DrayTek

VigorAccess A48 Series

ADSL2/2+ IP DSLAM

Your reliable networking solutions partner

User's Guide

V.1.0

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ADSL2/2+ IP DSLAM
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Version: 1.0

Date: 25/06/2009

This manual is available for Vigor Access with Annex A (Annex M and Annex L)/Annex B.

Copyright Information

Copyright Declarations

Trademarks

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- Apple and Mac OS are registered trademarks of Apple Inc.
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Safety Instructions and Approval

Safety Instructions

- Make sure that the AC power source is in the range of AC 90-260V. The VigorAccess should be used in a sheltered area, within a temperature range from -10 to +65 °C and relative humidity in the range of 10% and 95%.
- DC power source operating condition: -42 to –56VDC. Do not expose the VigorAccess to direct sunlight or other heat sources. The housing and electronic components may be damaged by direct sunlight or heat sources.
- Read the manual before turning on the power switch of device.
- Locate the emergency power-off switch near the device prior to power connection.
- Fixing the device on chassis to maintain air circulation and stable condition is recommended.
- Do not work alone if the operation environment is dangerous.
- Check and avoid the potential hazard for moist environment, and grounding issue for power cable.
- Please turn off the power switch when replacing fuse, installing or removing chassis.
- Do not place the device in a damp or humid place, e.g. a bathroom- (such as this environment).
- Avoid operating cable connection during lightning period.
- When you want to dispose of the VigorAccess, please follow local regulations on conservation of the environment.
- Users can replace fuses by removing the module and replace it when necessary. Other components should be repaired by authorized and qualified personnel. Do not try to open or repair the device by yourself.
- The fuse for AC power inlet should be identical to the following standard: 250VAC, 2A

Warranty

We warrant to the original end user (purchaser) that the router will be free from any defects in workmanship or materials for a period of two (2) years from the date of purchase from the dealer. Please keep your purchase receipt in a safe place as it serves as proof of date of purchase. During the warranty period, and upon proof of purchase, should the product have indications of failure due to faulty workmanship and/or materials, we will, at our discretion, repair or replace the defective products or components, without charge for either parts or labor, to whatever extent we deem necessary tore-store the product to proper operating condition. Any replacement will consist of a new or re-manufactured functionally equivalent product of equal value, and will be offered solely at our discretion. This warranty will not apply if the product is modified, misused, tampered with, damaged by an act of God, or subjected to abnormal working conditions. The warranty does not cover the bundled or licensed software of other vendors. Defects which do not significantly affect the usability of the product will not be covered by the warranty. We reserve the right to revise the manual and online documentation and to make changes from time to time in the contents hereof without obligation to notify any person of such revision or

changes.

Be a Registered Owner	Web registration is preferred. You can register your VigorAccess via http://www.draytek.com. Alternatively, fill in the registration card and mail it to the address found on the reverse side of the card.
Firmware & Tools Updates	Due to the continuous evolution of DrayTek technology, all IP DSLAMs will be regularly upgraded. Please consult the DrayTek web site for more information on newest firmware, tools and documents. http://www.draytek.com

European Community Declarations

Manufacturer:	DrayTek Corp.
Address:	No. 26, Fu Shing Road, HuKou Township, HsinChu Industrial Park, Hsin-Chu, Taiwan 303
Product:	VigorAccess IP DSLAM A48

DrayTek Corp. declares that VigorAccess is in compliance with the following essential requirements and other relevant provisions of R&TTE Directive 1999/5/EEC.

The product conforms to the requirements of Electro-Magnetic Compatibility (EMC) Directive 2004/108/EC by complying with the requirements set forth in EN55022/Class A and EN55024/Class A.

The product conforms to the requirements of Low Voltage (LVD) Directive 2006/95/EC by complying with the requirements set forth in EN60950-1.

Regulatory Information

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class A 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 may accept any interference received, including interference that may cause undesired operation.

Taiwanese BSMI (Bureau of Standards, Metrology and Inspection) A Warning:

Warning: This device might cause interference of radio frequency under the environment of dwelling. In such condition, the users might be asked to adopt some proper strategies.

Please visit http://www.draytek.com/user/AboutRegulatory.php

This product is designed for the DSL network throughout the EC region and Switzerland with restrictions in France. Please see the user manual for the applicable networks on your product.

Customer Support

Please prepare the following information before you contact your customer support.

- Product model and serial number
- Warranty information
- Date that you received VigorAccess
- Product configuration
- Software release version number
- Brief description of your problem

The information of customer supports and sales representatives is in **www.DrayTek.com**, respectively.

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1. Introduction

With the explosive growth of Internet, people are becoming more and more relying on Internet in daily life. The rapidly increase in bandwidth demanded by digital society has put pressure on the network therefore, bandwidth and performance management are becoming critical issue for ISP.

VigorAccess, which is equipped with 48 ADSL2/+ ports, is designed for ISP (Internet Service Provider) to implement bandwidth management for multiple subscribers. As VigorAccess supports high upstream and downstream bit-rates performance, therefore, VigorAccess is being deployed primarily for residential customer for IPTV application or high speed Internet service or business customers to replace expensive T1/E1 leased line.

VigorAccess is not only equipped with a console port being used for local management, but also provided excellent capabilities of SNMP, Telnet for remote management. In particular, VigorAccess can be easily configured by EMS. The EMS system covers topology, configuration, deployment, security, alarm management and backed storage. Moreover, with the solution of port-based and tag-based VLAN, VigorAccess can isolate traffic between different users and provide improved security.

1.1 Features of VigorAccess

The VigorAccess (Integrated Ethernet Switch) is an IP-based DSLAM (Internet Digital Subscriber Line Access Multiplexer) that connects to 48 ADSL subscribers to the Internet. When deployed together with DSL modems and WAN routers, the combination forms are integrated solution for providing broadband services to multiple tenants such as apartments, hotels, offices and campus buildings. VigorAccess supports a lot of features as listed below.

- **ADSL Access Module**
  The name marked "**Line**" on the front panel is a RJ-21 connector integrated 24 ADSL ports internally. It aggregates traffic from 48 lines to Ethernet port(s) and has integrated splitters to allow voice and ADSL to be carried over the same phone line wiring.
- **10/100/1000 Mbps Auto-negotiating Ethernet Port**
  VigorAccess supports FE/GE auto-negotiate Ethernet ports connecting to an Ethernet network. It can be aggregated together as a logical port as the backbone, and provide ADSL service to lots of subscribers.
- **ADSL Compliance**
  - Multi-Mode ADSL standard
  - G.dmt (ITU-T G.992.1)
  - G.dmt.bis (ADSL2, G.992.3)
  - G.dmt.bisplus (ADSL2plus, G.992.5)
  - G.lite (ITU-T G.992.2)
  - G.hs (ITU-T G.994.1)
  - ANSI T1.413 issue 2

- **Ethernet Bridging**
  - IEEE 802.1d STD transparent bridging
  - Up to 4000 MAC entries address table
  - Port-based VLAN
- **IEEE 802.1Q Tagged VLAN**
  VigorAccess uses the IEEE 802.1Q Tagged VLAN; users can allow this device to deliver tagged/untagged frames in these ports. VigorAccess supports up to 512 VLAN groups and can be applied up to 4094 VLAN identifications.
- **IEEE 802.1p Priority**
  VigorAccess supports IEEE 802.1p to assign priority levels to all individual ports. Users can set different quality of service for individual application.
  For example, voice and video services can set high priority and Internet data service will be lower priority.
  - Support 4 queues for per ATM port.
  - Support 8 queues for per physical Ethernet port.
- **MAC Address (Media Access Control) Filter**
  - VigorAccess can let users use the MAC filter for incoming frames based on MAC (Media Access Control) addresses that specified by users. Users can enable/disable this function on specific port.
    Access Control List per port is up to 8 entries. If port receives a packet which source MAC address is met with one of the 8 entries, this packet can be forwarded to destination port.
  - Access Control List per device is up to 1024 entries. If port receives a packet which source MAC address is met with one of these entries, this packet would not be forwarded to destination port.
    The high priority of ACL rules is the allowing rule checking for per port.
- **MAC Address (Media Access Control) Count Filter**
  VigorAccess supports users to limit the number of MAC addresses that may be dynamically learned or statically configured on a port. Users can enable/disable this function on individual ports.
  The global static learning table has up to 512 entries. Each entry can be set to a specific port. In dynamic learning mode, there are 16 MAC address entries in DSL port and 256 entries in Ethernet uplink port.
- **Multi-Protocol Encapsulation**
  VigorAccess supports multi-protocol encapsulation over ATM adaptation Layer 5 based on RFC2684.
- **Management**
  VigorAccess supports some management method as listed below.
  - Remote configuration backup/restore via EMS client/server.
  - Remote firmware upgrade
  - SNMP management
  - Command Line Interface, it can be accessed by local Console or Telnet interface.

- **Multiple PVC on single port**
  VigorAccess allows you to use different virtual connection also called PVC (Permanent Virtual Circuits) for different services or subscribers. Users can define up to 8 connections on each DSL port for different services or levels of service, and users can assign different priority for each connection.
- **IGMP Snooping**
  IGMP (Internet Group Management Protocol) snooping reduces multicast traffic for maximum performance. The feature is very popular for video multicast application for example IPTV service.
- **Load-sharing Redundancy**
  These two Ethernet uplinks of VigorAccess can be used as a single load-shared uplink for data and management path, with a provision to fall back to single one, in the event one of the links failed.
- **Active Standby Redundancy**
  These two Ethernet uplinks of VigorAccess can be used in an active stand by mode for data and management path, with a provision to fall back to standby link, in the event of the active links failure.
- **Configuration**
  Modification of Ethernet IP address, mask, speed, and duplex mode is supported. Support for safe mode boot where the TE Image can be downloaded for field upgrade.

Quality of Service (QoS)

Quality of Service (QoS) refers to the capability of a network to provide better service to select network traffic over various technologies. The primary goal of QoS is to provide priority including dedicated bandwidth, controlled jitter and latency (required by some real-time and interactive traffic), and improved loss characteristics. Also it is important to make sure that providing priority for one or more flows does not make other flows fail. QoS technologies provide the elemental building blocks that will be used for future business applications in campus, WAN and service provider networks.

- **Prioritized Bridging**
  VigorAccess supports for multiple queues per port. There are different queues both on ATM and Ethernet uplink.
  - Four queues supported per ATM port.
  - Eight queues supported per physical Ethernet port.
- **Scheduling Mechanism**
  VigorAccess supports multiple scheduling mechanisms.
  - Strict Priority Scheduling
  - Probabilistic Priority Scheduling
- **Rate Limiting**
  VigorAccess supports rate-limiting function in input/output both direction.
  - Input Rate Limiting (IRL) on a per-AAL5 interface.
  - Output Rate Limiting (ORL) on a per ATM-port basis
  - Output Rate Limiting (ORL) on a per-physical Ethernet Interface basis. One feature supports for buffer admission control triggered using IRL. Moreover, it also supports for dynamic modification of ORL on ATM and Ethernet interfaces.

- **Mapping Table**
  VigorAccess supports a packet priority to traffic class mapping table supported on a per egress bridge port.
- **Multiple Mechanisms**
  VigorAccess supports two multiple mechanisms as below.
  Multiple mechanisms of prioritizing incoming traffic are based on a per-bridge port.
  - Using Source Port configuration (for untagged packets)
  - Using Packet Classifier actions
  - Using priority regeneration table (mapping ingress priority to egress priority)
  - Combination of the above

  Multiple mechanisms of 802.1p re-tagging of outgoing traffic is based on a per ingress bridge port.

  - Using Source Port configuration (for untagged packets)
  - Using Classifier actions
  - Using priority regeneration table (mapping ingress priority to egress priority)
  - Combinations of the above
- **Abilities**
  VigorAccess can be able to create multiple scheduling profiles, either Strict Priority or Probabilistic Priority. It also can be able to share the same profile across multiple (similar) ports.

Security

VigorAccess supports some different methods to implement this feature in following sections.

- **Rate Limitation**
  VigorAccess supports a function for throttling flooded packets. Users can configure some limited rates by per-port.
- **Static Mac Address**
  VigorAccess supports this feature to be configured with certain ports to learn MAC addresses on a semi-permanent basis. These learned entries would be treated similar to the static entries, but will not be subject to aging or overwriting. These only may be deleted explicitly by management or by making the ports, as non-static after aging will happen normally.
- **FDB Conflicting Traps**
  VigorAccess will transmit a trap packet to central manager when any MAC address moves from one port to another port.
- **MAC Address Tracking**
  VigorAccess can be configured to track a global list of MAC addresses. When these MAC addresses move from one port to another port, a trap is generated. Whether packets from a particular bridge port should be subjected to this tracking is configurable. This may be used to prevent denial of service from certain MAC addresses.
- **Access Control List by MAC address**
  It can be configured by per-port. It also supports a MAC address deny list, the application of the MAC address deny list can be enabled/disabled on a per bridge port basis.

- **Access Control List by IP Address**
  This feature still can be configured by per-port, and enabled/disabled on a per bridge port basis.

Packet Filtering

This function is provided for users to setup some rules to filter the specific packets while receiving packets from logical ports.

VigorAccess supports for rule-based packet filtering, it can be used to implement filtering required of NetBeui, NetBIOS, DHCP, 802.1x and other protocols.

- **Filtering Modes**
  - VigorAccess supports for independent rule ordering and rule ID. It means that rule ID no longer determines the order in which the rule is applied. The rule can be modified easily; users can replace a rule sequence of a stage on an interface by another sequence in one step.
  - Moreover, VigorAccess also supports for capturing unicast and multicast packets that fail lookup in the forwarding database is provided. Users may write their own applications to terminate and act on this information. On the other side, it also supports for capturing packets coming to Control Plane that do not match any registered filter.
- **Multiple Filter Stages**
  VigorAccess supports a concept of multiple filter stages are provided for ingress and egress filter rules. Moreover, VigorAccess supports an Egress filtering for unicast, broadcast and multicast traffic. It also supports multiple actions configurations by per filter rule.

ATM Features

VigorAccess supports some functions about ATM issue.

- **Remote CPE Management**
  VigorAccess supports RAW AAL5 interface for remote CPE management.
- **Diagnostic Testing**
  VigorAccess supports OAM-I.610 end-to-end and segment loop back and DELT.
- **Dynamic Modification**
  VigorAccess supports a lot of dynamic modifications and is shown as below.
  - VPI/VCI value (VC should be disabled)
  - Transmit and receive PDU sizes
  - Management mode modification per port
  - Max VPI/VCI bits (interface must be disabled)
  - Maximum number of VCCs supported
  - OAM source ID

1.2 Applications

The compact design of VigorAccess is composed of DSL, optical interfaces, and 2 subtend interfaces. VigorAccess provides lots of applications such as:

High speed Internet Service - VigorAccess aggregates DSL subscribers and terminates the encapsulated type ATM cell. Users can easily access Internet through the IP backbone network.

Gaming application Service - By combining gaming server, VigorAccess can provide gaming service.

Stream TV Service - VigorAccess uses ADSL 2/+ high speed DSL technology, and supports stream TV Service.

Video on Demand Service - Service provider can offer multimedia services by setting up video or content server on the local side. By combining rich content video server, VigorAccess also provides the video on demanded service. Users can easily access multimedia content based on VigorAccess architecture.

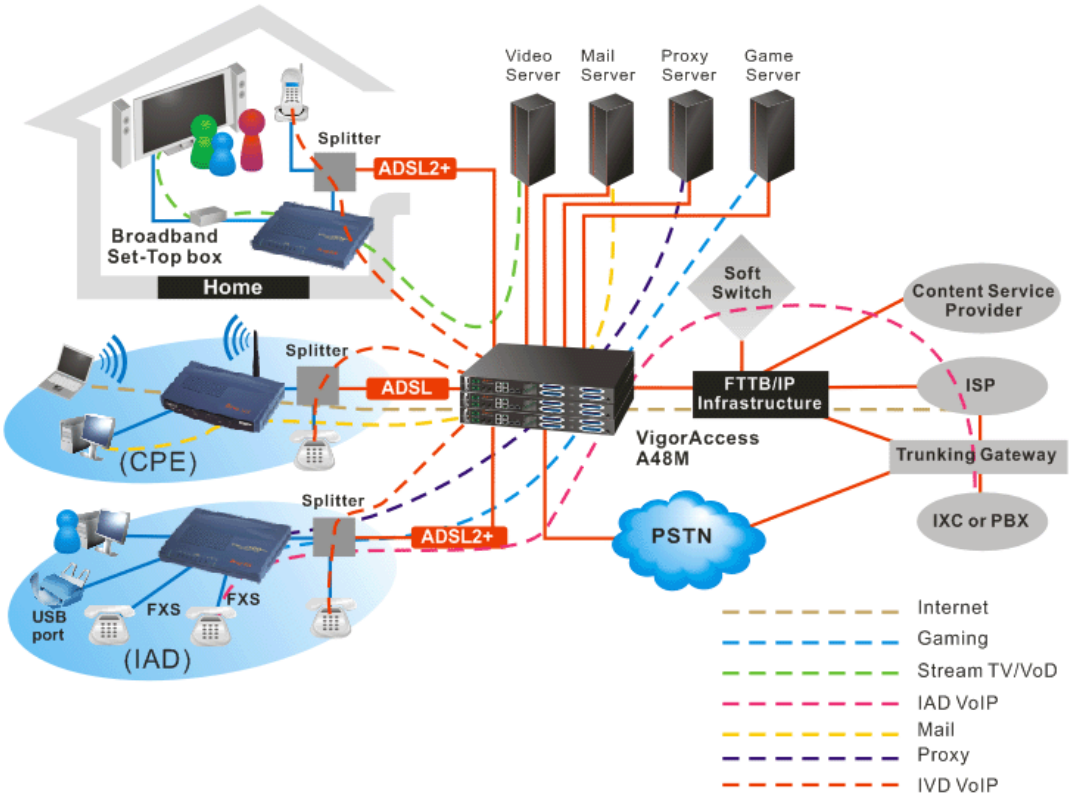
Combined with VoIP Service - VigorAccess can combine IAD, DSL/VoIP gateway with highest priority to provide toll quality voice communication in terms of voice quality and reliability for the users.

