configured for DHCP mode and have proxies disabled on your browser. If you do not get the page as shown below, you may need to delete your temporary Internet files by flushing the cached web pages.

### 3.1 Log into Your FREEWAY DSL

Use the following procedures to log in to your FREEWAY DSL.

- Open your web browser. Type the default IP address of the FREEWAY DSL http://192.168.1.1 and press Enter. The Log In page appears.
- 2. Enter user name as Admin and password as Admin (case sensitive).
- 3. Click OK. The main page appears.





You can change the password in System->Password page at any time.

The Web Application is displayed as shown below. This page displays the FREEWAY DSL's current status.

	FREEW	AY DSL					
	s	System					
	Firmware Version: R139.080201a1_76	DSP Version: 2.8.1.2					
System	Interf	face Status					
	ADSL DOWN Line D/D Kbps WLAN UP	LAN 1 link up LAN 2 link down LAN 3 link down LAN 4 link down					
	Internet Connection						
	Status: PPPoE disconnect IP Address:						

### 4. Web Configuration

### 4.1 Overview

This page displays the firmware version, DSP version, interface status and Internet connection. This information will vary depending on the Internet connection status.

	FREEW	VAY DSL					
Site contents: Easy Configurator Overview Internet WLAN		System					
	Firmware Version: R139.080201a1_76	DSP Version: 2.8.1.2					
- System - Ca Advance	Inte	rface Status					
	ADSL DOWN Line 0/0 Kbps WLAN UP	LAN 1 link up LAN 2 link down LAN 3 link down LAN 4 link down					
	Internet Connection						
	Status: PPPoE disconnect IP Address:						

### 4.2 Internet

### 4.2.1 Internet Connection

The FREEWAY DSL supports multiple channel operation modes. The FREEWAY DSL is bridge mode enabled by factory default. There is a 1483-bridged mode PVC 0/35 in system.

		F	REE		VA	∆¥	dsl	-	
I Site contents: I Sasy Configurator I Sasy				Interr	net Co	nnection			
Overview	No.	Connection Name	Mode	VPI	VCI	Encap	DRoute	Status	Actions
	1	default	PPPoE	0	35	LLC	On	Enable	/ 🗊
Orenain Blocking     Orenain Blocking     ADSL Information     WLAN     System     Advance								New Co	onnection

You can click the **Edit** icon to edit the default configuration or click **New Connection** button to create a new connection.

Site contents: Easy Configurator Overview Internet URL Blocking Domain Blocking ADSL Information WLAN System Advance	0.       Connection Name         1       default         Proter Mode(PPP This device will act connection to the Ir Bridge Mode(1483) This device will act own connection to to pecify whether the Ir Require account i Do not require account	Mode PPPoE oE, PPPoA as a router. iternet. Bridge) as a simple the Internet. iternet conr nformation count infor	Intern VPI 0 Ope 4, 1483 All loc bridge bridge	erating MER, cal (LA) e device needs	nnection Encap LLC J Mode 1483 Ron N) networ e. All loca ormation : account	DRoute On uted) k devices w I (LAN) netw information	Status Enable New Co ill share the work device or not.	Actions The first same a same s use their rr			
Overview Internet Internet Connection URL Blocking Domain Blocking ADSL Information WLAN System Advance S S	o.     Connection Name       I     default       Protection to default     Connection to the ling       Bridge Mode(1483)       This device will act connection to the ling       Bridge Mode(1483)       This device will act own connection to the ling       Decify whether the ling       Require account in the ling       Do not require account in the ling	Mode PPPoE oE, PPPoA as a router. iternet. Bridge) as a simple the Internet. iternet conr nformation count infor	VPI 0 Ope 4, 1483 All loc bridge Account rection	VCI 35 MER, cal (LA) e device needs	Encap LLC J Mode 1483 Roo N) networ e. All loca ormation : account	DRoute On uted) k devices w I (LAN) netw information	Status Enable New Co ill share the work device or not.	Actions mnection s same s use their m			
Internet Connection     URL Blocking     Domain Blocking     ADSL Information     WLAN     System     Advance	I default Router Mode(PPP This device will act connection to the In Bridge Mode(1483 This device will act own connection to t pecify whether the In Require account i Do not require acc	PPPoE oE, PPPoA as a router. iternet. Bridge) as a simple the Internet. iternet conr nformation count infor	0 Ope A, 1483 All loc bridge Account rection (PPP)	35 erating MER, cal (LA e device unt Info	LLC J Mode 1483 Roi N) networ e. All loca ormation : account	On uted) k devices w I (LAN) netw information	Enable New Co ill share the work device or not.	onnection e same s use their m			
Domain Blocking     ADSL Information     WLAN     System     Advance	Router Mode(PPP This device will act connection to the In Bridge Mode(1483 This device will act own connection to t pecify whether the In Require account i Do not require acc	oE, PPPoA as a router. iternet. Bridge) as a simple he Internet. he Internet nformation count infor	Ope A, 1483 All loc bridge Account rection	erating MER, cal (LA e device unt Info	J Mode 1483 Roi N) networ e. All loca ormation	u <b>ted)</b> k devices w I (LAN) netv information	New Co ill share the work device or not.	onnection e same s use their m			
ADSL Information	Router Mode(PPP This device will act connection to the In Bridge Mode(1483 This device will act own connection to t pecify whether the In Require account i Do not require acc	oE, PPPoA as a router. iternet. Bridge) as a simple he Internet. iternet conr nformatior count infor	Ope A, 1483 All loc bridge Account ection (PPP	erating MER, cal (LA) e device unt Info needs	<b>Mode</b> 1483 Ron N) networ e. All loca ormation	u <b>ted)</b> k devices w I (LAN) netv information	ill share the work device or not.	e same s use their m			
System Advance	Router Mode(PPP This device will act connection to the In Bridge Mode(1483 This device will act own connection to t pecify whether the In Require account i Do not require acc	oE, PPPoA as a router. iternet. Bridge) as a simple he Internet. he Internet conr nformation count infor	A, 1483 All loc bridge Accou ection (PPP	MER, cal (LA e device unt Info needs	1483 Ron N) networ e. All loca ormation	u <b>ted)</b> k devices w I (LAN) netv information	ill share the work device or not.	e same s use their m			
C S ⊙	Bridge Mode(1483 This device will act own connection to t pecify whether the In Require account i Do not require acc	Bridge) as a simple the Internet. Internet conr Information count infor	bridge Accou ection (PPP)	e devico Int Info needs	e. All loca ormation account	I (LAN) netv information	work device or not.	s use their m			
s ⊙	pecify whether the Ir Require account i Do not require acc	nternet conr nformatior count infor	Accou lection I (PPP	int Info needs	ormation account	information	or not.				
S ©	pecify whether the Ir Require account i Do not require acc	nternet conr nformatior count infor	ection (PPP	needs	account	information	or not.				
0	Do not require ac	count infor		Specify whether the Internet connection needs account information or not. • Require account information (PPPoE, PPPoA)							
		○ Do not require account information (1483 MER, 1483 Routed)									
	Connection Settings										
	Connection Name:										
	Channel Mode: 💿 F	PPOE (	) PPP	'oA							
	DSL ATM Settings										
	Encapsulation		Adm	in Stat	tus						
	VC-Mux		0	Disah	e le						
	PPP Settings		Ŭ	DISUDI	10						
	User Name:										
	Password:										
	Type: Continuous	*	I	Idle Tin	me (min):						
	Enable NAPT: 🗹	Enable NAPT: 🗹 Default Route: ODisable 💿 Enable									
				-							
				Apply	y						

### Bridge Mode

- 1. Člick **New Connection** button.
- 2. Select the connection Mode to **1483 Bridged**. Set the parameters VPI/VCI and Encapsulation mode according to the CO DSLAM's setting.
- 3. Click Apply button to add this channel into Connection table.
- 4. Select **Save Settings/Reset** link from **System** menu at the left column of Web Application. Click **Save Settings/Reset** to save the settings permanently.
- 5. The new settings will take effect after reboot the system.

