

Actelis Networks ML1300

Carrier Ethernet Over Copper™

The ML1300 is an Ethernet in the First Mile (EFM) aggregation switch, delivering symmetrical Ethernet services to remote subscribers over multiple voice-grade copper pairs within the customer service area. The ML1300 allows service providers and enterprises to use the existing copper infrastructure to deliver up to 100 Mbps of Ethernet service per customer. It achieves unprecedented rate, reach and reliability on any grade of available copper and installs within minutes, enabling immediate deployment of broadband services. The ML1300 is interoperable with any standard Ethernet switch or router. Aligned with Metro Ethernet Forum (MEF) recommendations, Actelis Networks® systems seamlessly integrate into carrier Ethernet networks.

Architecturally, the ML1300 platform serves as a central office aggregator in a Point-to-Multipoint topology, connecting to multiple ML600 Ethernet Access Devices (EADs). Each ML600 EAD or ML1300 can be connected to the ML1300 via a High Speed Link (HSL) comprised of 1-8, or 1-32, bonded copper pairs, respectively. A number of ML1300 shelves can be stacked in a star or ring topology, providing higher port density per uplink.

The ML1300 provides two Service Dispatcher Unit (SDU) slots and four Multi-port Line Unit (MLU) slots, allowing incremental service growth, equipment redundancy and flexible modem allocation (any modem to any HSL) using pluggable cards. A variety of SDU and MLU cards exist, supporting different numbers of Ethernet and up to 128 modem ports, either using the MLU-16N line unit (116 G.SHDSL.bis modems per card) or using the MLU-32EF line unit (32 .SSHDSL.bis modems per card).

The ML1300, equipped with MLU-32EF cards, may also use up to 4 repeaters in a span across up to 64 pairs per system using XR239 EFM Repeaters to increase the loop length and by using up to 8 concatenated remote powering units, PFU-8 or PFU-8E. *Note: 4 repeaters per span requires double-sided feeding when using the PFU-8E as the remote powering unit.*



Small form factor ports accept standard 100Base-FX, 1000Base-FX, 1000Base-T and T3/E3 modules, providing redundant uplinks to Ethernet and SONET/SDH networks.

Implementing the standard IEEE 802.3ah-2004 EFM long-reach Ethernet-over-Copper specification, the ML1300 bonds up to 8 copper pairs together to create a 2Base-TL aggregated link. Powered by Actelis Networks® award-winning EFMplus™ technology, the rate, reach and reliability are increased significantly using advanced Dynamic Spectrum Management (DSM) and Dynamic Spectral Shaping (DSS) techniques.

The ML1300 supports current and evolving Ethernet Quality of Service (QoS) and Type of Service (ToS) requirements, and has the highest available packet throughput efficiency.

The ML1300 provides 802.1q VLAN-aware wire-speed bridging, double tagging (VLAN stacking) for end-user VLAN transparency, L2 (Ethernet priority) and L3 (ToS/DiffServ) classification with eight hybrid scheduled traffic classes, RSTP/STP, bandwidth monitoring, HSL rate limiting and Link Aggregation (LAG) on all Ethernet ports.

The ML1300 can be managed In-Band and Out-of-Band by Actelis' MetaASSIST™ View graphical craft application and via our multiplatform 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.

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
- 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
- WiFi and Cellular Backhaul (Radio Access Network)
- MDU/MTU Backhaul
- DSLAM Backhaul

Markets Served

- RBOCs, PTTs, Alternative Carriers and IOCs
- Federal, State and Municipalities
- Education, Health Care, Utilities, Private Campuses

ML1300



Specifications

System

- Modem Line Cards 4 (MLU-16N), 2 (MLU-32EF)
- Max. Copper Pairs 64
- End-to-end Delay 2-4 ms (typical)

Product Interfaces

Ethernet (Network/User)

- 10/100Base-T 2 ports
Connector: RJ45, Auto-MDIX
- 10/100/1000Base-T (option) 2 ports
Connector: RJ45, Auto-MDIX
- 100/1000Base-FX (option) 2 ports
Connector: SFP based, MSA compliant

High Speed Link (Bonded Copper Pairs)

- Max HSLs 32
- Protocol IEEE 802.3ah 2Base-TL
- Linecode ITU-T G.991.2 rev. 2
- Bandwidth per HSL 1-100 Mbps (symmetrical)
- Copper Pairs per HSL 1-32
Connector: 50-pin telco rear access for MLU-16N and 2x50-pin telco front access for MLU-32EF
- Spectral Compliancy ITU-T G.991.2 (Annex A, B, F, G)
ETSI TS 101 524 (Annex E)
ANSI T1.417, T1.426
NICC ND1602 (ANFP)
BIPT BRUC 2005
- Sealing (Wetting) Current 48V/4mA nominal (MLU-16N); 1.5mA nominal for MLU-32EF
- TDR MLU-32EF

Management (Out-of-Band)

- 10/100Base-T Connector: RJ45, Auto-MDIX
- Craft EIA RS-232 (DCE)
Connector: DB9
- Dialup Modem EIA RS-232 (DTE)
Connector: DB9
- Alarm Contacts 4 Input; 4 Output
Connector: DB15 and Wire-wrap

External Loop Test

- RLM-16MT 2 RJ45 connectors for external metallic loop testing (MLU-16N only) allows any copper pair to be connected to the MLT test port

LAN Protocols

- Dynamic Bridging IEEE 802.1, 8K MAC addr.
- VLAN Tagging IEEE 802.1Q
- Double Tagging Q-in-Q, VMAN
- RSTP, STP IEEE 802.1d
- Link Aggregation IEEE 802.3ad
- Provider Bridges IEEE 802.1ad

Quality of Service

- Classes of Service 8
- Scheduler WFQ, SP or hybrid
- Queue Management Tail Drop or RED
- Classification L2 802.1p/Q priorities
L3 ToS/DiffServ

Front Panel Indicators and Controls

System

- Power A/B
- Critical • Major • Minor • HSL/RMT Alarm Button
- ACO (Alarm Cut-Off) / LMT (Lamp Test)

Card

- Active
- ACT (Activity)
- Status
- LNK (Link) per Ethernet port

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
- EFM OA&M IEEE 802.3ah
- CFM IEEE 802.1ag

Applications

- EMS MetaASSIST EMS
- Craft GUI MetaASSIST View

Physical

- Mounting Rack: 19", 23" or ETSI front access racks
- Dimensions Height: 7" / 175mm (4U) or 10.8" / 274mm (ETSI chassis)
Depth: 12" / 305mm or 11" / 280mm (ETSI chassis)
Width: 21.32" / 538mm or 17.2" / 436mm (19" and ETSI chassis)
- Weight 19lbs / 8.6 Kg (chassis only) or 16.75lbs / 7.6Kg or (19" and ETSI chassis)
- Plug-in Cards 6 horizontal, front loading
- Power DC: -48/-60 VDC nominal, dual A+B
110 Watt for minimal system
205 Watt for fully loaded system

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 A
- ICES-003 Class A
- ETSI EN 300 386
- ETSI ETS 300 132-2
- ITU-T K.20

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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