Mail or Portal Service - VigorAccess provides the feasibility to connect mail or proxy server.

The following section provides general and commercial applications scenarios for your reference.

1.2.1 General Application Scenario

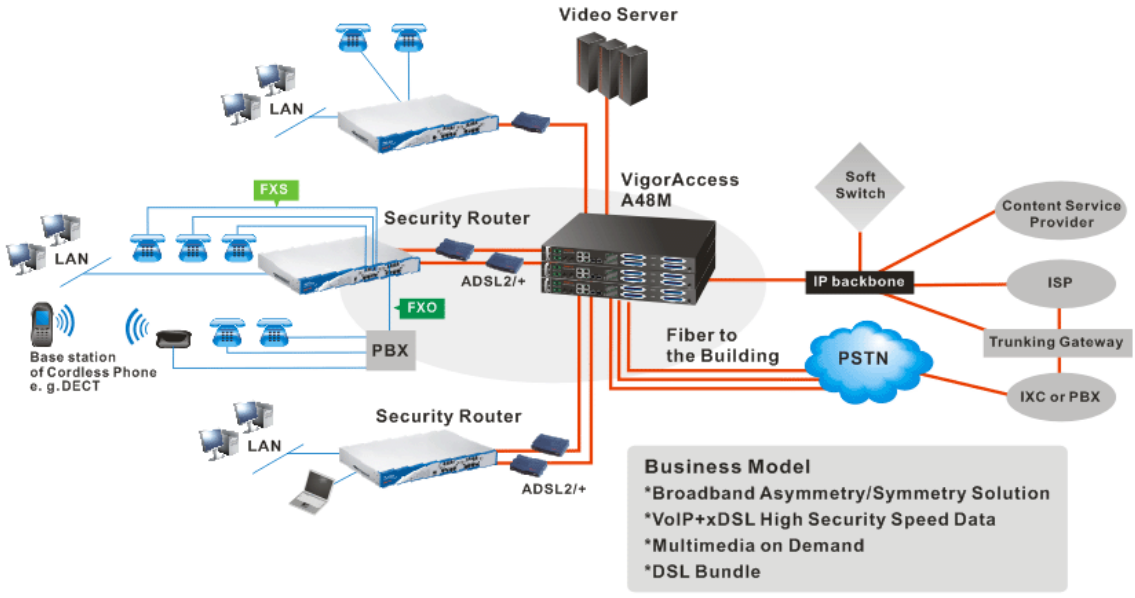
Take the following figure as an example. For users living in the same building, VigorAccess can set up additional Video Server, Mail Server, Proxy Server and Game Server in the network different from the ones set up by ISP, and allows users to share the multiple services. In addition, the users can access into Intranet through WAN ports, to communicate with others with PSTN feature by using routers (CPE, Customer Premise Equipment) or IAD (Integrated Access Device). In general, VigorAccess can handle and control all of the services for saving user's money with quick speed through Fiber connection, and it can simplify the construction procedure of network setup.



1.2.2 Commercial Application Scenario

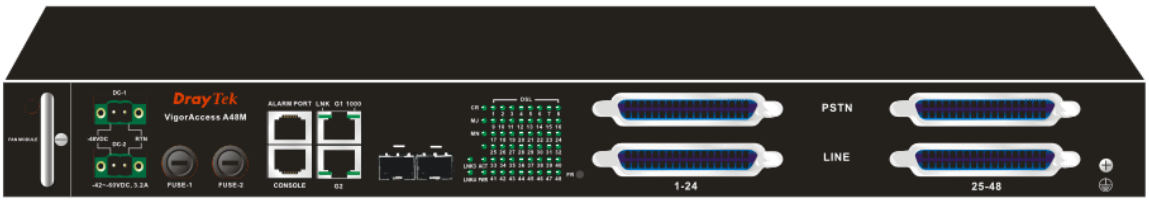
VigorAccess is able to support enterprise customer with high-speed service request. Customers can subscribe multiple ADSL 2/+ lines by integrating security router with load balance feature. By combining VoIP devices, system integrator provides multiple services with VoIP, Video on Demand, and ADSL2/+ bundle solution, etc.

In addition, the firewall and VPN security of VoIP security router is also provided by the architecture to meet business requirements. This application is suitable on **Hotel** and **MTU (Multi-Tenant Unit)** applications. The entire system is managed by EMS system. The following graphic shows the possible application for VigorAccess in business.



1.3 Panel Explanation

The connectors on the front panel for the VigorAccess A48 is shown below:



Interface	Description
FAN MODULE	Support hot-swappable
DC1 ~ DC2	DC power connector (dual feed)
FUSE-1 ~ FUSE-2	Fuse-1 maps to DC1 and Fuse-2 maps to DC2.
ALARM PORT	An alarm relay with RJ45 interface can connect to buzzer when the FAN is out of order.
CONSOLE	A RS232 serial interface is used to connect a local management computer.
G1 – G2	The subtend interface with RJ45 interface is Gigabit Ethernet connection.
G3 – G4	Slots used for SFP module.
FR (Factory Reset)	A reset button is used to reset system, and then IPDSLAM will operate by default configuration.
PSTN	Connected to PSTN normally.
LINE	Connected to twist pair of subscriber line which connects ADSL devices or telephones for users.

Warning:

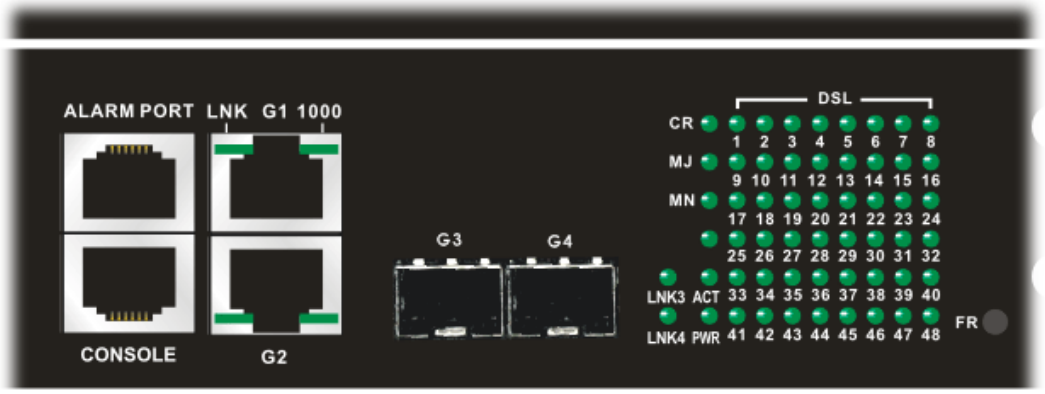
- The laser energy of the **fiber optic** communication channels in the single-mode will be **harmful** when operate, especially **to the eyes**. During normal operation with cable connection, this energy is confined to the cable with no danger present.
- **Never stare** into an optical cable or connector when the connector is not in use.

In addition, below shows the cables used in different connectors：

Name	Type, Color	Connected to
Power Cord	Cord, Black Wire,	DC-1 or DC-2
RJ45 Cable	RJ45 connect to Buzzer	ALARM PORT connection.
Serial Cable (Console)	RS232, Grey	PC RS232 port for CLI.
G3-G4 Cable	LC/RJ45, Yellow/Orange	Gigabits Fiber Optical Interface Interconnection.

RJ45 Cable for G1 –G2	RJ-45 (8P8C), Blue	Connect to slave unit (UP1or UP2).
RJ-21 Cable for PHONE	RJ-21, Grey	MDF or Panel to PSTN.
RJ-21 Cable for LINE	RJ-21, Grey	To subscriber copper line.

LED Indication



LED		Status	Explanation
G1 – G2	**LNK**	Green	Subtend interface by GE Interface. When the Ethernet link is established, it will blink during data transmitting/receiving.
		OFF	It means no Ethernet link established.
	1000	Green	The speed for Ethernet is 1000Mbps when LNK LED is on.
		OFF	The speed for Ethernet is 10/100Mbps when LNK LED is on.
G3-G4	**LNK**	Green	When the optical connection is established, it will blink during data transmitting/receiving.
		OFF	It means no optical connection established.
CR		Green	Critical alarm is present.
		OFF	No critical alarm is present to system.
MJ		Green	Major alarm is present.
		OFF	No major alarm is present to system.
MN		Green	Minor alarm is present.
		OFF	No minor alarm is present to system.
ACT		Green	It blinks when this device is active.
		OFF	It is off when system is hanged.
PWR		Green	The power LED is on when the power is applied.
		OFF	The Power is not applied.
DSL 1 - 48		Green	The DSL 1-48 port link status is up.
		Blinking	The DSL link is training.
		OFF	The DSL x port link status is down.

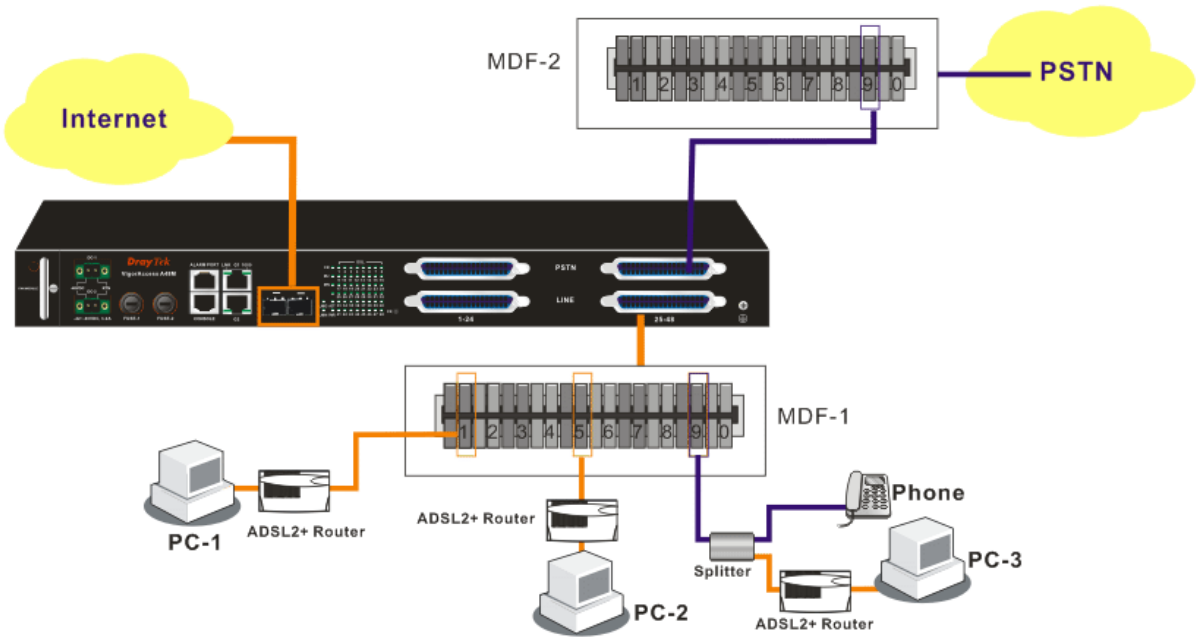
2. Installation and Connection

This section will guide you to install the VigorAccess through hardware connection

To fully setup the VigorAccess connection, you have to finish the following items:

- Rack-mounted installation
- Line interface connection (ADSL port connection)
- Phone interface connection

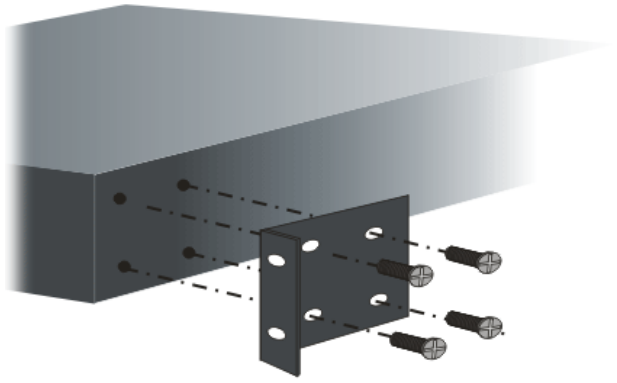
Below shows **an example** of VigorAccess network connection for your reference.



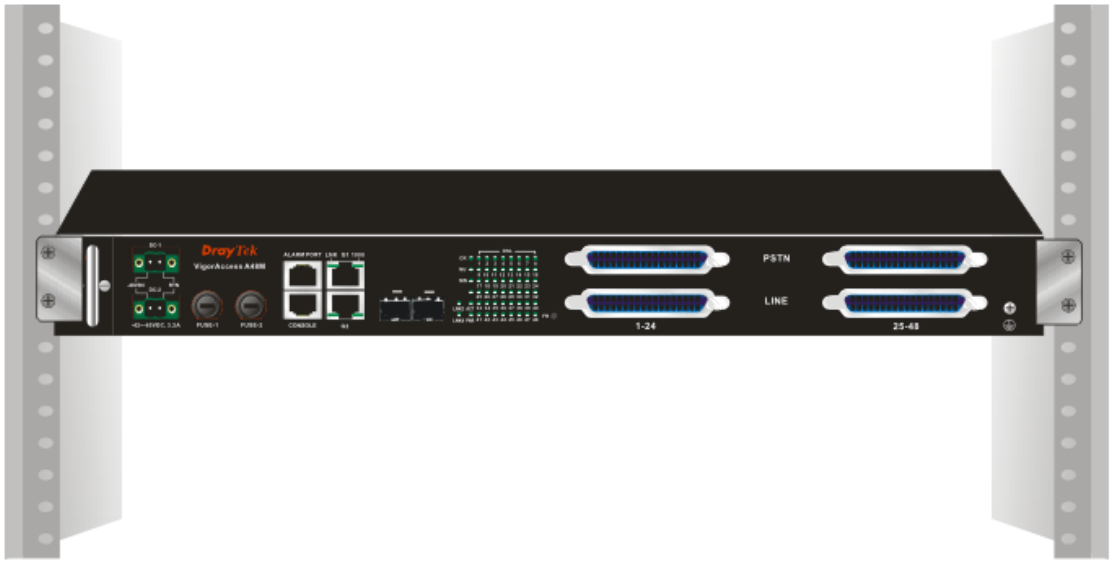
2.1 Rack-Mounted Installation

VigorAccess can be installed on 19-, 23-inches racks by using standard brackets in 19-inch rack or optional larger brackets on 23-inch rack with other equipments. The bracket for 19-, 23-inch racks are shown below.

Attach the brackets to the chassis in 19-, 23-inch rack. The second bracket attaches the other side of the chassis as above procedure.



After bracket installation, VigorAccess chassis could be installed in the rack by using two screws for each side of rack.

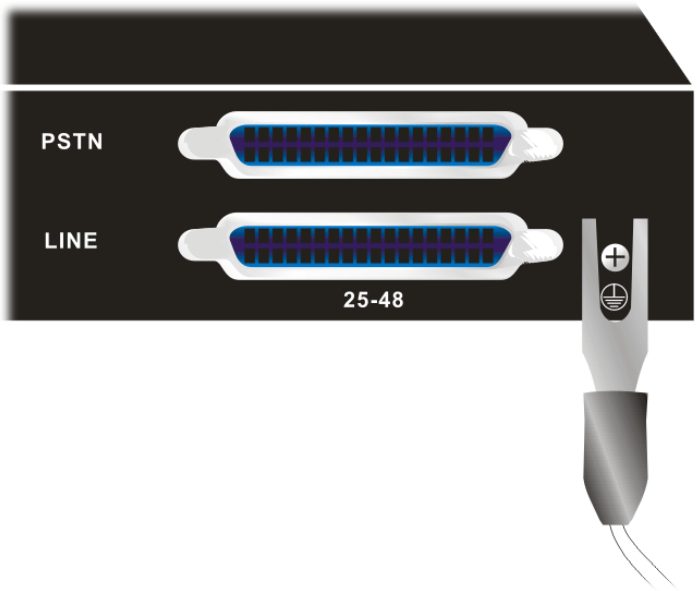


2.2 Desktop Placement

The VigorAccess can be placed on the rack or on a flat surface. There are four rubber feet attached on the bottom of the VigorAccess to stabilize the device for placing on a flat surface. These rubber feet aims to improve the air circulation, and at the same time it can decrease unnecessarily rubbing on the desk. Therefore, you can simply put the master or slave device on your desk or any plane surface without worrying damage.

2.3 Frame Ground Installation

The frame ground is on the front of the VigorAccess which is powered by DC connector. Connect the frame ground to a building's earthing terminal by using frame ground wire.



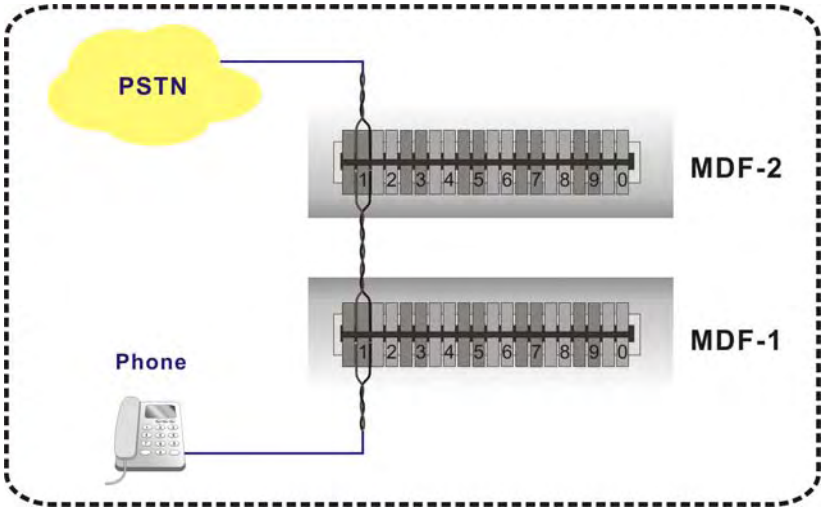
Importance: Please connect the frame ground first before you connect any other cables for this device.