#### PPPoE / PPPoA Mode

- 1. Click **New Connection** button.
- 2. Select the connection Mode to **PPPoE** or **PPPoA**. Set the parameters VPI/VCI and Encapsulation mode according to the CO DSLAM's setting.
- 3. Set User name and Password provided by the ISP.
- 4. Click **Apply** button to add this channel into Connection table.
- 5. Select **Save Settings/Reset** link from **System** menu at the left column of Web Application. Click **Save Settings/Reset** to save the settings permanently.
- 6. The new settings will take effect after reboot the system.

#### 1483 MER (Mac Encapsulating Routing) Mode

- 1. Click New Connection button.
- 2. Select the connection Mode to **1483 MER**. Set the parameters VPI/VCI and Encapsulation mode according to the CO DSLAM's setting.
- 3. Set Local IP Address, Default Gateway and Subnet Mask (Fixed IP) provided by the ISP or select Dynamic IP (DHCP) to obtain them from the ISP.
- 4. Click **Apply** button to add this channel into Connection table.
- 5. Select **Save Settings/Reset** link from **System** menu at the left column of Web Application. Click **Save Settings/Reset** to save the settings permanently.
- 6. The new settings will take effect after reboot the system.

#### 1483 Routed Mode

- 1. Click **New Connection** button.
- 2. Select the connection Mode to **1483 Routed**. Set the parameters VPI/VCI and Encapsulation mode according to the CO DSLAM's setting.
- 3. Set Local IP Address, Default Gateway and Subnet Mask provided by the ISP.
- 4. Click Apply button to add this channel into Connection table.
- 5. Select **Save Settings/Reset** link from **System** menu at the left column of Web Application. Click **Save Settings/Reset** to save the settings permanently.
- 6. The new settings will take effect after reboot the system.

### 4.2.2 URL Blocking

This page is used to configure the blocked FQDN (Fully Qualified Domain Name, such as http://www.yahoo.com) or filtered keywords. If you want to prevent computers in local network from accessing certain website (like pornography, violence, or anything you want to block), you can use this function to stop computers in local network from accessing the site you configured in this page.

	FREEWAY DSL
Site contents: Easy Configurator Overview Internet URL Blocking Domain Blocking ADSL Information WLAN System Advance	URL Blocking Configuration         This page is used to configure the Blocked FQDN(Such as tw.yahoo.com) and filtered keyword.         URL Blocking Capability: <ul> <li>Disable</li> <li>Enable</li> <li>Apply Changes</li> <li>FQDN:</li> <li>Delete Selected FQDN</li> <li>URL Blocking Table:</li> <li>Select</li> <li>FQDN</li> <li>Delete Selected Keyword</li> <li>Keyword Filtering Table:</li> <li>Select</li> <li>Filtered Keyword</li> <li>Filtered Keyword</li></ul>

Field	Description
URL Blocking	Select the radio button to enable/disable URL blocking function.
Capability	
FQDN	Enter the URL (host name or IP address of website, such as
	http://www.blocked-site.com or http://11.22.33.44) you want to block.
Keyword	Enter the keyword which is contained in URL (such as pornography,
	cartoon, stock or anything) you want to block.
Keyword Filtering	This table lists all the existing URL/Keywords in filtering table.
Table	

### 4.2.3 Domain Blocking

This page is used to configure the blocked Domains.

	FREEWAY DSL
Site contents: Easy Configurator Overview Internet URL Blocking Domain Blocking ADSL Information WLAN System Advance	Domain Blocking Configuration         This page is used to configure the Blocked domain. Here you can add/delete the blocked domain.         Domain Blocking Capability:         Domain:         Apply Changes         Add Domain         Delete Selected Domain         Domain Block Table:         Select

Field	Description
Domain Blocking	Select the radio button to enable/disable domain blocking function.
Capability	
Domain	Enter the domain you want to block.
Domain Block	This table lists all the existing domains in blocking table.
Table	

### 4.2.4 ADSL Information

### 4.2.4.1 Statistics

This page shows the ADSL line statistics information.

FREE	way	DSL		
A	DSL Statistics	3		^
Mode Latency Trellis Coding Status Power Level	Enable DOWN LO			
SNR Margin (dB) Attenuation (dB)		Downstream 0.0 0.0	Upstream 0.0 0.0	
Output Power (dBm) Attainable Rate (Kbps) Rate (Kbps)		0.0 0 0	25.5 0 0	
K (number of bytes in DMT frame) R (number of check bytes in RS code S (RS code word size in DMT frame) D (interleaver depth) Delay (msec)	word)			
FEC CRC Total ES		0 0 0	0 0 0	
	A Mode Latency Trellis Coding Status Power Level SNR Margin (dB) Attenuation (dB) Output Power (dBm) Attainable Rate (Kbps) Rate (Kbps) K (number of bytes in DMT frame) R (number of bytes in DMT frame) R (number of check bytes in RS code S (RS code word size in DMT frame) D (interleaver depth) Delay (msec) FEC CRC Total ES Total ES	FREEWAY         ADSL Statistics         Mode	Image: Contract of the system of the syst	Downstream       Upstream         SNR Margin (dB)       0.0       0.0         Ownstream       Upstream         SNR Margin (dB)       0.0       0.0         Output Power (dBm)       0.0       0.0         Attainable Rate (Kbps)       0       0         R (number of bytes in DMT frame)       0       0         R (number of check bytes in RS code word)       0       0         S (RS code word size in DMT frame)       0       0         Piels       0       0       0         CRC       0       0       0         Trell S Code word Size in DMT frame)       0       0         CRC       0       0       0         Test S ES       0       0       0

### 4.2.4.2 Diagnostic

This page shows the ADSL tone diagnostic information. You will not typically need to view this data, but you may find it helpful when working with your ISP to diagnose network and Internet data transmission problems.

		FR	EEW	AY	dsl		
Site contents: Easy Configurator Overview Internet URL Blocking Domain Blocking ADSL Information Statistics Diagnostic WLAN System Advance	Adsl Tone Diagnos	tics. Hlin Scale Loop Attenua Signal Attenu SNR Margin( Attainable Ra	Diagnostic Start Do stion(dB) (dB) (dB) tte(Kbps)	cs ADSL wnstream	, Upstream		_
	Tone Number 0 1 2 3 4 5 6 7 8	Attainable Ka Output Powe: H.Real	r(dBm) H.Image	SNR	QLN	Hlog	×

# 4.3 WLAN (Wireless Model Only)4.3.1 WLAN Monitor

This section provides the wireless network settings for your WLAN interface. The wireless interface enables the wireless AP function for FREEWAY DSL. To display updated information showing any new data since you opened this page, click Refresh.

