24-Port VDSL2 IP DSLAM

Perfectly designed for FTTx last mile applications

The PLANET VDL-24240MR series is a telecom-level high performance **VDSL2 IP-DSLAM** (Digital Subscriber Line Access Multiplexer) with **24-Port VDSL2**, **2-Port Gigabit TP / SFP** combo interfaces, Hot-Swappable **AC/DC Redundant Power System** and robust Layer 2+ switching features. The VDL-2420MR series is fully compliant with the ITU-T G.993.2 standard and supports VDSL2 30a profiles to offer maximum download and upload line rate up to **100/100Mbps** on the existing twisted pair lines. The VDL-2420MR helps service providers to easily provide high bandwidth demanded triple-play services such as IPTV, HDTV, Video Phone and Internet Gaming at the same copper line and uplink to the core / metro Ethernet network through the two Gigabit fiber optical interfaces. It is an ideal CO solution for **FTTx last mile** applications of broadband access by ISPs, Telecoms and campuses.

Comprehensive and Advanced VDSL2 Configuration

For the bandwidth and distance of broadband access, the VDL-2420MR VDSL2 IP-DSLAM supports multiple selective VDSL2 profiles (8a, 8b, 8c, 8d, 12a, 12b, 17a and 30a) and 997/998 Band plan to each subscriber line. To help the ISPs provide always on internet access service in different physical line installation environments, the VDL-2420MR supports configurable **DPBO** (Downstream Power Back-Off) and **UPBO** (Upstream Power Back-Off) to adjust the downstream / upstream transmit power levels for service provider to reduce the interference by nearby wires. Furthermore, it can be configured on a per-link basis for transmission mode, rate limitation and SNR (signal-to-noise) margin. These advanced VDSL2 functionalities help service providers to adjust the line performance to ensure the VDSL2 service not be impacted by other xDSL services in the same binder group and building a stable and reliable IP DSLAM solution.

High Speed Connectivity for ISP / Triple Play Devices

As the demand of broadband connections increases for home-communication and entertainment needs, VDSL2 technology is the next step media to support the integration of home services and provide significant faster transmission speed than current cable modems and ADSL technology. The VDL-2420MR series applies the EoVDSL (Ethernet over VDSL) to provide up to 100Mbps download capability and brings many Multi-Media services come true on local network:

- » IPTV / HDTV
- » Video Conference / Video Phone
- » Internet Radio / On-Line Music
- » VOD (Video on Demand)
- » On-Line Game
- » Long distance education
- » Voice over IP

The VDL-2420MR series gives the excellent bandwidth to satisfy the triple play devices for home entertainment and communication.

Traffic Flow QoS Ensuring for Application Services

The VDSL2 DSLAM contains robust QoS features such as Port-Based, 802.1p priority and also IP TOS/DSCP. It guarantees the best performance at VoIP and Video stream transmission and empowers the enterprises to take full advantages of the limited network resources.

Efficient Management

Afford the current network to grow and expand, the PLANET VDL-2420MR series provides **console** and **telnet** command line interface, advanced **WEB** and **SNMP** management interface to fill this kind of demand. With its built-in Web-based management interface, the VDSL2 DSLAM offers an easy-to-use, platform-independent management and configuration facility. The VDSL2 DSLAM supports standard Simple Network Management Protocol (SNMP) and can be monitored via any standard-based management software. For text-based management, the VDSL2 DSLAM can also be accessed via Telnet and the console port. Moreover, the VDL-2420MR series offers secure remote management by supporting Secure Socket Layer (**SSL**) connection which encrypts the packet content at each session. The features above provide an efficient way for the administrators to manage the devices from the internet environment with no need to add extra secure system either by means of hardware or software.

Robust Layer 2 Features

For efficient management, via WEB interface the VDL-2420MR series can be programmed for basic switch management functions such as port speed configuration, Port link aggregation, IEEE 802.1Q VLAN and Q-in-Q VLAN, Port Mirroring, Rapid Spanning Tree and ACL security. Additionally, the firmware includes advanced features such as IGMP snooping, QoS (Quality of Service), broadcast storm and bandwidth control to enhance bandwidth utilization.