2.4 ADSL Port Connection

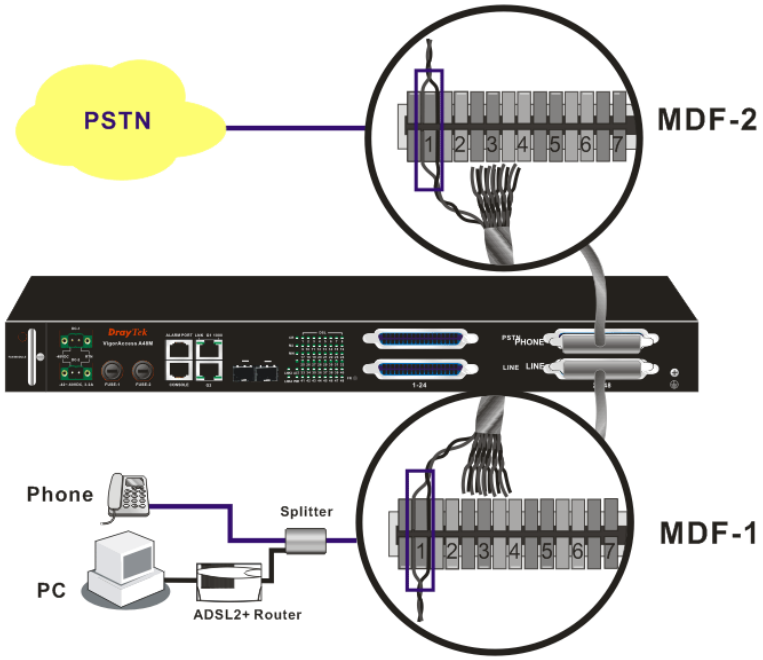
2.4.1 MDF (Main Distribution Frame)

The PSTN splitter should be connected to MDF on building. An MDF is usually placed in the building's telephony room or wiring closet. MDF can terminate the outside telephone line into the building. In general, the **LINE** and **PHONE** interface on the A48 device will connect to MDFs respectively and then to outside connection.

The traditional connection via MDFs for the phone set used in family is shown as the following picture. The telephone set must connect to one port (in this case, Port 1) of MDF-1, meanwhile that port must connect to corresponding place of MDF-2. Next, the other end of Port 1 (in MDF-2) will connect to PSTN.



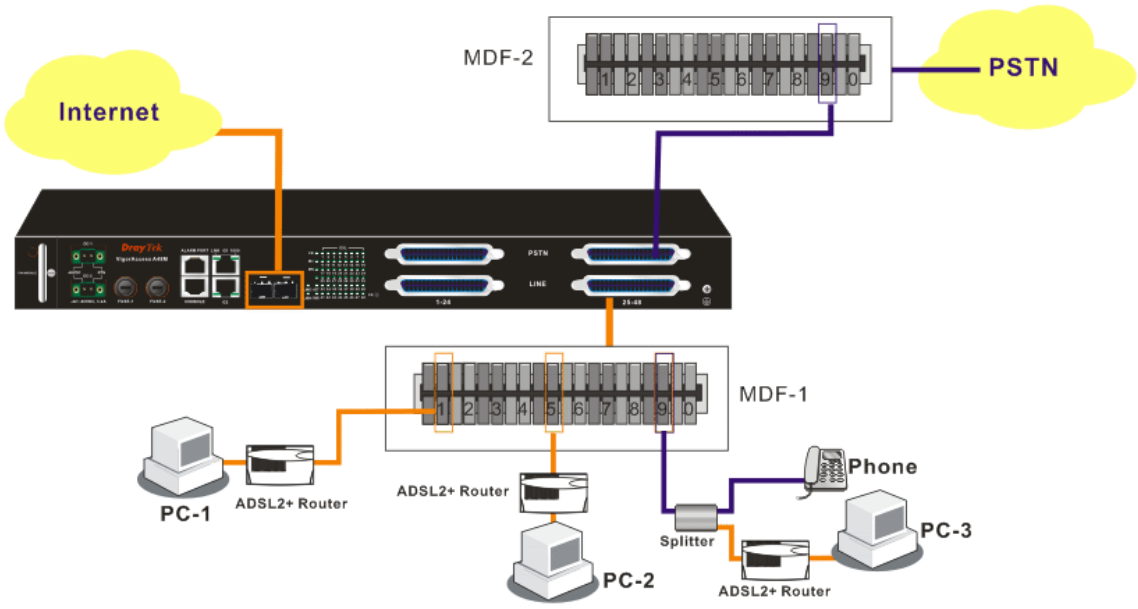
An example for MDF connection through VigorAccess is shown as the following picture.



For different applications, you have to can change the connection according to the real circumstance that you encounter.

2.4.2 Scenario – Standalone

A48 is used standalone for it cannot manage any slave device. In such condition, it can connect and control 24 ADSL CPE routers with DB-21 cable through MDF connection.



In the above picture, the user of PC-3 wants to use phone and access the Internet at the same time; yet PC-1 and PC-2 just want to access the Internet through the A48 device. As for the connection, please follow the steps below:

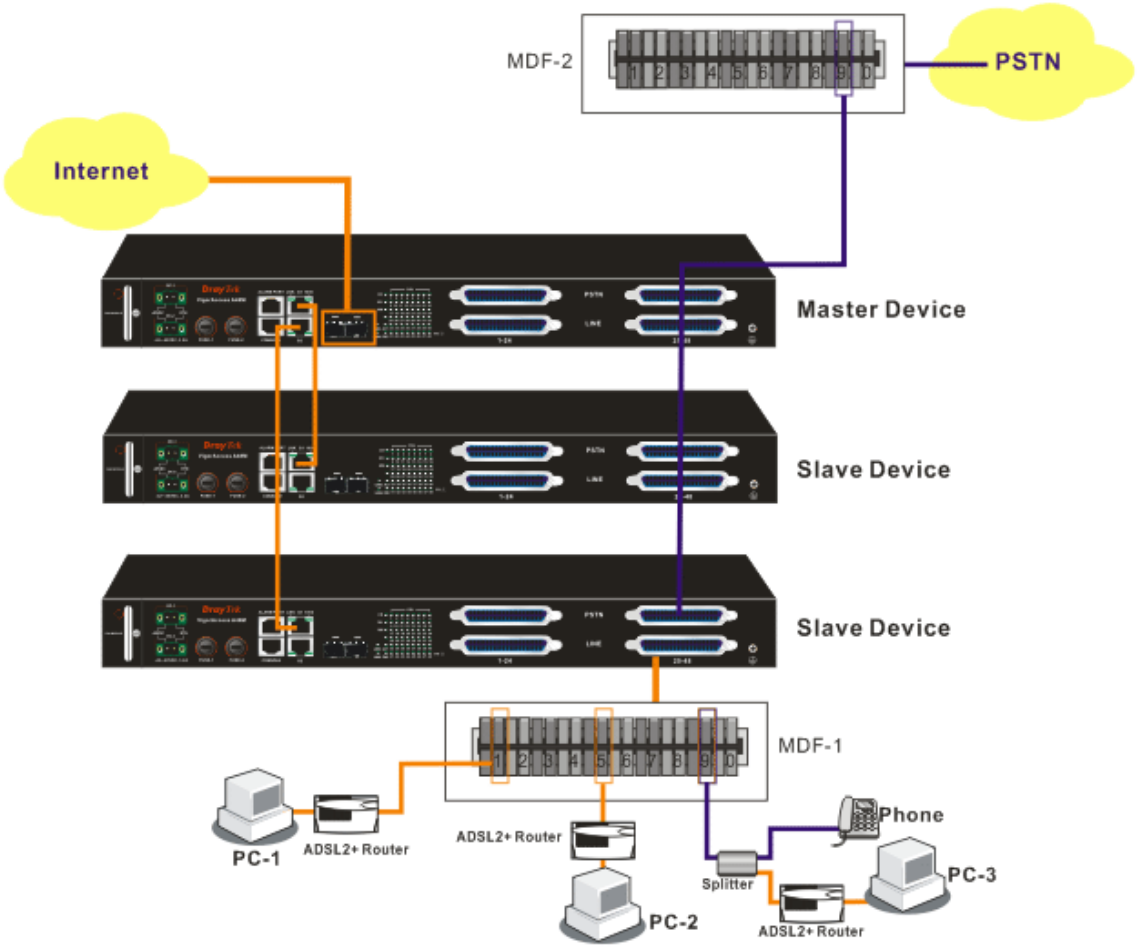
1. Connect PC-3 to number **9** of MDF-1, PC-2 to number **5** of MDF-1 and PC-1 to number **1** of MDF-1 with Ethernet cable.
2. Connect the MDF-1 to **Line** port of the A48 device.
3. Connect the **Phone** port of the A48 device to the matching connector (in this case, it is number **9**, be careful and not to misconnect) to MDF-2 which will be connected to PSTN. This step is just useful for PC-3 for the user wants to call out through the A48 device.
4. Connect the device and ISP with Fiber cable through **G3-G4** port.
5. With such connection, all the users of the PCs can access the Internet through **G3-G4** connector of the device. Yet only PC-3 can call out with a telephone set directly.

The device can connect 24 ADSL CPE routers which supported by the DB-21 cables. If you want to expand the usage for more users, we recommend you to purchase A48 device.

2.4.3 Scenario – Cascade Installation

For Master device and Slave device, at least there are 48 ADSL CPE routers can be connected to outside Internet via the Master device.

The following picture shows the sample connection for A48 devices. Here we take PC-1, PC-2 and PC-3 as the examples that connecting to the Slave device directly and wanting to access the Internet through the Master device.



In the above picture, the user of PC-3 wants to use phone and access the Internet at the same time; yet PC-1 and PC-2 just want to access the Internet through the Slave and Master devices. As for the connection, please follow the steps below:

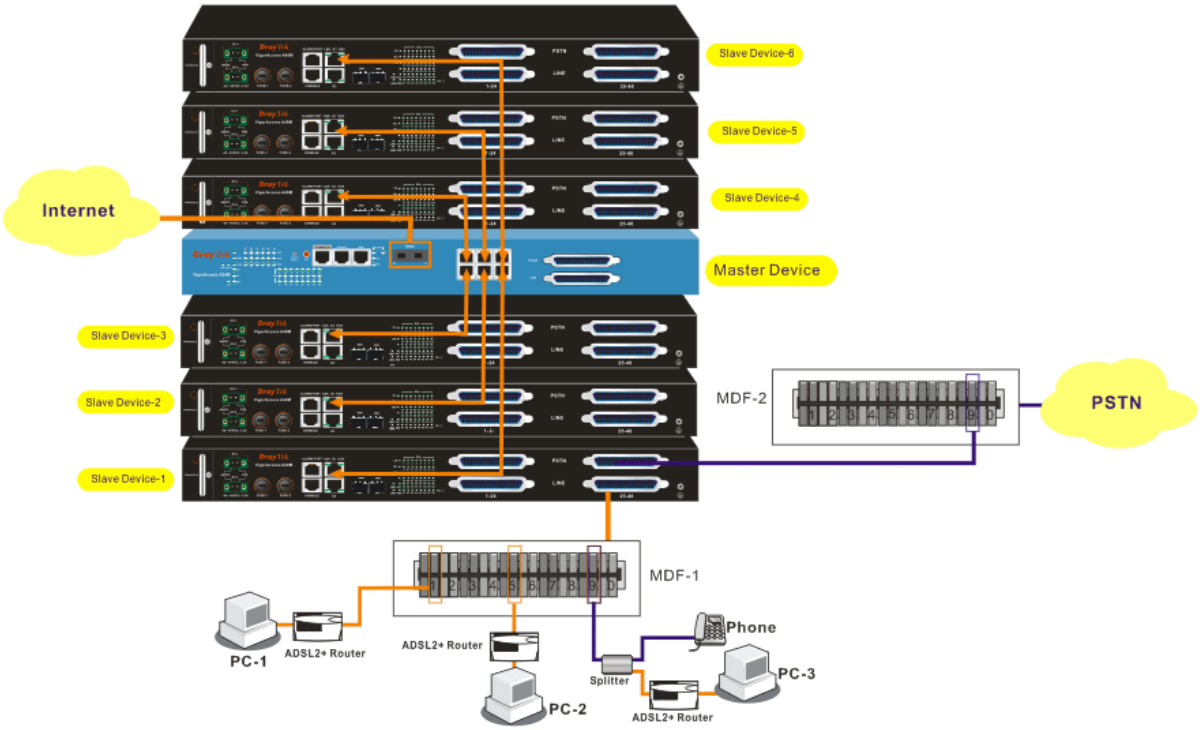
1. Connect PC-3 to number **9** of MDF-1, PC-2 to number **5** of MDF-1 and PC-1 to number **1** of MDF-1.
2. Connect the MDF-1 to **Line** port of the Slave device.
3. Connect the **Phone** port of the Slave device to the matching connector (in this case, it is number **9**, be careful and not to misconnect) to MDF-2 which will be connected to PSTN. This step is just useful for PC-3 for the user wants to call out through the connected Slave device.
4. Slave devices can be connected to **G1** or **G2** port of the Master device with Ethernet cable.
5. Connect the Master device and ISP with Fiber cable through **G3** or **G4** port.

6. With such connection, all the users of the PCs (connecting to Slave device) can access the Internet through **fiber** connector of the Master device. Yet only PC-3 can call out with a telephone set directly.

Such connection allows 48 ADSL CPE routers to connect to outside Internet via the A48 device. If you want to connect more of the routers, please refer to next scenario for one A24 and six A48 devices connection.

2.4.4 Scenario – A24M and Six A48 Devices

The following picture shows the sample connection between six A48 devices and one A24M device. Here we take PC-1, PC-2 and PC-3 as the examples that connecting to one A48 directly and wanting to access the Internet through A24M device.



In the above picture, the user of PC-3 wants to use phone and access the Internet at the same time; yet PC-1 and PC-2 just want to access the Internet through the connected Slave and Master devices. As for the connection, please follow the steps below:

1. Connect PC-3 to number **9** of MDF-1, PC-2 to number **5** of MDF-1 and PC-1 to number **1** of MDF-1 with Ethernet cable).
2. Connect the MDF-1 to **Line** port of the *Slave Device -1*.
3. Connect the **Phone** port of the *Slave Device-1* to the matching connector (in this case, it is number **9**, be careful and not to misconnect) to MDF-2 which will be connected to PSTN. This step is just useful for PC-3 for the user wants to call out through the *Slave Device-1*.
4. Connect **G1** or **G2** port of the *Slave Device-1* and **G6** port of the Master device with Ethernet cable. As to the connection among the Master device and *Slave Device-2* to *Slave Device-6*, please refer to arrow indication shown on the picture.
5. Connect the Master device and ISP with Fiber cable through **G3** or **G4** port.
6. With such connection, all the users of the PCs (connecting to the Slave devices) can access the Internet through **G3** or **G4** connector of the Master device. Yet only PC-3 can call out with a telephone set directly.

Such connection allows 168 ADSL CPE routers (24 from the Master device and 144 from the *Slave Device-1* to *Slave Device-6*) to connect to outside Internet via the Master device at one time.

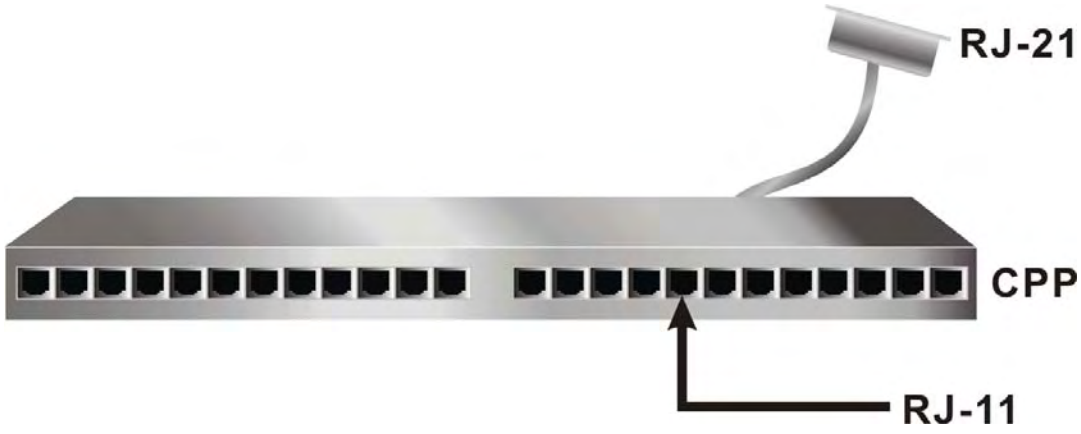
To make the required configuration for master and slave devices, use CLI command.

```
Admin> dsl -m

Press 'exit' to return
Entering character mode
Escape character is '^]'.

[dsl-master]#

or

Admin> dsl -s <n>

Press 'exit' to return

Entering character mode
Escape character is '^]'.

[dsl-slave-n]#
```

2.4.5 CPP (Centric Patch Panel)

The VigorAccess can provide ADSL and voice services over the same telephone wiring. It also has built in splitters internally that can save space and simplify installation.