		FRE	EWA	Y D	SL	
Site contents: Basy Configurator Overview Internet WI AN	WLAN Monitor This table shows the MAC address, transmission, receiption packet counters and encrypted status for each associated wireless client.					
WLAN Monitor	MAC Address	Tx Packet	Rx Packet	Tx Rate	Power	Expired Time (s)
Access Control	00:15:00:21:6b:a9	63	1151	24	no	293
WPS System Advance	Refresh					

### 4.3.2 RF Settings (Wireless Basic Settings)

This page contains all of the wireless basic settings. Most users will be able to configure the wireless connection and get it working properly using the setting on this screen.

	FREEWAY DSL
Site contents: Coverview Internet WLAN WLAN Monitor RF Settings Security Access Control WDS WPS System Advance	Wireless Basic Settings   This page is used to configure the parameters for wireless LAN clients which may connect to your Access Point. Here you may change wireless encryption settings as well as wireless network parameters.   Disable Wireless LAN Interface   Band: 2.4 GHz (B+G) •   Mode: AP   SSID:   FREEWAY   Channel Number:   Auto •   Associated Clients:   Show Active Clients

Field	Description
Disable Wireless	Check it to disable the wireless function for FREEWAY DSL.
LAN Interface	
Band	Select the appropriate band from the list provided to correspond with your network setting.
Mode	<ul> <li>Select the mode to be AP or AP+WDS.</li> <li>Used to specify the wireless mode to be:</li> <li>AP: Configure the FREEWAY DSL as a standard wireless AP (access point).</li> </ul>
	<ul> <li>AP+WDS: This mode allows you to connect the FREEWAY DSL with up to four WDS-capable wireless routers to expand the network.</li> </ul>
SSID	The Service Set Identifier (SSID) or network name. It is case sensitive and must not exceed 32 characters, which may be any keyboard character. The mobile wireless stations shall select the same SSID to be able to communicate with the FREEWAY DSL (AP).
Channel Number	Select the appropriate channel from the list provided to correspond with your network settings. You shall assign a different channel for each AP and FREEWAY DSL to avoid signal interference.

Radio Power (mW)	Select the output power of wireless radio to 100%, 50% or 25%.		
	Unless you are using this FREEWAY DSL in a really wide space,		
	you may not have to set radio power to 100%. The wider coverage		
	the more security risk (malicious or unknown users in distance will		
	be able to reach the FREEWAY DSL).		
Associated Clients	Click this button to show the clients currently associated with the		
	FREEWAY DSL.		

### 4.3.3 Wireless Advanced Settings

This page contains the wireless advanced settings. It is recommended that you remain this page as its default settings unless you have sufficient wireless knowledge.

	FB	REEWAY DSL
Site contents: Coverview Internet WLAN WLAN Monitor RF Settings Security Access Control WDS WPS Advance	These settings are only for about wireless LAN. These changes will have on your Authentication Type: Fragment Threshold: RTS Threshold: Beacon Interval: Data Rate: Preamble Type: Broadcast SSID: Relay Blocking: Ethernet to Wireless Blocking: Apply Changes	Wireless Advanced Settings rr more technically advanced users who have a sufficient knowledge the settings should not be changed unless you know what effect the r Access Point. Open System O Shared Key O Auto 2346 (256-2346) 2347 (0-2347) 100 (20-1024 ms) Auto © Long Preamble O Short Preamble © Enabled O Disabled O Enabled O Disabled Enabled O Disabled

Field	Description
Authentication	Used to specify the wireless authentication type which can be:
Туре	<ul> <li>Open System: Enables your client adapter, regardless of its WEP settings, to attempt to authenticate and communicate with an access point. Open Authentication is the default setting.</li> <li>Shared Key: Enables your client adapter to communicate only with access points that have the same WEP key. This option is available only if Use Static WEP Keys is selected.</li> <li>Auto: This allows either Open System or Shared Key authentication to be used.</li> </ul>
Fragment	Defines the largest RF packet that the client adapter sends without
Threshold	splitting the packet into two or more smaller fragments. If a single fragment experiences interference during transmission, only that fragment must be resent. Fragmentation generally reduces throughput because the packet overhead for each fragment consumes a higher portion of the RF bandwidth.

RTS Threshold	Specifies the data packet size beyond which the low-level RF protocol invokes RTS/CTS flow control. A small value causes RTS packets to be sent more often, which consumes more of the available bandwidth and reduces the throughput of other network packets. However, small values help the system recover from interference or collisions, which can occur in environments with obstructions or metallic surfaces that create complex multipath signals. Should you encounter inconsistent data flow, only minor reduction of the default value, 2347, is recommended. If a network packet is smaller than the preset RTS threshold size, the RTS/CTS mechanism will not be
	enabled. The Router sends Request to Send (RTS) frames to a particular receiving station and negotiates the sending 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. The RTS Threshold value should remain at its default value of 2347.
Beacon Interval	Specifies the interval between beacon packets, which IEEE 802.11 systems use to synchronize clients. Beacon packets contain timing and other information that is broadcast over the airwaves. Any station that receives the beacon packet can then synchronize with the system broadcasting beacons. The default value of the beacon period is 100 milliseconds.
Data Rate	The rate of data transmission should be set depending on the speed of your wireless network. You can select from a range of transmission speeds, or you can select Auto to have the Router automatically use the fastest possible data rate and enable the Auto-Fallback feature. Auto-Fallback will negotiate the best possible connection speed between the Router and a wireless client. The default value is Auto.
Preamble Type	Preamble is part of the wireless signal that synchronizes network traffic. Select the appropriate preamble type, Long Preamble (default) or Short Preamble. High network traffic areas should use the shorter preamble type.
Broadcast SSID	When wireless clients survey the local area for wireless networks to associate with, they will detect the SSID broadcast by the Router. To broadcast the Router's SSID, keep the default setting, Enable. If you do not want to broadcast the Router's SSID, then select Disable.
Relay Blocking	When Relay Blocking is enabled, wireless clients will not be able to directly access other wireless clients.
Ethernet to Wireless Blocking	When enabled, traffic between Ethernet and wireless interfaces are not allowed.

### 4.3.4 Security

This page allows advanced users who have sufficient knowledge of wireless LAN to configure advanced settings for the wireless connection. The default settings shall not be changed unless you know exactly what will happen for the changes you made to your FREEWAY DSL. This screen allows you to setup the wireless security. Enable WEP or WPA by configuring encryption keys can prevent unauthorized access to your WLAN.

