

DATAKOM



DM4615

OLT – OPTICAL LINE TERMINATOR

PRODUCT DATASHEET

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DM4615

OLT – Optical Line Terminator

COMPACT AND HIGH CAPACITY SOLUTION FOR FTTH GPON ACCESS NETWORKS.

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

The DM4615 OLT GPON is a compact and cost effective solution to provide FTTH services. The DM4615 16GPON model supports up to 2,048 subscribers on 16 GPON ports (1:128 split ratio), it has 4 1GbE ports (electrical in RJ45) and 4 10 GbE ports in SFP+ connectors.

It is fully compatible with the ITU-T G.984 and ITU-T.988 standards. Each GPON link supports downstream rates of 2,488 Gbit/s and upstream rates of 1,244 Gbit/s and offers dynamic band allocation (DBA).

The configuration of the network ONUs is performed remotely by the DM4615 through the OMCI protocol, in conformity with the ITU-T standards. Also, FXS ports to provide VoIP services for clients can be configured in this manner. In addition, with the DM4615 it allows remote configuration of the main ONU / ONT DM984-420 and DM984-422 parameters (PPPoE, Fixed IP, DHCP, Bridge and WLAN).

Using 4094 VLANs defined in standard IEEE 802.1Q simultaneously, in addition to providing Q-in-Q and VLAN translate features, allowing dual TAG, addition (*Q-in-Q*), removal or replacement of VLAN, the DM4615 meets a wide range of applications and GPON network concentration needs and interconnection with Metro Ethernet networks.

The traffic and service prioritization of different levels is achieved with the QoS (Quality of Service) features, such as the classification of traffic, SP and WFQ scaling, DSCP mapping for P-bit (PCP), among others.

The Spanning Tree Protocol (STP) and Rapid Spanning Tree Protocol (RSTP), and the loop operation through the EAPS protocol, are supported, ensuring the protection of the Ethernet uplinks. In addition, the Link Aggregation (LAG / LACP) feature provides fast uplink expansions.

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

The equipment has a command line interface (CLI) accessible through SSHv2, Telnet and RS-232 Console. SNMP v1, v2c and v3 agents are available. In addition, it provides an XML interface based on the NETCONF standard.

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

The equipment and network's security is ensured through protection mechanisms against IP Spoofing, user isolation and ACLs (Access Control List) with multiple comparison parameters.

- Compact design (1 U)
- 16x GPON (SFP+ SC/UPC)
- 4x 10GbE (SFP+)
- 4x 1GbE (RJ45)
- GPON classes B+ and C+
- DHCP option 82
- PPPoE Intermediate Agent
- Redundant and hot-swappable AC or DC power supplies
- Hot-swappable fan module
- High L2 switching capacity
- RSTP, EAPS and LAG / LACP
- Multicast - IGMP
- Network integration

DIGITAL CITIES

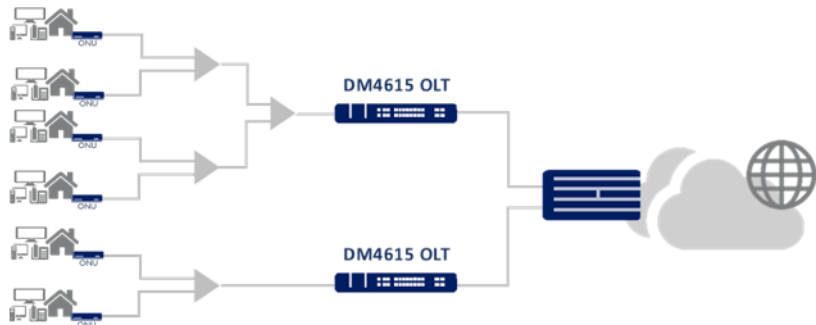
- Modernization of public administration
- Integration of all city institutions
- Presence in remote public administration districts
- Internet access for microbusinesses, creating business opportunities
- Interconnection with emergency services, such as Fire Department and Civil Defense
- Educational laboratories with Internet access
- Remote surveillance
- Local or institutional news services through TV over the metropolitan network

APPLICATIONS

TRIPLE PLAY BROADBAND ACCESS

GPON technology, by means of optical access, provides users higher rates than copper and cable-based technologies, allowing voice (VoIP) and video (IPTV) convergence in a single access.

