VDSL Solution

The VDSL Concentrator networking solution delivers cost-effective, high-performance broadband access to multiunit buildings (hotels, apartment, and multi-tenant unit office buildings) and enterprise campus environments such as manufacturing, educational campuses, and medical facilities. VDSL technology dramatically extends Ethernet over existing Category 1/2/3 wiring at speeds from 10 Mbps (full duplex) and distances up to 1200 meter. The VDSL technology delivers broadband service on the same lines as Plain Old Telephone Service (POTS), digital telephone, and ISDN system. In addition, VDSL supports modes compatible with symmetric digital subscriber line , allowing service providers to provision VDSL to buildings where broadband services already exist.

The VDSL solution includes VDSL Concentrator (VDSL switches), and VDSL Modem for Customer Premise Equipment (CPE) device.

The VDSL solution delivers everything needed to quickly deploy an Ethernet-based network with the performance required to deliver high-speed Internet access at much greater distances and drive services like IP telephony and audio/video streaming. With this technology, a broad range of customers can benefit from lower operating costs and rapid deployment. The VDSL solution provides multicast, Layer 2 quality of service (QOS), Link Aggregation (LACP) dynamic trunking group, security, GVRP, IGMP for VOD (Video on demand) and SNMP RMON management and Web-based Switch network management.

The VDSL Concentrator is a bridge between external Internet backbone through a router for IP sharing and the building 110D telephone rack or telephone box. It utilizes the available telephone wire to enable high-speed Internet access to building residents.

The Concentrator uses the phone line networking technology endorsed by the VDSL (Very High Data Rate DSL), and the Concentrator utilizes the already existing telephone wire to deliver 10 Mbps Internet access on each RJ-11 port.

This gives users a low-cost, end-to-end solution and eliminates the need to train installation teams on multiple systems.

VDSL SWITH

Figure 1:VDSL SWITH

The VDSL SWITH has 8x 10M VDSL ports and 2 x 10/100M Ethernet ports. The switches is one rack-unit (1RU) high, 10-inches deep. It is a standard Rack mounted size. VDSL SWITH switches deliver dedicated bandwidth per port at rates up to 10 Mbps. VDSL transmissions coexist with POTS and ISDN, and can be compatible with ADSL/HomePNA traffic in the same building. The switches can be configured on a per-switch basis to support the following modes:

- 10 Mbps symmetrical rate (up to 1200 meter)

The VDSL Concentrator and VDSL Modem provide fast and easy connectivity into building patch panels with RJ-11 connector. The 10/100 Ethernet ports can be used to connect servers, Ethernet switches. These connectivity options provide multiple price/performance options to meet building and budget requirements.

The VDSL switches provide the important features necessary for robust networks:

- Quality of Service: 802.1p QoS support. Provides high-and low-priority queuing on a per-port basis.
- **Supports: IGMP** Snooping by 1K IP multicast table for VOD (Video on demand)
- Scalability: Up to 10 Mbps symmetric performance over single-pair wiring. Fast Ether Channel port aggregation.
- Security: 802.1Q port-based and 802.1V protocol-based virtual local-area network (VLAN) support. Private VLAN access, assuring port security without requiring a VLAN per port, and also supports MAC filtering to Lock MAC address.
- Network Management: VDSL Switch technology support Telnet and Web-based Management easy-to-use configuration and ongoing monitoring. This software is embedded in the VDSL SWITH and delivers remote, intuitive management of VDSL switch and connected VDSL CPE devices through a single IP address.

  VDSL switches are easy-to-configure and deploy, and offer a compelling option in terms of cost, performance, scalability and services compared to traditional ATM-based xDSL solutions.

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1.Unpacking Information

Check List

Carefully unpack the package and check its contents against the checklist.

Package Contents

1. VDSL Concentrator
   2 x10/100 Base-T N-way Ethernet ports and 8 x 10Mbps VDSL ports
2. Users manual CD
3. AC Power Core
4. 2x Rack Mounting Brackets
5. 4x Screws
6. 4x Plastic feet

Please inform your dealer immediately for any missing, or damaged parts. If possible, retain the carton, including the original packing materials. Use them to repack the unit in case there is a need to return for repair.

Product Guide

Product Name：2ports 10/100 Mbps Fast Ethernet plus 8Ports 10Mbps VDSL With SNMP Management Concentrator

Feature

- Supports Bandwidth setup with 10 Mbps VDSL ports
- Build in POTS/ISDN filter
- High Bandwidth up to 10Mbps
- Long driver capable 10M：1.2Km
- Full Duplex capable
- Supports GVRP 802.1q VLAN
- Supports QOS 802.1p
- Supports IGMP snooping
- Supports Multicast IP
- Supports LACP 802.1ad Port Trunking
- Supports IEEE 802.1s Multi Spanning trees for MAC bridge with redundant link
- Supports IEEE 802.1w Rapid reconfiguration
- Supports port Monitor
- Supports maximum bridge transit delay bound
- Support Broadcast Storm filtering
- Ethernet transport with POTS / ISDN traffic over single copper wire pair
- Spectral compatibility with XDSL, ISDN (2B1Q/4B3T),HomePNA.
- Robust operation on severely distorted line
- Supports port security with MAC address filtering
- Supports Web Base and Telnet for remote control access
- Supports system ERR LED
- Supports SNMP v1 RFC-1493 Bridge MIBs
  RFC-1643 Ethernet MIB
  RFC-1213 MIB II
- Supports RMON groups 1(Statistics), 2(Alarm), 3(Event), 9(History)
- Cascading up to 8 Units along with NS-108S or other 8 +1G switch
- Supports TFTP for firmware upgrade
- Supports In-Band/Out-of-Band Management

◆ Supports Fan & Temperature Monitor & management

Product Specifications：

- Compliant with IEEE 802.3 & 802.3u Ethernet Standards
- Compliant with ETSI, ITU, ANSI standards
- 10/100Mbps Ethernet ports：2 x RJ-45
- MDI Ethernet port ： 1 x RJ-45
- 10 Mbps VDSL port ：8 x RJ-11
- POTS/ISDN Split port ： 8 x RJ-11
- MAC address table:：8K Entries
- Switching method ： Store-and-forward
- Flow control method by IEEE802.3x for Full Duplex & Back Pressure for Half Duplex
- Compliant with GVRP IEEE 802.1q port-base VLAN with 4094 VID
- Compliant with IEEE 802.1v protocol-base VLAN classification
- Compliant with IEEE 802.1d Spanning trees
- Compliant with IEEE 802.1w Rapid reconfiguration
- Multicast IP table ：1024
- Compliant with IEEE 802.1p QOS by class of service with 2-level priority queuing
- Compliant with LACP IEEE 802.3ad Trunking
- RS-232 console port :：DB-9Pin Female / 9600bps
- SNMP v1 RFC-1493 Bridge MIBs
  RFC-1643 Ethernet MIB
  RFC-1213 MIB II
  Enterprise MIBs
  RMON groups 1(Statistics), 2(Alarm), 3(Event), 9(History)
- Port security by MAC address filtering
- LED indication ：Power good and System ERR LED
  Link/Active/Speed/Full Duplex Status for Ethernet port.
  Link for VDSL port.
- Power consumption ：18.7 watt
- VDSL Frequency Spectrum：Transmitter ：4.5 ~ 7.9 MHz
  Receiver：0.9 ~ 3MHz
- POTS/ISDN pass filter Spectrum ：0 ~ 720 kHz
- Internal switching power adapter Input: AC 85-265 volts/50-60Hz/1A.
- Dimensions: 412 x 258.5 x 44 mm
- Weight ：3 Kg
- Operating Temperature : 5℃ ~ 50℃(41F ~ 122F)
- Storage Temperature : - 20℃ ~ 65℃(-4F ~ 149F)

- Humidity: 10%~90% non-condensing
- Safety ：FCC & CE Mark

2. General Description

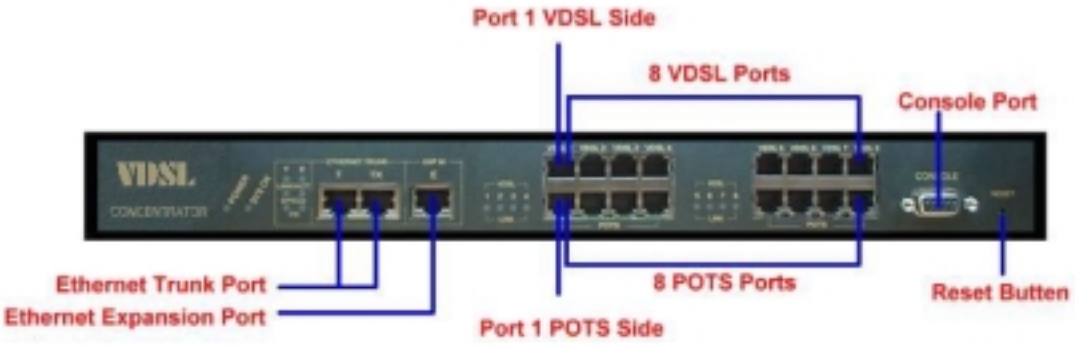
Hardware Description

This section describes the important parts of the concentrator. It features the front and rear panel drawings showing the LED, connectors, and switches.