Advanced Security

The VDL-2420MR series offers comprehensive Layer 2, Layer 3 and Layer 4 Access Control List (ACL) to filter out unwanted traffic. Its protection mechanisms comprises of RADIUS and Port-Based 802.1X user and device authentication. Moreover, the VDSL2 DSLAM provides MAC filter, Static MAC, IP/MAC binding and Port Security for enforcing security policies to the edge. The administrators can now construct highly secured corporate networks with considerably less time and effort than before.

Extremely Reliable Design to Ensure Continuous Operation

Power Redundant

The VDL-2420MR series supports the optional hot-swappable **Redundant Power System (RPS)** to ensure continuous operation. The VDL-2420MR equips with one 100~240V AC power supply unit and the VDL-2420MR48 equips with one DC -48V power supply unit on their standard package. To enhance the reliability, both the VDL-2420MR and VDL-2420MR48 provide one spare power supply unit slot for optional 100~240V AC or DC -48V redundant power supply installation. The continuous power systems are specifically designed to handle high tech facilities requiring the highest power integrity available. Also, the -48V DC power supply implemented makes the VDL-2420MR series VDSL2 DSLAM as a telecom level device that can be located at the electronic room.

VDL-2420MR – One 100~240V AC   VDL-2420MR48 – One -48V DC

Temperature and FAN Status Monitoring

The VDL-2420MR series is equipped with temperature sensor and cooling fans to ensure reliable operation. Whenever there is abnormal temperature detected or cooling fan service stops, the managed VDSL2 DSLAM would display related information on the Web management interface. Therefore, it helps the administrator to efficiently manage the managed VDSL2 DSLAM operation.

KEY FEATURES

VDSL INTERFACE

- 24 Full-Duplex VDSL links via RJ-21(Telco-50) connector
- 24 corresponding POTS lines via RJ-21(Telco-50) connector
- Built-in POTS splitter for each VDSL port
- Link to VC-231 / VC-234 / VC-230/ VC-230N CPE Bridge
- Auto-speed function for VDSL2 link (by distance and cable quality)

ETHERNET INTERFACE

- 2 10/100/1000Mbps TP and SFP shared combo interfaces
- Auto-MDI/MDI-X detection on Gigabit RJ-45 port

VDSL2 FEATURES

- Cost-effective VDSL2 link and central management solution
- Compliant with VDSL2 standard
  - ITU-T G.993.2
  - ITU-T G.994.1
  - ITU-T G.997.1
- ITU-T G.993.2, 8a / 8b / 8c / 8d /12a / 12b / 17a / 30a Profiles
- Configurable Line Template and Alarm Template
- Configurable UPBO / DPBO / US0 Allow / Virtual Noise PSD
- Configurable Bitswarp / G.hs carrier set / RFI Band
- Manual / RaInit / Dynamic Rate Adaption
- DMT (Discrete Multi-Tone) line coding VDSL

- Up to 100/100Mbps symmetric data rate
- Selectable target data rate and target SNR margin
- Built-in surge protection to against surge damage from high energy spike
- Voice and data communication can be shared on the existing telephone wire simultaneously
- Supports Downstream / Upstream rate control on each port

LAYER 2 FEATURES

- High performance of Store-and-Forward architecture, runt/CRC filtering eliminate erroneous packets to optimize the network bandwidth
- Broadcast / Multicast / Unicast storm control
- Supports VLAN
  - IEEE 802.1Q Tag-Based VLAN
  - Port-Based VLAN
  - Q-in-Q tunneling (VLAN Stacking)
  - GVRP for dynamic VLAN management
  - Private VLAN Edge (PVE / Protected port)
- Link Aggregation
  - IEEE 802.3ad LACP (Link Aggregation Control Protocol)
  - Cisco ether-channel (Static Trunk)
- Spanning Tree Protocol
  - STP, IEEE 802.1D (Classic Spanning Tree Protocol)
  - MSTP, IEEE 802.1s (Multiple Spanning Tree Protocol, Spanning Tree by VLAN)

Data Sheet

- Port Mirroring to monitor the incoming or outgoing traffic on a particular port

- PPPoE packet pass-through

- VPN pass-through

QUALITY OF SERVICE

- 4 priority queues on all switch ports

- Traffic classification
  - IEEE 802.1p CoS
  - IP TOS / DSCP to 802.1p priority mapping
  - Port-Based priority

- Strict priority and Weighted Round Robin (WRR) CoS policies

- Voice QoS by application source / destination protocol no.