Site contents: Easy Configurator Overview Internet WLAN WLAN Monitor RF Settings Security Access Control WDS WPS System Advance	Wireless Security Setup   This page allows you setup the wireless security. Turn on WEP or WPA by using Encryption Keys could prevent any unauthorized access to your wireless network.   SSID TYPE:   Provide OVAPD OVAP1 OVAP2 OVAP3   Image: Overall
---	---

<b>P</b> <sup>1</sup> - 1 - 1	Description
Field	Description
SSID Type	A VAP (Virtual Access Point) is a logical entity which exits within a physical Access Point (AP). A physical AP can support several VAPs. Each VAP might advertise either different SSID and capability set or same SSID with different capability set. In general terms, VAPs can be seen as totally independent APs. That is, with different capabilities, SSID, MAC addresses, IP addresses, client configurations and connected to different VLANs.
Encryption	<ul> <li>There are 4 types of security to be selected. To secure your wireless network, it's strongly recommended to enable this feature.</li> <li>WEP: Make sure that all wireless devices on your network are using the same encryption level and key. Click Set WEP Key button to set the encryption key.</li> <li>WPA (TKIP): WPA uses Temporal Key Integrity Protocol (TKIP) for data encryption. TKIP utilized a stronger encryption method and incorporates Message Integrity Code (MIC) to provide protection against hackers.</li> <li>WPA2 (AES): WPA2 uses Advanced Encryption Standard (AES) for data encryption. AES utilized a symmetric 128bit block data encryption.</li> <li>WAP2 Mixed: The AP supports WPA (TKIP) and WPA2 (AES) for data encryption.</li> </ul>

Use 802.1x	Check it to enable 802.1x authentication. This option is selectable only
Authentication	when the Encryption is choose to either <b>None</b> or <b>WEP</b> . If the Encryption
	is <b>WEP</b> , you need to further select the WEP key length to be either <b>WEP</b>
	64bits or WEP 128bits.
WPA	There are 2 types of authentication mode for WPA.
Authentication	• Enterprise (WPA-RADIUS): WPA RADIUS uses an external RADIUS
Mode	server to perform user authentication. To use WPA RADIUS, enter
	the IP address of the RADIUS server, the RADIUS port (default is
	1812) and the shared secret from the RADIUS server. Please refer to
	"Authentication RADIUS Server" setting below for RADIUS setting.
	Personal (Pre-Shared Key): Pre-Shared Key authentication is based
	on a shared secret that is known only by the parties involved. To use
	WPA Pre-Shared Key, select key format and enter a password in the
	Pre-Shared Key Format and Pre-Shared Key setting respectively.
Pre-Shared	• PassPhrase: Select this to enter the Pre-Shared Key secret as user-
Key Format	friendly textual secret.
-	• Hex (64 characters): Select this to enter the Pre-Shared Key secret
	as hexadecimal secret.
Pre-Shared	Specify the shared secret used by this Pre-Shared Key. If the Pre-
Кеу	Shared Key Format is specified as PassPhrase, it indicates a
-	passphrase of 8 to 63 alphanumerical characters. If the Pre-Shared Key
	Format is specified as Hex (64 characters), it indicates a 64-
	hexadecimal characters of 0-9, a-f and A-F.
Authentication	Specify the IP address, port number and password of external RADIUS
RADIUS	server if the Enterprise (RADIUS) is selected at WPA Authentication
Server	Mode.

### 4.3.5 Access Control

When Enable Access Control function, MAC address can be added into access control list and only those clients whose wireless MAC address are in the ACL (Access Control List) will be able to connect to your FREEWAY DSL (or AP).

Site contents:  Carbon Site contents:  Carbo		FREEWAY DSL
WLAN Monitor   PF Settings   Security   Access Control   WDS   WVPS   System   Advance     Current Access Control List:   MAC Address   Current Access Control List:   MAC Address   Delete Selected   Delete All	Site contents: Coverview Unternet WLAN Monitor RF Settings Security Access Control WDS WPS System Advance	Wireless Access Control   If you choose 'Allowed Listed', only those clients whose wireless MAC addresses are in the access control list will be able to connect to your Access Point. When 'Deny Listed' is selected, these wireless clients on the list will not be able to connect the Access Point.   Wireless Access Control Mode: Disable   MAC Address: (ex. 00E086710502)   Apply Changes Reset   Current Access Control List:   MAC Address   Delete Selected   Delete All

Field	Description
Wireless	The Selections are:
Access	Disable: Disable the wireless ACL function.
Control Mode	<ul> <li>Allow Listed: When this option is selected, no wireless clients except those whose MAC addresses are in the current access control list will be able to connect (to the FREEWAY DSL).</li> <li>Deny Listed: When this option is selected, all wireless clients except those whose MAC addresses are in the current access control list will be able to connect (to the FREEWAY DSL).</li> </ul>
MAC Address	Enter client MAC address and press "Apply Changes" button to add
	client MAC address into current access control list.
Current	It lists the client MAC addresses can/cannot connected to the
Access	FREEWAY DSL. You can select the entries at the Select column and
Control List	apply to the following function buttons.

### 4.3.6 WDS

Wireless Distribution System (WDS) is a system that interconnects BSS (Basic Service Set) to build a premise wide network. The FREEWAY DSL supports the WDS protocol, which allows a point to point link to be established between two APs.

Note Only if you be configure	select <b>AP+WDS</b> mode on the RF Settings page, this WDS page can ed.
	FREEWAY DSL
Site contents: Coverview Internet WLAN WLAN Monitor RF Settings Security Access Control WDS WPS System Advance	WDS Settings         Wireless Distribution System uses wireless media to communicate with other APs, like         the Ethernet does. To do this, you must set these APs in the same channel and set MAC         address of other APs which you want to communicate with in the table and then enable the         WDS         Add WDS AP:         MAC Address:       Comment:         Apply Changes       Reset         Current WDS AP List:         MAC Address       Comment         Delete Selected       Delete AI

Field	Description
Enable WDS	Check to enable the WDS function. Only if you select <b>AP+WDS</b> mode
	on the RF Settings page, this WDS page can be configured.
MAC Address	This is where you enter the MAC address of the peer AP's wireless
	interface that you are connecting to.
Comment	Enter the comment for this MAC address.
Current WDS	It lists the peer MAC addresses of the WDS link. Any AP with its MAC
AP List	address listed in this WDS AP list may have a WDS link to the device.
	You can select the entries at the Select column and apply to the
	following function buttons.

### 4.3.7 WPS

This page is used to configure the settings for WPS (Wi-Fi Protected Setup). It uses a pushbutton or a 4- or 8-digit personal identification number (PIN) to simplify the secure network setup. The PIN can be generated by software or preprogrammed into a client device and printed on an included card. With WPS, FREEWAY DSL 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.

	FREEWAY DSL
Site contents: Easy Configurator Overview Internet WLAN WLAN Monitor RF Settings	Wi-Fi Protected Setup           This page allows you to change the setting for WPS (Wi-Fi Protected Setup). Using this feature could let your wireless client automically syncronize its setting and connect to the Access Point in a minute without any hassle.           Disable WPS
	WPS Status:     Configured       Self-PIN Number:     12345670         Regenerate PIN
UPS	PIN Configuration: Start PIN
- C Advance	Push Button Configuration:     Start PBC       Apply Changes     Reset
	Current Key Info:
	Authentication Encryption Key
	Open None N/A
	Client PIN Number: Start PIN

Field	Description
Disable WPS	Check this box to disable WPS function.
WPS Status	If the wireless security (encryption) function of the FREEWAY DSL is properly set, you will see "Configured" radio button in action
	mode, otherwise, "UnConfigured" is in action mode.
Self-PIN Number	The the PIN Number of this FREEWAY DSL. This number is useful
	when you need to build wireless connection by WPS with other
	WPS-enabled wireless devices.
Regenerate PIN	Click this button to generate a set of new PIN number.
Start PBC	Click this button to start PBC (Push-Button Configuration) setup
	procedure. The <b>WPS</b> LED on the FREEWAY DSL will blink slowly
	for 2 minutes when the FREEWAY DSL is waiting for incoming WPS
	request.
Client PIN Number	Enter the PIN number of the wireless client you wish to connect.
Start PIN	Click this button to start PIN setup procedure. The WPS LED on the
	FREEWAY DSL will blink slowly for 2 minutes when the FREEWAY
	DSL is waiting for incoming WPS request.