Front Panel

The following figure shows the front panel.

Figure Chapter 2.1 Front Panel description



Front panel.

(1) “PWR.”: Power Led light

(2) “SYS ERR”: System ERR Led light

(3) 2X10/100 Mbps auto-sensing N-way Ethernet ports

(4) 8X10 Mbps VDSL Ports.

(5) 8XPOTS Ports.

(6) RS-232 Console Port

(7) Reset Button

VDSL SWITH has embedded Splitter between every VDSL side and POTS side. It permit you can delivers broadband service on the same lines as Plain Old Telephone Service (POTS), PBX, ISDN traffic and VDSL Signal.

Several LED indicators for monitoring the device itself, and the network status. At a quick glance of the front panel, the user would be able to tell if the product is receiving power; if it is monitoring another concentrator or concentrators; or if a problem exists on the network.

Each port is labeled with a port number.
MDI port labeled with “TX” is shared from port T.
Do not use the same section bearing the markings of T and TX port otherwise, failure will occur.

Figure Chapter 2.2

The "TX" port is used for connecting another hub through an ordinary straight-wired twisted-pair cable by running one end of straight cable to “TX” port and the other end to another Concentrator or hub’s station port.

LED Indications

The following describes the function of each LED indicator.

LEDs	Status	Descriptions
PWR. (Power LED)	Steady Green	This LED light is located at the left side on the front panel. It will light up (ON) to show that the product is receiving power. Conversely, no light (OFF) means the product is not receiving power.
SYS ERR	Steady	SYS ERR Led will light to show system is booting now. When system is ready the led will light off.
LINK/ACT (Link LEDs)	Steady Green Flashing	Each RJ45 station port on the Ethernet is assigned an LED light for monitoring port “Good Linkage”. Each LED is normally OFF after the power on operation, but will light up steadily to show good linkage. And Flashing to show data transmission.
Speed (Speed 100 LEDs)	Steady Yellow	Indicates that communications have been set 100 Mbps. Each port on the hub is assigned an LED light for 100 Base-TX connecting.
FD (Full-Duplex LEDs LEDs)	Steady Yellow	Indicates that communications have been set to full-duplex operation for the indicated port
	Steady Yellow	The indicator lights up working in Full Duplex And light down working in Half Duplex
LINK	Steady Green	RJ11 LED is lit up to show “Link”. The indicator both CO and CE side connecting OK, and light down which Meaning is no connecting.

Rear Panel

The following figure shows the rear panel

Figure Chapter 2.3 Rear Panel

AC Power Socket

The power cord should be plug into this socket. The AC Socket accepts AC power 100 to 240 voltage. 1A.

3.Installation

Hardware Installation

This chapter describes how to install the Concentrator. To established network connection. You may install the Concentrator on any level surface (table, shelf, 19 inch rack or wall mounting). However, please take note of the following minimum site requirements before you begin.

Pre-Installation Requirements

Before you start actual hardware installation, make sure you can provide the right operating environment, including power requirements, sufficient physical space, and proximity to other network devices that are to be connected. Verify the following installation requirement:

- Power requirements: AC 100V to 240 V at 50 to 60 Hz.
  The Switch power supply automatically adjusts to the input voltage level.
- The Concentrator should be located in a cool dry place, with at least 10cm/4in of space at the front and back for ventilation.
- Place the Concentrator out of direct sunlight, and away from heat sources or areas with a high amount of electromagnetic interference.
- Check if network cables and connectors needed for installation are available.

General Rules

Before making any connections to the Concentrator, note the following rules:

Ethernet Port (RJ-45)

All network connections to the concentrator Ethernet port must be made using Category 5 UTP for 100Mbps and Category 3,4 UTP for 10Mbps. No more than 100 meters (about 328 feet) of cabling may be use between Concentrators or with HUB or an end node.

- VDSL Port (RJ-11)
  All home network connections to the VDSL
  Port made using 24 ~ 26 Gauge phone wiring.
- We do not recommend using 28 Gauge or above phone line.

Connecting the Concentrator

The Concentrator has 2 10/100 Mbps N-way ports which support connection to 10Base-T Ethernet or 100Base-TX Fast Ethernet. Support full or half-duplex operation. The transmission mode is using auto-negotiation. Therefore, the devices attached to these ports must support auto-negotiation unless they will always operate at half duplex. If transmissions must run at full duplex, but the attached device does not support auto-negotiation, then you should upgrade this device to a newer version that supports auto-negotiation.

Use “T” port to connect to devices such as a cable modem, server, bridge or router. You can also cascade to another compatible MUX or hub by connecting the UP-Link port to an “MDI” port (e.g., port TX on this switch) on the other device.

Connecting “MDI-X” Station Port

1. You can connect the “T” port on the Concentrator to any device that uses a standard network interface such as a Cable modem, ADSL modem, Ethernet Switch, workstation or server, or also to a network interconnection device such as a bridge or router (depending on the port type implemented).
2. Prepare the network devices you wish to connect. Make sure you have installed suitable VDSL Modem before making a connection to any of the VDSL SWITH (1-8) station ports. You also need to prepare 18 ~ 26 gauge one twist pair phone Line wiring with RJ-11 plugs at both ends.
3. Connect one end of the cable to the RJ-11 port of the Home Access network adapter, and the other end to any available (1~8) station port on the VDSL. Every port supports 10 Mbps connections. When inserting an RJ-11 plug, be sure the tab on the plug clicks into position to ensure that it is properly seated.

- Do not plug a RJ-11 phone jack connector into the Ethernet port (RJ-45 port). This may damage the VDSL. Instead, use only twisted-pair cables with RJ-45 connectors that conform the FCC standards.

Notes:

1. Be sure each twisted-pair cable (RJ-45) is not over by 100 meters (328 feet).
2. RJ-11 port use 18 ~ 26 gauge phone wiring, 28 gauge or above is not recommended.
3. We advise using Category 5 cable for Cable Modem or router connections or to attach to any high bandwidth device to avoid any confusion or inconvenience.

Connecting "MDI" Port (TX)

Prepare straight through shielded or unshielded twisted-pair cables with RJ-45 plugs on both ends. Use 100Ω Category 5 cable for connections. Connect one end of the cable to "TX" port of the concentrator, and the other end to a standard RJ-45 station port on cable modem, ADSL router, wireless bridge, etc. When inserting an RJ-45 plug, be sure the tab on the plug clicks into position to ensure that it is properly seated.

