Actelis Networks

ML640

GLOBAL SUPPLIER OF EFM OVER COPPER

INFONETICS RESEARCH 2005 2010

Accelerate Everything

The ML640 Ethernet Access Device (EAD) from Actelis Networks® is the most intelligent Ethernet service delivery on the market. Using the existing copper network, the ML640 can deliver up to 100 Mbps of symmetrical Ethernet traffic at fiber quality over existing voice-grade copper. The ML640 comes in two models capable of supporting either 4 or 8 copper pairs, and has 2 optional SFP interfaces supporting 100/1000Base-FX optical connections.

The ML640 EAD can be deployed back-to-back in a Point-to-Point topology or in Multi-Point topologies with Actelis' Ethernet aggregation switches. With its superior performance, extensive functionality and low cost, the ML640 EAD offers rapid service delivery and allows for complete utilization of the existing network infrastructure.

The ML640 EAD is interoperable with any standard Ethernet switch, router or hub. Compliant with Metro Ethernet Forum (MEF) specifications, ML640 EADs seamlessly integrate into carrier Ethernet networks. Equipped with four 10/100Base-T Ethernet interfaces and 2 optional 100/1000Base-FX Small Form Factor (SFP) ports, the ML640 EAD allows assignment of a service or a customer per port. DS3/E3 uplinks can be used to connect to legacy networks instead of the 100/1000Base-FX SFPs.

The ML640 EAD models let service providers create an intelligent Ethernet access edge with advanced bandwidth control and traffic management features, fully compliant with the MEF 9 and 14 specifications. The ML640 enables flexible service provisioning using Ethernet Virtual Connections (EVCs) with flexible mapping and Quality of Service (QoS) capabilities that maximize the efficiency of access bandwidth. The ML640 enforces Service Level Agreements (SLAs) for each subscriber and Class of Service based on the MEF 10 traffic management model, allowing service providers to safely aggregate multiple services or multiple subscribers on the same Ethernet access uplink. All ML640 EAD models provide 802.1q VLAN-aware wire-speed bridging, double tagging (VLAN stacking) for end-user VLAN transparency, L2, L3 and L4 classification with eight traffic classes, RSTP/STP, bandwidth monitoring, Multicast/Broadcast limiting, as well as IGMP snooping for video distribution applications.

Powered by Actelis' award-winning, patented 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 provides the best rate/reach performance and most resilient fiber-quality transmission, ensuring carrier-class reliability, and can double the rate/reach in real-world deployments. When combined with Actelis' industry-leading XR239 EFM Repeaters, the reach can be extended even further.

The ML640 EADs provide 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 ML640 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 command line interface and SNMP using standard MIBs for seamless integration with third-party Network Management Systems (NMS).

Highlights

- Standards-based IEEE 802.3ah Ethernet in the First Mile (EFM) 2Base-TL transport
- MEF 9 and MEF 14 Certified Carrier Ethernet Switch
- 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

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XLR8

ML640

Specifications

Interfaces

Ethernet (Network/User)

- 10/100Base-T — 4 ports
  - Connector: RJ45, Auto-MDIX
- 100/1000Base-FX — 2 ports (option)
  - Connector: 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 — 1-100 Mbps (symmetrical)
- Number of Copper Pairs — 4-8
  - 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/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, 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

- EVCs — 8
- Mapping Rules — 16 ingress rules (Port/VLAN/L2/L3/L4 Flexible)
- BW profiling — CIR, CBS, EIR, EBS per EVC
- Frame Marking — 2 rate, 3 color traffic management (green, yellow, red) ingress policing
- CoS Marking — Per EVC L2/L3 marking

Quality of Service

- Classes of Service — 8
- 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, 13.5-17 Watt (per model)
  AC: 90-264 VAC, 47-63 Hz, 17-21 Watt (per model)

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

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