### 4.4 System 4.4.1 Password

The first time you log into the system with default password. This page allows you to change the password for administrator.

Site contents: Coverview Internet VULAN System Password Network Time Store/Restore Settings Save settings/Reset Advance New Password: Advance Apply Reset		FREEWAY DSL
	Site contents: Overview Internet WLAN System Password Network Time Store/Restore Settings Firmware Update Save settings/Reset Advance	Password Setup         This page is used to set the account to access the web server of ADSL Router. Empty user name and password will disable the protection.         User Name:       Admin          Old Password:       Image:

Field	Description
User Name	Select the login user name.
Old Password	Enter the old password in this field.
New Password	Enter the new password in this field.
Confirmed Password	Enter the new password in this field to confirm the password.

### 4.4.2 Network Time

Simple Network Timing Protocol (SNTP) is a protocol used to synchronize the system time to the public SNTP servers. The FREEWAY DSL supports SNTP client functionality in compliance with IETF RFC2030. This page allows you to manually configure the time and select Time Zone. Also, you can enable SNTP client update function and configure the SNTP server to let the FREEWAY DSL synchronize with the public SNTP servers.

Site contents: Overview Internet Password Password Password Network Time Store/Restore Settings Firmware Update Save settings/Reset Xou can maintain the system time by synchronizing with a public time server over the internet. Urrrent Time : yr 1970 Mon 1 Day 1 Hr 0 Mn 11 Sec 20 Time Zone Select : (CMT+08.00)Beijing. Chongqing. Hong Kong. Urumqi v Image: Content Store/Restore Settings Firmware Update Save settings/Reset XTP server : 2011/18036-Asia Padite v (Manual IP Setting) Apply Change Refresh		FREEWAY DSL
	Site contents: Coverview Coverv	Time Zone Setting         You can maintain the system time by synchronizing with a public time server over the Internet.         Current Time :       Yr 1970 Mon 1 Day 1 Hr 0 Mn 11 Sec 20         Time Zone Select :       (GMT+08:00)Beijing, Chongring, Hong Kong, Urumqi         Enable SNTP client update         SNTP server :       203.117.180.36- Asia Pacific (Manual IP Setting)         Apply Change       Refresh

Field	Description
Current Time	The current time of the specified time zone. You can set the current time
	by yourself or configured by SNTP.
Time Zone	Select The time zone in which the FREEWAY DSL resides.
Enable SNTP	Enable the SNTP client to update the system clock.
client update	
SNTP server	The IP address or the host name of the SNTP server. You can select
	from the list or set it manually.

### 4.4.3 Restore/Restore Settings

This page allows you to backup current settings to a file or restore the settings from a previously saved file. Also, you can reset the FREEWAY DSL to default settings.

	FREEWAY DSL
Site contents: Coverview Internet WLAN System Password Network Time Store/Restore Settings Firmware Update Save settings/Reset Advance	System Settings         This page allows you to backup current settings to a file or restore the settings from the file which was saved previously. Besides, you could reset the current configuration to factory default.         Save Settings to       Save         File:       Load Settings from         Browse       Upload         File:       Reset Settings to         Reset Settings to       Reset

To save settings to a file, just click the **Save** button to save the file to a local drive.

To load settings from a file, please follow the following instructions:

- 1. Click the Browse button to select the saved file.
- 2. Confirm your selection.
- 3. Click the **Upload** button to start restoring.

To reset all the current settings, just click **Reset** button to reset all settings to default value. This is the same as you push the **Reset** button on the rear panel of FREEWAY DSL.

**IMPORTANT!** Do NOT power off the FREEWAY DSL or press the Reset button while this procedure is in progress.

### 4.4.4 Firmware Update

The system software used by this FREEWAY DSL is called "firmware". This page allows you to upgrade the firmware to newer version.

	FREEWAY DSL
Site contents: Coverview Coverv	Update Firmware         This page allows you update the ADSL Router firmware to new version. Please note, do not power off the device during the update because it may crash the system.         Select File:       Browse         Update       Reset

To upgrade firmware, please follow the following instructions:

- 4. Click the **Browse** button to select the firmware file.
- 5. Confirm your selection.
- 6. Click the **Upload** button to start upgrading.

**IMPORTANT!** Do NOT power off the FREEWAY DSL or press the Reset button while this procedure is in progress.

### 4.4.5 Save Settings/Reset

Whenever you use the Web Application to change system settings, the changes are initially placed in temporary storage. To save your changes for future use, you can use the Commit/Reboot function. This page allows you to save the changes permanently and reboot the system. Or you may lose the settings you made after power off or reboot.

	FREEWAY DSL
Site contents: Coverview Internet WLAN System Password Network Time Store/Restore Settings Firmware Update Save settings/Reset Advance	Save settings/Reset         This page is used to commit changes to system memory and reboot your system.         Save settings/Reset

**IMPORTANT!** Do NOT power off the FREEWAY DSL or press the Reset button while this procedure is in progress.

### 4.5 Advanced

### 4.5.1 LAN

### 4.5.1.1 LAN

This page shows the current setting of LAN interface. You can set IP address and subnet mask for LAN interface in this page.

Site contents: <ul> <li>Graview</li> <li>Graview<!--</th--><th></th><th>FREEWAY DSL</th></li></ul>		FREEWAY DSL
	Site contents: Coverview Internet WLAN System Advance LAN DHCP Firewall Network Settings DNS Device Management	LAN Interface Setup         This page is used to configure the LAN interface of your ADSL Router. Here you may change the setting for IP addresss, subnet mask, etc         Interface Name:       br0         IP Address:       192.168.1.1         Subnet Mask:       255.255.255.0         Apply Changes       Undo

Field	Description
IP Address	Enter the IP address of FREEWAY DSL.
Subnet Mask	Enter the subnet mask for this network.

### 4.5.1.2 DHCP

The FREEWAY DSL supports the Dynamic Host Configuration Protocol (DHCP). This page is used to configure the FREEWAY DSL to be a DHCP server or a DHCP Relay agent. When acting as DHCP server, you can setup the server parameters at the **DHCP Server** page, while acting as DHCP Relay, you can setup the relay at the **DHCP Relay** page.

#### **DHCP Server Configuration**

By default, the FREEWAY DSL is configured as a DHCP server, with a predefined IP address pool from 192.168.1.2 to 192.168.1.100 (subnet mask 255.255.255.0).

	F	REEWAY DSL
Site contents: Coverview Unternet WLAN System Advance LAN ChCP Firewall Network Settings DNS Device Management	This page be used to cor DHCP Mode: None DHCP Server Enable the DHCP Server thelP address pools avail thepool to hosts on your LAN IP Address: 192.16 IP Pool Range: Max Lease Time: Domain Name: Gateway Address: Apply Changes	DHCP Settings         figure DHCP Server and DHCP Relay.         ● DHCP Relay ● DHCP Server         if you are using this device as a DHCP server. This page lists able to hosts on your LAN. The device distributes numbers in network as they request Internet access.         8.1.1 Subnet Mask: 255.255.255.0         192.168.1.2       - 192.168.1.100         B6400       seconds (-1 indicates an infinite lease)         domain.name       -         192.168.1.1       MAC-Base Assignment

Field	Description
IP Pool Range	Enter the start and end addresses in the pool.
Show Client	Click this button to display the clients that is connected to the FREEWAY DSL.
Max Lease Time	The Lease Time is the amount of time hat a network user is allowed to maintain a network connection to the device using the current dynamic IP address. At the end of the Lease Time, the lease is either renewed or a new IP is issued by the DHCP server. The amount of time is in units of seconds. The default value is 86400 seconds (1 day). The value -1 stands for the infinite lease.
Domain Name	A user-friendly name that refers to the group of hosts (subnet) that will be assigned addresses from this pool.
Gateway Address	Enter the Gateway's Address of the FREEWAY DSL.
MAC-Base Assignment	Click this button to configure the static IP base on MAC Address. You can assign/delete the static IP. To configure the host MAC address, enter a string with hex number, e.g. "00-d0-59-c6-12-43". To configure the assignment IP address, enter a string with digit, e.g. "192.168.1.100".