Notes:

Make sure the length of twisted-pair cable is not over by 100 meters (328 feet)

Cascading Configuration

1. To connect to another Concentrator or hub, you may also run straight-through twisted-pair cabling from the “EXP IN” station port on the concentrator to a crossover port on another device. However, if you must connect to another device via station ports on both ends of the cable, use crossover cabling.
2. When cascading two concentrators, the default setting are full duplex and 100Mbps for daisy-chain port.
3. VDSL SWITH can cascade up to 8 Units. But we don’t suggest you cascading more than 3 Units. When you cascade mort than 3 units the network performance will be badly, because the Store-and-forward Switching method.
   IF you want cascade more than 3 units please use Vlan Hub to connect every VDSL concentrator. Follow the figure 3.2

Figure Chapter 3.1 UP-Link Configuration

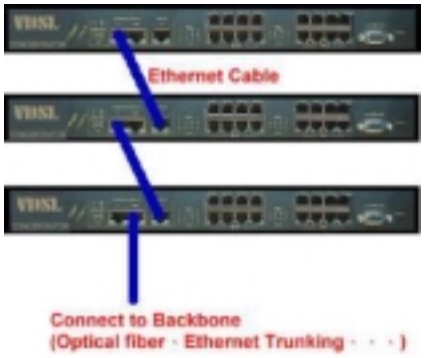
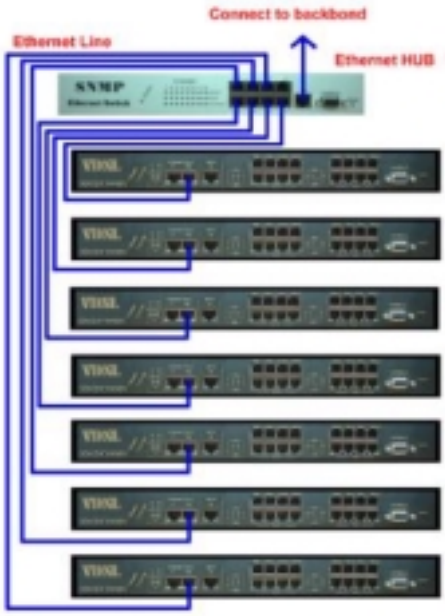


Figure Chapter 3.2 VLAN Hub UP-Link Configuration



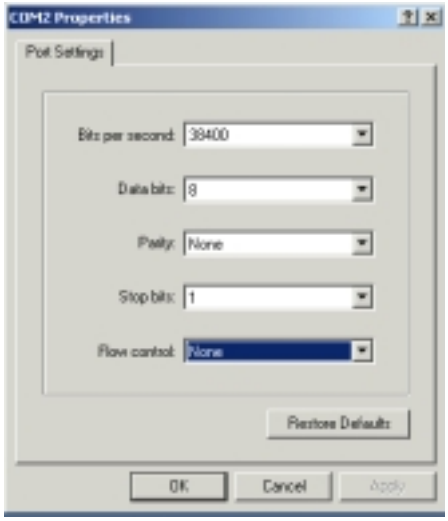
4. Management Configuration

4.1 In-Band Management

Console port (RS-232) Configuration

(Change IP Address By Terminal)

You can configure the product with the local serial console port, If one of the RJ11 port is not in use, you can disable it, that procedure is to connect a notebook computer to the RS-232 port, then boot windows @95/98/ME/2000 system, and run “Hyper-terminal” program into terminal window, and setup step are as follow.



1. Set “Bits per second” at 9600 to the content window.
2. Set “Flow control” at None
3. Connects PC with the concentrator, you will find login manual window on the screen then enter
   Login name ：”**admin**” ; password：”**123**”
   you will find user manual window on the screen of the following ：

4. Operation Button:
   Tab=Next Item ;
   BackSpace=Previous Item
   Enter=Select ItemSelect
5. Set IP Address: Please follow the following steps
   (1) Choose **VDSL SWITH Static Configuration** you can enter next page

   (2) Choose **Administration Configuration** you can enter next page

(3) Choose **IP Configuration** you can enter IP configuration page

(4) a. Choose **Edit** item to Change IP address, Subnet Mask and Getway
b. Use **CTRL+A** button to back actions choice
c. Choose **Save** item to save change and back to System Configuration page
d. Choose **Previous Menu** item to quit System Configuration page
e. Choose **Main Menu** item to quit VDSL SWITH Configuration page and back to Main Manual
f. Choose **Reboot Concentrator** item
g. Choose **Restart** item to reboot your VDSL SWITH.

4.2 Remote Network Management

4.2.1 IP Setting

You must setup the “IP Address” with the local serial console port (RS-232 Port), and then you can use this IP address to control this VDSL Concentrator by **Telnet** and **WEB**. Or you can change your computer’s IP domain same with VDSL SWITH. Then use the default IP address to control this VDSL concentrator.

一、Remote control by “Telnet”

To enter Telnet, type the IP address of the VDSL switch to connect management system. And type User name and password.

Default User Name: admin

Default Password: 123

Note:

1. For secretary we limit the user login number on Telnet and Console port. So you can’t login Telnet and Console port in the same time. But you can login Telnet and Console port in the different time.
2. WEB Login don’t have user login limit.
   When you want to end console port control you must logout to leave. Otherwise you can’t login by Telnet.

二、Network control by “WEB”

4.2.2 Web Management Function

1. Provide a Web browser to manage and monitor the switch, the default values as follows:

If you need change IP address in first time, you can use console mode to modify it.

IP Address: 192.168.16.250

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.16.1

User Name: admin

Password: 123

2. You can browse http:// 192.168.16.250, type user name and password as above.

4.2.2-1. Web Management Home Overview

This is VDSL Home Page.

4.2.2-2. Port status

1. This page can see every port status

State: Display port status disable or enable, disable is unlink port, enable is link port.

Link Status: Down is “No Link”, UP is “Link”

Auto Negotiation: Switch auto negotiation mode

Speed status: Port T、E are 10/100Mbps or and Port 1- 8 are 10MBbps,

Configure: Display the state of user setup,

Actual: Display the negotiation result.

Duplex status: Display full-duplex or half-duplex mode.

Configure: Display the user setup,

Actual: Display the negotiation result.

Flow control: Display flow control status enable or disable mode

The following information provides a view of the current status of the unit.

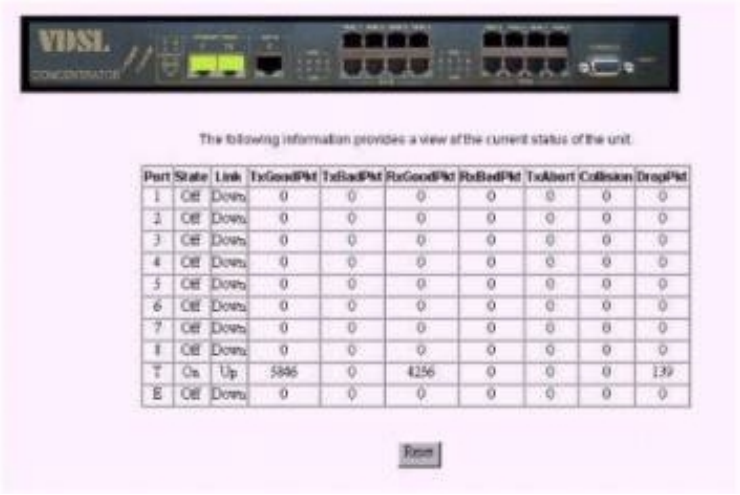
Port Num	State		Link Status	Auto Negotiation		Speed Status		Duplex Status		Flow Control	
	Config	Atual		Config	Atual	Config	Atual	Config	Atual	Config	Atual
1	On	Off	Down	Auto	Auto	10	10	Full	Full	On	On
2	On	Off	Down	Auto	Auto	10	10	Full	Full	On	On
3	On	Off	Down	Auto	Auto	10	10	Full	Full	On	On
4	On	Off	Down	Auto	Auto	10	10	Full	Full	On	On
5	On	Off	Down	Auto	Auto	10	10	Full	Full	On	On
6	On	Off	Down	Auto	Auto	10	10	Full	Full	On	On
7	On	Off	Down	Auto	Auto	10	10	Full	Full	On	On
8	On	Off	Down	Auto	Auto	10	10	Full	Full	On	On
T	On	On	Up	Auto	Auto	100	100	Full	Full	On	On
E	On	Off	Down	Auto	Auto	100	100	Full	Full	On	On

User can see single port counter as follows

Port	9
State	On
Link	Up
TxGoodPkt	3537
TxBadPkt	0
RxGoodPkt	2603
RxBadPkt	0
TxAbort	0
Collision	0
DropPkt	85

4.2.2-3. Port Statistics

1. The following information provides a view of the current status of the unit.



The following information provides a view of the current status of the unit.

