#1 GLOBAL SUPPLIER OF EFM OVER COPPER

INFONETICS RESEARCH

Actelis Networks
ML684

Accelerate Everything

The ML684 Ethernet Access Device (EAD) from Actelis Networks® is a copper Add-Drop EAD that enables delivery of high-speed Carrier Ethernet services over existing copper and fiber infrastructure with speeds up to 60 Mbps of symmetrical Ethernet traffic over copper. As a 4 copper pair model, the ML684 takes in the copper pairs and allows them to be split into two directions, thereby allowing multiple nodes to be connected to each other over copper in a linear chain or ring configuration. Each node has full switching capabilities and can drop and add Ethernet traffic at each location while transferring the rest of the traffic through. The ML684 EAD can also be deployed as a mini-CO supporting EADs. With its superior performance, extensive functionality and low cost, the ML684 EAD offers rapid service delivery and allows for complete utilization of the existing network infrastructure.

The ML684 EAD is interoperable with any standard Ethernet switch, router or hub. Compliant with Metro Ethernet Forum (MEF) specifications, ML684 EAD systems seamlessly integrate into carrier Ethernet networks. Equipped with 4 10/100Base-T Ethernet interfaces and an optional 100/1000Base-FX Small Form Factor (SFP) port, the ML684 EAD allows assignment of a service or a customer per port. The ML684 EAD model lets service providers, enterprises and municipalities create an intelligent Ethernet access edge with bandwidth limiting per ingress port and traffic shaping on the Ethernet Access uplink (HSL).

Powered by Actelis Networks' award-winning, patented EFMplus™ technology, the rate, reach and reliability are increased significantly using advanced Dynamic Spectrum Management (DSM) techniques. This technology provides the best rate/reach performance and most resilient fiber-quality transmission, ensuring carrier-class reliability.

The ML684 EAD 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, as well as IGMP snooping for video distribution applications.

The ML684 EAD 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 ML684 EADs 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 and SNMP using standard MIBs for seamless integration with third-party Network Management Systems (NMS).

Highlights

- Support for 2 High Speed Copper Links
- 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, NEMA II
- Environmentally Hardened

Applications

- Security Cameras
- Traffic cameras
- Railway connectivity (ticketing, arrival info, security cameras, etc)
- Traffic Management (Security and traffic cameras)
- Private Campus Network ring

Markets Served

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

Actelis Networks

XLR8

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MOBILITY & TRAFFIC EXPERTS

ML684

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)
- Protocol   IEEE 802.3ah 2Base-TL
- Line code   ITU-T G.991.2 rev. 2
- Bandwidth   Up to 60 Mbps (symmetrical)
- Number of Copper Pairs   4 (2 high speed links each of 2 copper pairs)
  - Connector: RJ45 (per modem/pair)
- End-to-end Delay   2-4 ms (typical)
- Spectral Compliance   ITU-T G.991.2 (Annex A, B, F) ETSI TS 101 524 (Annex E) ANSI T1.417, T1.426 Per-country regulatory compliant spectral modes
- Sealing Current   48VDC/1.5mA nominal

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

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 (EFM OAM) IEEE 802.1ag ITU Y.1731

Management

Protocols
- SNMP   SNMP v1 and v2c
- Command Line Interface   TL1
- 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/Diff Serv

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 +74°C
- Storage Temp.   -40° to +74°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
- NEMA II Thermal

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