#### **DHCP Relay Configuration**

Some ISPs perform the DHCP server function for their customers' home/small office network. In this case, you can configure this device to act as a DHCP relay agent. When a host on your network requests Internet access, the device contacts your ISP to obtain the IP configuration, and then forward that information to the host. You should set the DHCP mode after you configure the DHCP relay.

Site contents: Easy Configurator Overview Internet WLAN System Advance LAN DACP PhCP Mode: None DHCP Relay DHCP Server DHCP Mode: None DHCP Relay DHCP Server DHCP Relay Configuration This page is used to configure the DHCP server ip addresses for DHCP Relay. DHCP Server Address: 172.19.31.4 DHCP Server Address: 172.19.31.4		FREEWAY DSL
	Site contents: Easy Configurator Overview Unternet WLAN System Advance LAN DHCP Firewall Network Settings DNS Device Management	DHCP Settings   This page be used to configure DHCP Server and DHCP Relay.   DHCP Mode:   None   OHCP Relay   OHCP Relay Configuration   This page is used to configure the DHCP server ip addresses for DHCP Relay.   DHCP Server Address:   172.19.31.4     Apply Changes   MAC-Base Assignment

Field	Description
DHCP Server	Specify the IP address of your ISP's DHCP server. Requests for
Address	IP information from your LAN will be passed to the default
	gateway, which should route the request appropriately.

### 4.6 Firewall

Firewall contains several features that are used to deny or allow traffic from passing through the FREEWAY DSL.

### 4.6.1 IP/Port Filtering

This page allows you to deny/allow specific services or applications in the forwarding path.

	FREEWAY DSL
Site contents: Corrview Internet WLAN System Advance LAN Firewall Port Filtering Port Forwarding Network Settings DNS Device Management	IP/Port Filtering         Entries in this table are used to restrict certain types of data packets through the Gateway. Use of such filters can be helpful in securing or restricting your local network.         Outgoing Default Action O Deny O Allow         Incoming Default Action O Deny O Allow         Incoming Default Action O Deny O Allow         Direction: Outgoing Protocol: TCP Rule Action O Deny O Allow         Source IP Address:         Subnet Mask:         Port:         Port:         Add    Current Filter Table:          Select Direction       Protocol Src Address         Delete Selected       Delete All

Field	Description
Outgoing Default	Select to deny or allow the default action on the LAN to WAN
Action	forwarding path.
Incoming Default	Select to deny or allow the default action on the WAN to LAN
Action	forwarding path.
Direction	Select the traffic forwarding direction.
Protocol	There are 3 options available: TCP, UDP and ICMP.
Rule Action	Select to deny or allow traffic when matching this rule.
Source IP Address	The source IP address assigned to the traffic on which filtering
	is applied.
Source Subnet Mask	Enter the subnet mask of the source IP.
Source Port	Enter the starting and ending source port numbers.
Destination IP	The destination IP address assigned to the traffic on which
Address	filtering is applied.
Destination Subnet	Enter the subnet mask of the destination IP.
Mask	
Destination Port	Enter the starting and ending destination port numbers.

### 4.6.2 MAC Filtering

This page allows you to define rules to allow or deny frames through the FREEWAY DSL based on source MAC address, destination MAC address and traffic direction.

	FRE	EWAY	( DSL	
Site contents: Coverview Internet WLAN System Advance LAN Firewall IP/Port Filtering Port Forwarding Dovrk Settings DNS Device Management	Entries in this table are used to re network to Internet through the Ga restricting your local network. Outgoing Default Action Incoming Default Action Rule Action Direction: Outgoing V Src MAC Address: Apply Char Current Filter Table: Select Direction Src M/ Delete Selected Delete	MAC Filterin strict certain types teway. Use of such O Deny O Deny O Deny O Deny O Deny AC Address All	g of data packets fro n filters can be help I Allow Allow Allow Allow Address: Dst MAC Addres	m your local ful in securing or oply Changes s Rule Action

Field	Description
Outgoing Default	Select to deny or allow the default action on the LAN to WAN
Action	bridging/forwarding path.
Incoming Default	Select to deny or allow the default action on the WAN to LAN
Action	bridging/forwarding path.
Rule Action	Select to deny or allow traffic when matching this rule.
Direction	Select the traffic bridging/forwarding direction.
Src MAC Address	Enter the source MAC address. It must be xxxxxxxxxx format.
Dst MAC Address	Enter the destination MAC address. It must be xxxxxxxxxx format.

### 4.6.3 Port Forwarding

This page allows you to configure port forwarding rules. Add a Port Forwarding entry will create a tunnel through your firewall so that the computers on the Internet can communicate to one of the computers on your LAN on a single port.

	FREEWAY DSL
Site contents: Coverview Internet WLAN System Advance LAN Firewall P/Port Filtering Network Settings Dovs Device Management	Port Forwarding         Entries in this table allow you to automatically redirect common network services to a specific machine behind the NAT firewall. These settings are only necessary if you wish to host some sort of server like a web server or mail server on the private local network behind your Gateway's NAT firewall.         Port Forwading:       Disable       Enable       Apply Changes         Port Forwading:       Disable       Enable       Apply Changes         Port Forwading:       Disable       Enable       Apply Changes         Port Forwading:       Comment:       Image: Comment:       Image: Comment:         Protocol:       Both       Comment:       Image: Comment:       Image: Comment:         Interface:       any       Add         Current Port Forwarding Table:       Add       Image: Comment Enable RemotePublic         Select       Local IP       Protocol Local Port Comment Enable RemotePublic       Protocol Host Port         Delete Selected       Delete All       Delete All       Delete All

Field	Description
Enable Port	Check this item to enable the port-forwarding feature.
Forwarding	
Protocol	There are 3 options available: TCP, UDP and Both.
Enable	Check this item to enable this entry.
Local IP Address	IP address of your local server that will be accessed by Internet.
Port	The destination port number that is made open for this application
	on the LAN-side.
Remote IP	The source IP address from which the incoming traffic is allowed.
Address	Leave blank for all.
External Port	The destination port number that is made open for this application
	on the WAN-side.
Interface	Select the WAN interface on which the port-forwarding rule is to be
	applied.

### 4.7 Network Settings

### 4.7.1 Static Routing

The Routing page enables you to define specific route for your Internet and network data. Most users do not need to define routes. On a typical small home or office LAN, the existing routes that set up the default gateways for your LAN hosts and for the FREEWAY DSL provide the most appropriate path for all your Internet traffic.