Port	State	Link	TxGoodPkt	TxBadPkt	RxGoodPkt	RxBadPkt	TxAbort	Collision	DropPkt
1	Off	Down	0	0	0	0	0	0	0
2	Off	Down	0	0	0	0	0	0	0
3	Off	Down	0	0	0	0	0	0	0
4	Off	Down	0	0	0	0	0	0	0
5	Off	Down	0	0	0	0	0	0	0
6	Off	Down	0	0	0	0	0	0	0
7	Off	Down	0	0	0	0	0	0	0
8	Off	Down	0	0	0	0	0	0	0
T	On	Up	5846	0	4256	0	0	0	139
E	Off	Down	0	0	0	0	0	0	0

Reset

4.2.2-4. Administrator

There are many management function, include:

IP address

Switch setting

Console port information

Port controls

Link aggregation

Filter database

VLAN configuration

Spanning tree

SNMP

Security Manager

System Manager

Configuration backup

Reset system and reboot

4.2.2-4-1. IP Address

1. User can configure the IP Settings and fill in the new value, than clicks apply button.

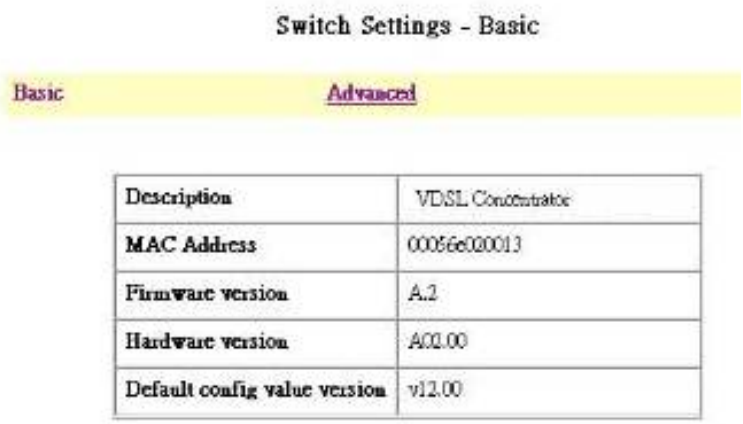
2. User must be reset switch and use new IP address to browser this web management.

Default IP is 192.168.16.250

4.2.2-4-2. Switch Setting

2-4-2-1.Basic

1. **Description:** Display the device type of name.
2. **MAC Address:** The unique hardware address assigned by manufacturer
3. **Firmware Version:** Display the switch's firmware version.
4. **Hardware Version:** Display the switch's Hardware version.
5. **Default config value version:** Display write to default eeprom value tale version.



2-4-2-2.Advanceed

Miscellaneous Setting :

MAC Address Age-out Time: Type the number of seconds that an inactive MAC address remains in the switch's address table. The valid range is 300~765 seconds. Default is 300 seconds.

Max bridge transit delay bound control : Limit the packets queuing time in switch. If enable, the packets queued exceed will be drop. This valid value are 1sec, 2 sec, 4 sec and off. Default is 2 seconds.

Broadcast Storm Filter: To configure broadcast storm control, enable it and set the upper threshold for individual ports. The threshold is the percentage of the port's total bandwidth used by broadcast traffic. When broadcast traffic for a port rises above the threshold you set, broadcast storm control becomes active. The valid threshold value are 5%, 10%, 15%, 20%, 25% and off.

Priority Queue Service settings:

First Come First Service: The sequence of packets sent is depend on arrive order.

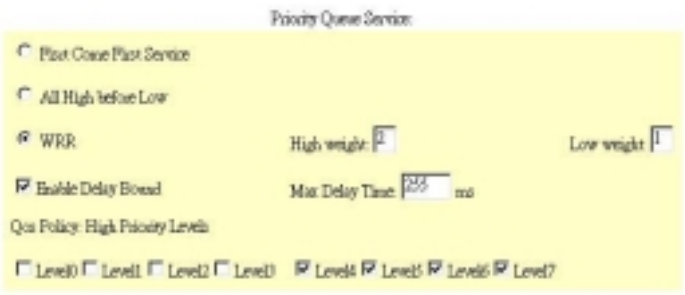
All High before Low: The high priority packets sent before low priority packets.

Weighted Round Robin: Select the preference given to packets in the switch's high-priority queue. These options represent the number of high priority packets sent before one low priority packet is sent. For example,5 High : 2 Low means that the switch sends 5 high priority packets before sending 2 low priority packet.

Enable Delay Bound: Limit the low priority packets queuing time in switch. Default Max Delay Time is 255ms. If the low priority packet stays in switch exceed Max Delay Time, it will be sent. The valid range is 1~255 ms.

NOTE: Make sure of "Max bridge transit delay bound control" is enabled before enable Delay Bound, because Enable Delay Bound must be work under "Max bridge transit delay bound control is enabled" situation.

Qos Policy: High Priority Levels: 0~7 priority level can map to high or low queue.



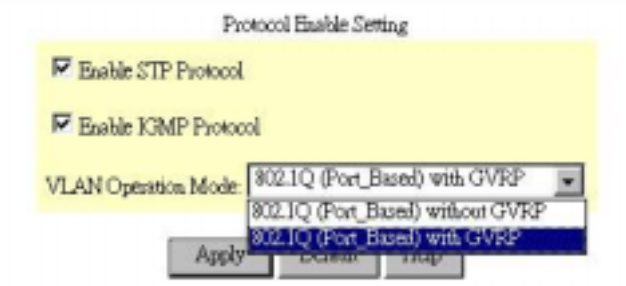
Protocol Enable Setting :

Enable Spanning Tree Protocol : Default recommend to enable STP

Enable Internet Group Multicast Protocol: enable IGMP protocol

VLAN Protocol: 802.1Q(Port_Based) without GVRP VLAN mode

802.1Q(Port_Based) with GVRP VLAN mode



GVRP (GARP [Generic Attribute Registration Protocol] VLAN Registration Protocol)

GVRP allows automatic VLAN configuration between the switch and nodes. If the switch is connected to a device with GVRP enabled, you can send a GVRP request using the VID of a VLAN defined on the switch, the switch will automatically add that device to the existing VLAN.

4.2.2-4-3. Console Port Information

1. Console is a standard UART interface to communicate with Serial Port.

User can use windows HyperTerminal program to link the switch. Connect To->Configure

Bits per seconds: 9600

Data bits: 8

Parity: none

STOP BITS: 1

Flow control: none

4.2.2-4-4. VDSL port Enable/Disable

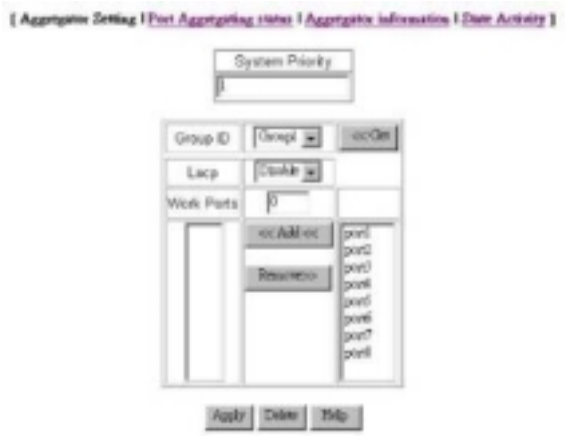
1. This page can Change every port status and speed mode

State: You can disable or enable VDSL port control

4.2.2-4-5. Link Aggregation

The Link Aggregation Control Protocol (LACP) provides a standardized means for exchanging information between Partner Systems on a link to allow their Link Aggregation Control instances to reach agreement on the identity of the Link Aggregation Group to which the link belongs, move the link to that Link Aggregation Group, and enable its transmission and reception functions in an orderly manner. In conclusion, Link aggregation lets you group up to eight consecutive ports into a single dedicated connection. This feature can expand bandwidth to a device on the network. **LACP operation requires full-duplex mode,** more detail information refer to IEEE 802.3ad.

2-4-5-1. Aggregator setting



System Priority: A value used to identify the active LACP. The switch with the lowest value has the highest priority and is selected as the active LACP.

1.Group ID: you can create a link aggregation across two or more ports, choose the "group id" and click "Get".

2.LACP: If enable, the group is LACP static trunking group. If disable, the group is local static trunking group. All ports support LACP dynamic trunking group. If connecting to the device that also supports LACP, the LACP dynamic trunking group will be created automatically.