MULTICAST

- Supports IGMP Snooping v1 and v2

- IGMP Snooping v2 fast leave

- Querier mode support

SECURITY

- IEEE 802.1x Port-Based network access control protocol

- RADIUS users access authentication

- L3 / L4 Access Control List (ACL)

- MAC Filtering and Source IP-MAC / Port-Binding

- Port Security for Source MAC address entries filtering

MANAGEMENT

- Switch Management Interface
  - Telnet Command Line Interface
  - Web switch management
  - SNMP v1, v2c, v3 switch management
  - SSL switch management

- DHCP client for IP address assignment

- DHCP Option82 and DHCP Relay

- SNTP (Simple Network Time Protocol)

- Built-in Trivial File Transfer Protocol (TFTP) client

- Firmware upgrade via TFTP or HTTP

- Configuration upload/download via TFTP or HTTP

- Four RMON groups 1, 2, 3, 9 (history, statistics, alarms, and events)

- SNMP trap for interface Link Up and Link Down notification

- Logging to remote syslog server

- Link Layer Discovery Protocol (LLDP) for easy network management

- Supports Ping function

- Reset button for system management

- 1 RS-232 male DB9 console interface for Switch basic management and setup

- User privilege control – admin, operator, viewer

REDUNDANT POWER SYSTEM

- 100~240V AC / 48V DC Dual power redundant (Optional)

- Active-active redundant power failure protection

- Backup of catastrophic power failure on one supply
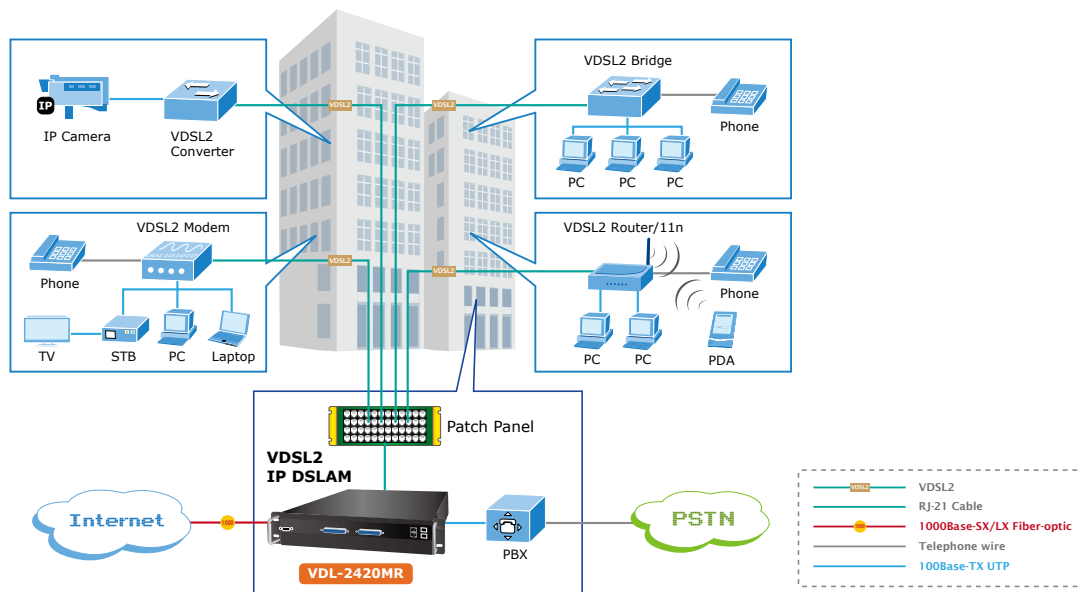
APPLICATIONS