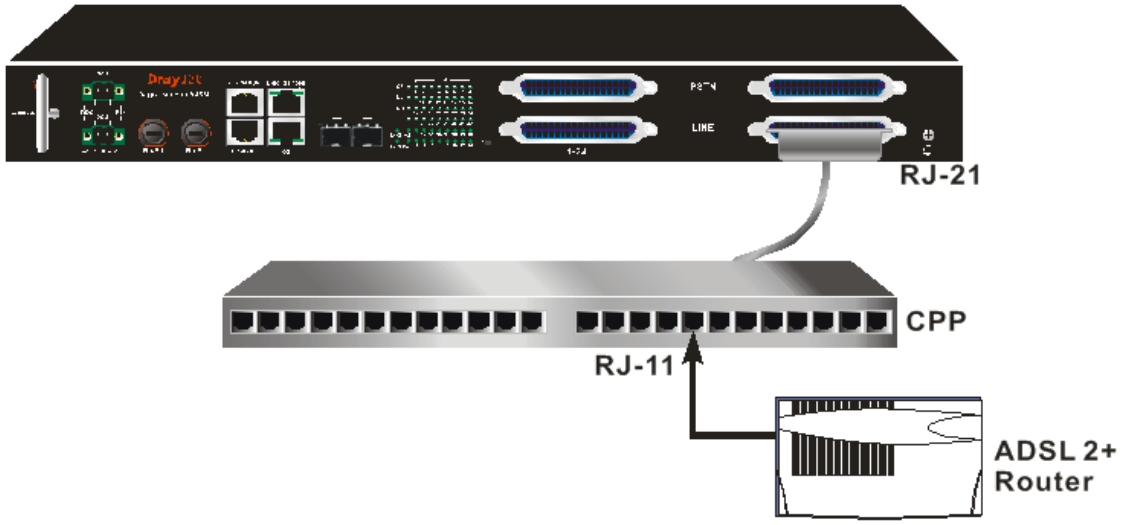
If the application is using on building environment, the CPP (Centric Patch Panel) is preferred. **The purpose of CPP module is to transfer RJ-21 jack in VigorAccess to RJ-11 connector.** It is usually installed between end-users' equipment and telephone company in a basement or telephone room. The CPP is the point of termination for the outside telephone company lines coming into a building and the telephone lines in the building.



The existing **telephone wiring** usually depends on user's region. Here are descriptions of two typical installation scenarios. Use telephone wires with RJ-11 jacks on one end for connecting to the CPP board.

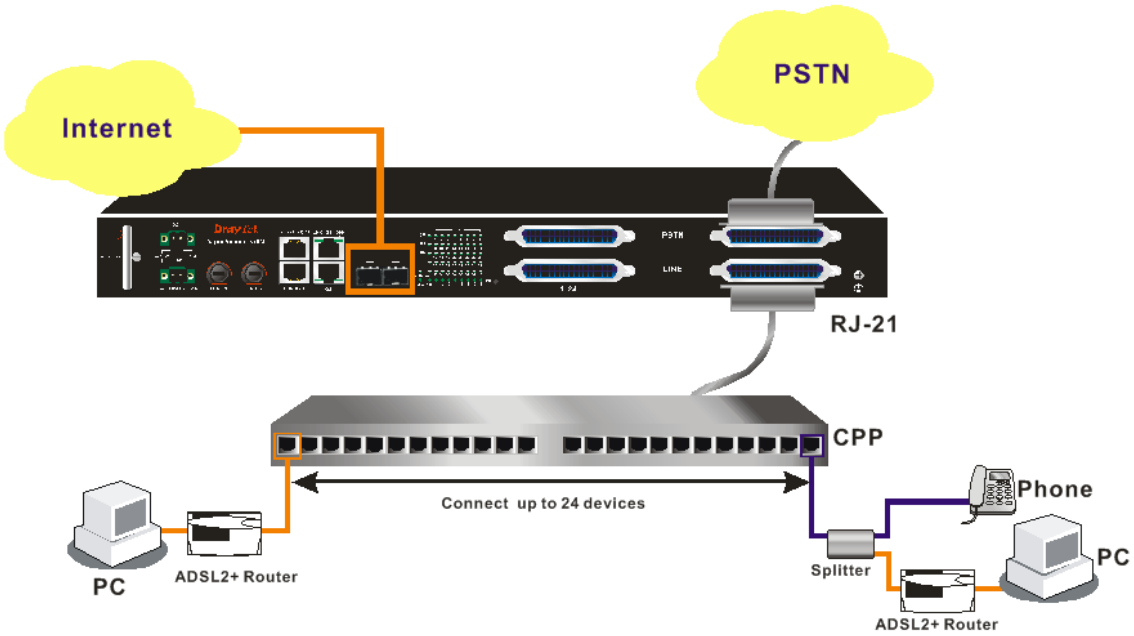
Scenario A

Users can connect a cable from RJ-21 (LINE) attached in VigorAccess to the CPP board. Then users can connect a RJ-11 jack port attached in a CPP to ADSL modem directly. The following example shows the connection for *data transmission only* through CPP.



Scenario B

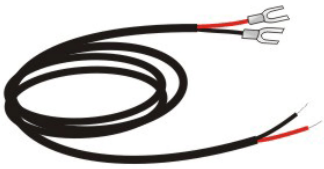
Phone service is available in VigorAccess. You can connect a RJ-11 jack port attached in a CPP to a telephone directly or applied in the same way shared in ADSL modem. The following example shows the connection for *Data/Voice transmission* through CPP.



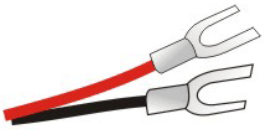
2.5 Power Connection

Before you purchasing the device, please check your environment to determine which power type that matches with your requirement.

Get acquainted with the following parts first:



DC Power Cord

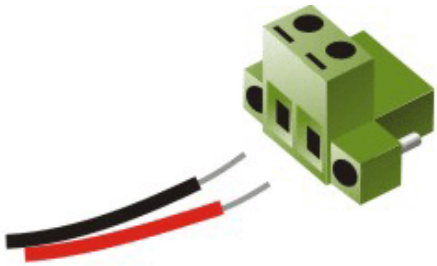


Y type terminator

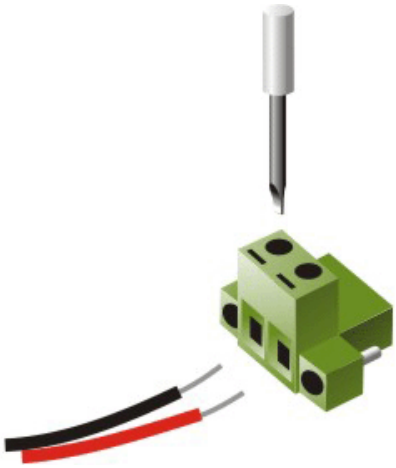
DC Power Terminator Head

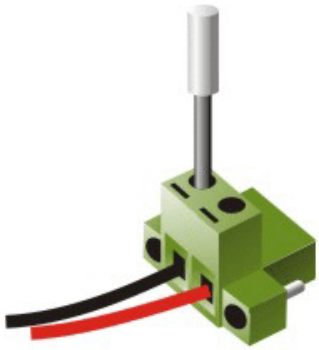
Follow the steps below to complete the power cord combination.

1. Insert the DC Power Cord into the socket of DC Power Terminator Head.

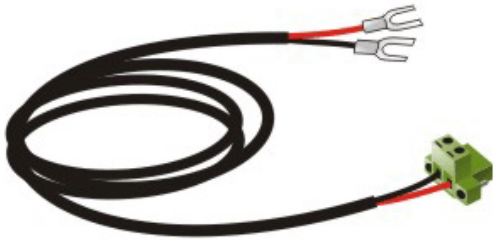


2. Use the screwdriver to fasten the power cord inside the head.





3. The assembled power cord with head should be the same as the following:



4. Plug the power cord head into the DC-1/DC-2 connector on A48.

Warning: The above figure shows the DC power supply terminal block. It is the lugs at the wiring end from the power source. The wiring procedure is for ground-to-ground, positive-to-positive, and negative-to-negative in order. The ground wire should always be connected first and disconnected last.

2.6 Optical Fiber Connection (SFP Optional)

Before you start to do the optical fiber connection, please read the following warnings first.

Warnings:

- The **laser energy** of the fiber optic communication channels in the single-mode will be **harmful** when operate, especially **to the eyes**. During normal operation with cable connection, this energy is confined to the cable with no danger present.
- Because the laser radiation is invisible and may be emitted from the aperture of the port before connect the cable or protective cap, please avoid exposure to laser radiation and also do not fix the gaze to open apertures.
- The following precautions are to avoid injury when connecting or disconnecting optical channel.
  ✓ Always connecting optical cables before power on.
  ✓ Always keep the protective cap on the optic connector.
  ✓ **Never stare into** an optical cable or connector when the connector is not in use.

A48 only supports SFP module for optical fiber connection.

There are two types of connectors that the SFP module supports: LC and RJ45 connector. Which type you need to use depends on the device you want to connect.

- Long haul LX single-mode interface
- Short haul SX multi-mode interface

For each type of optical transceiver, it should connect with corresponding optical fiber with proper mode. Incorrect fiber mode may affect link distance or even link fail.

Interface Type	Proper Mode for the Interface
Long haul LX single-mode	Single-mode (SM), 9/125 micron

interface	
Short haul SX multi-mode interface	Multi-mode (MM), 50/125 or 62.5/125-micron

The two types of interface are visually and functionally similar. Installation procedures are the same. This dual port has both connectors on transmit (upstream) and a receiving (downstream) is shown below.

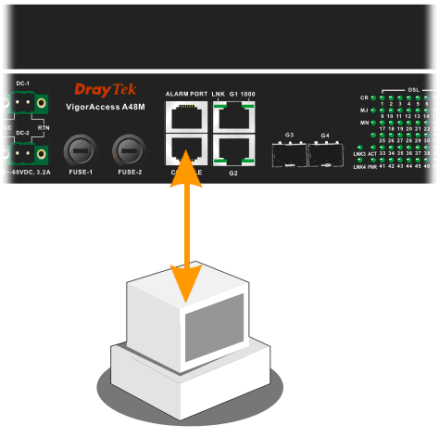
Follow the steps below to connect the fiber channel:

1. Read and understand the previous warnings and alarm.
2. Remove the protective caps from the fiber optic connector and from the external data cable.
3. Attach the external cable to the recessed connector on the faceplate.
4. To avoid exposure to laser radiation, plug the **protective cap**. Store protective cap on the clear place to use when there is no optical fiber connection or on stock.

2.7 Console Port Connection

The default setting of the console port is "**baud rate 9600, no parity, and 8 bit with 1 stop bit (N81)**".

For the initial configuration, users need to use terminal emulator software on a computer and connect it to a network module through the console port. Users can connect the RJ-45 end of the console cable to the console port of the network module. On the other side, users can connect the other end to a serial port (RS232) of a computer.



Beware that the default login is "**admin**", password is "**1234**".

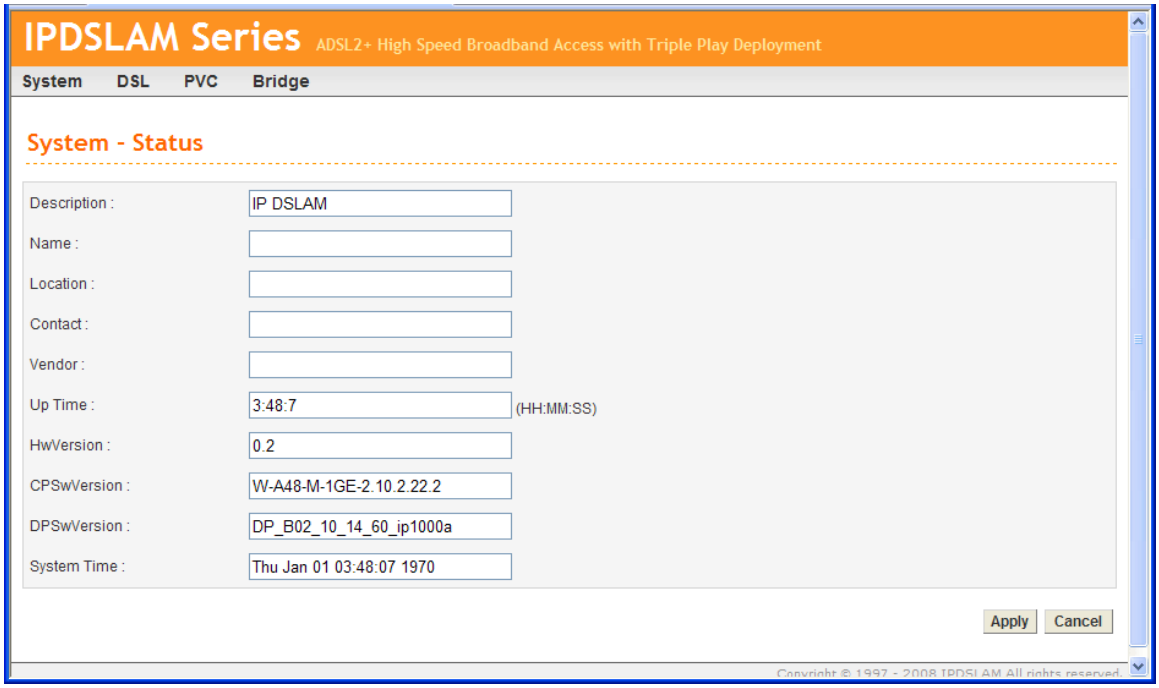
```
**********************************************************
*                    Bootloader Version: V1.XX                    *
**********************************************************
Press [ENTER] key within 5 sec. to download image...0
Please wait a minute...
Login:
```

3. Web Configuration

This chapter introduces you how to access IPDSLAM devices via WEB user interface.

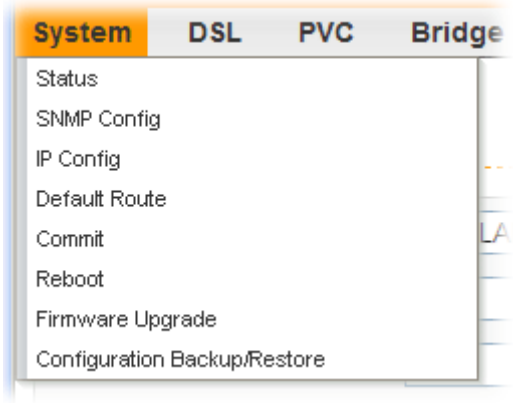
1. Please upgrade new firmware at first.
2. Configure management IP address
3. Open browser to access IPDSLAM via Web pages as below:
   * Browse master control => http://[IP address]
   * Browse master dsl => http://[IP address]:8800
   * Browse standalone Slave => http://[IP address]

The default value for user name is **admin** and the password is **1234**. Next, click **OK**.



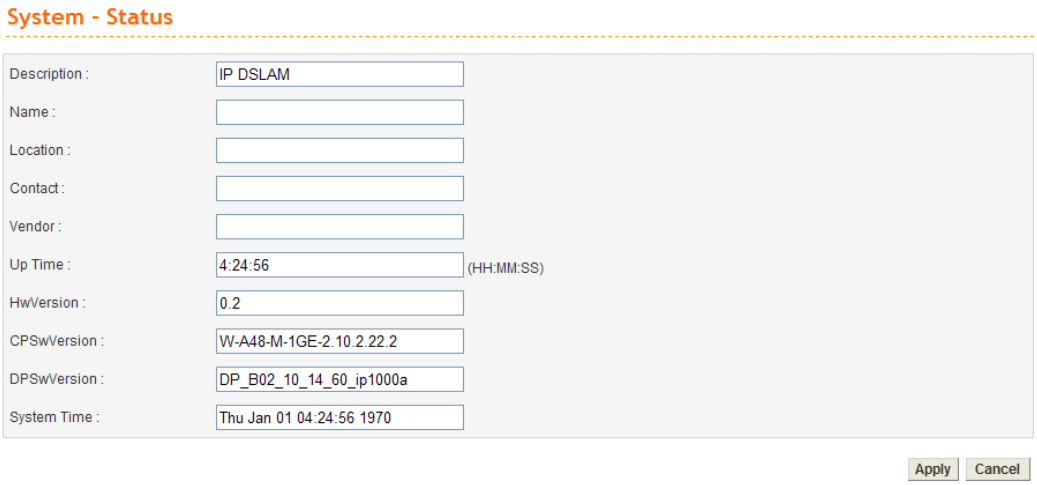
3.1 System Configuration

For the system setup, there are several items provided for you to configure ---- Status, SNMP Config, IP Config, Default Route, Commit, Reboot, Firmware Upgrade Setup, and Configuration Backup/Restore.



3.1.1 Status

The online **Status** function provides some useful system information on the current status of the VigorAccess. A user can observe the system status on this Web page and determine which setting needed to be changed in corresponding web pages. Open **System>>Status**. The **Status** Web page will be shown as follows:



Description	Type a name to show the nature of such device.
Name	Type a name for such device.
Location	Type the physical location of such device, e.g.,”Hsinchu Taiwan”.
Contact	Type the textual identification of the contact person for such device, together with information on how to contact this person, e.g., “Mr. Lin, phone: +886 3 5972727 ext 123” .
Vendor	Type the vendor-specific information, e.g., “Draytek Taiwan”.
Up Time	Display the system up time.
HwVersion	Type the version number of hardware.
CPSwVersion	Display CP module firmware version number.
DPSwVersion	Display DP module firmware version number.

System Time	Display current system time.
Apply	Click **Apply** to save the settings Click **Cancel** to cancel the configured settings and restore to the previous configuration.

3.1.2 SNMP Config

The Simple Network Management Protocol (SNMP) is an application layer protocol that facilitates the exchange of management information between network devices. There is a set of protocols for managing complex networks. SNMP works by sending messages, called protocol data units (PDUs), to different parts of a network. SNMP enables network administrators to manage network performance, find and solve network problems, and plan for network growth.

A SNMP-managed network consists of three key components, **managed devices**, **agents**, and **network-management systems (NMSs)**.