3. Work ports: The max number of ports can be aggregated at the same time. If LACP static trunking

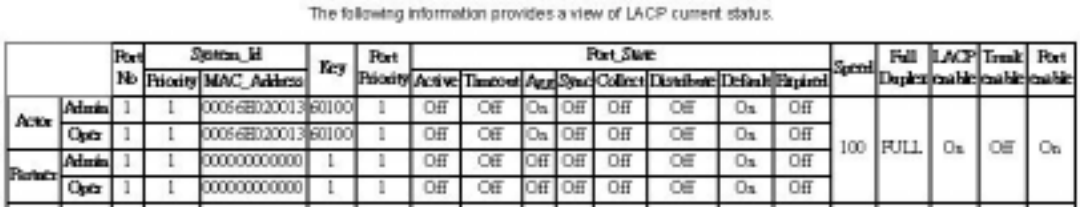
group, the exceed ports is standby and able to aggregate if work ports fail. If local static trunking group, the number must be the same as group ports.

4. Select the ports to join the trunking group

5. If LACP enable, you can configure LACP Active/Passive status in each ports

6. Click Apply.

2-4-5-2. Port aggregating status


The following information provides a view of LACP current status.

		Port No	System_Id		Key	Port Priority	Port_State								Speed	Full Duplex	LACP enable	Trunk enable	Port enable
			Priority	MAC_Address			Active	Timeout	Agg	Sync	Collect	Distribute	Default	Expired					
Actor	Admin	1	1	00068B020013	60100	1	Off	Off	On	Off	Off	Off	On	Off	100	FULL	On	Off	On
	Oper	1	1	00068B020013	60100	1	Off	Off	On	Off	Off	Off	On	Off					
Partner	Admin	1	1	00000000000	1	1	Off	Off	Off	Off	Off	Off	On	Off					
	Oper	1	1	00000000000	1	1	Off	Off	Off	Off	Off	Off	On	Off					

You can see the LACP state in this page, the detail description as follows:

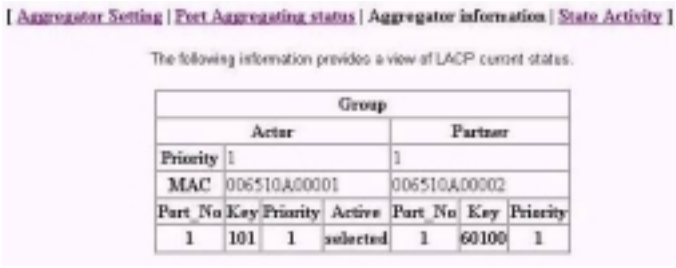
Actor	Oneself device
Partner	Link partner device
Admin	Switch default value
Oper	User setting and aggregating result
Priority	System priority value
Mac address	Switch ‘s MAC address
Key	Aggregating key, 100 serial is LACP static trunking, 60000 serial is LACP dynamic trunking, i.e:101: 100MB Group 1’s LACP static trunking, 102: 100MB Group 2’s LACP static trunking.60100: 100MB.LACP dynamic trunking, 60010: 10 MB. LACP dynamic trunking.
Port Priority	Always is 1
Active	ON: Active status , OFF: Passive status
Timeout	ON: Short timeout(30sec), OFF : Long timeout(90sec)
Aggregation	ON: This link to be aggregatable, OFF: This link to be individual.
SYNC	ON: Synchronization status, it has been allocated to the Link Aggregation information. OFF: Asynchronization status, it is not in the right Aggregation.
Collect	ON: Enable collection of incoming frames OFF: Disable collection of incoming frames
Distribute	ON: Enable distribution of outgoing frames OFF: Disable distribution of outgoing frames
Default	ON: In default setting value, using admin configured for the partner. OFF: The operational partner information in use has been received in a LACPDU
Expired	ON: The receive machine is in the expired state OFF: The receive machine is not in the expired status

Speed	Show link speed status
Full duplex	Show link duplex status, LACP operation requires full-duplex link
LACP enable	Show LACP status
Trunk enable	Show Local trunk status
Port enable	Show Port status

2-4-5-3. Aggregator Information

When you are setting LACP aggregator, you can see relation information in here.

This page is Actor and Partner trunking one group with port 1 to port 1.

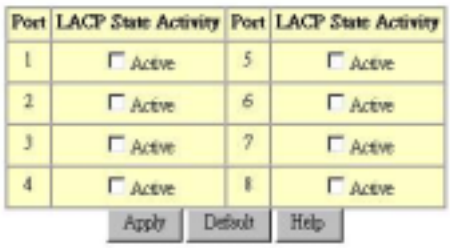


2-4-5-4. State Activity

Active (select)**:** The port automatically sends LACP protocol packets.

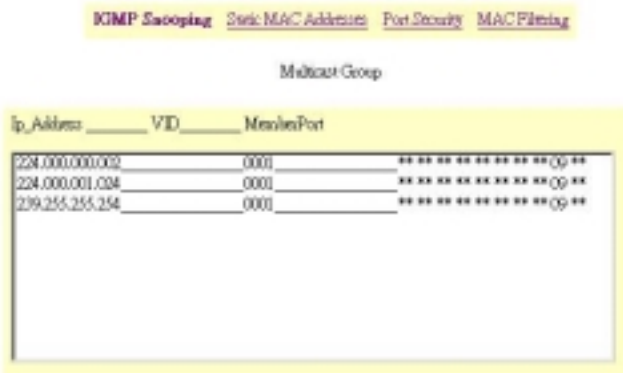
Passive (no select)**:** The port does not automatically sends LACP protocol packets, and responds only if it receives LACP protocol packets from the opposite device.

1. A link having either two active LACP ports or one active port can perform dynamic LACP trunking. A link has two passive LACP ports will not perform dynamic LACP trunking because both ports are waiting for and LACP protocol packet from the opposite device.
2. If you are active LACP's actor, when you are select trunking port, the active status will be created automatically.



4.2.2-4-6. Filter Database

2-4-6-1. IGMP Snooping



The VDSL SWITH support IP multicast , you can enable IGMP protocol on web management's switch setting advanced page, then display the IGMP snooping information in this page, you can view difference multicast group ,VID and member port in here, IP multicast addresses range from 224.0.0.0 through 239.255.255.255.

The Internet Group Management Protocol (IGMP) is an internal protocol of the Internet Protocol (IP) suite.

IP manages multicast traffic by using switches, routers, and hosts that support IGMP. Enabling IGMP allows the ports to detect IGMP queries and report packets and manage IP multicast traffic through the switch. IGMP have three fundamental types of message as follows:

Message	Description
Query	A message sent from the queries (IGMP router or switch) asking for a response from each host belonging to the multicast group.
Report	A message sent by a host to the queries to indicate that the host wants to be or is a member of a given group indicated in the report message.
Leave Group	A message sent by a host to the queries to indicate that the host has quit to be a member of a specific multicast group.

2-4-6-2. Static MAC Address

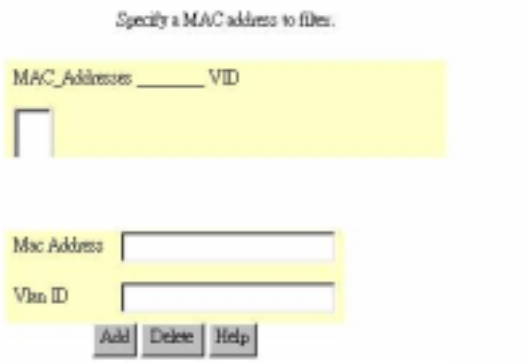
When you add a static MAC address, it remains in the switch's address table, regardless of whether the device is physically connected to the switch. This saves the switch from having to re-learn a device's MAC address when the disconnected or powered-off device is active on the network again.

1. To add a static MAC address
2. From the main menu, click administrator, then click Filter Database.
3. Click Static MAC Addresses. In the MAC address box, enter the MAC address to and from which the port should permanently forward traffic, regardless of the device's network activity.
4. In the Port Number box, select a port number.
5. If tag-based (IEEE 802.1Q) VLANs are set up on the switch, static addresses are associated with individual VLANs. Type the VID (tag-based VLANs) to associate with the MAC address.
6. Click add

2-4-6-3. Port Security

A port in security mode will be “locked” without permission of address learning. Only the incoming packets with SMAC already existing in the address table can be forwarded normally. User can disable the port from learning any new MAC addresses, then use the static MAC addresses screen to define a list of MAC addresses that can use the secure port.Enter the settings, then click Submit to apply the changes on this page.

2-4-6-4. MAC filtering



MAC address filtering allows the switch to drop unwanted traffic. Traffic is filtered based on the destination addresses. For example, if your network is congested because of high utilization from one MAC address, you can filter all traffic transmitted from that MAC address, restoring network flow while you troubleshoot the problem.