Perfect solution for Network Service Provider to offer broadband services

Co-work with various PLANET VDSL2 CPE product line, the VDL-2420MR series provides up to 100/100Mbps symmetric data rate within 300m and in long range connections. It offers the benefit of high performance to central office co-location and MTU (Multi-Tenant Unit) / MDU (Multi-Dwelling Unit) markets. It provides service of broadband data over existing copper wires without affecting the conventional voice service by 24 subscriber ports with built-in POTS splitter and long distance support through the two fiber optic uplink interfaces. The various distances of SFP (small-form factor) and Bidi (WDM) transceivers are optional for customers. The VDL-2420MR VDSL2 IP DSLAM is a great and ideal solution for FTTx (Fiber to the Building, Fiber to the Campus or Fiber to the Home) applications. It supports high bandwidth VDSL2 over existing telephone wires in the "**last mile**" from the ISP / Telecom / Service provider's fiber node to the buildings and customers' home with cost-effective and high-value central management capability
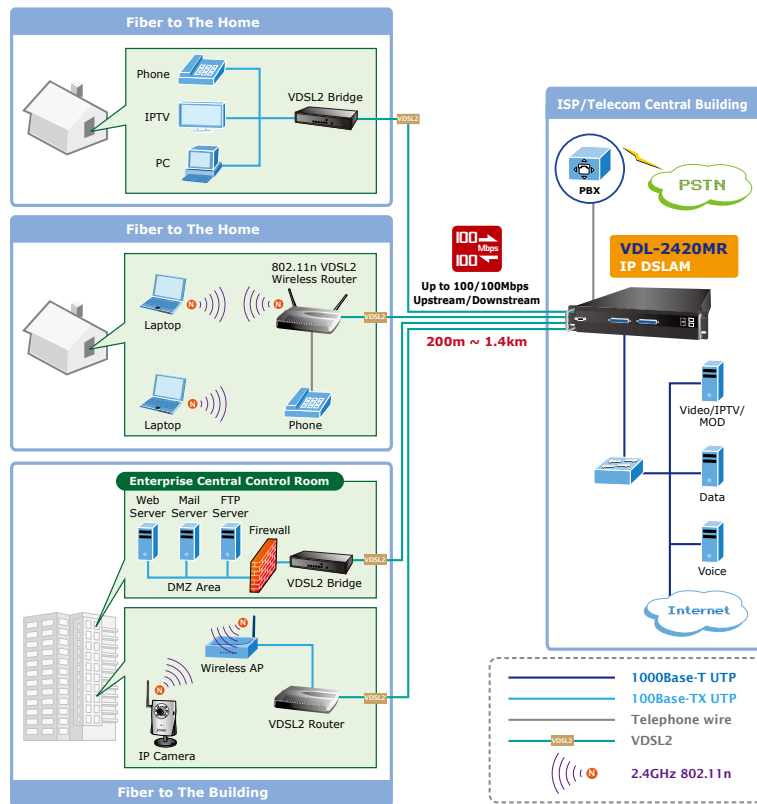
MTU / MDU / Hospitality Solution

IPTV, VOD and digital message broadcasting services are the worldwide hot trends, and more and more service providers have gradually upgraded the client side devices from analog system to digital system. The PLANET VDL-2420MR series VDSL2 CO Switch and VC-23x VDSL2 CPEs are the best solution to quickly provide cost-effective and high speed network services by utilizing the existing telephone wire infrastructure. IP network installation is straightforward and requires no extra wiring. With enough bandwidth, the 100/100Mbps symmetric capability of VDL-2420MR series enables many Multi-Media services on local Internet to come true, such as VOD (Video on Demand), Voice over IP, Video phone, IPTV, distance education, and so on. The VDL-2420MR series provides excellent bandwidth to satisfy the triple play devices for entertainment and communication. Meanwhile, this kind of infrastructure will minimize the burden on the Internet.

