AOLT-4000
GPON OLT (ETSI)

Feature Summary

- 9 RU, ETSI 515 mm hole to hole rack mount, 500 mm aperture
- Requires front access only
- Supports card hot swap
- Redundant 1+1 controller and 1+1 aggregation switch card options
- 1+1 (from different cards) uplink protection option
- 1:1 (same card) uplink protection option
- Stable GPON
    - Complies with ITU-T G.984.x and G.988 2.488Gbps downstream and 1.244Gbps upstream
    - DBA (Dynamic Bandwidth Allocation) and QoS based on 1,024 T-CONTs per PON port
    - 128 bit AES encryption and FEC
- High performance layer 2 switching
    - Full throughput for all ports (non-blocking)
    - High capacity packet switching (16K MACs SNI, 32Kx10 MACs GPON (32K/4))
    - Powerful layer 1~ 4 filtering and QoS
    - IGMP snooping/proxy for multicasting
- Flexible SNI networking
    - 802.3ad LAG and 802.3ad LACP (option)
    - G.8031 linear and G.8032 ring ERPS V1/v2 option (future)
- Various interfaces
    - Downlink interface: 4+4 GPONs (SFPs) per GLCPx10
    - Uplink interface: 8 x 1GbE (SFP) and 2 x 10GbE (XFP) per SWT x2
- Excellent operation and management
    - Management via EMS (SNMPv2c/v3), CLI(Telnet/console) and syslog
- Security
    - Layer 1~4 packet filtering (ACL)
    - DHCP packet filtering
    - DHCP Option 82
    - MAC restriction per port
    - Broadcast/multicast/DLF packet limit
    - Port flood guard for abnormal traffic
    - Loop detection and blocking
- Dual shelf power inputs
- Dual BITS/SSU clock inputs
- Central office dry alarm contacts via the control card
- Integrated fiber management
- Forced air cooling with field replaceable air filter

Applications

The AOLT-4000 is designed for carrier central office or MSO hub environments for enabling cost-effective FTTx services.

Flexible Configuration

Two control card slots for 1+1 CTL cards. Two switch and timing slots for 1+1 SWT cards with redundant 10-GbE and 1-GbE Service Node Interfaces (SNI) uplinks. Ten line card slots for 10 GLCP cards.

Data Plane Connectivity

The AOLT-4000's data plane consists of redundant 10Gbps connections to each card slot from the two dedicated double-width SWT slots in the shelf.

Control Plane Connectivity

The AOLT-4000's control plane consists of redundant 1Gbps connections to each card slot from the two dedicated CTL slots.

Synchronization Connections

Inputs for redundant BITS/SSU timing interfaces for GPON and TDM synchronization and outputs for sourcing clocks for external synchronization use.

Switch Capacity

Dual star redundant architecture with 20 Gbps bandwidth to each card slot and 400 Gbps bandwidth total capacity.

High Availability

High availability architecture where removal or insertion of any single card does not affect existing connections on other cards. Even in a system with a single CTL card, a failure of the control card does not affect the working traffic. To increase control plane availability, a second mate CTL card can be inserted in the AOLT-4000 chassis, providing 1+1 redundancy for the control plane. Likewise to increase data plane availability, a second mate SWT card can be inserted in the AOLT-4000 chassis, providing 1+1 redundancy for the data and signaling plane.

AEMS Managed

With the CTL card installed, AOLT-4000 is either remotely or locally managed from either Alphion's Element Management System (AEMS) or with a 3rd party NMS using AEMS's north bound interface (NBI).

Fiber to the Future®

SPECIFICATIONS

GPON
Standard: ITU-T G.984.1,2,3,4 and G.988 compliant
Downstream: 2.488Gbps, 1490nm, Class B+ and C+
Upstream: 1.244Gbps, 1310nm, Class B+ and C+
Service distance: up to 60km (depending on split ratio and reach extension)
Split ratio: up to 64/128
T-CONT: 1K per OLT port
GEM ports: 4K per OLT port

Switching
Two-stage layer 2 switching (store and forward)
Switching capacity: 200Gbpsx2 Ethernet switching
Switching performance:
    Full throughput for all ports (non-blocking)
    16K MACs SNI, 32Kx10 MACs GPON (32K/4)
    4095 VLANs
Layer 2 line rate forwarding
MAC-forced forwarding (RFC4562) on SNI
Multicasting: IGMP snooping/proxy
STP (802.1d), RSTP (802.1w), MSTP (802.1s) (future)
802.3ad LAG and LACP (future)
DHCP relay with Option 82
Security:
    Packet filtering (access control list), port flood guard
    Dynamic, Reflexive, TCP intercept time based ACLs (future)
    MAC address limitation per UNI port

Protection option
G.8031 linear and G.8032 ring ERPS v1/v2

QoS
8 priority queues per port
802.1p, ToS, DSCP marking/remarking
Scheduling: SPQ, WRR, DRR
SrTcm and TrTcm
Congestion control
    Head of line blocking prevention
    Back pressure, 802.3x

Management
Alphion EMS (SNMPv2c/v3), CLI (Telnet/console), syslog, RMON
Remote software upgrade via TFTP
RADIUS, TACACS+ authentication for management access
Alarm contacts (critical, major, minor, audible, visual)
802.1ag (CFM, CCM, Linktrace) (future)
ITU-T Y.1731 (CFM,AIS, Test, MCC, PMM) (future)
NTPv4 (RFC5905) (future)
Built-in temperature sensor

System
Synchronization:
    Free run SONET/SDH Minimum Clock (SMC) internal clock
    Revertive or non-revertive protection switching option
    Redundant BITS/SSU 1544/2048 KHz and 1544/2048 Kbps inputs
    Redundant BITS/SSU 1544/2048 KHz and 1544/2048 Kbps outputs per G.812
    Automatic holdover (Stratum 3 or 3E local OCXO) on loss of reference inputs
    G.8262 SyncE (EEC option 1,2) line-timed (future)
    IEEE1588v2 PTP per G.984.3-Amd 2 (2008) (future)
Capacity:
    2 slots redundant control cards (CTL)
    2 slots (double-width) redundant switch and timing cards (SWT)
    10 slots GPON line cards (GLCP)
BITS/SSU clock:
    Two inputs 75 ohms BNC and DB9
    Two outputs 75 ohms BNC and DB9
Management ports:
    LCT MGT A 10/100Base-T
    Out-of-band MGT B 10/100Base-T
    Craft interface USB 2.0 (type B)
Alarm:
    Five outputs DB15
Power supply:
    -36 to -72 VDC, dual input individually controlled by circuit breaker
Cooling:
    Forced air cooling with fans

Dimensions
W x D x H	537 mm x 300 mm x 400 mm
Weight	46lb/17kg (chassis with fan tray)
	65lb/30kg (fully loaded)
Frame mounting	ETSI 515 mm hole to hole, and 500mm aperture

Operating environment
Temperature	-5 to +50ºC
Relative humidity	5% to 90% (non-condensing)

Compliance
EMC	EN55022, CISPR-22 Class B
Safety	EN60950, UL60950, CE
Laser safety	IEC60825-1 Class 1, ITU-T G.664
Environmental	EN300 019-1-3, QM-333 B2 category
Chassis	EN300 119-4
Transient	EN/IEC61000-4-4 (2001) level 2
Immunity	
Radiated RF	EN/IEC61000-4-3 (2002) level 2
Conducted	EN/IEC61000-4-6 (2001) level 2
Surge	EN/IEC61000-4-5 (2001) 0.5 KV (line), 1.5 KV (earth)
ESD	EN/IEC61000-4-2 (2001)
	contact level 2, air discharge level 3