



DM4610

OLT – OPTICAL LINE TERMINATOR

PRODUCT DATASHEET

DM4610 OLT – OPTICAL LINE TERMINATOR

COMPACT AND HIGH CAPACITY SOLUTION FOR GPON FTTH ACCESS NETWORKS.

GPON (Gigabit Passive Optical Network) is a technology for optical access, offering high speed and cost-effective solution for broadband and Triple Play services (voice, video and data). This technology allows the sharing of the fiber optic among customers, reducing cost and maximizing the use of bandwidth.

The DM4610 OLT GPON (Gigabit Passive Optical Networks) is a compact and cost-effective solution to provide FTTH services. The DM4610 8GPON model supports up to 1024 subscribers on 8 GPON ports (1: 128 split rate), has 12 x 1GbE ports (8 SFP and 4 electrical RJ45) and 2 x 10 GbE ports using SFP+ connectors. The DM4610 4GPON model supports 512 subscribers through 4 GPON ports (same split ratio of 1: 128), has 4 x 1GbE ports in SFP and 2 x 10 GbE ports using SFP+ connectors.

It is fully compatible with ITU-T G.984 and ITU-T.988. Each GPON links supports downstream rates of 2.488 Gbit/s, upstream rates of 1,244 Gbit/s and offers dynamic bandwidth allocation (DBA).

The ONUs configuration is performed remotely by DM4610 through the OMCI protocol according to ITU-T standards, including FXS ports to provide VoIP services to customers.

The Virtual LANs (VLANs) configuration on the DM4610 can use up to 4,094 VLANs defined in IEEE 802.1Q simultaneously. Q-in-Q and VLAN translation are also available allowing double TAG, adding, removing, or replacing VLAN. These features allow the DM4610 to serve a wide range of applications, GPON network concentration and interconnection with Metro Ethernet networks.

Prioritizing traffic and services levels is achieved with QoS (Quality of Service) features, as traffic classification, SP and WFQ scheduling, DSCP mapping to P-bit (PCP), among others.

The Spanning Tree (STP) and Rapid Spanning Tree (RSTP) protocols and ring operation using EAPS are supported, ensuring Ethernet uplinks protection. In addition, the Link Aggregation (LAG / LACP) feature provides quick uplink bandwidth upgrades.

Through IGMPv2/v3 protocols, multicast traffic is distributed to all clients using a single instance of each stream, making possible the offer of video and IPTV services.

The devices have a CLI (Command Line Interface) accessible via SSH, Telnet and RS-232 Console. SNMP v1, v2c and v3 agents are available. Furthermore, provides a XML interface based on the NETCONF standard.

Commit and rollback operations (commands and Firmware), user authentication via RADIUS and TACACS+, local and remote Syslog are also available to facilitate configuration management and troubleshooting.

To guarantee the network and equipment security, IP spoofing protection mechanisms, user isolation and ACLs (Access Control List) with multiple comparison parameters are available.

HIGHLIGHTS

- *1U high compact design*
- *Up to 8x GPON interfaces - SFP*
- *2x 10GbE interfaces -SFP+*
- *Up to 12x 1GbE interfaces (8xSFP + 4xRJ45)*
- *GPON class B+ and C+*
- *DHCP option 82*
- *PPPoE Intermediate Agent*
- *AC or DC redundant and hot-swappable power supplies*
- *Hot-swappable FAN modules*
- *High capacity L2 switching*
- *RSTP, EAPS and LAG / LACP*
- *Multicast - IGMP*
- *Metro Ethernet networks integration.*

SMART CITIES

- Modernization of public administration
- Integration of direct and indirect institutions
- Presence in remote districts of the public administration
- Internet access to micro enterprises, creating business opportunities
- Interconnection with emergency services such as Fire and Civil Defense
- Educational labs with internet access
- Remote Surveillance
- Services of local or institutional news through TV over the metropolitan network

FTTD - FIBER TO THE DESK

The traditional LAN network design consists of a structure with copper wires connecting each user equipment to an access switch, typically installed in a communication room. These access switches are connected to aggregators switches through cables or fiber. The FTTD GPON simplifies the network by replacing the switches typically by a central OLT and ONUs on users, reducing network infrastructure by using passive elements, optical fiber and point-multipoint topology.