A managed device is a network node that contains an SNMP agent and that resides in a managed network. Managed devices collect and store management information and make this information available to NMSs by using SNMP. Managed devices, sometimes called network elements, can be routers and access servers, switches and bridges, computers hosts, or printers.

This function is to define a community string name. An agent is a network-management software module that resides in a managed device. An agent has local knowledge of management information and translates that information into a form compatible with SNMP.

An NMS executes applications that monitor and control managed devices. NMSs provide the bulk of the processing and memory resources required for network management. One or more NMSs must exist on any managed network.

Open **System>>SNMP Config**.

Snmp Config	**IP** – type the IP address of the administrator who has the authority to access into. **ro** – Configure read only community string. The default value of Master DSL is“public_00”. **rw** – Configure read and write community string. The default value of Master DSL is “private_00”. **trap** – Configure trap community string. The default value of Master DSL is “trap_00”.
Apply	Click **Apply** to save the settings.

3.1.3 IP Config

The Internet Protocol (IP) is a protocol used for communicating data across a packet-switched internetwork using the Internet Protocol Suite, also referred to as TCP/IP.

IP is the primary protocol in the Internet Layer of the Internet Protocol Suite and has the task of delivering distinguished protocol datagrams (packets) from the source host to the destination host solely based on their addresses. For this purpose the Internet Protocol defines addressing methods and structures for datagram encapsulation.

It must be configured only if this interface is used for management IP traffic.

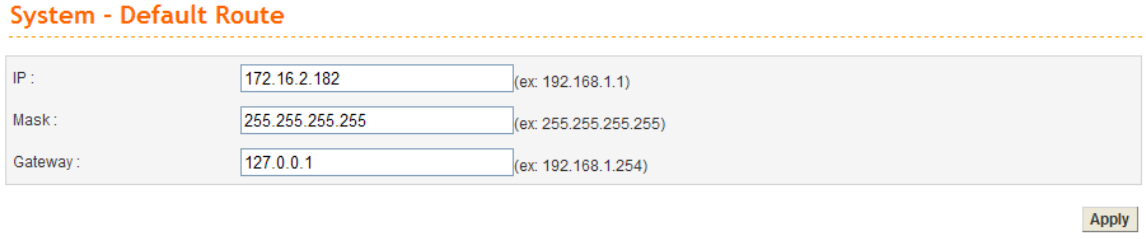
If IP and mask is 0.0.0.0 , it means that it is working at DHCP mode.

IP	Type the IP address for DSL module.
Mask	Type the subnet mask for DSL module.
Apply	Click **Apply** to save the settings.

Note: If IPDSLAM is used standalone, the user needs to configure these settings for management. The default value is 0.0.0.0 for both.

3.1.4 Default Route

A default route is the network route used by a router when no other known route exists for a given IP packet's destination address. All the packets for destinations not known by the router's routing table are sent to the default route. This route generally leads to another router, which treats the packet the same way: If the route is known, the packet will get forwarded to the known route. If not, the packet is forwarded to the default-route of that router which generally leads to another router.



IP	Type the IP address for destination IP address of this route.
Mask	Type the subnet mask for the mask to be logical-ANDed with the destination address before being compared to the value in the IP field.

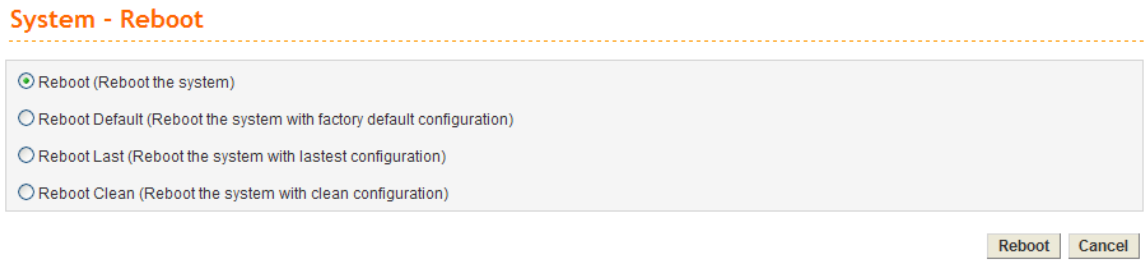
Gateway	Type the gateway for the IP address of the next hop of this route.
Apply	Click **Apply** to save the settings.

3.1.5 Commit

This page allows you to save current configured settings. Simply click **Commit**. The device will restart after storing the configuration.

3.1.6 Reboot

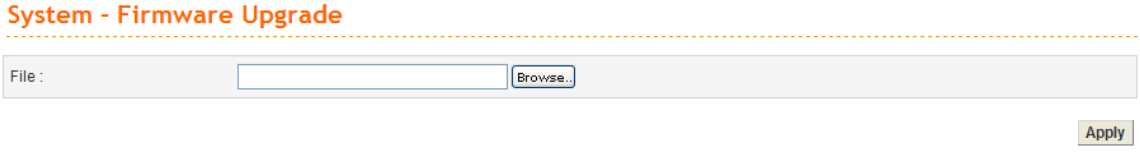
This page allows you to reboot the device under different condition.



Reboot	Reboot the system with current configuration.
Reboot Default	Reboot the system with default settings.
Reboot Last	Reboot the system with the lasted configuration.
Reboot Clean	Reboot the system with factory default values except IP and VLAN for management only.

3.1.7 Firmware Upgrade

This page allows users to upgrade firmware through a Web interface. In the **System** group, click the **Firmware Upgrade** option. You can see the following page then. Before you execute the firmware upgrade, please download the **newest firmware** from Draytek's website (www.draytek.com) or FTP site (ftp.draytek.com) on the computer first.

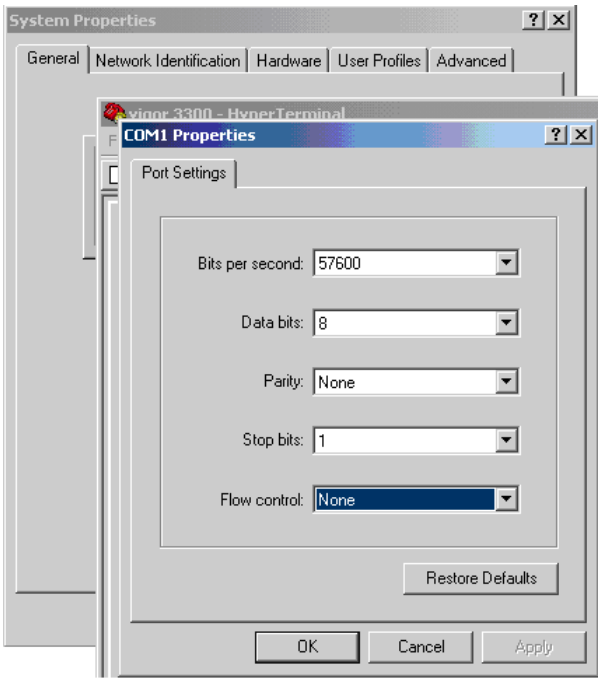


Firmware	Specify the location of the firmware file if you want to upgrade the firmware locally.
Apply	After finished your selection, please click **Apply** to execute the firmware upgrade.

Firmware Upgrade from a Console Port

Firmware upgrade can be done from a console port, too. The following example was run on a Windows environment.

1. Download the newest firmware from the DrayTek Website (www.draytek.com.tw) or FTP site (ftp.draytek.com) on your computer first.
2. Connect the RJ45 connector of console cable to the console port on Vigor device and the DB9 connector of the console cable to the RS232 port on the PC.



The default setting of the console port is “baud rate 57600, no parity, and 8 bit with 1 stop bit.”

3. Power on Vigor device, then press **ENTER** before the system reboots completely.
4. Open Hyper Terminal on the PC. Now, the device can accept a TFTP download and will display the following message:

```
 Cin- Uncompressing Dataplane
 Uncompressing "DP.bin.gz" (382933->848776) ..... Done

 Locking Text Area DP Text Start: 0x4818000 CP Text End : 0x4e78d08
 CfgInit: System Coming up from Default Configuration

 Initializing DataPlane
 DataPlane Initialized successfully
 Updating System Version.....
Block 31 erase in progress
........Flash block 31 erase successful...

 FLASH program starts at ADDR 3e0000
################
 Cin:- Factory Default File received from NVRAM
The DSL binary file to be opened is dsl_10_330000003C00000D.bin.gz
The DSL bin size is 257012
Loading The system.....
Loading system over.....
Initializing system.....
Initializing system over.....

                        **********************
                         Welcome to IP DSLAM
                        **********************

 Software Release: A24-A-1GE-2.10.2.20.I Date: May 25 2009


$
```

5. Type the path name of the firmware image and activate the **TFTP Client** from the PC to download the image. The corresponding message is shown as follows:

   firmware upgrade <firmware firle name> all <tftp server ip >

6. Now in the Console you will find the following information. When **Updating flash block** at **bfXXXXXX** appears, it means the firmware is under downloading.

```
$Downloading the File...
.....................................................
.....................................................
.....................................................
.....................................................
.....................................................
.....................................................
.....................................................
.....................................................
.....................................................
.....................................................
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.....................................................
.....................................................
```
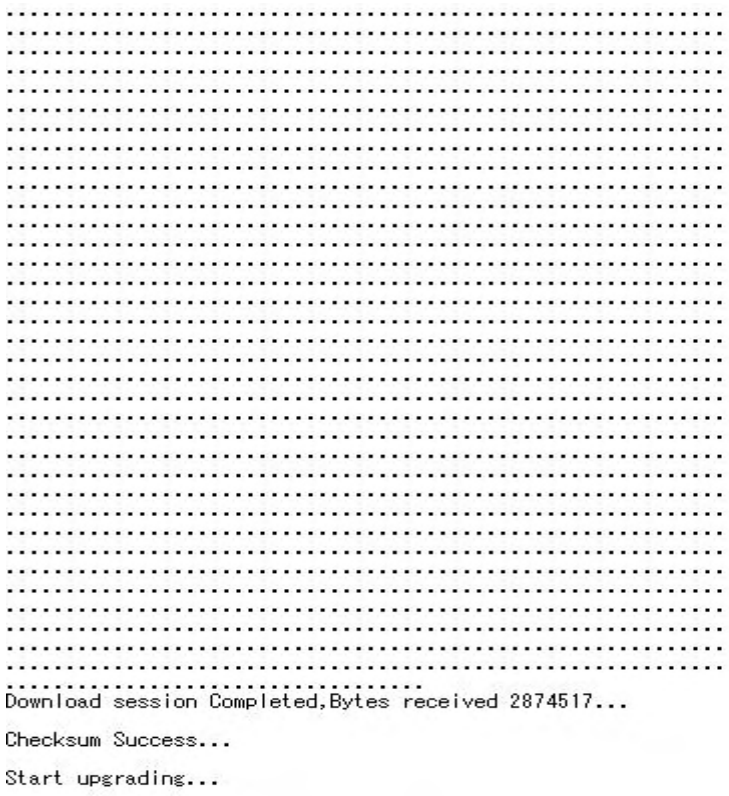
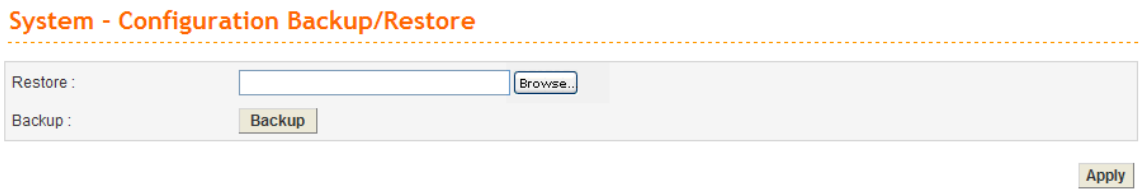

7. When **Start Upgrding** appears, it means the firmware downloading has been completed.



8. When **Firmware Upgrade SUCCESSFUL** appears, it means the firmware upgrading is finished. User should reboot it manual.

3.1.8 Configuration Backup/Restore

Most of the settings can be saved locally as a configuration file, and can be applied to another router. VigorAccess supports the restore and upload functions of the **configuration files.** Open **System** >> **Configuration Backup/Restore**. You can see the following page.

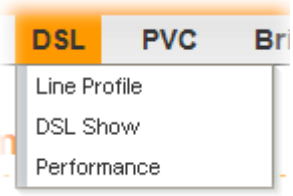


Restore Click this button to restore the previous saved configuration file and apply to the device.

Backup Click this button the backup current configuration file.

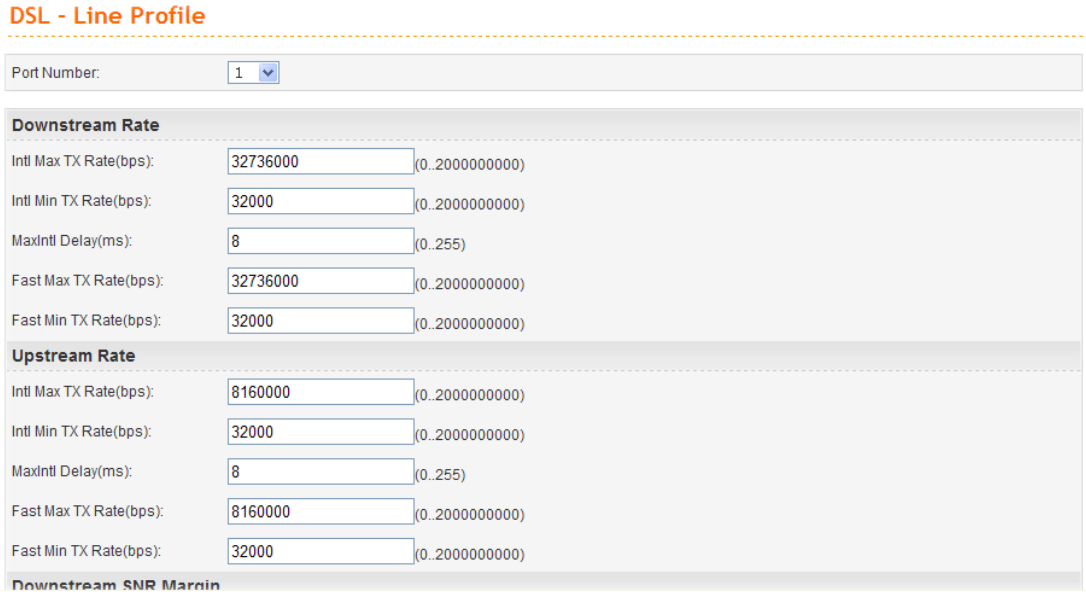
3.2 DSL Configuration

This page is used for DSL related configuration. Line profile configures train rate, SNR, and etc. DSL show can display current DSL training status. Performance shows different type of error counts during Curr15Min/Curr1Day/Prev1Day.　有修改，請幫我再看看



3.2.1 Line Profile

This page allows you to configure line profile parameters for the selected port. These parameters are defined in RFC 2662 of ADSL MIB. When a user wants to change these parameters, he/she can input the new value in the corresponding fields and click **Apply** button.

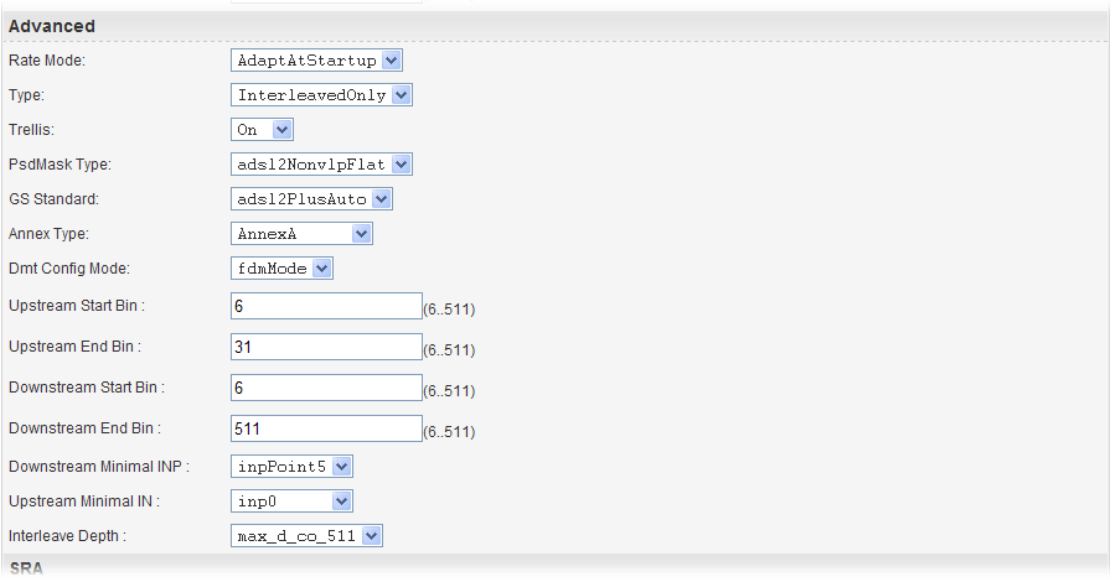


Port Number	Choose the port that you want to set. The port number includes 1 – 48.
Downstream/Upstream Rate	Configure DSL Downstream/Upstream transmit rate related parameter Intl Max TX Rate (bps)-Configure Maximum Transmit rate for 'Interleaved' channel, in bps. Intl Min TX Rate(bps)- Configure Minimum Transmit rate for 'Interleaved' channel, in bps. MaxIntl Delay(ms) - Configure Maximum Interleave Delay for this channel. Interleave delay applies only to the interleave channel and defines the mapping (relative spacing) between subsequent input bytes at the interleaved input and their placement in the bit stream at the interleaved output.

Fast Max TX Rate (bps) - Configure Maximum Transmit rate for 'Fast' channel, in bps.
Fast Min TX Rate (bps) - Configure Minimum Transmit rate for 'Fast' channel, in bps.

