Actelis Networks
ML698

Accelerate Everything

The Actelis Networks® ML698 expands our central office solutions, offering a compact and cost-effective Ethernet in the First Mile (EFM) mini-aggregation solution for low-pair count locations. The ML698 operates in a Point-to-Multipoint topology, connecting to up four ML600 Ethernet Access Devices (EADs) delivering symmetrical Ethernet access services to remote subscribers over multiple voice-grade copper pairs. Each of the ML600 EADs can be connected to the ML698 via a High Speed Link (HSL) comprised of 1-8 bonded copper pairs. Any combination of copper pairs per HSL can be supported to a total of 8 pairs per ML698 unit.

The ML698 bonds up to 8 copper pairs together to create a 2Base-TL aggregated link, implementing the standard IEEE 802.3ah-2004 (EFM) long-reach Ethernet-over-Copper specification.

Powered by Actelis Networks' award-winning EFM*plus*™ technology, the rate, reach and reliability are increased significantly using advanced Dynamic Spectrum Management (DSM) and Dynamic Rate Boost (DRB) techniques. This technology doubles the rate/reach in real-world field deployments. Combined with Actelis industry-leading XR239 EFM repeaters, the reach can be extended even further.

Interoperable with any standard Ethernet switch or router and aligned with Metro Ethernet Forum (MEF) recommendations, the ML698 allows service providers and enterprises to use existing copper infrastructure to deliver up to 100 Mbps Ethernet service per customer in G.SHDSL.bis technologies. The ML698 is equipped with 4 10/100Base-T Ethernet interfaces and an optional 100/1000Base-FX Small Form Factor (SFP). The SFP ports can accept any standard 100Base-FX, 1000Base-FX, 1000Base-T and T3/E3 modules, providing redundant aggregation uplinks to Ethernet and SONET/SDH networks.

The ML698 mini-aggregator provides 802.1q VLAN-aware wire-speed bridging, double tagging (VLAN stacking) for end-user VLAN transparency, L2 (Ethernet priority), L3 (ToS/Diff-Serv) classification with four traffic classes, RSTP/STP, link aggregation, bandwidth monitoring, multicast/broadcast limiting, and IGMP snooping for video distribution applications. The ML698 supports full Intra-switching between the HSLs connected to it.

Advanced loop diagnostics capabilities are integrated as part of the ML698, including a Time-Domain Reflectometer (TDR), enabling an effective troubleshooting tool to locate most DSL-affecting copper problems. The information gathered includes accurate end-to-end loop length measurement, as well as identification of various fault types impacting signal continuity between loop spans.

The ML698 provides proactive and dynamic tools for enhanced trouble shooting and monitoring capabilities. Advanced Carrier-class EFM OAM, including 802.3ah, CFM (802.1ag) and Y.1731 (ITU), are incorporated, offering both physical link as well as service level end-to-end advanced troubleshooting mechanisms.

The ML698 can be managed In- and Out-of-Band by the MetaASSIST™ View graphical craft application and via the multi-platform Element Management System, MetaASSIST EMS. The management protocols include standard TL1 Command Line Interface (CLI), Cisco like CLI and SNMP using standard MIBs for seamless integration with third-party Network Management Systems (NMS).

Highlights

- IEEE 802.3ah Ethernet in the First Mile (EFM) 2Base-TL Solution
- MEF Certified Ethernet Capabilities
- Rapid Service Deployment
- Superior Rate, Reach & Reliability
- Low Delay and Jitter for Voice and Video Transmission
- Carrier-Class OAM
- Worldwide Spectral Compliancy
- OSMINE, NEBS III, FCC, UL, CE
- Environmentally Hardened

Applications

- Transparent LAN Service
- Fast Internet Access
- Metro Ethernet Extension
- Private Campus Network Intra-Connection
- MDU/MTU Backhaul
- DSLAM Backhaul
- WiFi and Cellular Backhaul (Radio Access Network)
- Leased Lines Replacement

Markets Served

- RBOCs, PTTs, Independent Operators, Competitive Operators
- Federal, State and Local Government Agencies
- Education, Health Care, Utilities, Private Campuses