Data Sheet

4

SPECIFICATION

Product	24-Port VDSL2 IP DSLAM	
Model	VDL-2420MR	VDL-2420MR48
Hardware Specification		
VDSL Interface	24-Port VDSL2 Line via 1 RJ-21 (Telco-50) connector **24-Port POTS/Telephone** via 1 RJ-21 (Telco-50) connectors	
1000Mbps Copper Ports	2 10/100/1000Mbps RJ-45 Auto-Negotiation, Auto MDI/MDI-X	
SFP/mini-GBIC Slots	2 1000Base-SX/LX/BX, shared with Port-25 ~ Port-26	
Console	1 x RS-232 Serial Port (DB9, 57600, N, 8, 1)	
Surge Protect	3KV	
Switch Architecture	Store-and-Forward	
Switch Fabric	8.8Gbps / non-blocking	
Switch Throughput	6.547Mpps @64Bytes	
Address Table	8K entries	
Share Data Buffer	512Kbytes	
Maximum Frame Size	9K Bytes	
Flow Control	Back pressure for Half-Duplex IEEE 802.3x Pause Frame for Full-Duplex	
LED	System: Power, SYS Status Alert: FAN 1, FAN 2, Power 1, Power 2 VDSL: VDSL Link/Sync. Gigabit Port: 1000 Link/Active, 100 Link/Active	
Reset Button	< 5 sec: System reboot > 10 sec: Factory Default	
Dimension (W x D x H)	440 x 300 x 44 mm, 2U height	
Weight	6.4kg	
Power Requirement — AC Input	100~240V AC, 50-60 Hz	Optional AC Power module
Power Requirement — DC Input	Optional DC Power module	-48V DC; Range: 30V~60V
Power Consumption / Dissipation	130Watts maximum / 404 BTU/hr maximum	
Standard Accessory	2-Meter Telco-50 Cable x 2 FAN Module x 1 19" rack mount kit	
VDSL2		
VDSL2 Standard	Comply with ITU-T G.993.2. Supports provisioning the VDSL optional band (25K to 138K Hz) usage ITU-T G.994.1: Handshake procedure of each DMT xDSL circuit ITU-T G.997.2: Physical layer management of each DMT xDSL circuit	
Encoding	VDSL-DMT	
VDSL2 Template	Configurable Line Template Configurable Alarm Template	
VDSL2 Profile	Selectable spectrum profile of - 8a / 8b / 8c / 8d / 12a / 12b / 17a / 30a	

Band Plan	Selectable band plan for each VDSL line on a per port basis
	Band plan A:
	  - Profile 998, Annex A of G.993.1; Optimized for symmetric services
	Band plan B:
	  - Profile 997, Annex B of G.993.1 ; Optimized for asymmetric services	

Rate Adaptation	Manual RaInit Dynamics	
Power Back-Off	Downstream Power Back-Off (DPBO) PSD Upstream Power Back-Off (UPBO) PSD	
VDSL2 Features	Selectable rate limit control Selectable target SNR (signal to Noise Ratio) mode POTS voices pass through	
POTS Splitter	Compliant with ETSI TS 101 952-1-1 option A for European The splitter is passive element. Even the system is loss of power, the POTS service is still OK	
Layer 2 Function		
Management Interface	Console, Telnet, Web Browser, SSL, SNMPv1 / v2c / v3	
Gigabit Port Configuration	Port disable/enable Auto negotiation 10/100/1000Mbps full and half duplex mode selection Flow Control disable / enable	

Gigabit Port Status	Display each port's speed duplex mode, link status and Flow control status Auto negotiation status, trunk status
Port Mirroring	TX / RX / Both 1 to 1 monitor

Bandwidth Control	Ingress / Egress rate limit control
	Gigabit Port:
	  - Allow to configure per 128Kbps
	VDSL2 Port:
	  - Allow to configure per 4Kbps

VLAN	IEEE 802.1Q Tag-Based VLAN, up to 256 VLAN groups, out of 4041 VLAN IDs Port-Based VLAN, up to 26 VLAN groups GVRP, up to 128 dynamic VLAN groups Q-in-Q tunneling Private VLAN Edge (PVE / Protected port) with two protected port groups Supports Asymmetric VLAN membership configuration
Spanning Tree Protocol	IEEE 802.1D Spanning Tree IEEE 802.1s Multiple Spanning Tree Up to 16 MST instances (0~15)
Link Aggregation	Static Port Trunk IEEE 802.3ad LACP (Link Aggregation Control Protocol) 13 groups of 8-Port trunk support

QoS	4 priority queue
	Traffic classification based on
	  - Port priority
	  - 802.1p priority
	  - DSCP/TOS field in IP Packet
	VoIP QoS by application protocol no.