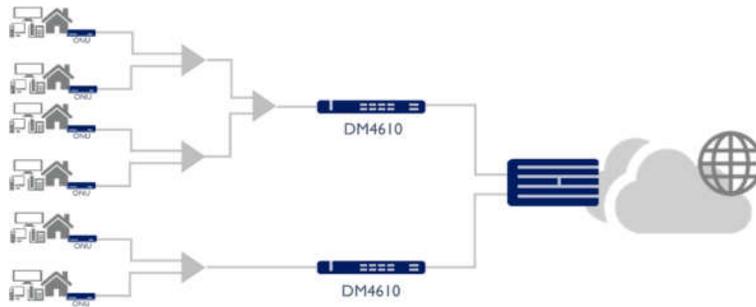
The DM4610 provides features that enable the implementation of GPON LAN networks for various sizes and company's needs.

APPLICATIONS

TRIPLE PLAY BROADBAND SERVICES

Through optical access, the GPON technology provides users rates higher than copper and cable-based technologies, enabling data, voice (VoIP) and video (IPTV) convergence in a single access.

Moreover, the point-to-multipoint network and use of only passive elements between the central and users reduce the CAPEX and OPEX for these services.



BUSINESS SERVICES

The DM4610 provides several features enabling the delivery of data, voice and video for small, medium and large businesses.

The TLS function (Transparent LAN Service) together with the hairpin feature allows offering LAN-to-LAN services without additional equipment - such as routers.



SMART CITIES

Cities are the center of modern society and they are becoming more complex each day. Technology can make life better and easier, empowering the universalization of public services. However, the government should not only pay attention to a network for digital inclusion but it also should deploy a high-performance network that foments the city development.

The DM4610 deployment associated to the DATACOM GPON and Ethernet Switches is a valuable cost-effective solution for smart cities. Through the numerous features available it can connect government offices, provide internet population and businesses with high rates, reliability and security.

FEATURE LIST

DM4610

	DM4610 4GPON	DM4610 8GPON
Height chassi 19"		1U
GPON ports (SFP - SC/PC)	4	8
10GBase-X ports (SFP+)	2	2
1000Base-X ports (SFP)	4	8
10/100/1000Base-T ports (RJ45)	0	4

GPON

- GPON Laser Class B+ e C+
- Maximum reach 60km
- AES (Advanced Encryption Standard) 128 bits for downstream
- DBA (Dynamic Bandwidth Allocation) and SBA (Static Bandwidth Allocation)
- FEC (Forward Error Correction) - *upstream* and *downstream*
- ONU authentication by serial number, password and serial number + password
- ONU remote firmware upgrade
- ONU pre-provisioning
- Automatic ONU discovery
- Hairpin turn – ONU L2 intercommunication
- Rogue ONU isolation
- Automatic ONU discovery
- N:1, 1:1 and TLS services
- User isolation
- DHCP option 82
- PPPoE Intermediate Agent
- Static Access List IPv4
- Remote ONU FXS ports provisioning via OMCI
- ONUs traffic monitoring
- GPON link monitoring

SWITCHING

- Auto negotiation configuration per interface
- Auto MDI/MDIX
- Speed/Duplex configuration per interface
- Aging L2 Global configuration
- Spanning Tree Protocol (STP) and Rapid Spanning Tree (RSTP)
- EAPS
- Static and Dynamic Link Aggregation
- Selective Q-in-Q
- VLAN dual mode

SECURITY

- Local and remote Syslog
- Authentication of users by RADIUS or TACACS+
- Blocking unauthorized user access
- ACL (Access Control List) L2 and L3
- Protection Against IP Spoofing
- Storm control against Broadcast, Multicast and DLF attacks

QUALITY OF SERVICE

- Packet classification by Ethernet port, MAC, VLAN, DSCP and source/destination IP address
- P-bit (PCP) remarking
- QoS Scheduler (Strict Priority and WFQ)
- DSCP to COS mapping
- 8 QoS queues per port

