

## 24-Port VDSL2 IP DSLAM



### *Perfectly designed for FTTx last mile applications*

The PLANET VDL-2420MR 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 on 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 is not impacted by other xDSL services in the same binder group and to build a stable and reliable IP DSLAM solution.

### *High Speed Connectivity for ISP / Triple Play Devices*

As the demand for broadband connections increases for home-communication and entertainment needs, VDSL2 technology is the next 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 makes many Multi-Media services come true on local network:

- » IPTV / HDTV
- » Video Conferencing / 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 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*

To meet the growing current network, 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 is equipped with one 100~240V AC power supply unit and the VDL-2420MR48 is equipped 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 in 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 / USO Allow / Virtual Noise PSD
- Configurable Bitswap / 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)

- 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

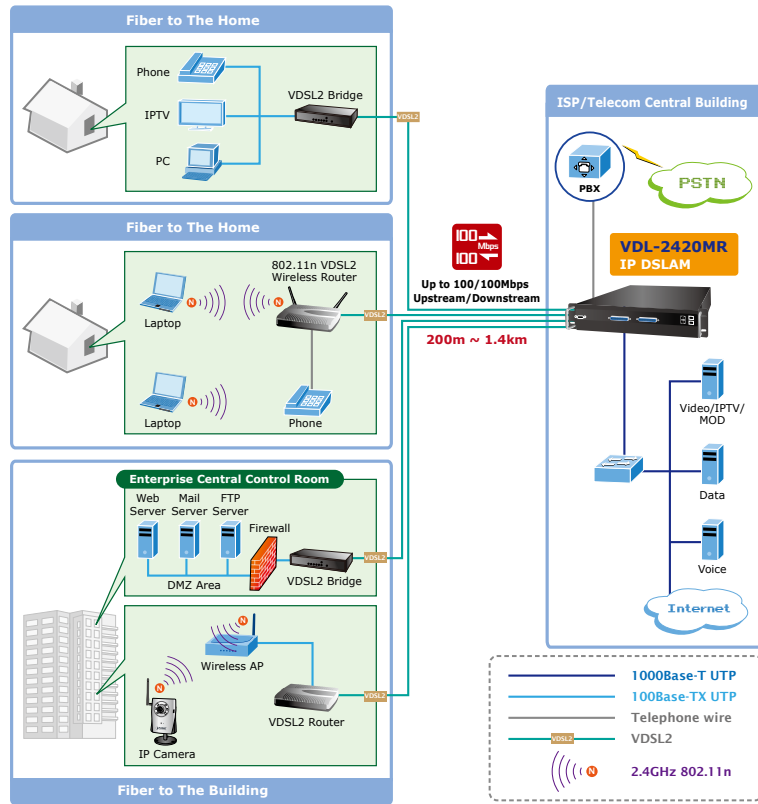
#### **REDUNDANT POWER SYSTEM**

- 100~240V AC / 48V DC dual power redundant (Optional)
- Active-active redundant power failure protection
- Backup of catastrophic power failure on one supply

**APPLICATIONS**

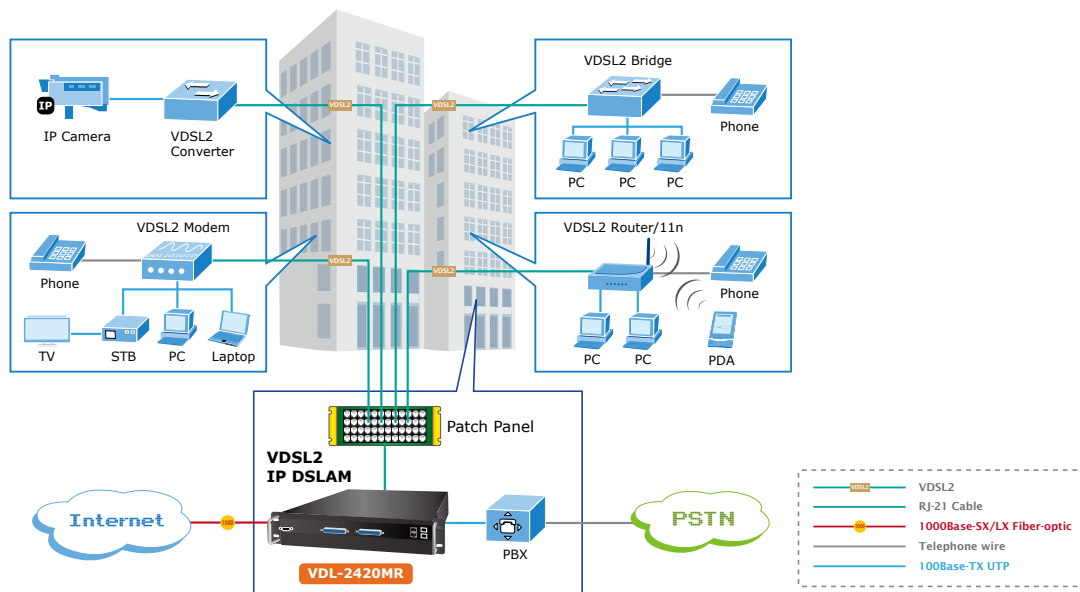
*Perfect solution for Network Service Provider to offer broadband services*

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 providing 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.