IGMP Snooping	IGMP (v1/v2) Snooping, up to 256 multicast Groups
Access Control List	IP-Based Layer 3 / Layer 4 ACL Up to 200 ACL rule entries
Security	Port Security – supports per port MAC limit up to 64 entries Static MAC and MAC Filter – up to 256 MAC address entries Source IP / Source MAC Address and Port binding IEEE 802.1X Port-Based Network Access Control – supporting authentication types: - EAP-MD5 / EAP-TLS / EAP-PEAP
SNMP MIBs	RFC-1213 MIB-II RFC-2863 Interface MIB RFC-2665 EtherLike MIB RFC-1493 Bridge MIB RFC-2819 RMON MIB (Group 1, 2, 3,9) RFC-2737 Entity MIB RFC 5650 VDSL2 MIB
Standards Conformance	
Regulation Compliance	FCC Part 15 Class A, CE
Standards Compliance	IEEE 802.3 — 10Base-T IEEE 802.3u — 100Base-TX IEEE 802.3z — 1000Base- SX / LX IEEE 802.3ab — 1000Base-T IEEE 802.3x — Flow Control and Back pressure IEEE 802.3ad — Link Aggregation Control Protocol (LACP) IEEE 802.1D — Spanning tree protocol IEEE 802.1s — Multiple Spanning tree protocol IEEE 802.1p — Class of service IEEE 802.1Q — VLAN tagging IEEE 802.1x — Port-based authentication network control ITU-T — G.997.1 G.993.2 VDSL2 (Profile 30a Support), Annex A RFC 768 — UDP RFC 783 — TFTP RFC 791 — IP RFC 792 — ICMP RFC 854 — Telnet RFC 2068 — HTTP RFC 1112 — IGMP version 1 RFC 1157 — SNMPv1 RFC 1902 — SNMPv2 RFC 2236 — IGMP version 2 RFC 5424 — Syslog

Data Sheet

Cables	• VDSL2: twisted-pair telephone wires (AWG24 or better) up to 1.4km • 10/100Base-TX: 2-Pair UTP Cat.5, up to 100m (328ft) • 1000Base-T: 4-pair UTP Cat.5E, up to 100m • 1000Base-SX: 50/125µm and 62.5/125µm fiber-optic cable, up to 550m • 1000Base-LX: 9/125µm fiber optic cable, up to 10km 50/125µm and 62.5/125µm fiber-optic cable, up to 550m
Environment	
Temperature	0~50 Degree C
Humidity	5~95% (non-condensing)

ORDERING INFORMATION

VDL-2420MR	24-Port VDSL2 + 2-Port Gigabit TP/SFP Combo Managed Switch / 100~240V AC Power
VDL-2420MR48	24-Port VDSL2 + 2-Port Gigabit TP/SFP Combo Managed Switch / 48V DC Power

RELATIVE PRODUCT

VC-231	Ethernet over VDSL 2 Converter (30a, 1 x RJ-11, 1 x RJ-45)
VC-234	Ethernet over VDSL 2 Bridge (30a, 2 x RJ-11, 4 x RJ-45)
VC-230	Ethernet over VDSL2 Router (4*RJ45, 1*VDSL2, 1*Phone -30a)
VC-230N	802.11n wireless VDSL2 Router (4*RJ45, 1*VDSL2, 1*Phone -30a)

AVAILABLE MODULES FOR MINI-GBIC SFP SLOTS

MGB-GT	SFP-Port 1000Base-T mini-GBIC module
MGB-SX	SFP-Port 1000Base-SX mini-GBIC module
MGB-LX	SFP-Port 1000Base-LX mini-GBIC module
MGB-L30	SFP-Port 1000Base-LX mini-GBIC module - 30km
MGB-L50	SFP-Port 1000Base-LX mini-GBIC module - 50km
MGB-L70	SFP-Port 1000Base-LX mini-GBIC module - 70km
MGB-L120	SFP-Port 1000Base-LX mini-GBIC module -120km
MGB-LA10	SFP-Port 1000Base-LX mini-GBIC module - LC WDM(TX:1310nm), SM, 10km
MGB-LB10	SFP-Port 1000Base-LX mini-GBIC module - LC WDM(TX:1550nm), SM, 10km
MGB-LA20	SFP-Port 1000Base-LX mini-GBIC module - LC WDM(TX:1310nm), SM, 20km
MGB-LB20	SFP-Port 1000Base-LX mini-GBIC module - LC WDM(TX:1550nm), SM, 20km
MGB-LA40	SFP-Port 1000Base-LX mini-GBIC module - LC WDM(TX:1310nm), SM, 40km
MGB-LB40	SFP-Port 1000Base-LX mini-GBIC module - LC WDM(TX:1550nm), SM, 40km

C-VDL-2420MR / VDL-2420MR48