On your LAN hosts, a default gateway directs all Internet traffic to the LAN port(s) on the FREEWAY DSL. Your LAN hosts know their default gateway either because you assigned it to them when you modified your TCP/IP properties, or because you configured them to receive the information dynamically from a server whenever they access the Internet. On the FREEWAY DSL itself, a default gateway is defined to direct all outbound Internet traffic to a route at your ISP. The default gateway is assigned either automatically by your ISP whenever the device negotiates an Internet access, or manually by user to setup through the configuration.

You may need to define routes if your home setup includes two or more networks or subnets, if you connect to two or more ISP services, or if you connect to a remote corporate LAN.

	FREEWAY DSL
Site contents: Coverview WLAN System Advance LAN Firewall Overview Dot Mapping DNS Device Management	Routing Configuration   This page is used to configure the routing information. Here you can add/delete IP routes.   Enable:   Destination:   Subnet Mask:   Next Hop:   Metric:   Interface:   any   Add Route   Update   Delete Selected   Show Routes   Static Route Table:   Select   State   Destination   Subnet Mask

Field	Description
Enable	Check to enable the selected route or route to be added.
Destination	The network IP address of the subnet. The destination can be specified as the IP address of a subnet or a specific host in the subnet. It can also be specified as all zeros to indicate that this route should be used for all destinations for which no other route is defined (this is the route that creates the default gateway).
Subnet Maak	The network mask of the destination subnet. The default gateway uses a
Wask	mask of 0.0.0.0.
Next Hop	The IP address of the next hop through which traffic will flow towards the destination subnet.

Metric	Defines the number of hops between network nodes that data packets travel. The default value is 0, which means that the subnet is directly one hop away on the local LAN network.
Interface	The WAN interface to which a static routing subnet is to be applied.
Show	Click this button to view the FREEWAY DSL's routing table.
Routes	

### 4.7.2 Port Mapping

The FREEWAY DSL provides multiple interface groups. Up to five interface groups are supported including one default group. The LAN and WAN interfaces could be included. Traffic coming from one interface of a group can only be flowed to the interfaces in the same interface group. Thus, the FREEWAY DSL can isolate traffic from group to group for some application. By default, all the interfaces (LAN and WAN) belong to the default group, and the other four groups are all empty. It is possible to assign any interface to any group but only one group.

	FREEWAY DSL
Site contents: Easy Configurator Overview WLAN System Advance LAN Static Routing Port Mapping DNS Device Management	Port Mapping Configuration   To manipulate a mapping group:   1. Select a group from the table.   2. Select interfaces from the available/grouped interface list and add it to the grouped/available interface list using the arrow buttons to manipulate the required mapping of the ports.   3. Click "Apply Changes" button to save the changes.   Mote that the selected interfaces will be removed from their existing groups and added to the new group.   O isabled   O isabled   O isabled   Select   Image:   Available Interfaces   Select   Interfaces   DefaultLAN1_LAN2_LAN3_LAN4_wlan0_vap0_vap1_vap2_vap3.ppp0   Select   Image:

Field	Description		
Enabled/Disabled	Radio buttons to enable/disable the interface group feature. If disabled,		
	all interfaces belong to the default group.		
Grouped	To manipulate a mapping group:		
Interfaces	1. Select a group from the table.		
	2. Select interfaces from the available/grouped interface list and add		
	it to the grouped/available interface list using the arrow buttons to		
	manipulate the required mapping of the ports.		
	3. Click Apply Changes to save the changes.		

### 4.8 DNS

There are two submenus for the DNS Configuration: DNS Server and Dynamic DNS.

### 4.8.1 DNS Server

This page is used to select the way to obtain the IP addresses of the DNS servers.

	FREEWAY DSL
Site contents: Coverview Overview WLAN System Advance LAN Firewall Network Settings DNS DNS Server Dynamic DNS Device Management	DNS Configuration   This page is used to configure the DNS server ip addresses for DNS Relay. <ul> <li>Attain DNS Automatically</li> <li>Set DNS Manually</li> <li>DNS 1:</li> <li>DNS 2:</li> <li>DNS 3:</li> </ul> Apply Reset

Field	Description
Attain DNS	Select this item if you want to use the DNS servers obtained by the
Automatically	WAN interface via the auto-configuration mechanism.
Set DNS Manually	Select this radio button to configure up to three DNS IP addresses
	manually.

### 4.8.2 DDNS (Dynamic DNS)

Each time your device connects to the Internet, your ISP assigns a different IP address to your device. In order for you or other users to access your device from the WAN-side, you need to manually track the IP that is currently used. This page allows you to register your device with a DNS server and access your device each time using the same host name.

	FR.	EEWAY DSL
Site contents: Coverview Unternet WLAN System Advance LAN Firewall Network Settings DNS Server Dynamic DNS Device Management	Dy This page is used to configure you can Add/Remove to config Enable: DDNS provider: Hostname: Interface: Pussword: TZO Settings: Email: Key: Dynamic DDNS Table: Select state Add Re	Imamic DNS Configuration         the Dynamic DNS address from DynDNS.org or TZO. Here         gynDNS.org          gynDNS.org          gop0          ostname       Username         Service

Field	Description
Enable	Check this item to enable this registration account for the DNS server.
DDNS Provider	There are two DDNS providers to be selected in order to register your device with: DynDNS and TZO. A charge may occur depends on the service you select.
Hostname	Enter the domain name to be registered with the DDNS server.
Interface	This field defaults to your device's WAN interface over which your device will be accessed.
DynDNS Username / Password	Enter the user name and password of your registered account in DDNS service provider DynDNS.
TZO Email / Key	Enter the e-mail address and key (password) of your registered account in DDNS service provider TZO.

### 4.9 Device Management

### 4.9.1 UPnP

The FREEWAY DSL supports a control point for Universal Plug and Play (UPnP) version 1.0, and supports two key features: **NAT Traversal** and **Device Identification**. This feature requires one active WAN interface. In addition, the host should support this feature. In the presence of multiple WAN interfaces, select an interface on which the incoming traffic is present.

With NAT Traversal, when an UPnP command is received to open ports in NAT, the application translates the request into system commands to open the ports in NAT and the firewall. The interface to open the ports on is given to UPnP when it starts up and is part of the configuration of the application.

For Device Identification, the application will send a description of the FREEWAY DSL as a control point back to the host making the request.

	FREEWAY DSL
Site contents: Easy Configurator Overview WLAN System Advance LAN Firewall Network Settings DNS Device Management UPnP TR-069	UPnP Configuration This page is used to configure UPnP. The system acts as a daemon when you enable it by doing the follows: • Enable UPnP. • Select WAN interface (uptream) that will use UPnP. UPnP: • Disable • Enable WAN Interface: • ppp • • Reset

Field	Description
UPnP	Daemon Enable/disable UPnP feature.
WAN Interface	Select WAN interface that will use UPnP from the drop-down lists.

### 4.9.2 TR-069

The TR-069 (CPE WAN Management Protocol) function can secure remote host access to your FREEWAY DSL from LAN and WLAN interfaces for some services provided by it.