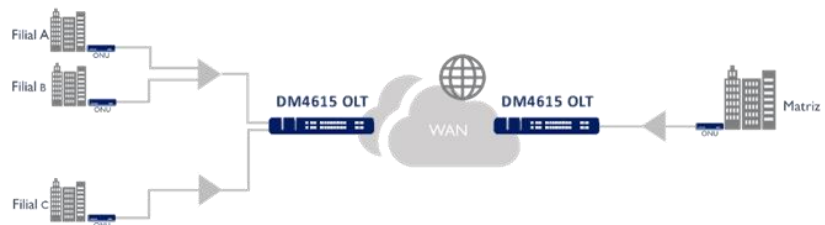
In addition, the feature of point-multipoint network and of passive elements between the central and users reduce the CAPEX and OPEX to offer these services.



CORPORATE SERVICES

The DM4615 provides various features, providing data, voice and video services for small, medium and large companies.

The TLS (Transparent LAN Service) function, together with the hairpin, provides LAN-to-LAN services without the need of additional equipment, as for example, routers.



FTTD - FIBER TO THE DESK

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

The DM4615 provides features that allow the implementation of LAN GPON networks for companies of various sizes and needs.

DIGITAL CITIES

Cities are the center of modern society and are becoming more complex every day. Technology can make life better and easier. In this context, universal public services are needed. However, the government shouldn't pay attention only to a digital inclusion network, but must also implement a high-performance network that fosters the city's development.

The implementation of the DM4615, associated with GPON equipment and DATACOM Ethernet switches, is a valuable and cost-effective solution for smart cities. Through the numerous features available, it is possible to connect public departments, provide fast, reliable and completely secure internet access to the population and companies.

LIST OF FEATURES

Features	
19" chassis height	1U
GPON (SFP+ SC/UPC) ports	16
10GBase-X (SFP+) ports	4
10/100/1000Base-T (RJ45) ports	4

GPON

- GPON Laser Class B+ and C+
- Maximum range 60km
- AES (Advanced Encryption Standard) 128 bits downstream
- DBA (Dynamic Bandwidth Allocation) and SBA (Static Bandwidth Allocation)
- FEC (Forward Error Correction) upstream and downstream
- ONU activation by serial number, password and serial number + password
- Remote firmware upgrade of the ONUs
- Supports ONU pre-provisioning
- Automatic ONU discovery
- Auto-provisioning of ONUs, including the application of profiles for ONU router
- Hairpin turn
- ONU rogue insulation
- Supports N:1, 1:1 and TLS service
- User isolation
- DHCP option 82
- PPPoE Intermediate Agent
- Static Access List IPv4
- Remote provisioning of FXS ports in ONU via OMCI
- ONU traffic monitoring
- GPON link monitoring

SWITCHING

- Configuration of auto-negotiation by interface
- Auto MDI/MDIX
- Configuration of Duplex by Ethernet interface
- Configuration of L2 Global aging
- Spanning Tree (STP) and Rapid Spanning Tree Protocols (RSTP)
- EAPS
- Static and dynamic link aggregation (LACP)
- Selective Q-in-Q
- VLAN dual mode

SECURITY

- Local and remote Syslog
- User authentication through RADIUS and TACACS+
- Unauthorized access blocking
- ACL (Access Control List) L2 and L3
- IP spoofing protection mechanisms
- Protection mechanisms for Broadcast, Multicast or DLF counterattacks

SERVICE QUALITY

- Classification of packets based on the Ethernet port, MAC, VLAN, DSCP and source/destination IP address
- P-bit (PCP) markdown
- Queue scheduling (Strict Priority and WFQ)
- DSCP mapping for COS
- 8 priority queues per port

MANAGEMENT

- IPv4 management
- In-band and Out-of-Band management
- Statistics per GPON port and per Ethernet port
- Supports commit and rollback operations
- Command Line Interface (CLI) via SSHv2, Telnet and Console RS-232
- Digital diagnostics according to SFF 8472
- Firmware rollback
- Firmware upgrade via TFTP, SCP or HTTP
- Inventory information
- SNMPv1, v2c, v3
- Supports configuration via XML (NETCONF)
- Alarm LED
- Supports storage of up to 2 firmware
- CPU use monitoring
- Supports Sntp
- Storage of up to 64 configurations in Flash memory
- CPU and system memory status available by SNMP

MULTICAST

- IGMP snooping com proxy report
- IGMPv2/v3

ROUTING (ONLY BETWEEN ETHERNET PORTS)