4.2.2-4-7. VLAN configuration

A Virtual LAN (VLAN) is a logical network grouping that limits the broadcast domain. It allows you to isolate network traffic so only members of the VLAN receive traffic from the same VLAN members. Basically, creating a VLAN from a switch is logically equivalent of reconnecting a group of network devices to another Layer 2 switch. However, all the network devices are still plug into the same switch physically.

The VDSL SWITH support port-based and protocol-base VLAN in web management page, In the default configuration, VLAN support is enable and all ports on the switch belong to default VLAN, VID is 1.

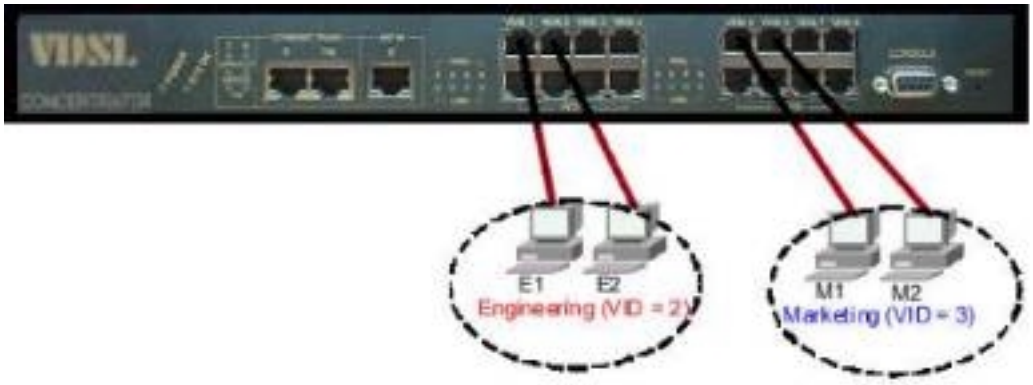
Support Port-based VLANs (IEEE 802.1Q VLAN)

Port-based Tagging rule VLAN is an IEEE 802.1Q specification standard. Therefore, it is possible to create a VLAN across devices from different switch venders. IEEE 802.1Q VLAN uses a technique to insert a “tag” into the Ethernet frames. Tag contains a VLAN Identifier (VID) that indicates the VLAN numbers.

Support Protocol-based VLAN

In order for an end station to send packets to different VLANs, it itself has to be either capable of tagging packets it sends with VLAN tags or attached to a VLA N-aware bridge that is capable of classifying and tagging the packet with different VLAN ID based on not only default PVID but also other information about the packet, such as the protocol.

VDSL SWITH will support protocol-based VLAN classification by means of both built-in knowledge of layer 2 packet formats used by selected popular protocols, such as Novell IPX and AppleTalk’s EtherTalk, and some degree of programmable protocol matching capability.

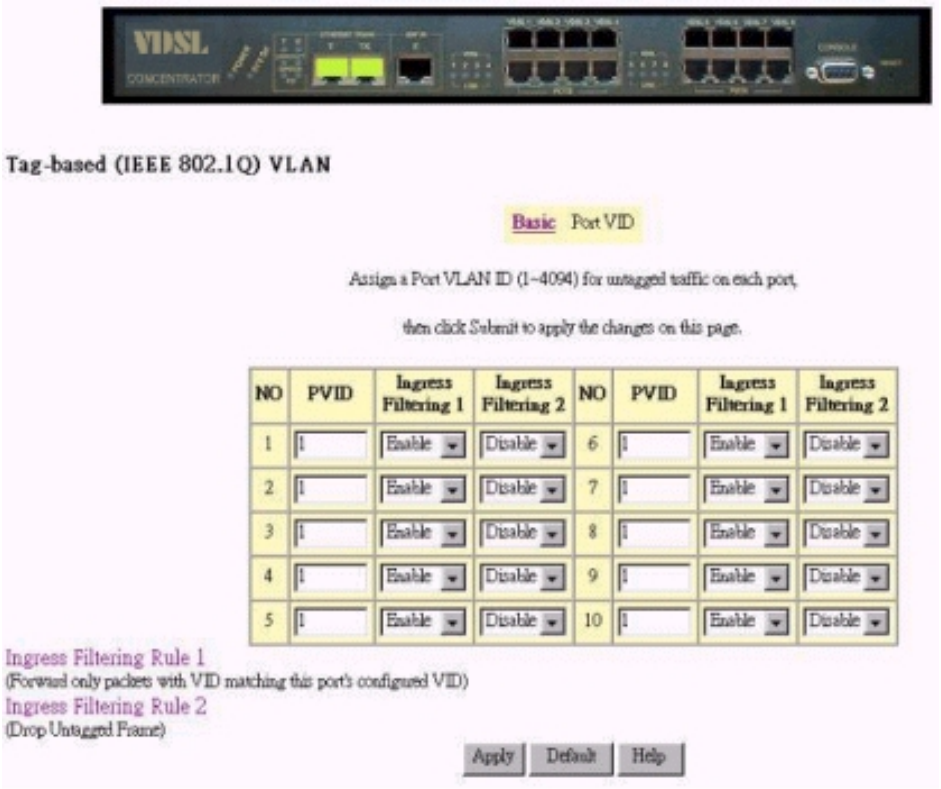


2-4-7-1. Basic

Create a VLAN and add tagged member ports to it.

1. From the main menu, click administrator -- VLAN configuration.
2. Click Add
3. Type a name for the new VLAN.
4. Type a VID (between 2-4094). The default is 1.
5. From the Available ports box, select ports to add to the switch and click Add.
6. Click Apply

2-4-7-2. Port VID



Configure port VID settings

From the main Tag-based (IEEE 802.1Q) VLAN page, click Port VID Settings.

Port VID (PVID)

Sets the Port VLAN ID that will be assigned to untagged traffic on a given port. For example, if port 10's Default PVID is 100, all untagged packets on port 10 will belong to VLAN 100. The default setting for all ports is VID 1.

This feature is useful for accommodating devices that you want to participate in the VLAN but that don't support tagging. Only one untagged VLAN is allowed per port.

Ingress Filtering

Ingress filtering lets frames belonging to a specific VLAN to be forwarded if the port belongs to that VLAN.

VDSL SWITH have two ingress filtering rule as follows :

Ingress Filtering Rule 1 :Forward only packets with VID matching this port's configured VID

Ingress Filtering Rule 2 :Drop Untagged Frame

4.2.2-4-8. Spanning Tree

The Spanning-Tree Protocol (STP) is a standardized method (IEEE 802.1D) for avoiding loops in switched networks. When STP enabled, to ensure that only one path at a time is active between any two nodes on the network.

You can enable Spanning-Tree Protocol on web management's switch setting advanced item, select enable Spanning-Tree protocol. We are recommended that you enable STP on all switches ensures a single active path on the network.

1. You can view spanning tree information about the Root bridge. such as follow screen.

Set Spanning Tree

Root Bridge Information

Priority	32768
Mac Address	00056e010009
Root_Path_Cost	128
Root Port	9
Max Age	8
Hello Time	3
Forward Delay	5

2. You can view spanning tree status about the switch . such as follow screen.

STP Port Status

PortNum	PathCost	Priority	PortState
1	128	128	FORWARDING
2	128	128	FORWARDING
3	128	128	FORWARDING
4	128	128	FORWARDING
5	128	128	FORWARDING
6	128	128	FORWARDING
7	128	128	FORWARDING
8	128	128	FORWARDING

3. You can setting new value for STP parameter , then click set Applybutton to modify .

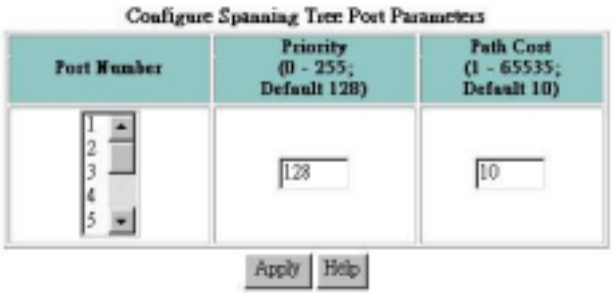
Configure Spanning Tree Parameters

Priority (1-65535)	32768
Max Age (6-40)	15
Hello Time (1-10)	3
Forward_Delay_Time (4-30)	5

Apply

Parameter	Description
Priority	You can change priority value, A value used to identify the root bridge. The bridge with the lowest value has the highest priority and is selected as the root. Enter a number 1 through 65535.
Max Age	You can change Max Age value, The number of seconds a bridge waits without receiving . Spanning-Tree Protocol configuration messages before attempting a reconfiguration. Enter a number 6 through 40.
Hello Time	You can change Hello time value, the number of seconds between the transmission of Spanning-Tree Protocol configuration messages. Enter a number 1 through 10.
Forward Delay time	You can change forward delay time, The number of seconds a port waits before changing from its Spanning-Tree Protocol learning and listening states to the forwarding state. Enter a number 4 through 30.