**SPECIFICATION**

Product	<b>24-Port VDSL2 IP DSLAM</b>		
Model	<b>VDL-2420MR</b>	<b>VDL-2420MR48</b>	
<b>Hardware Specifications</b>			
VDSL Interface	24-Port VDSL2 Line via 1 RJ-21 (Telco-50) connector <b>24-Port POTS/Telephone</b> 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		
Dimensions (W x D x H)	440 x 300 x 44 mm, 2U height		
Weight	6.4kg		
Power Requirements	AC Input	100~240V AC, 50-60 Hz	Optional AC Power module
	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		
<b>VDSL2</b>			
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 Rlnit 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		
<b>Layer 2 Function</b>			
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		

<b>Gigabit Port Status</b>	Display each port's speed duplex mode, link status and Flow control status Auto negotiation status, trunk status	
<b>Port Mirroring</b>	TX / RX / Both 1 to 1 monitor	
<b>Bandwidth Control</b>	Ingress / Egress rate limit control Gigabit Port: - Allow to configure per 128Kbps VDSL2 Port: - Allow to configure per 4Kbps	
<b>VLAN</b>	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	
<b>Spanning Tree Protocol</b>	IEEE 802.1D Spanning Tree IEEE 802.1s Multiple Spanning Tree Up to 16 MST instances (0~15)	
<b>Link Aggregation</b>	Static Port Trunk IEEE 802.3ad LACP (Link Aggregation Control Protocol) 13 groups of 8-Port trunk support	
<b>QoS</b>	4 priority queue Traffic classification based on - Port priority - 802.1p priority - DSCP/TOS field in IP Packet VoIP QoS by application protocol no.	
<b>IGMP Snooping</b>	IGMP (v1/v2) Snooping, up to 256 multicast Groups	
<b>Access Control List</b>	IP-based Layer 3 / Layer 4 ACL Up to 200 ACL rule entries	
<b>Security</b>	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	
<b>SNMP MIBs</b>	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	
<b>Standards Conformance</b>		
<b>Regulation Compliance</b>	FCC Part 15 Class A, CE	
<b>Standards Compliance</b>	IEEE 802.3 IEEE 802.3u IEEE 802.3z IEEE 802.3ab IEEE 802.3x IEEE 802.3ad IEEE 802.1D IEEE 802.1s IEEE 802.1p IEEE 802.1Q IEEE 802.1x ITU-T  RFC 768 RFC 783 RFC 791 RFC 792 RFC 854 RFC 2068 RFC 1112 RFC 1157 RFC 1902 RFC 2236 RFC 5424	10Base-T 100Base-TX 1000Base-SX / LX 1000Base-T Flow Control and Back pressure Link Aggregation Control Protocol (LACP) Spanning tree protocol Multiple Spanning tree protocol Class of service VLAN tagging Port-based authentication network control G.997.1 G.993.2 VDSL2 (Profile 30a Support), Annex A  UDP TFTP IP ICMP Telnet HTTP IGMP version 1 SNMPv1 SNMPv2 IGMP version 2 Syslog

<b>Cables</b>	<ul style="list-style-type: none"> <li>• VDSL2: twisted-pair telephone wires (AWG24 or better) up to 1.4km</li> <li>• 10/100Base-TX: 2-Pair UTP Cat.5, up to 100m (328ft)</li> <li>• 1000Base-T: 4-pair UTP Cat.5E, up to 100m</li> <li>• 1000Base-SX: 50/125µm and 62.5/125µm fiber-optic cable, up to 550m</li> <li>• 1000Base-LX: 9/125µm fiber optic cable, up to 10km 50/125µm and 62.5/125µm fiber-optic cable, up to 550m</li> </ul>
<b>Environment</b>	
<b>Temperature</b>	0~50 degrees C
<b>Humidity</b>	5~95% (non-condensing)

## ORDERING INFORMATION

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

## RELATED PRODUCTS

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

## AVAILABLE MODULES FOR MINI-GBIC SFP SLOTS

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