

Actelis Networks ML688



Carrier Ethernet Over Copper™

The ML688 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 100 Mbps of symmetrical Ethernet traffic. An 8 copper pair model, the ML688 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 ML688 EAD can also be deployed as a mini-CO supporting EADs. With its superior performance, extensive functionality and low cost, the ML688 EAD offers rapid service delivery and allows for complete utilization of the existing network infrastructure.

The ML688 EAD is interoperable with any standard Ethernet switch, router or hub. Compliant with Metro Ethernet Forum (MEF) specifications, ML688 EAD systems seamlessly integrate into carrier Ethernet networks. Equipped with 4 10/100Base-T Ethernet interfaces and an optional 1000Base-FX Small Form Factor (SFP) port, the ML688 EAD allows assignment of a service or a customer per port. The ML688 EAD model lets service providers 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 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 ML688 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 and advanced OAM.

The ML688 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).

The ML688 EADs provide full Carrier Ethernet over Copper access functionality, including basic traffic management and QoS application at the edge. One hundred percent compatible with Carrier Ethernet switching equipment in the CO, the ML688 EAD provides basic bandwidth management and QoS at the edge, making the most efficient use of the bandwidth in the copper access network.

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
- Worldwide Spectral Compliancy
- OSMINE, NEBS III, FCC, UL, CE
- 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

ML688



Specifications

Interfaces

Ethernet (Network/User)

- 10/100Base-T 4 ports
Connector: RJ45, Auto-MDIX
- 100/1000Base-FX 1 port (option) SFP Based
Connector: 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 100 Mbps (symmetrical)
- Number of Copper Pairs 8 (2 high speed links each of 4 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
- OAM IEEE 802.3ah clause 57 (EFM OA&M)
- IEEE 802.1ag

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 (per model)
AC: 90-264 VAC, 47-63 Hz, 21 Watt

Environmental

- Operating Temp. -40° to +74°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



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