- Static IPv4 routing
- Routing between VLANs

SYSTEM UTILITIES

- Ping IPv4
- Telnet and SSH client

HARDWARE FEATURES

- Power redundancy
- AC power : 100 to 240Vac ($\pm 10\%$) / 50Hz or 60Hz
- DC power: -48 to -60Vdc ($\pm 20\%$)
- Overcharge and under-voltage protection
- Automatic FAN control
- Temperature monitoring
- Hot-swappable power supplies
- Hot-swappable ventilation module

SPECIFICATIONS AND STANDARDS

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
802.3ad	
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 (G-PON): Transmission convergence layer specification
G.984.4	Gigabit-capable Passive Optical Networks (G-PON): 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 to RFC1908	SNMPv2c
RFC2030	Simple Network Time Protocol (SNTP) Version 4 for IPv4, IPv6 and OSI
RFC2236	Internet Group Management Protocol, Version 2
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 to RFC3418	SNMPv3 agent
RFC3619	EAPS
RFC3986	Uniform Resource Identifier (URI): Generic Syntax

TECHNICAL SPECIFICATIONS

DM4615 OLT 16GPON+4GT+4XS		
INTERFACES	GPON (SFP+ SC/SP)	16
	1 GbE (RJ45)	4
	10G Base-X (SFP+)	4
	GE Outband Management (RJ45)	1
	Console (RJ45)	1
	USB Console	1
	Alarms	1 output and 2 inputs (*)
	LED status: Power, Fail, Sys UP	

(*) Product or feature in Roadmap. Consult Datacom for availability information.

		PSU 125 AC'	PSU 125 DC
Power Supplies	Rated Operating Voltage	100 to 240Vac ($\pm 10\%$) 50/60Hz;	-48 to -60Vdc ($\pm 20\%$)
	Rated Input Current	1.5 A @ 100Vac 0.63 A @ 240Vac	3.3 A @ -48Vdc 2.6 A @ -60Vdc
	Maximum OLT Consumption (Watts)	125W	125W

DM4615 OLT 16GPON+4GT+4XS		
Environmental Information	Operating Temperature	0°C to 65°C
	Operating Relative Humidity	0% to 95%, non-condensing
	Altitude	0 to 3000m
	Storage Temperature	-10°C to 70°C
	Storage Relative Humidity	0% to 95%, non-condensing

DM4615 OLT 16GPON+4GT+4XS

Dimensions	Height	44 mm
	Width (with L adaptors)	483 mm
	Width (without L adaptors)	446 mm
	Depth	271 mm
	Net weight (without accessories)	3.2 Kg
	Fan Module net weight	0.335 Kg

DM4615 OLT 16GPON+4GT+4XS

Scalability	Switching	148Gbits/s
	Package forwarding	110Mpps
	MAC Table	64k addresses
	VLANs	4094
	Jumbo frames (Ethernet)	9000 bytes
	Jumbo frames (GPON)	2040 bytes
	ONUs by PON link	128
	T-CONTs by PON link	768
	GEM Ports by PON link	2048
	Service-ports	4096

DM4615 OLT 16GPON+4GT+4XS

Software	DmOS	4.2 or higher
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MODELS

Product	Description
DM4615 16GPON 800.5198.xx	OLT with 16 GPON ports, 4 10 Gigabit Ethernet optical ports in SFP+ and 4 Gigabit Ethernet ports in RJ45. 100-240Vac or -48Vdc power supplies. Power supplies, fan module and SFPs must be purchased separately.

MODULES

Module	Description
PSU 125 AC 800.5187.xx	Power supply with 100Vac to 240Vac input. It allows hot swapping and operates in redundancy with backup source.
PSU 125 DC 800.5188.xx	Power supply with -48Vdc input. It allows hot swapping and operates in redundancy with backup source.
DM4615 FAN 800.5214.xx	Fan module for the DM4615 consisting of three FANs. It allows hot swapping.

ACCESSORIES

Accessory	Description
SFP GPON B+ PN: Inquire	SFP single-fiber optical module, Singlemode, 1490 nm, compatible with Digital Diagnostics, DFB, output power of 1.5 dBm and sensitivity of -28 dbm.
SFP GPON C+ PN: Inquire	SFP single-fiber optical module, Singlemode, 1490 nm, compatible with Digital Diagnostics, DFB, output power of 3 dbm and sensitivity of -30 dbm.
SFP 1GBE Optical PN: Inquire	SFP optical module for Gigabit Ethernet applications.
SFP 1GBE Electrical PN: Inquire	SFP electrical module for Gigabit Ethernet applications.
SFP 10GBE PN: Inquire	SFP+ optical module for 10 Gigabit Ethernet applications.

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