Actelis
Networks

XLR8

Specifications

Interfaces

Ethernet (Network/User)
- 10/100Base-T   4 ports
    - Connector: RJ45, Auto-MDIX
- 100/1000Base-FX
    - Connector: 1 port (option) SFP Based MSA compliant

High Speed Link (Bonded Copper Pairs)
- Max HSLs: 4
- Protocol   IEEE 802.3ah 2Base-TL
- Line code   ITU-T G.991.2 rev. 2
- Bandwidth per HSL   1 - 100 Mbps (symmetrical)
- Copper Pairs per HSL   1-8
    - Connector: RJ45 (per modem/pair)
- End-to-end Delay   2-4 ms (typical)
- Spectral Compliance   ITU-T G.991.2 (Annex A, B, F, G)
    - ETSI TS 101 524 (Annex E)
    - ANSI T1.417, T1.426
    - Per-country regulatory compliant spectral modes
- Spectral Friendliness   Dynamic Spectral Shaping (DSS)
- Cross-talk Cancellation   Dynamic Rate Boost (DRB)
- Sealing Current   48VDC/4mA nominal

TDR
- Loop length measurement   Fault types identifications (presence & location)

Management (Out-of-Band)
- 10/100Base-T
    - Connector: RJ45, Auto-MDIX
- Craft   EIA RS-232 (DCE)
    - Connector: DB9
- PFU management

LAN Protocols
- Dynamic Bridging   IEEE 802.1, 8K MAC addresses
- Discovery Mechanisms   LLDP
- VLAN Tagging   IEEE 802.1Q
- Double Tagging   Q-in-Q
- RSTP, STP   IEEE 802.1d
- Link Aggregation   IEEE 802.3ad
- Provider Bridges   IEEE 802.1ad
- IGMP snooping   IGMP V1/V2
- OAM   IEEE 802.3ah clause 57
    - IEEE 802.1ag
    - ITU Y.1731

Management

Protocols
- SNMP   SNMP v1 and v2c
- Command Line Interface   TL1, CLI
- Remote Access   Telnet
- Secure Access (option)   SSH v2
- Time Synchronization   SNTP v3
- Web Access   HTTP
- File transfer   FTP, TFTP
- IEEE 802.3ah EFM OAM   Dying Gasp
- User Authentication   RADIUS and/or local passwords

Metro Ethernet Forum – Advanced Service Provisioning and Traffic Management

Quality of Service
- Classes of Service   4
- Scheduler   WFQ, SP
- Classification   L2 802.1p/Q priorities
    - L3 ToS/DiffServ

Applications
- EMS   MetaASSIST EMS
- Craft GUI   MetaASSIST View

Front Panel Indicators (LEDs)
- Power
- Status
- Alarm
- MLP per modem/pair
- ACT (Activity), LNK (Link) per Ethernet/HSL port

Alarm Contacts
- Terminal Block   2 Input, 1 Output

Physical
- Dimensions Height: 1.6" / 40mm (1U)
    - Depth: 11.0" / 280mm
    - Width: 8.4" / 213mm
- Weight   3.75 lbs / 1.7 Kg
- Mounting Rack: 2 units in 19", 23" or ETSI racks Desktop, Wall Mount
- Power   DC: -48/-60 VDC nominal
    - 17 Watt
    - AC: 90-264 VAC, 47-63 Hz
    - 21 Watt

Environmental
- Operating Temp.   -40° to +65°C
- Storage Temp.   -40° to +70°C
- Relative humidity   Up to 95%, non-cond.

Regulatory Approval/Certifications

Metro Ethernet Forum
- MEF 9, 14

Safety
- UL 60950, CSA C22.2 60950
- EN 60950, IEC 60950

EMC
- FCC Part 15 Class B
- ICES-003 Class B
- ETSI EN 300 386 Class B
- ETSI ETS 300 132-2
- ITU-T K.20, K.21

NEBS
- Level III (GR-1089-CORE, GR-63-CORE)

CE
- EMC and Safety

Environmental
- GR-63-CORE
- ETSI ETS 300 019

CARRIER ETHERNET
MEF Certified Compliant

Pb RoHS 6 COMPLIANT

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