Actelis Networks™

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INFONETICS RESEARCH

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ML684D Ethernet Access Device

The ML684D Industrial Ethernet Access Device (EAD) from Actelis® is a small form factor Add-Drop EAD that enables delivery of symmetrical high-speed Ethernet services over existing copper and fiber infrastructure. Up to 60 Mbps of symmetrical Ethernet traffic over copper and 1Gbps over fiber.

Designed for Industrial, utility and traffic applications, The ML684D takes in two fiber ports or four copper pairs and allows them to be split into two directions, east and west, thereby allowing multiple nodes to be connected over copper or fiber 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 ML684D offers extremely small factor and DIN rail mounting for flexible deployment within utilities, traffic and industrial cabinets. With its superior performance, extensive functionality, high robustness and reliability, the ML684D EAD offers rapid service delivery and allows for complete utilization of the existing network infrastructure.

Interoperable with any standard Ethernet switch, router or hub and compliant with Metro Ethernet Forum (MEF) specifications, ML684D EAD systems seamlessly integrate into carrier Ethernet networks. Equipped with six 10/100Base-T Ethernet interfaces and two 100/1000Base-FX Small Form Factor (SFP) port, the ML684D EAD allows assignment of a service or a customer per port.

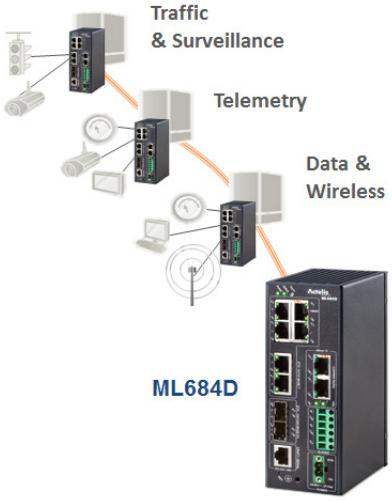
The ML684D is a hardened EAD designed for flexible deployment in harsh environments. It complies with NEMA 4 extended temperature requirements and K.21/K.45 for extended protection against overvoltages and over-currents.

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

The ML684D 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, band-width monitoring, Multicast/Broadcast limiting, as well as IGMP bandwidth snooping for video distribution applications.

The ML684D 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 MetaASSIST™ View graphical craft application and the MetaASSIST EMS multi-platform Element Management System offer in- and out-of-band management of the ML684D. 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 two High Speed Copper Links
- Small form factor, no fan, DIN railing
- Environmentally hardened
- IEEE 802.3ah Ethernet in the First Mile (EFM) 2Base-TL Solution
- CE 1.0
- Rapid Service Deployment
- Superior Rate, Reach & Reliability
- Low Delay and Jitter for Voice and Video Transmission
- Carrier-Class OAM
- Worldwide Spectral Compliancy
- FCC, UL, CE, NEMA 4

Applications

- Telemetry
- IP-based Traffic Controllers
- Smart Grid Sensors
- Dynamic Message Signs
- HD Video Cameras & Streaming
- Vehicle Detection
- Smart Parking
- Emergency Response
- Supports & Complements City Wi-Fi Access

ML684D

Specifications

Interfaces

Ethernet (Network/User) - 8 port switch

- **10/100Base-T:** 6 ports, Connector: RJ45, Auto-MDIX
- **100/1000Base-FX:** 2 ports **Connector:** SFP Based, MSA compliant

High Speed Link (HSL) - Bonded copper pairs

- **Protocol:** IEEE 802.3ah 2Base-TL
- **Line code:** ITU-T G.991.2 rev. 2
- **Number of copper pairs:** 4, **Connector:** RJ45 x 2
- **Number of HSLs:** 1 HSL- up to 4 pairs, 2 HSLs- east/west, 2 pair each
- **Bandwidth per HSL:** 1 HSL - up to 60 Mbps; 2 HSLs up to 30Mbps
- **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
- **Sealing Current:** 48 VDC/1.5mA nominal (sink)

Serial interface*

- RS-232/RS-485 terminal server **Connector:** RJ45

Management (Out-of-Band)

- **10/100Base-T Connector:** RJ45, Auto-MDIX
- **Craft:** EIA RS-232 (DCE) **Connector:** RJ45

Alarm Contacts

- Terminal Block, 2 Input, 1 Output

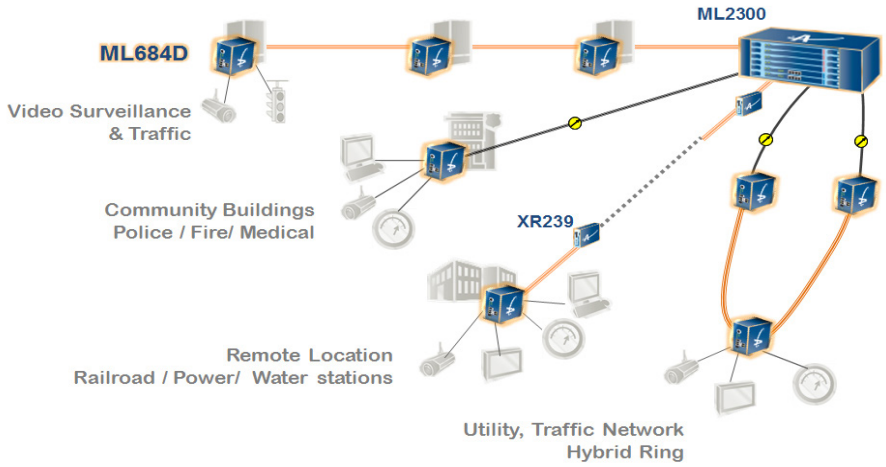
LAN Protocols

- **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, Ethernet loopback with MAC swap

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



Management

Management Applications

- **EMS**: MetaASSIST EMS
- **Craft GUI**: MetaASSIST View

Protocols

- **SNMP:** SNMP V3, V2C, V1
- **IP addresses:** IPV4 and IPV6
- **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

Front Panel Indicators (LEDs)

- **Power**
- **Status**
- **Alarm**
- **MLP per modem/pair**
- **ACT (Activity) per Ethernet port**
- **LNK (Link) per Ethernet/HSL port**

Physical

- **Dimensions: Height:** 5.95" / 151 mm, **Depth:** 5.1" / 130 mm, **Width:** 2.3" / 58 mm
- **Weight:** 1.76 lbs / 0.8 kg
- **Mounting**: Din Rails, Wall Mount
- **Power DC:** -24/-48 VDC nominal, 9 Watt **AC:** 90-264 VAC

Environmental

- **Operating Temp.** -40° to +74°C
- **Storage Temp.** -40° to +75°C
- **Relative humidity:** Up to 95%, non condensing

Regulatory Approval/Certifications

Metro Ethernet Forum

- CE 1.0 - MEF 9, 14

Safety

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

EMC

- FCC Part 15 Class A
- ICES-003 Class A
- ETSI EN 300 386 Class A
- ETSI ETS 300 132-2
- ITU-T K.21, K.45

CE

- EMC and Safety

Environmental

- ETSI ETS 300 019
- NEMA 4 Thermal

* Future Support, Utilizing same port as craft interface

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