	FR	EEV	VAY DSL
Site contents: Coverview VULAN System Advance LAN Firewall Device Management UPnP TR-069	This page is used to configu         ACS's parameters.         ACS:         URL:         User Name:         Password:         Periodic Inform Enable:         Periodic Inform Interval:         Connection Request:         User Name:         Password:         Debug:         Show Message:         CPE Sends GetRPC:         Skip MReboot:         Delay:         Auto-Execution:         CT Inform Extension:	TR-069 Inter the TR-069 http:// username password O Disabled 300 Disabled O Disabled O Disabled O Disabled O Disabled O Disabled O Disabled O Disabled O Disabled	Configuration CPE. Here you may change the setting for the

Field	Description
ACS URL	URL of the Auto Configuration Sserver (ACS) provided by the ISP.
User Name	Enter the user name for the ACS to authenticate.
Password	Enter the password for the ACS to authenticate.
Periodic Inform	Enable/disables the FREEWAY DSL to connect to the ACS
Enable	periodically.
Periodic Inform	This field is enabled only when the Periodic Inform Enabled field is
Interval	checked. It defines the amount of time (in seconds) between a
	successful connection with an ACS server and a new attempt to
	connect to an ACS server.
Connection	Enter the user name if the connection required authentication
Request Username	process.
Connection	Enter the password if the connection required authentication
Request Password	process.
Debug	Software debugging message. Specify/change the contents only
	when you are directed by a technical support representative.

### **Appendix A. Troubleshooting**

Below is a list of commonly asked questions. Before calling technical support, please look through these issues to see if they help solve your problem.

### The FREEWAY DSL is not functional.

- 1. Check to see that the POWER LED is lit and than the network cables are installed correctly. Refer to the Quick Start Guide for more details.
- 2. Check to see that the LAN, DSL and Internet LEDs are lit.
- **3.** Check the settings on your PC and FREEWAY DSL. Again, refer to the Quick Start Guide for more details.
- 4. From your PC, can you PING the FREEWAY DSL? Assuming that the FREEWAY DSL has DHCP enabled and your PC is on the same subnet as the FREEWAY DSL, you should be able to PING the FREEWAY DSL.
- 5. Can you PING the Internet? Your ISP should have provided the IP address of their server. If you can ping the FREEWAY DSL and your protocols are configured correctly, you should be able to ping the ISPs network. If you cannot PING the ISP's network, make sure your using the correct protocols with the correct VPI/VCI values.

### I can't connect to the FREEWAY DSL.

- 1. Check to see that the POWER LED is lit and that the network cables are installed correctly.
- 2. Make sure that the PC and the FREEWAY DSL is on the same network segment. The FREEWAY DSL's default IP address is 192.168.1.1. If you are running a Windows based PC, you can open a DOS window and type IPCONFIG; make sure that the network adapter that is connected to the FREEWAY DSL is within the same subnet.
- **3.** Also, your PC's Subnet Mask should match the FREEWAY DSL's subnet mask. The FREEWAY DSL has a default subnet mask of 255.255.255.0.
- **4.** If this still does not work, press the Reset button. This will place the FREEWAY DSL into its factory default state. Go through the above procedures again.

### The DSL LED continues to blink but does not go solid.

- 1. Make sure you have DSL service. You should get some kind of information from your ISP which states that DSL service is installed. You can usually tell if the service is installed by listening to the ADSL phone line; you will hear some high-pitched noise. If you do not hear high-pitched noise, contact your ISP.
- 2. This means that the DSL line is trying to train but for some reason it cannot establish a valid connection. The main cause of this is that you are too far away from the central office. Contact your DSL service provider for further assistance.
- **3.** Verify that the DSL line is connected directly to the wall and to the line input on the FREEWAY DSL.

### The WAN Link LED is always off.

- 1. Make sure you have DSL service. You should get some kind of information from your ISP which states that DSL service is installed. You can usually tell if the service is installed by listening to the phone line; you will hear some high-pitched noise. If you do not hear high-pitched noise, contact your ISP.
- 2. Verify that the phone line is connected directly to the wall and to the line input on the FREEWAY DSL. If the FREEWAY DSL is connected to the wall outlet via a splitter, make sure you connect the FREEWAY DSL to the port labeled MODEM.

### I cannot ping the FREEWAY DSL from the attached LAN.

- 1. Verify that the IP addresses are properly configured. In most cases, you enable the FREEWAY DSL's DHCP function to dynamically assign IP addresses to hosts on the attached LAN. However, if you manually configure IP addresses on the LAN, verify that the same network address (network component of the IP address) and subnet mask are used for both the FREEWAY DSL and any attached LAN devices.
- 2. Make sure the device you want to ping (or from which you are pinging) has been configured for TCP/IP correctly.

### I cannot connect using the web browser.

- **1.** Be sure to have configured the FREEWAY DSL with a valid IP address, subnet mask and default gateway.
- 2. Check to see if you have a valid network connection to the FREEWAY DSL and the port you are using has not been disabled.
- 3. Check the network cabling between the attached PC and the FREEWAY DSL.

### I forgot or lost the password.

1. Press the Reset button on the rear panel (holding it down for at least 3 seconds) to restore the factory defaults.

### **Appendix B. Specification**

### ADSL Compliance

- Support Multi mode standard (ANSI T1.413 Issue 2, G.dmt, G.lite)
- ADSL2 G.dmt.bis (G.992.3)
- ADSL2 G.lite.bis (G.992.4)
- ADSL2+ (G.992.5)
- Reach Extended ADSL (RE ADSL)

### **ATM Protocols**

- 8 PVC Support
- Adaptation Layers AAL5, AAL2 and AAL0 Support
- OAM F4/F5 Loop Back

### **PPP Support**

- PPP over ATM PVC (RFC 2364&RFC1577)
- PPP over Ethernet (RFC 2516)
- PAP (Password Authentication Protocol), CHAP (Challenge Handshake Authentication Protocol) and MS-CHAP (Microsoft Challenge Handshake Authentication Protocol)

#### **Network Stack**

- NAT: Static Port Mappings, NAT Policies, UPnP NAT Traversal
- Packet backbone: ICMP, ARP, RARP, UDP, TCP, Multicast, IPv4, DHCP Client / Relay / Server, DNS Proxy, DDNS, IGMP v1&v2, IGMP Proxy, IGMP Snooping
- Bridging: IEEE 802.1d Bridge
- Routing: Static route, RIP v1 / v2

### **Firewall / Security**

- SPI: Stateful Packet Inspection Firewall
- DOS Protection
- Management Access Control for LAN/WAN
- IPSEC / PPTP/L2TP Pass through
- Port Forwarding
- DMZ Host
- Filtering
  - Bi-direction IP Filter on LAN/WAN
  - IP/MAC/URL/Keyword Filtering
  - Domain Blocking

### Quality of Service (QoS)

- Constant Bit Rate (CBR), Real-Time Variable Bit Rate (VBR-rt)
- Non-Real-Time Variable Bit Rate (VBR-nrt)
- Unspecified Bit Rate (VBR)

#### Management

- Remote / Local configuration & management
- Web / Telnet configuration & management
- Firmware upgrade through web management

### Wireless Specification (wireless model only)

- Standard: IEEE 802.11b/g for wireless LAN
- Frequency Band: 2.400 ~ 2.4835 GHz ISM Band
- Modulations
- 802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)
- 802.11b: CCK (11 Mbps, 5.5 Mbps), DQPSK (2 Mbps), DBPSK (1 Mbps)
- Data Rate: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54MbpsDSSS (Direct Sequence Spread Spectrum)
- Encryption
  - Hardware-based IEEE 802.11i encryption / decryption engine
  - Includes 64-bit/128-bit WEP, TKIP, and AES
- Operating Range
  - Open space: 100m ~ 300m
  - Indoor: 35m ~ 100m