MANAGEMENT

- IPv4 management
- In-Band and Out-Of-Band management
- Statistics per GPON and Ethernet ports
- Commit and rollback operations
- Command Line Interface (CLI) via SSHv2, Telnet and RS-232 Console
- Transceivers inventory information and digital diagnostics in accordance with SFF 8472
- Firmware rollback
- Firmware Upgrade via TFTP, SCP or HTTP
- Product inventory
- SNMPv1, v2c, v3
- XML (NETCONF) support
- Alarms LED
- Supports up to 2 Firmware's (Running and Backup)
- CPU usage monitoring
- SNTP - Network Time Protocol
- Store up to 64 configuration files in Flash memory
- System CPU and memory status available via SNMP

MULTICAST

- IGMP snooping with proxy report
- IGMPv2/v3

ROUTING (ETHERNET PORTS ONLY)

- IPv4 static routing
- Routing between VLANs

SYSTEM UTILITIES

- IPv4 Ping
- Telnet and SSH client

HARDWARE CHARACTERISTICS

- Redundant power supply inputs
- AC full range (100Vac to 240Vac, 50Hz or 60Hz)

- DC full range (-36Vdc to -72 Vdc)
- Overvoltage and undervoltage protection
- Automatic FAN control
- Temperature monitoring
- Hot-swappable Power supply
- Hot-swappable FAN module

STANDARDS AND PROTOCOLS

BROADBAND FORUM

TR-156	Using GPON Access in the context of TR-101
TR-167	GPON-fed TR-101 Ethernet Access Node
TR-255	GPON Interoperability Test Plan

IEEE

802.1ad	Double Tagging (Q-in-Q)
802.1D	Spanning Tree Protocol (STP)
802.1D	MAC bridges
802.1p	Traffic Class Expediting
802.1Q	Virtual Bridged LAN (VLAN)
802.1w	Rapid Spanning Tree Protocol (RSTP)
802.1AX	Link aggregation
802.3i	10BASE-T 10Mbit/s (1.25 MB/s) over twisted pair
802.3i	10BASE-T 10 Mbit/s (1.25 MB/s) over twisted pair
802.3u	100BASE-TX Fast Ethernet at 100 Mbit/s (12.5 MB/s) w/auto negotiation
802.3z	1000BASE-X Gbit/s Ethernet over Fiber-Optic at 1 Gbit/s (125 MB/s)
802.3ab	1000BASE-T Gbit/s Ethernet over twisted pair at 1 Gbit/s (125 MB/s)
802.3ae	10 Gigabit Ethernet over fiber

ITU-T

G.984.1	Gigabit-capable Passive Optical Networks (GPON): General characteristics
G.984.2	Gigabit-capable Passive Optical Networks (GPON): Physical Media Dependent (PMD) layer specification
G.984.3	Gigabit-capable Passive Optical Networks (GPON): Transmission convergence layer specification
G.984.4	Gigabit-capable Passive Optical Networks (GPON): ONT management and control interface specification
G.984.7	Gigabit-capable passive optical networks (GPON): Long reach
G.988	ONU management and control interface (OMCI) specification

IETF

RFC783	The TFTP Protocol (Revision 2)
RFC792	Internet Control Message Protocol (ICMP) (Ping IPv4)
RFC854	TELNET Protocol Specification
RFC1157	A Simple Network Management Protocol (SNMPv1)
RFC1213	Management Information Base for Network Management of TCP/IP-based internets: MIB-II (Obsoletes RFC 1158)
RFC1215	A Convention for Defining Traps for use with the SNMP - TRAPS MIB
RFC1441	Introduction to version 2 of the Internet-standard Network Management Framework (SNMPv2)
RFC1901 - RFC1908	SNMPv2c
RFC2030	Simple Network Time Protocol (SNTP) Version 4 for IPv4, IPv6 and OSI
RFC2236	Internet Group Management Protocol, Version 2 - IGMPv2
RFC2348	TFTP Blocksize Option (obsoletes RFC1783)
RFC2474	Definition of the Differentiated Services Field (DS Field) in the IPv4 Headers (DSCP Remarking for IPv4)
RFC2516	A Method for Transmitting PPP Over Ethernet (PPPoE)
RFC2865	Remote Authentication Dial In User Service (RADIUS) (obsoletes RFC 2138)
RFC3376	Internet Group Management Protocol, Version 3 - IGMPv3
RFC3410 - RFC3418	SNMPv3 agent
RFC3986	Uniform Resource Identifier (URI): Generic Syntax