Downstream/Upstream SNR Margin

DSL Downstream/Upstream (Singal to Noise Ratio)SNR related parameter:
Target SNR Margin - the modem must achieve with a BER of 10 to the power 7 or better to successfully complete initialization for Noise Margin.
Max SNR Margin - Configure Maximum Signal/ Noise Margin for rate downshift or upshift.
Min SNR Margin – Configure Minimum Signal/ Noise Margin for rate downshift or upshift.



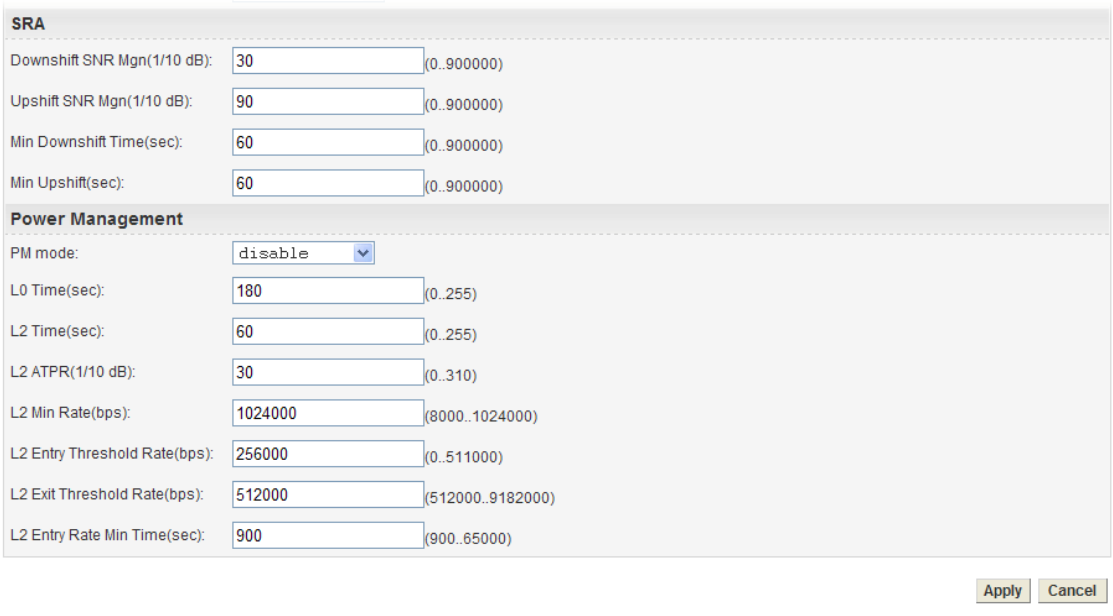
Rate Mode Defines what form of transmit rate adaptation is configured on this device.

Type It is used to configure the ADSL physical line mode.

Trellis This parameter enables/disables trellis coding.

PsdMask Type This parameter selects the PSD mask option to be used.

GS Standard	This parameter defines what DSL capability will be use after training.
Annex Type	This parameter defines what ADSL annex standard to be used.
Dmt Config Mode	This parameter defines what frequency division mode to be used.
Upstream Start Bin	The lowest bin number allowed for upstream signal.
Upstream End Bin	The highest bin number allowed for upstream signal.
Downstream Start Bin	The lowest bin number allowed downstream signal.
Downstream End Bin	The highest bin number allowed for downstream signal.
Downstream Minimal INP	Parameter used to specify the minimum impulse noise protection for the downstream bearer channel.
Upstream Minimal INP	Parameter used to specify the minimum impulse noise protection for the upstream bearer channel.
Interleave Depth	Minimum interleaving depth supported by the customer's hardware.

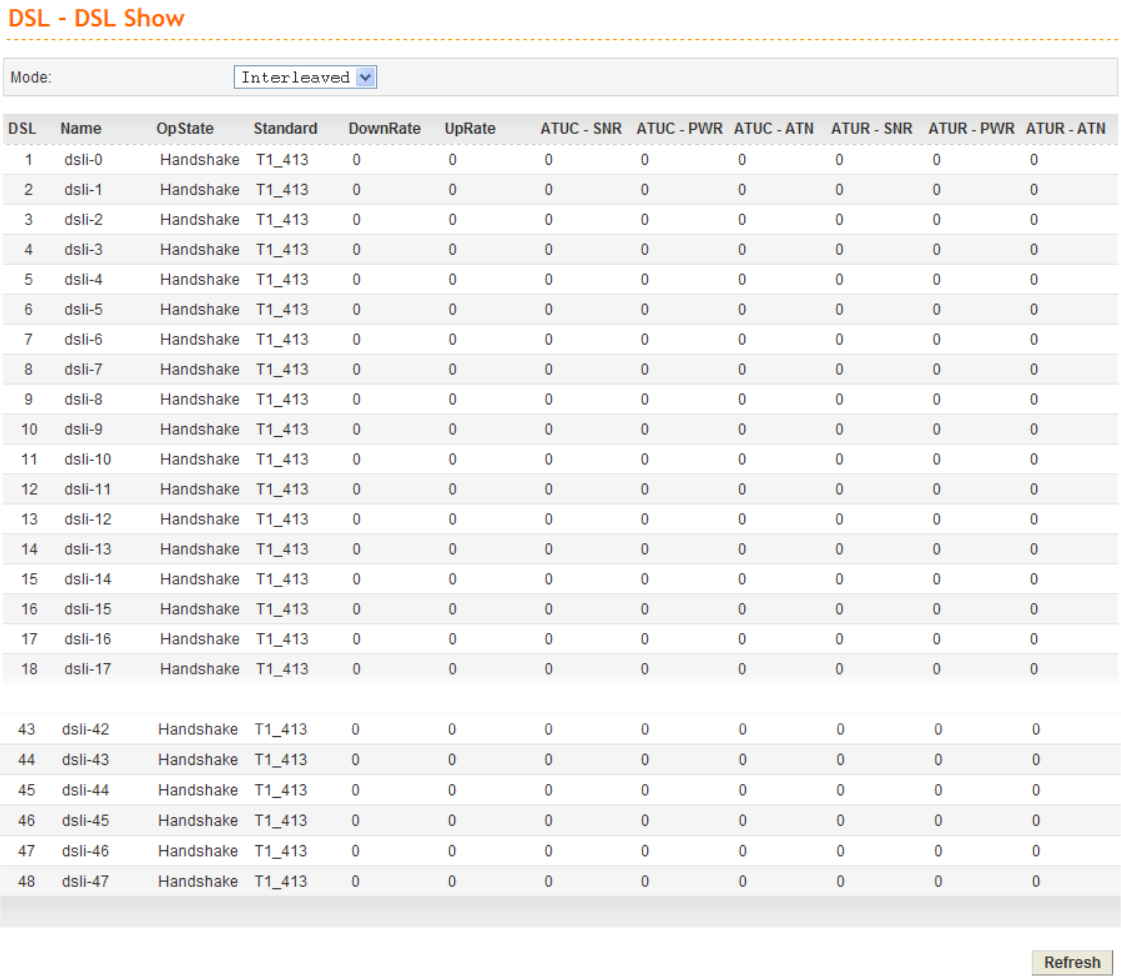


Downshift SNR Mgn	Configured Signal/ Noise Margin (SNR) for rate downshift. If the noise margin falls below this level, the modem should attempt to decrease its transmit rate.
Upshift SNR Mgn	Configured Signal/ Noise Margin(SNR) for rate upshift. If the noise margin rises above this level, the modem should attempt to increase itis transmit rate.
Min Downshift Time	Determine the minimum time that the current margin is below Downshift SNR Mgn, before a downshift occurs.
Min Upshift	Determine the minimum time that the current margin is below upshift SNR Mgn, before a downshift occurs.

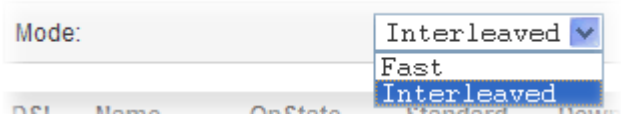
PM mode	PM-related parameter used by the ATU-C to set the allowed link states. **disable** – No power management. **l2enable** - The ADSL link is active, but a low-power signal conveying background data is sent from the ATU-C to the ATU-R. **l3enable** - There is no signal transmitted on the line and thus no transmission of information is possible.
L0 Time	This parameter represents the minimum time (in seconds) between an exit from the L2 state and the next entry into the L2 state.
L2 Time	This parameter represents the minimum time (in seconds) between an entry into the L2 state and the first Power Trim (power saving) in the L2 state and between two consecutive Power Trims in the L2 State.
L2 ATPR	This parameter represents the maximum aggregate transmit power reduction (in dB) that can be performed through a single Power Trim in the L2 state.
L2 Min Rate	This parameter specifies the minimum net data rate during the low power state (L2).
L2 Entry Threshold Rate	This parameter allows the user to set a Current Traffic Rate threshold for transition from L0 to L2.
L2 Exit Threshold Rate	This parameter allows the user to set a Current Traffic Rate threshold for transition from L2 to L0.
L2 Entry Rate Min Time	This parameter allows the user to define the minimum interval of time that the current traffic rate should stay below the L2-entry Rate Threshold before transits to Low Power state.

3.2.2 DSL Show

DSL show displays current DSL status, down rate, up rate, current use standard and etc.



Mode It is used to select the ADSL physical line mode. Fast and Interleaved represent different algorithms for DSL data transmission.



DSL Name Display DSL line name**.**

OpState Display current operation status.

Standard Display current used DSL standard.

DownRate Display current down rate.

UpRate Display current up rate.

ATUC-SNR Display the Noise Margin seen by this ATU with respect to its received signal in tenth dB in CO side.

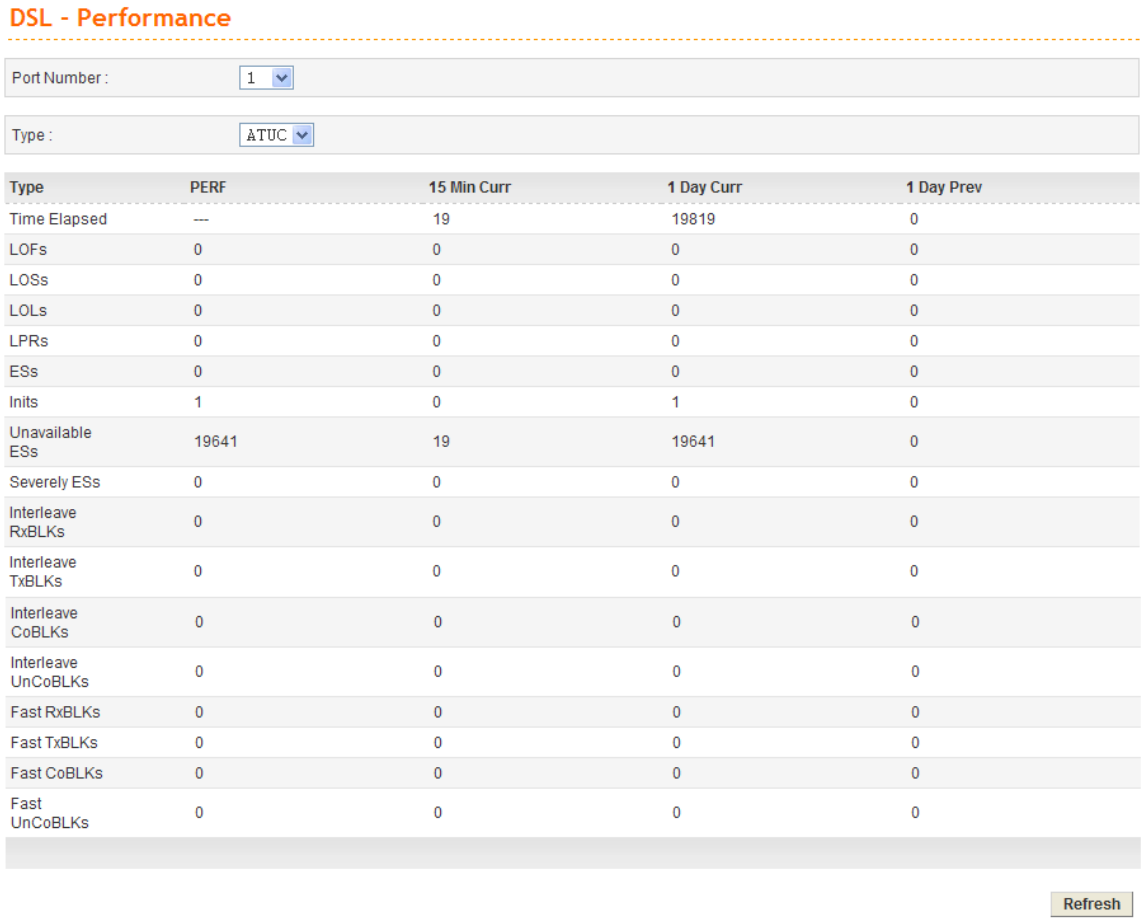
ATUC-PWR Display the total output power transmitted by this ATU in CO side.

ATUC-ATN Display measured difference in total power transmitted by the peer ATU and the total power received by this ATU in CO side.

ATUR-SNR	Display Noise Margin seen by this ATU with respect to its received signal in tenth dB in CPE side.
ATUR-PWR	Display the total output power transmitted by this ATU in CPE side.
ATUR-ATN	Display Noise Margin seen by this ATU with respect to its received signal in tenth dB in CPE side.
Refresh	Renew the current displayed information.

3.2.3 Performance

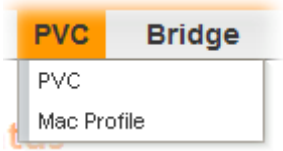
It shows error counts during current 15 minutes or current day or before.



Port Number	Choose the port that you want to see. The port number includes 1 – 48.
Type	The CPE (ATUR) or DSLAM (ATUC) side**.** 
Refresh	Renew the current displayed information.

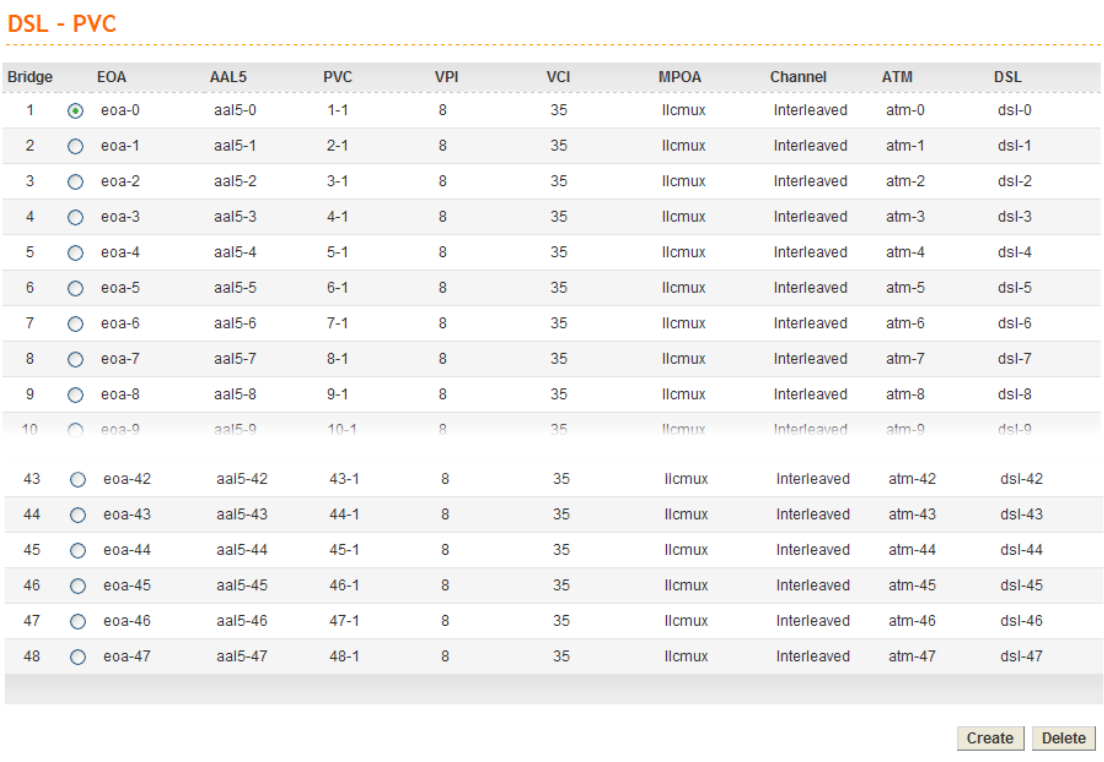
3.3 PVC Configuration

A **permanent virtual circuit (PVC)** is a virtual circuit established for repeated/continuous use between the same data terminal equipments (DTE). PVC can be established as an option to provide a dedicated circuit link between two facilities. PVC configuration is usually pre-configured by the service provider.



3.3.1 PVC

This page allows you to configure Virtual Path Identifier(VPI) and Virtual Circuit Identifier(VCI) for each PVC. The range for the Virtual Path Identifier is 0 to 255, and the range for the Virtual Circuit Identifier is 32 to 65535. The ATM Forum has reserved VCI identifiers 0 to 31 for control traffic.