4.The following parameter can be configured on each port , click set Apply button to modify .



Parameter	Description
Port Priority	You can make it more or less likely to become the root port, the rage is 0-255,default setting is 128 the lowest number has the highest priority. If you change the value, you must reboot the switch.
Path Cost	Specifies the path cost of the port that switch uses to determine which port are the forwarding ports the lowest number is forwarding ports, the rage is 1-65535 and default value base on IEEE802.1D 10Mb/s = 50-600 100Mb/s = 10-60 1000Mb/s = 3-10 If you change the value, you must reboot the switch.

4.2.2-4-9. Port Sniffer

The Port Sniffer is a method for monitor traffic in switched networks. Traffic through ports can be monitored by one specific port. That is, traffic goes in or out monitored ports will be duplicated into sniffer port.

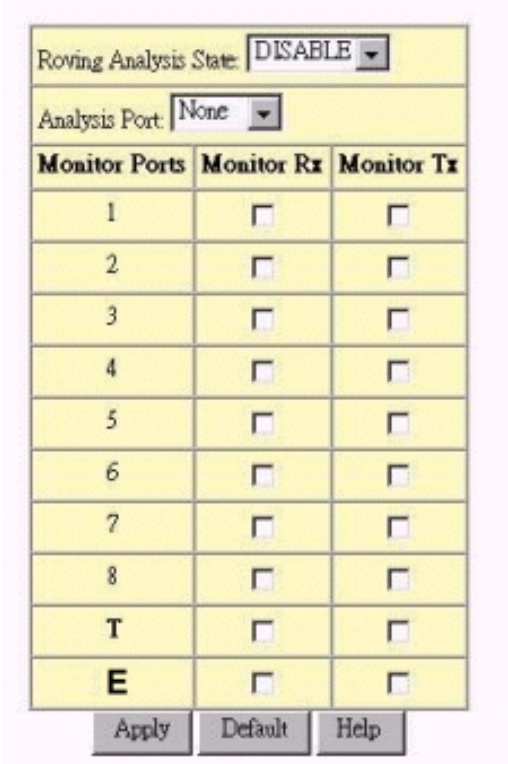
Roving Analysis State: Enable or disable the port sniffer function.

Analysis Port: Analysis port can be used to see all monitor port traffic. You can connect sniffer port to Lan Analysis, Session Wall or Netxray.

Monitor Ports: The ports you want to monitor. All monitor port traffic will be copied to sniffer port. You can select max 9 monitor ports in the switch. If you want to disable the function, you must select monitor port to none.

Monitor Rx: Monitored receive frames from the port.

Monitor Tx: Monitored send frames from the port.



4.2.2-4-10. SNMP

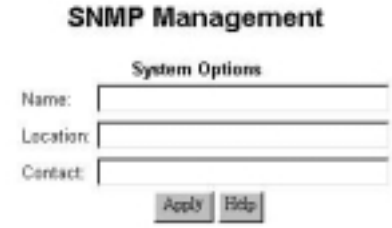
Any Network Management running the simple Network Management Protocol (SNMP) can management the switch, Provided the Management Information Base (MIB) is installed correctly on the management station. The SNMP is a Protocol that governs the transfer of information between management and agent. The VDSL SWITH support SNMP V1.

1. Use this page to define management stations as trap managers and to enter SNMP community strings. User can also define a name, location, and contact person for the switch. Fill in the system options data, and then click Apply to update the changes on this page

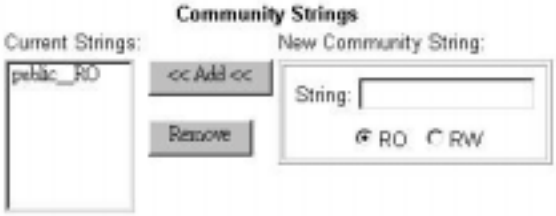
Name: Enter a name to be used for the switch.

Location: Enter the location of the switch.

Contact: Enter the name of a person or organization.



2. Community strings serve as passwords and can be entered as one of the following:



Read only: Enables requests accompanied by this string to display MIB-object information.

Read write: Enables requests accompanied by this string to display MIB-object information and to set MIB objects.

3. Trap Manager

A trap manager is a management station that receives traps, the system alerts generated by the switch. If no trap manager is defined, no traps are issued. Create a trap manager by entering the IP address of the station and a community string.

4.2.2-4-11.Security Manager

1. Use this page; user can change web management user name and password.

User name: Admin

Password: 123

4.2.2-4-12. TFTP Update Firmware

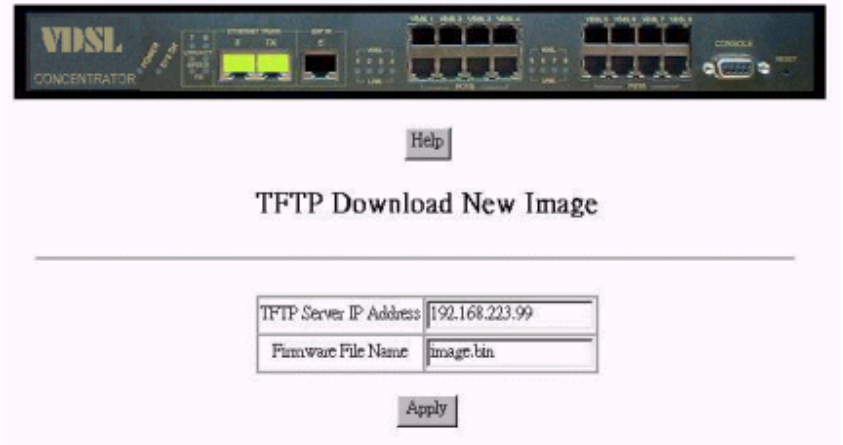
1. The following menu options provide some system control functions to allow a user to update firmware and remote boot switch system:

* Install TFTP Turbo98 and execution.

* Copy firmware update version image.bin to TFTP Turbo98 directory.

* In web management select administrator—TFTP update firmware.

* Download new image.bin file then in web management press <update firmware>.



4.2.2-4-13. Configuration Backup

2-4-13-1. TFTP Restore Configuration

Use this page to set tftp server address. You can restore EEPROM value from here, but you must put back image in tftp server, switch will download back flash image.

2-4-13-2. TFTP Backup Configuration

Use this page to set tftp server ip address. You can save current EEPROM value from here, then go to the TFTP restore configuration page to restore the eeprom value.

4.2.2-4-14. Reset System

Reboot the switch in software reset

5. Applications

The VDSL provides home network architecture. Transforming an apartment into a Multiple-Family Home network area, sharing a single internet account for multiple users via Router & Cable Modem, it can provide unlimited access time in the internet at a reasonable low price.

Bridging Functions – The concentrator provides full transparent bridging function. It automatically connects node addresses, that are later used to filter and forward all traffic based on the destination address. When traffic passes between devices attached to the shared collision domain, those packets are filtered from the Concentrator. But when traffic must be passed between unique segments (i.e., different ports of the concentrator), a temporary link is set up between the concentrator's port in order to pass this traffic, via the high-speed VDSL fabric.

Transceiver function

The Concentrator support Ethernet to VDSL convert, It can be transmit or receive packet from Ethernet port to the RJ11 port. Or VDSL port to Ethernet port.

Flexible Configuration–The Concentrator is not only Designed to segment your network, but also to provide a wide range of options in the configuration of Home network connections. It can be used as a simple stand-alone concentrator; or can be connected with another Concentrator, Cable modem, Router, XDSL, ISDN, gateway or other network interconnection devices in various configurations. Some of the common applications of the Concentrator are described in this chapter.