MODELS

Product	Description
DM4610 4GPON HW2* <i>800.5193.xx</i>	OLT with 4 GPON ports, 2 optical 10 Gigabit Ethernet ports using SFP+ and 4 Gigabit Ethernet ports using SFP. 100-240VAC or 48VDC Power Supply available. Power supply, fan modules and SFPs must be purchased separately.
DM4610 8GPON* <i>800.5081.xx</i>	OLT with 8 GPON ports, 2 optical 10 Gigabit Ethernet ports using SFP+ and 12 Gigabit Ethernet ports(8x optical SFP + 4x RJ45). 100-240VAC or 48VDC Power Supply available. Power supply, fan modules and SFPs must be purchased separately.
DM4610 8GPON HW2 * <i>800.5165.xx</i>	OLT with 8 GPON ports, 2 optical 10 Gigabit Ethernet ports using SFP+ and 12 Gigabit Ethernet ports(8x optical SFP + 4x RJ45). 100-240VAC or 48VDC Power Supply available. Power supply, fan modules and SFPs must be purchased separately.

* DM4610 and DM4610 HW2 are equivalent products.

MODULES

Module	Description
PSU 120 AC <i>800.5079.xx</i>	DC Power Supply for use into DM4610 chassis. Full range (-100Vac to 240Vac). Hot swappable. Redundant inputs.
PSU 120 DC <i>800.5080.xx</i>	DC Power Supply for use into DM4610 chassis. Full range (-3Vdc to -72Vdc). Hot swappable. Redundant inputs.
DM4610 FAN <i>800.5096.xx</i>	FAN module (with 3 FANs) for use into DM4610 chassis. Hot swappable.

ACCESSORIES

Accessory	Description
SFP GPON B+ <i>PN: Inquire</i>	SFP optical module for GPON class B+, one fiber, Singlemode, 1490 nm, Digital Diagnostics compliance, DFB, 1,5 dbm output power level and -28 dbm sensitivity.
SFP GPON C+ <i>PN: Inquire</i>	SFP optical module for GPON class B+, one fiber, Singlemode, 1490 nm, Digital Diagnostics compliance, DFB, 3 dbm output power level and -30 dbm sensitivity.
SFP 1GBE Optical <i>PN: Inquire</i>	SFP optical module for Gigabit Ethernet applications.
SFP 1GBE Electric <i>PN: Inquire</i>	SFP electric module for Gigabit Ethernet applications.
SFP 10GBE <i>PN: Inquire</i>	SFP+ optical module for 10 Gigabit Ethernet applications.

TECHNICAL SPECIFICATIONS

POWER CHARACTERISTICS

POWER SUPPLY

	PSU 120 AC	PSU 120 DC
Operational Voltage Range	100V to 240V	-40V to -72V
Power Supply Type	AC	DC
Power consumption	120W	120W

SCALABILITY

	DM4610 4GPON	DM4610 8GPON
Switching	63Gbits/s	94Gbits/s
Packets Forwarding	46Mpps	70Mpps
MAC table	64k addresses	
VLANs	4094	
Jumbo frames (Ethernet)	9000 bytes	
Jumbo frames (GPON)	2040 bytes	
ONUs per PON link	128	
T-CONTs per PON link	768	
GEM Ports per PON link	2048	
Service ports	4096	

SOFTWARE

Software	Version
DmOS	2.4 or above

ENVIRONMENT DATA

OPERATING CONDITIONS

	DM4610
Temperature Range	0°C to 65°C
Relative Humidity	5% to 95%, non-condensing

STORAGE AND TRANSPORTATION CONDITIONS

	DM4610
Temperature Range	-10°C to 70°C
Relative Humidity	5% a 95%, non-condensing

PHYSICAL DIMENSIONS

	DM4610
Height	44 mm(1U)
Width	483mm (19") with mounting brackets
Depth	312 mm with FAN module

WEIGHT

Module	Weight (kg)
DM4610 4GPON	3,200
DM4610 8GPON	3,440
PSU 120 AC	0.680
PSU 120 DC	0.500
DM4610 FAN	0.375

DATAKOM

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