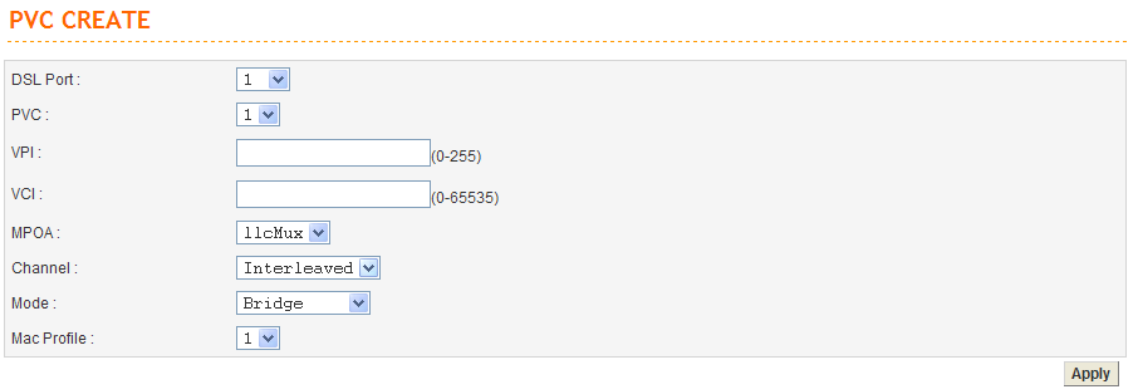


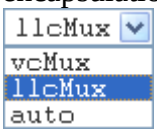
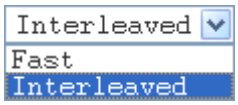
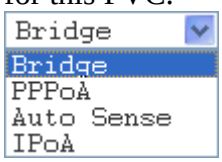
Bridge	Display the number of the PVC profile.
EOA	Display the EOA number of the PVC profile.
AAL5	Display ATM Adaptation Layer 5 (AAL5).It is used to send variable-length packets up to 65,535 octets in size across an Asynchronous Transfer Mode (ATM) network.
PVC	Display the PVC number with DSL interface (x-y, x means DSL interface, y means PVC number)
VPI	Display the value of Virtual Path Identifier.
VCI	Display the value of Virtual Circuit Identifier.

MPOA	Display the data encapsulation method used over the AAL5.
Channel	Display the physical ADSL line mode.
ATM	Display the ATM interface name.
DSL	Display the DSL interface name.
Create	Click this button to create a new PVC profile.
Delete	Click this button to delete the selected PVC profile.

Creating a PVC

Click **Create** to generate a new PVC profile. Below shows the detailed web page:



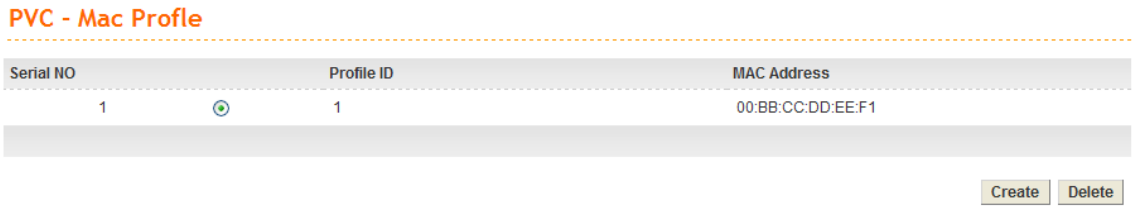
DSL Port 1 – 48	Choose the number (DSL port) to make all the configuration will be applied to the created PVC.
PVC 1 – 8	Use the drop down menu to choose the PVC number.
MPoA	Use the drop down menu to choose the data encapsulation method to be used over the AAL5. 
Channel	It is used to select the ADSL physical line mode. Fast and Interleaved represent different algorithms for DSL data transmission. 
Mode	Use the drop down menu to choose the type (protocol) for this PVC. 
Mac Profile	It will be available when IPoA mode is selected. Use the drop down menu to choose a number of MAC

profile. For more detailed of Mac Profile, please refer to 3.3.2.

3.3.2 Mac Profile

MAC address profile is a generic way for assigning MAC addresses for certain interfaces. The MAC address can be associated with a profile, and that profile can be attached to interface.

Mac profiles used by IPoA / IPoE must not conflict with any of the Virtual Mac addresses configured in the system.



Serial NO	Display the number of this profile.
Profile ID	Display the identification number for this profile.
MAC Address	Display the MAC address specified for this profile.
Create	Click this button to create a new MAC profile.
Delete	Click this button to delete the selected MAC profile.

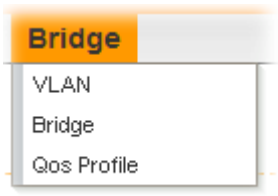
Creating a Profile

Click **Create** to generate a new VLAN profile. Below shows the detailed web page:

Profile ID	Type the value as the identification number. The range is from 1 to 48.
Mac Address	Type the Mac Address specified for this profile.

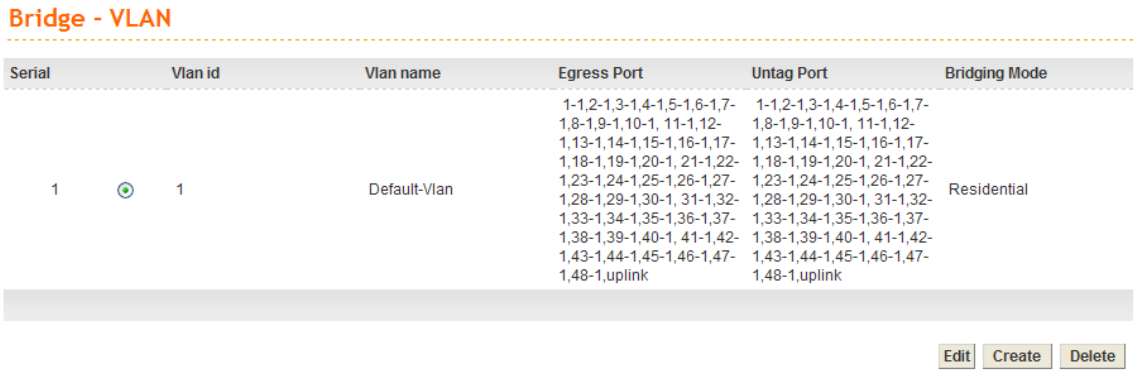
3.4 Bridge Configuration

Bridge configuration offers basic layer 2 switch configuration like VLAN create, delete, modify, Bridge port create, delete, modify and QoS profile create, delete, and modify.



3.4.1 VLAN

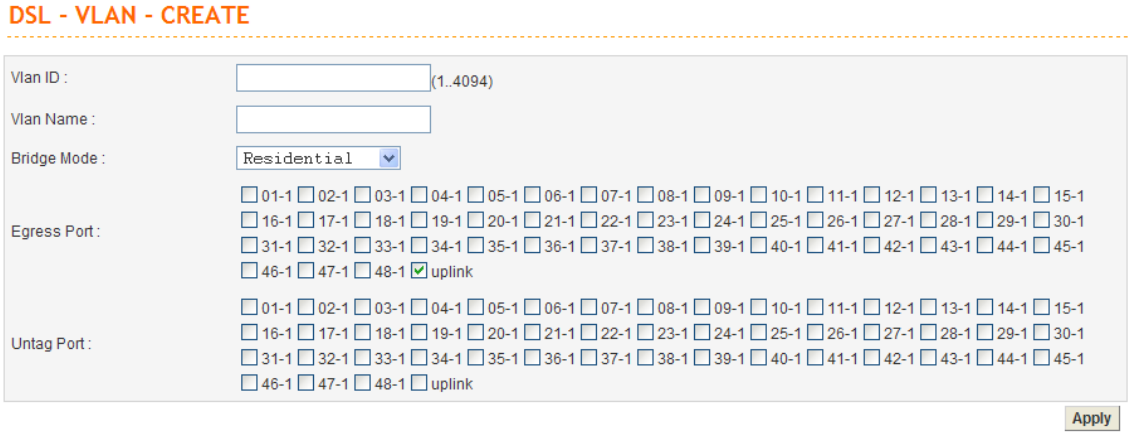
VLAN is a group of hosts with a set of requirements that communicate when they are attached to the Broadcast domain, regardless of their physical locations. In IPDSLAM, it supports up to 512 VLAN at one time.



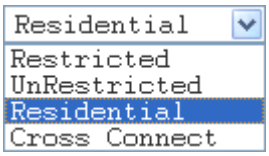
Serial	Display the number of the VLAN profile.
Vlan id	Display the ID number of the VLAN profile.
Vlan name	Display the name of the VLAN profile.
Egress Port	Display the egress port value for port 1- port 48.
Untag Port	Display the untag port value for port 1 - port 48.
Bridging Mode	Display the mode for the selected VLAN used.
Edit	Click this button to modify the existed VLAN profile.
Create	Click this button to create a new VLAN profile.
Delete	Click this button to delete the selected VLAN profile.

Creating VLAN

Click **Create** to generate a new VLAN profile. Below shows the detailed web page.

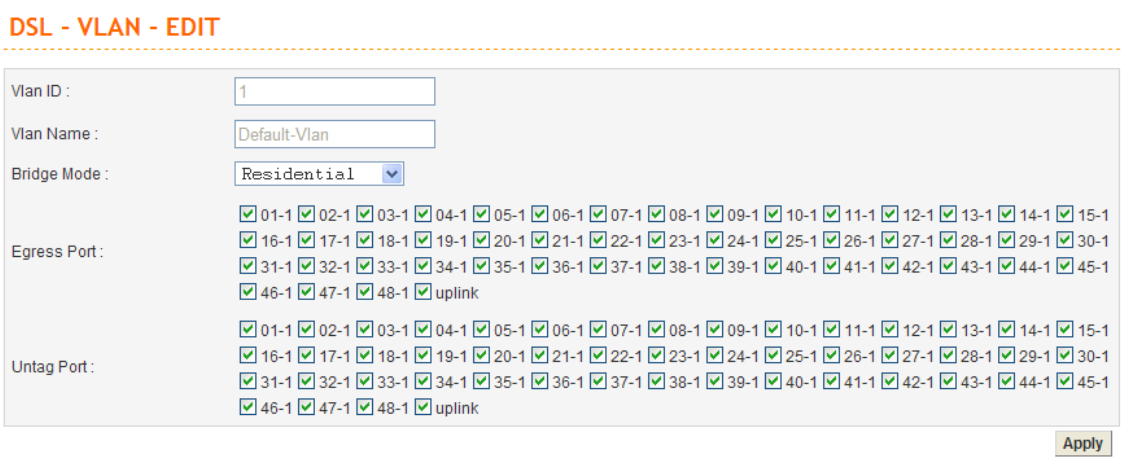


Vlan id	Type the identification number of the VLAN profile. The range is from 1 to 4094.
Vlan name	Type the name of the VLAN profile.

Bridging Mode	Choose the mode for the selected VLAN used. **Restricted** –Switching of traffic from one CPE to another CPE is prohibited. In case traffic coming from one CPE / downlink is meant for another CPE / downlink, it is dropped - effectively achieving VLAN isolation between CPEs / stacked DSLAMs. **Unrestricted** - Allow traffic passing between any two devices in the same VLAN. **Residential** - All traffic originating from the CPE ports are sent towards the uplink paths – without any destination address MAC lookup. **Cross Connect** - There is no learning and lookup, and there are at most two member ports for it. 
Egress Port	The set of ports are permanently assigned to the egress list for this VLAN by management. Choose the egress port to be applied under such VLAN profile.
Untag Port	The set of ports should transmit egress packets for this VLAN, as untagged. Choose the untag port to be applied under such VLAN profile.

Editing VLAN

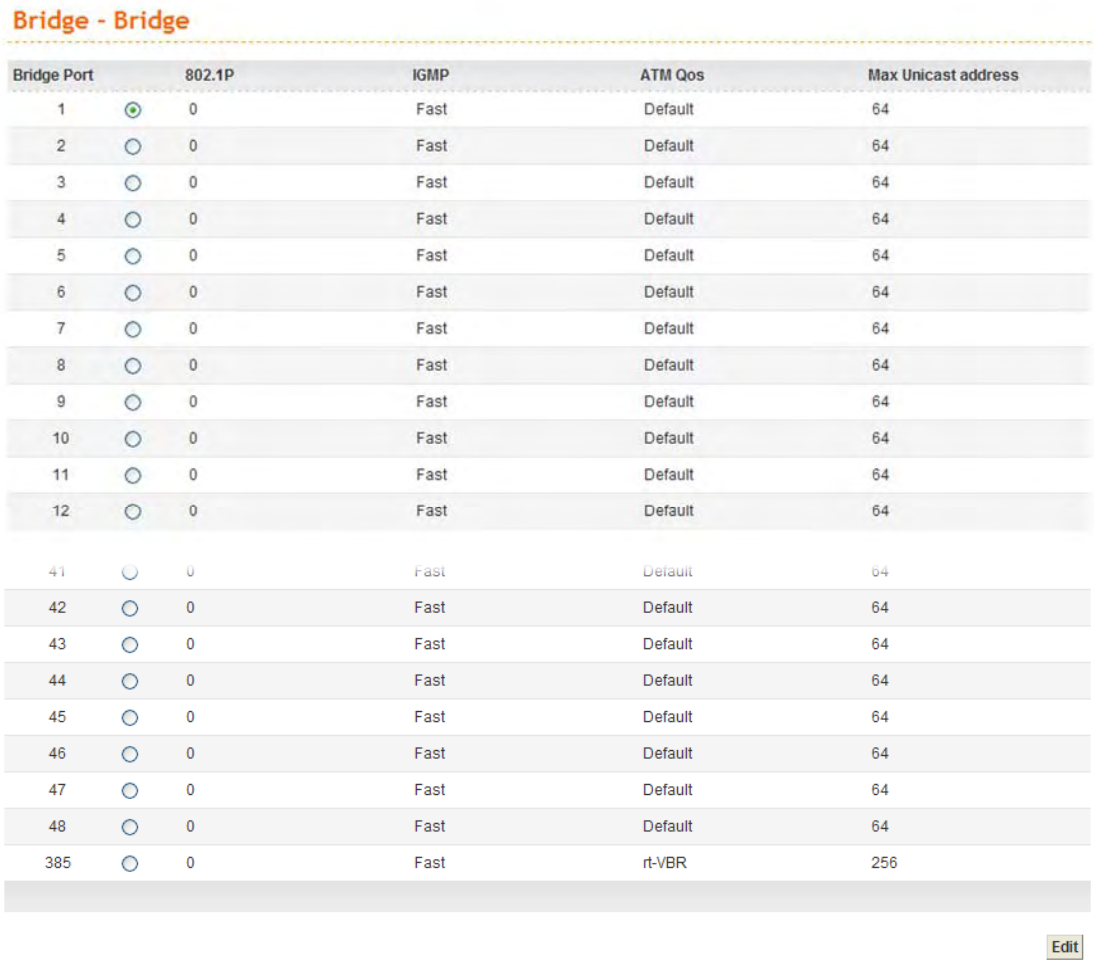
Click the radio button of the VLAN profile you want to edit. Next, click **Edit** to open it. Below shows the detailed web page.



Note: Vlan ID and Vlan Name are fixed and cannot be modified. If you want to change it, delete the profile and create a new one.

3.4.2 Bridge

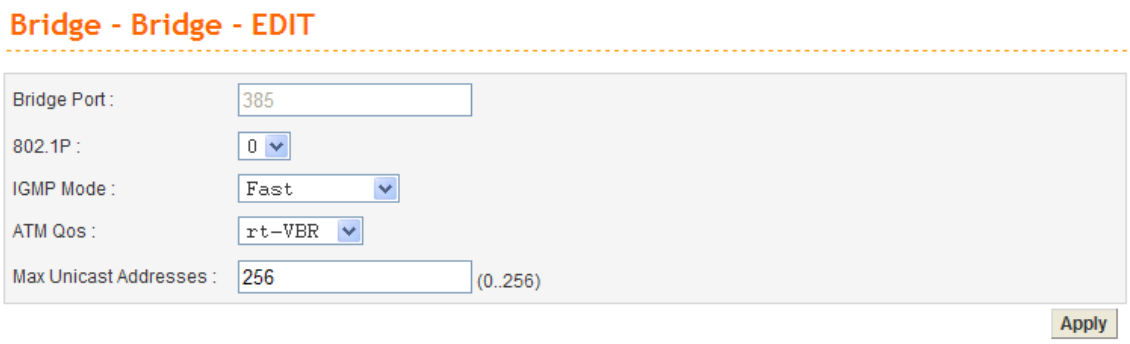
This page is for Bridge configuration including, 802.1P, IGMP leaved mode, QoS configuration, and Max Unicast address.



Bridge Port	Display the number of the profiles that system offered. 1 – 48 represents port 1 to port 48.

Editing Bridge Profile

Click the radio button of the profile you want to edit. Next, click **Edit** to open it. Below shows the detailed web page.

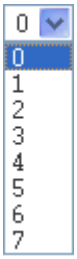


Bridge Port

Display the number of the profiles that you want to edit. Such number cannot be modified.

802.1P

The default ingress User Priority which can be configured by the user. The default value of this attribute can be 0. The large number means first priority.



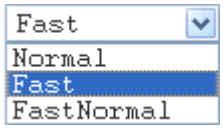
IGMP Mode

This parameter specifies the IGMP Snooping Leave message processing mode for the port.

Normal - the Leave message is forwarded to the Querier. Based on the Query received from Querier, the Leave processing is triggered.

Fast - the port is immediately deleted from that multicast group on Leave message reception and then the Leave message is forwarded.

Fast Normal – the Leave message is forwarded and the Leave processing is triggered immediately without waiting for any trigger from the Querier.



ATM Qos

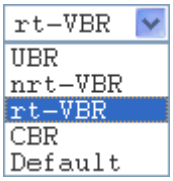
It determines the process queue that the received frame is mapped to.

UBR –all coming packets are dispatched with lowest priority queue.

nrt – VBR - all coming packets are dispatched with high priority queue.

CBR - all coming packets are dispatched with highest priority queue.

Default –all coming packet are dispatched with proper priority queue according its priority field.