Used as apartment for Internet access

The Concentrator provides a high speed, 10Mbps transmission over existing home telephone wiring over a single Internet account to provide simultaneous independent Internet access to multiple users.
No mater ISDN Telephone system or POTS Telephone system you are. VDSL Technology let you can use telephone system and VDSL network system in the same time.

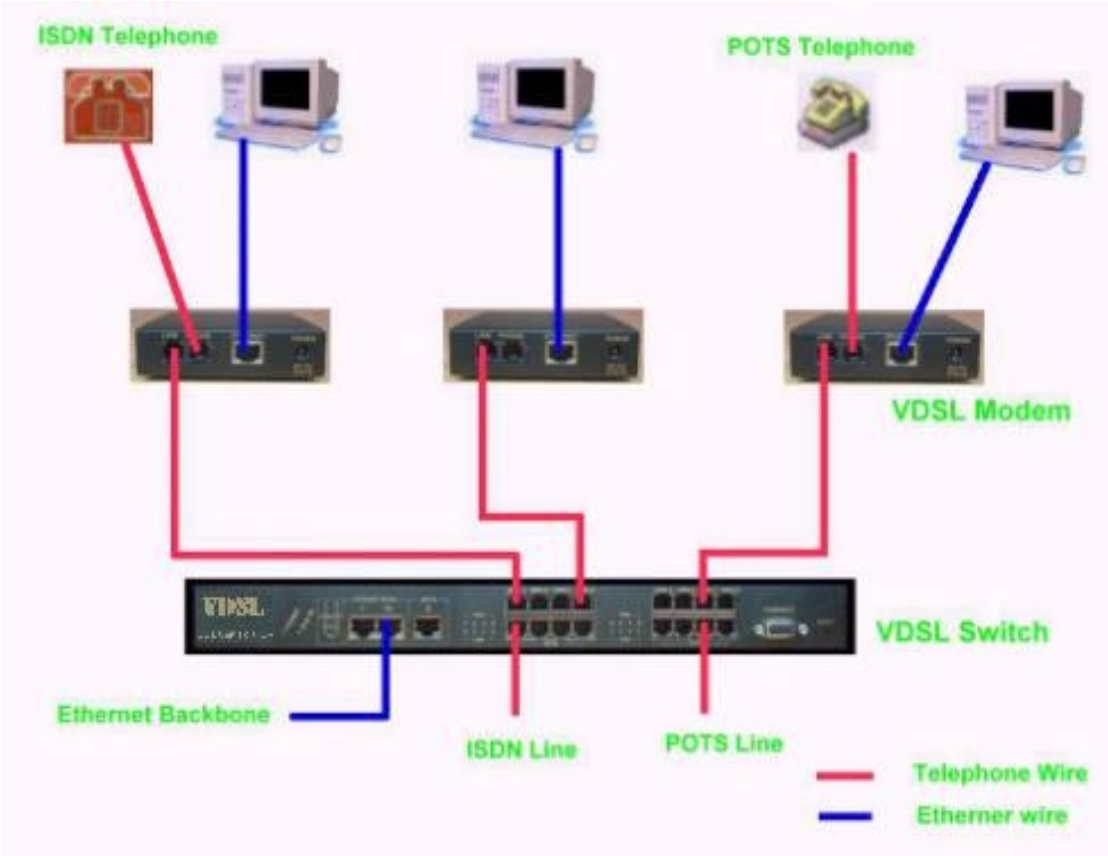


Figure Chapter 4.1

Application for Sharing a single internet account

If multiple users would like to share a single internet account using the concentrator, which is to be connected to a IP sharing device, then to a xDSL or Cable Modem.

Note:

For network applications that actually require
Router (e.g., Interconnecting dissimilar network types), attaching the concentrator directly to a router can significantly improve overall home networking performance.

High bandwidth backbone ready

The concentrator provides 10/100Mbps auto sensing for external trunk device (Fiber optics, Wireless Bridge, xDSL & other WAN services)

Appendix A: Troubleshooting

Diagnosing VDSL Indicators

The VDSL can be easily monitored through its comprehensive panel indicators. These indicators assist the network manager in identifying problems the concentrator may encounter. This section describes common problems you may encounter and possible solutions

1. Symptom: POWER indicator does not light up (green) after power on.
   Cause: Defective power outlet, power cord, internal power supply
   Solution: Cheek the power outlet by trying another outlet that is functioning properly. Check the power cord with another device. If these measures fail to resolve the problem, have the unit power supply replaced by a qualified distributor.
2. Symptom: Link indicator does not light up (green) after making a connection.
   Cause: Network interface (e.q., a network adapter card on the attached device), network cable, or switch port is defective.
   Solution: 2.1 Verifies the switch and attached device are powered on.
   2.2 Be sure the cable is plug into both the switch and corresponding device.
   2.3 Verify that the proper cable type is used and its length does not exceed specified limits.
   2.4 Check the adapter on the attached device and cable connections for possible defects.
   2.5 Replace the defective adapter or cable if necessary.
3. Symptom: I had a VDSL link. But, after disconnecting the line for several minute, there is no link any more.
   Solution: This is normal behavior for the modem. A link watchdog is activated in the VDSL modem, when ever is no link after a specified time.
   Users just re-plug the power of VDSL modem, and then they can link again and solve this problem.

System Diagnostics

Power and Cooling Problems

If the POWER indicator does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord, or internal power supply as explained in the previous section. However, if the unit should turn itself off after running for a while, check for loose power connections, power losses or surges at the power outlet, and verify that the fan on back of the unit is unobstructed and running prior to shutdown. If you still cannot isolate the problem, then the internal power supply may be defective. In this case, contact your supplier for assistance.

Installation

Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (e.g., the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

Transmission Mode

The selections of the transmission mode for the RJ-45 ports are auto-negotiation using the default method. Therefore, if the Link signal is disrupted (e.g., by unplugging the network cable and plugging it back in again, or by resetting the power), the port will try to reestablish communications with the attached device via auto-negotiation. If auto-negotiation fails, then communications are set to half duplex by default. Based on this type of industry-standard connection policy, if you are using a full-duplex device that does not support auto-negotiation, communications can be easily lost (i.e., reset to the wrong mode) whenever the attached device is reset or experiences a power fluctuation. The best way to resolve this problem is to upgrade these devices to version that will support auto-negotiation.

Cabling

1. Verify that the cable type is correct. Be sure RJ-45 cable connectors are securely seated in the required ports. Use 100Ω straight-through cables for all standard connections. Use Category 5 cable for

100Mbps Fast Ethernet connections, or Category 3, 4 or 5 cables for standard 10Mbps Ethernet connections. Be sure RJ-11 phone wiring, use 18~26 gauge.

2. Make sure all devices are connected to the network. Equipment any have been unintentionally disconnected from the network.
3. When cascading two devices using RJ-45 station ports at both ends of the cable (i.e., not an MDI port), make sure a crossover cable is used. Crossover cable should only be used if a MDI port is not available.

Physical Configuration

If problems occur after altering the network configuration, restore the original connections, and try to track the problem down by implementing the new changes, one step at a time. Ensure that cable distances and other physical aspects of the installation do not exceed recommendations

System Integrity

As a last resort verify the switch integrity with a power-on reset. Turn the power to the switch off and then on several times. If the problem still persists and you have completed all the preceding diagnoses, contact your dealer for assistance.

CE Side Start Link watch dog

If CE side(VDSL Modem) power on standby exceed 20 minute without connecting VDSL Switch, which will start up Link watch dog, you will find Link fail, users must re-plug power on once to clear that and reconnecting VDSL Switch.

FCC Warning

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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Warranty

We to the original owner that the product delivered in this package will be free from defects in material and workmanship for five years parts after purchase. For the warranty to apply, you must register your purchase by returning the registration card indicating the date of purchase.

There will be a minimal charge to replace consumable components, such as fuses, power transformers, and mechanical cooling devices. The warranty will not apply to any products which have been subjected to any misuse, neglect or accidental damage, or which contain defects which are in any way attributable to improper installation or to alteration or repairs made or performed by any person not under control of us.

THE ABOVE WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, WHETHER EXPRESS, IMPLIED, OR STATUTORY, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY WARRANTY ARISING OUT OF ANY PROPOSAL, SPECIFICATION, OR SAMPLE. SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. WE NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR IT ANY OTHER LIABILITY.