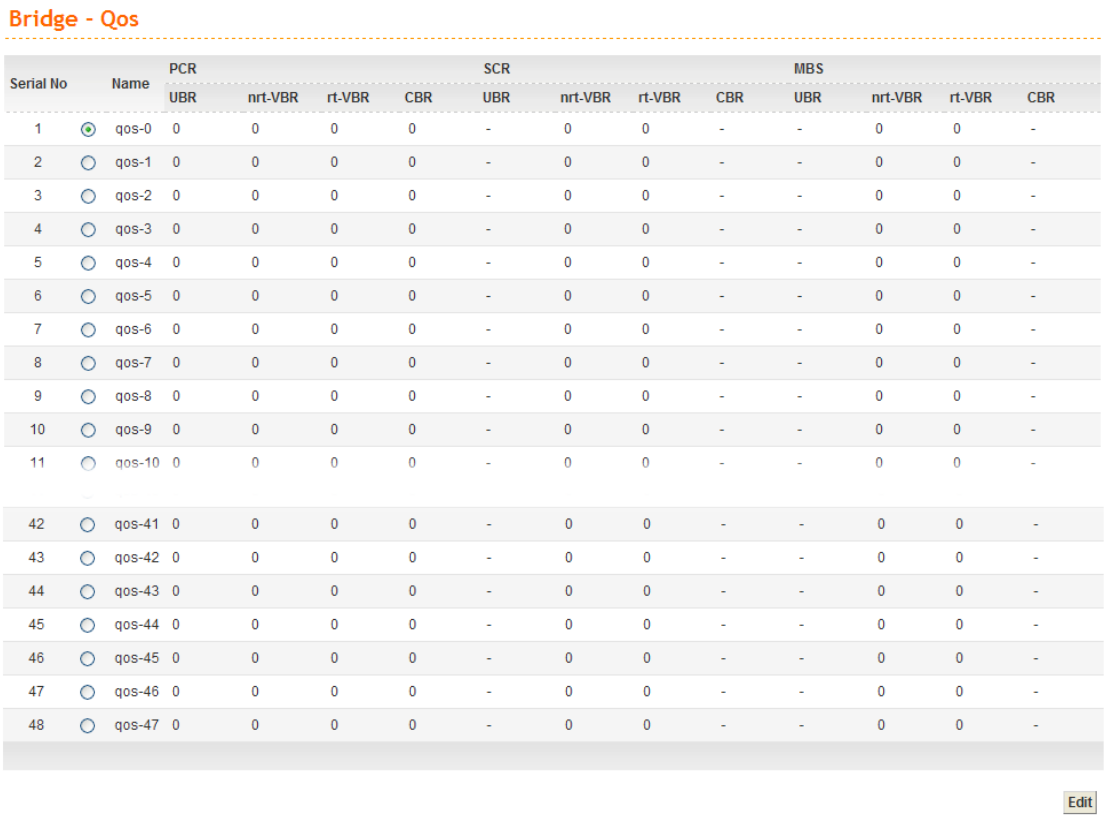


Max Unicast Addresses Configure max learned unicast addresses number. The default value is 64.Uplink port(193) default value is 256.

Note: Bridge port is fixed and cannot be modified. If you want to change it, delete the profile and create a new one.

3.4.3 Qos Profile

A profile with a set of parameters is used to quantify the quality of service provided.



Serial No Display the number of the profiles that system offered. 1 – 48 represents port 1 to port 48.

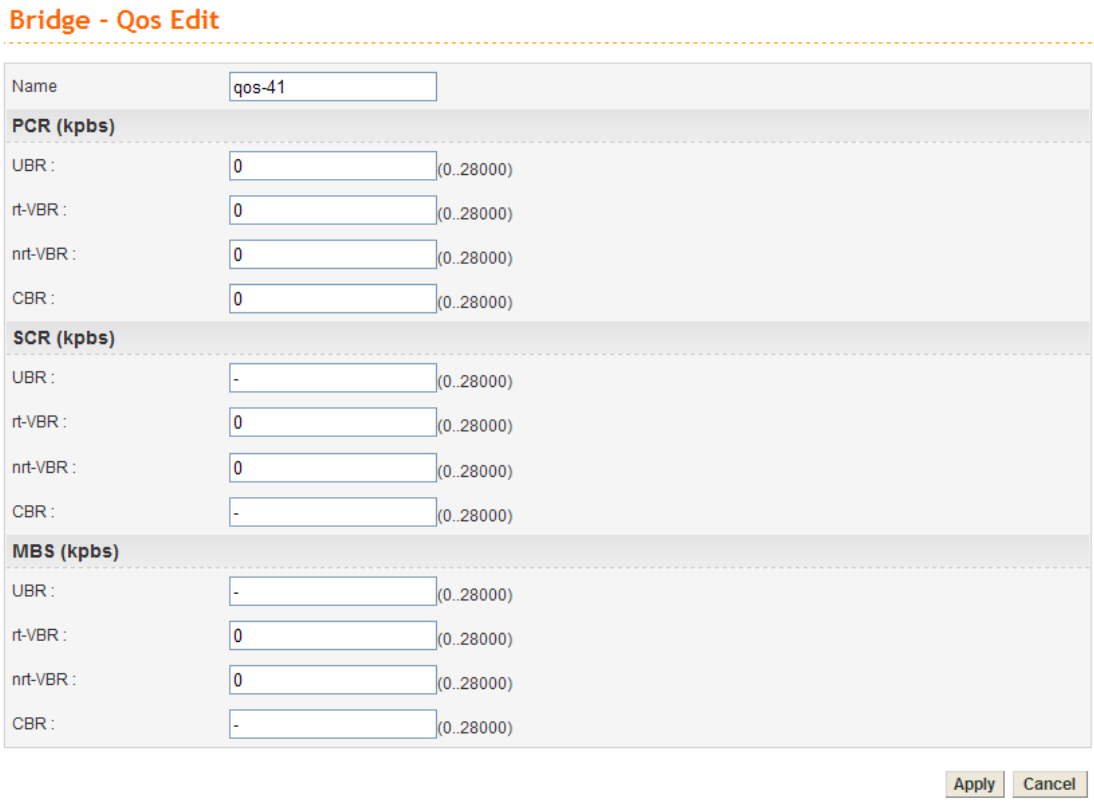
Name Display the QoS profile name for each port.

PCR/SCR/MBS Display the values of UBR, nrt-VBR, rt-VBR and CBR for PCR/SCR/MBS.
PCR represents Peak Cell Rate.
SCR represents Sustainable Cell Rat.
MBS represents Maximum Burst Size.

Edit Click this button to modify the selected Qos profile.

Editing QoS Profile

Click the radio button of the profile you want to edit. Next, click **Edit** to open it. Below shows the detailed web page.

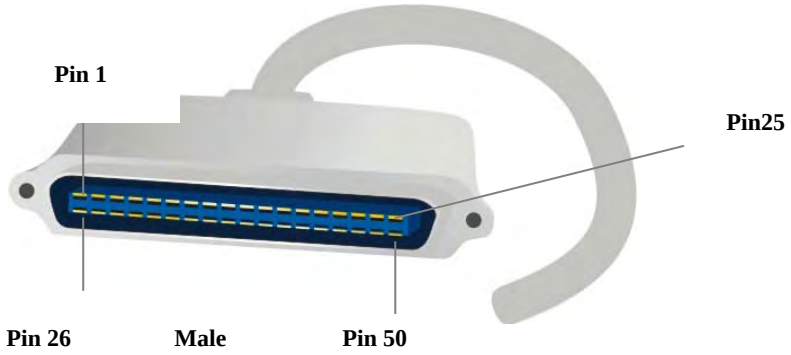


Name	Display the name of the profile. You can retype the name to modify it.
PCR	PCR means Peak Cell Rate. Values typed here can determine the process queue for the ratelimit of PCR value. UBR – The ratelimit of the lowest process queue. rt-VBR –The ratelimit of the high process queue. nrt-VBR –The ratelimit of the medium process queue. CBR –The ratelimit of the highest process queue.
SCR	SCR means Sustainable Cell Rat. Values typed here can determine the process queue for the ratelimit of SCR value. UBR – The ratelimit of the lowest process queue. rt-VBR –The ratelimit of the high process queue. nrt-VBR –The ratelimit of the medium process queue. CBR –The ratelimit of the highest process queue.
MBS	It means Maximum Burst Size. Values typed here can determine the process queue for the ratelimit of MBS value. UBR – The ratelimit of the lowest process queue. rt-VBR –The ratelimit of the high process queue. nrt-VBR –The ratelimit of the medium process queue. CBR –The ratelimit of the highest process queue.

Appendix A: Connectors

A.1 RJ21 DSL Connector

Connections made with two 50-pin champ cables are attached to the RJ21 interface on VigorAccess. Each cable terminates with a 50-pin Telco straight champ connector.

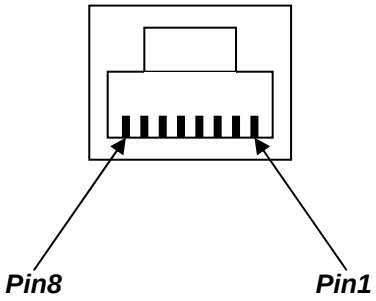


Pin assignments between the Line and the PSTN splitter.

Pin Number	Wire Color	TIP/RING	Port Number	Pin Number	Wire Color	TIP/RING	Port Number
26 1	White/blue Blue/white	TIP RING	1	38 13	Black/green Green/black	TIP RING	13
27 2	White/orange Orange/white	TIP RING	2	39 14	Black/brown Brown/black	TIP RING	14
28 3	White/green Green/white	TIP RING	3	40 15	Yellow/blue Blue/yellow	TIP RING	15
29 4	White/brown Brown/white	TIP RING	4	41 16	Black/gray Gray/black	TIP RING	16
30 5	White/gray Gray/white	TIP RING	5	42 17	Yellow/orange Orange/yellow	TIP RING	17
31 6	Red/blue Blue/red	TIP RING	6	43 18	Yellow/green Green/yellow	TIP RING	18
32 7	Red/orange Orange/red	TIP RING	7	44 19	Yellow/brown Brown/yellow	TIP RING	19
33 8	Red/green Green/red	TIP RING	8	45 20	Yellow/gray Gray/yellow	TIP RING	20
34 9	Red/brown Brown/red	TIP RING	9	46 21	Violet/blue Blue/violet	TIP RING	21
35 10	Red/gray Gray/red	TIP RING	10	47 22	Violet/orange Orange/violet	TIP RING	22
36 11	Black/blue Blue/black	TIP RING	11	48 23	Violet/green Green/violet	TIP RING	23
37 12	Black/orange Orange/black	TIP RING	12	49 24	Violet/brown Brown/violet	TIP RING	24
				50 25	Violet/gray Gray/violet	TIP RING	25 is dummy

A.2 Alarm Relay RJ45 Connector

RJ45 jets provide connection with an external alarm device to the alarm relay connector, The alarm relays provide relay contact closures. If you connect the alarm relays, they transmit critical, major, and minor alarms to a separate, external alarm device. The alarm device uses a bell, light, or some other signal to alert people of the change in status. The alarm relay connector also provides one set of contacts for audible alarms and one set for visual alarms. The maximum contact rating is 30VDC, 2A 125VDC, 0.5A.

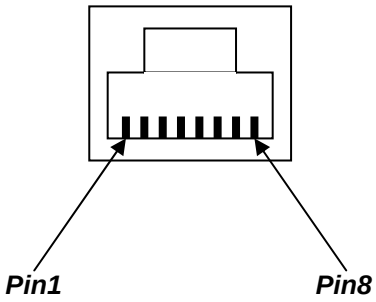


The table below lists the pin assignments for backplane connector RJ45, the alarm relay connector.

Pin	Signal	Description
1	NC1	(NORMAL CLOSE CONTACT GROUP1)
2	COM1	(COMMON CONTACT GROUP1)
3	NO1	(NORMAL OPEN CONTACT GROUP1)
4		NOT USED
5		NOT USED
6	NC2	(NORMAL CLOSE CONTACT GROUP2)
7	COM2	(COMMON CONTACT GROUP2)
8	NO2	(NORMAL OPEN CONTACT GROUP2)

A.3 Alarm Port RJ45 Connector

RJ45 jets provide connection with an external alarm device to the alarm connector. If you connect the alarm relays, they transmit critical, major, and minor alarms to a separate, external alarm device. The alarm device uses a bell, light, or some other signal to alert people of the change in status. The alarm relay connector also provides one set of contacts for audible alarms and one set for visual alarms. The maximum contact rating is 30VDC, 2A 125VDC, 0.5A.



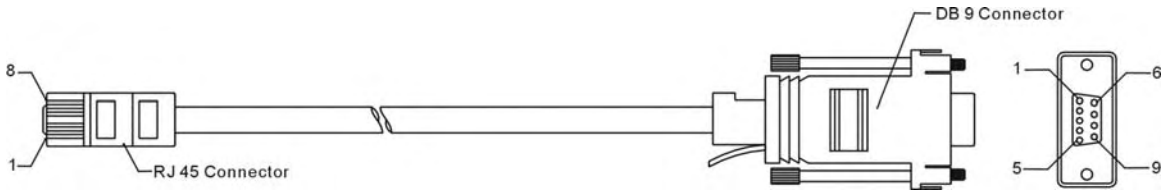
The table below lists the pin assignments for backplane connector RJ45, the alarm relay connector.

Pin	Signal	Description
1	RELAY NC	RELAY NORMAL CLOSE CONTACT
2	RELAY NO	RELAY NORMAL OPEN CONTACT)
3	RELAY COM	(RELAY COMMON CONTACT)
4	ALARM IN2	(ALARM INPUT CONTACT GROUP2)
5		NOT USED
6	ALARM IN1	(ALARM INPUT CONTACT GROUP1
7	ALARM GND1	ALARM GND CONTACT GROUP1
8	ALARM GND2	ALARM GND CONTACT GROUP2

A.4 RS232 Connector

The RJ45 connection jet is used for CLI commands for system configurations and controlling functions in the VigorAccess. The jet is used for initialization of the VigorAccess during the preliminary installation. The “management cable”, as shown in Figure 1-15, converts the RJ45 to the RS232 interface. The RJ45 jet connects to a console interface in the VigorAccess, while the RS232 DB9 connecting to a console port on the computer.

The default setting of the console port is “**baud rate 9600, no parity, and 8 bit with 1 stop bit (N81)**”.

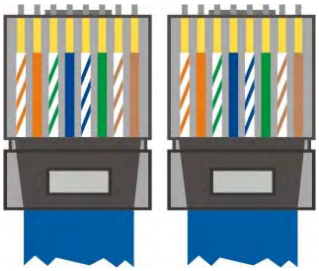


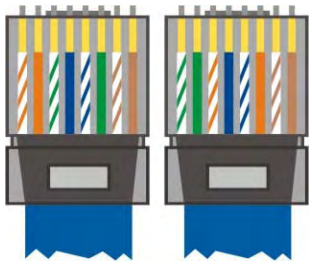
The pin-out for this connector is shown below:

RJ45	DB9 (Female)	Signal
No connection	1	CD
3	2	TD
6	3	RD
7	4	DTR
5	5	GND
2	6	DSR
8	7	RTS
1	8	CTS
No connection	9	RI

A.5 Standard 10/100 Base-T Ethernet Interface Connector

RJ45 jets provide 10/100 Base-T Ethernet interfaces. The interface supports MDI/MDIX auto-detection of either straight or crossover RJ45 cables. These cables are used on UP1,UP2/MGN interfaces.





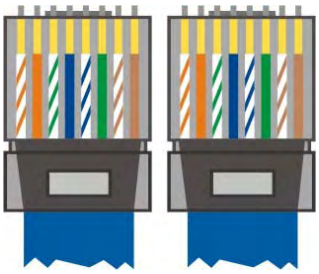
At 400 and 600 W the surface roughness was quite low (~15 2) and the coatings showed a mirror-like surface with a high brightness.

RJ-45 **Straight-through** Cable Pin-outs			
Signal	Pin	Pin	Signal
Tx+	1	1	Tx+
Tx-	2	2	Tx-
Rx+	3	3	Rx+
--	4	4	--
--	5	5	--
Rx-	6	6	Rx-
-	7	7	-
-	8	8	-

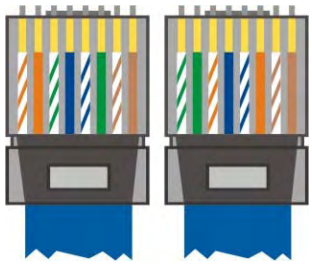
RJ-45 **Crossover** Cable Pin-outs			
Signal	Pin	Pin	Signal
Tx+	1	1	Rx+
Tx-	2	2	Tx+
Rx+	3	3	--
--	4	4	--
--	5	5	--
Rx-	6	6	Tx-
-	7	7	-
-	8	8	-

A.6 Standard 10/100/1000 Base-T Ethernet Interface Connector

RJ45 jets provide 8P8C 10/100/1000 Base-T Ethernet interfaces. The interface supports MDI/MDIX auto-detection of either straight or crossover RJ45 cables. These cables are used on GE interfaces for subtending connection on Master and UP1, UP2/MGN port on Slave.



RJ-45 **Straight-through** Cable Pin-outs (8P8C)			
Signal	Pin	Pin	Signal
TP0+	1	1	TP0+
TP0-	2	2	TP0-
TP1+	3	3	TP1+
TP1-	4	4	TP1-
TP2+	5	5	TP2+
TP2-	6	6	TP2-
TP3+	7	7	TP3+
TP3-	8	8	TP3-



RJ-45 **Crossover** Cable Pin-outs (8P8C)			
Signal	Pin	Pin	Signal
TP0+	1	1	TP1+
TP0-	2	2	TP1-
TP1+	3	3	TP0+
TP1-	4	4	TP0-
TP2+	5	5	TP3+
TP2-	6	6	TP3-
TP3+	7	7	TP2+
TP3-	8	8	TP2-

A.7 Contacting Your Dealer

If the device you have still cannot work correctly after trying many efforts, please contact your dealer for further help right away. For any questions, please feel free to send e-mail to support@draytek.com.