

Actelis Networks ML2300



Carrier Ethernet Over Copper™

Available with front and rear access for International and North American markets, respectively, the ML2300 is the next generation of Actelis Networks® Ethernet in the First Mile (EFM) aggregation switches, delivering symmetrical Ethernet access services to remote subscribers over multiple voice-grade copper pairs within the customer service area. Interoperable with any standard Ethernet switch or router and aligned with Metro Ethernet Forum (MEF) recommendations, the ML2300 allows service providers and enterprises to use existing copper infrastructure to deliver up to 100 Mbps Ethernet service per customer in G.SHDSL.bis technologies, and has the infrastructure ready for advanced Layer 1 and Layer 2 applications and features available in future releases. The ML2300 also achieves unprecedented rate, reach and reliability on any grade of available copper and installs within minutes, enabling immediate deployment of broadband services.

Architecturally, the ML2300 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 ML130 can be connected to the ML2300 via a High Speed Link (HSL) comprised of 1-8, or 1-32, bonded copper pairs, respectively. A number of ML2300 shelves can be stacked in a star or ring topology, providing higher port density per uplink.

The ML2300 provides two Service Dispatcher Unit (SDU) slots and four Multiport 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 modem ports. The MLU-32EF and MLU-32ER line unit offer 32 G.SHDSL.bis modems per card, reaching up to 128 modems per shelf. The SDU-400 and SDU-300 linecard series offer advanced Ethernet switching capability as well as flexible network integration via multiple interfaces. Two SDU-400 cards can be installed to offer a carrier-class redundant configuration, enabling high-service availability.

An ML2300 system may use XR239 EFM Repeaters to increase the loop rate and reach of its pairs. Up to four repeaters connected in series may be remotely powered by Actelis' Power Feed Unit (PFU). Time-Domain Reflectometer (TDR) capability, integrated as part of the ML2300, enables an effective troubleshooting tool to locate most DSL-affecting copper problems. The information gathered includes accurate end-to-end loop length measurement, as well as identification of various fault types impacting signal continuity between loop spans. The ML2300 also provides a variety of redundant uplinks to Ethernet and SONET/SDH networks. Multiple Small Form-factor Pluggable (SFP) ports accept standard 100Base-FX, 1000Base-FX, 1000Base-T and T3/E3 modules.

Implementing the standard IEEE 802.3ah-2004 (EFM) long-reach Ethernet-over-Copper specification, the ML2300 bonds up to 32 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 ML2300 supports current and evolving Ethernet Quality of Service (QoS) and Type of Service (ToS) requirements, and has the highest available packet throughput efficiency. Additionally, the ML2300 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 8 hybrid scheduled traffic classes, RSTP/STP, bandwidth monitoring, HSL rate limiting, and Link Aggregation (LAG) on all Ethernet ports.

The ML2300 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 (NMS).

Highlights

- IEEE 802.3ah Ethernet in the First Mile (EFM) 2Base-TL Solution
- MEF Certified Ethernet Capabilities
- Rapid Service Deployment
- Carrier-Class Redundancy
- 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
- MDU/MTU Backhaul
- DSLAM Backhaul

Markets Served

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

ML2300



Specifications

System

- Network Processor Cards 2, SDU-400 Series
2, SDU-300 Series
- Modem Line Cards 4, MLU32-ER (rear access) or
4, MLU32-EF (front access)
128
- Max. Copper Pairs 2-4 ms (typical)
- End-to-End Delay

Product Interfaces

Ethernet (Network/User)

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

Ethernet (Network/User)

- 10/100/1000Base-T
Connector: RJ45, Auto-MDIX
- 100/1000Base-FX
Connector: SFP-based, MSA compliant

High Speed Link (Bonded Copper Pair Link)

- Max HSLs 64
- Protocol IEEE 802.3ah 2Base-TL
- Linecode ITU-T G.991.2 rev. 2
- Bandwidth per HSL 1-100 Mbps (symm)
- Copper Pairs per HSL 1-8 and up to 32
Connector: 2x50-pin telco front access for MLU-32EF; 1x64-pin telco rear access for MLU-32ER
- Spectral Compliancy 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 (Wetting) Current 48V/1.5mA nominal

Management (Out-of-Band)

- 10/100Base-T
Connector: RJ45, Auto-MDIX
- Craft EIA RS-232 (DCE)
DB9
- Dial-up Modem EIA RS-232 (DTE)
DB9
- Auxiliary port For PFU-8 Remote Management
(with SDU-400 series only)
RJ45T port
- Alarm Contacts 4 Input; 4 Output
Connector: DB15 and Wire-wrap

Line Diagnostics

- TDR Loop length measurement fault types identifications (presence & location)

External Loop Test

- MLT 2 RJ45 connectors for external metallic loop testing (MLT) allows any copper pair to be connected to the MLT test port

Clock Synchronization

- External Port Clocks 2 RJ45 ports to external clock sources (with SDU-400* series only)

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

- Hybrid Scheduling WFQ, SP
- Classification L2 802.1p/Q priorities
L3 ToS/DiffServ

Front Panel Indicators

System

- Power A/B
- Critical • Major • Minor • HSL/FAN 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 clause 57
- CFM IEEE 802.3ag

Applications

- EMS MetaASSIST™ EMS
- Craft GUI MetaASSIST™ View

Physical

- Chassis 19" and ETSI
- Mounting Rack: 23", 19", or ETSI rack
- Dimensions Height: 7" / 178mm (4U) or 225 mm (for ETSI chassis)
Depth: 12" / 305mm or 11" / 280 mm (for ETSI chassis)
Width: 17.32" / 440 mm
15.0 lbs/ 6.8 Kg (chassis only)
6 horizontal, front loading
- Weight
- Plug-in Cards DC: -48/-60 VDC nominal, dual A+B
110W Min. configuration (1xSDU+1xMLU)
225W full chassis w/o SDU redundancy (1xSDU+4xMLU)
275W full chassis with SDU redundancy (2xSDU+4xMLU)

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, 10, 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



526R00180E
Revised 01-15-09

Corporate Headquarters

6150 Stevenson Blvd. | Fremont, CA 94538, USA
Tel. 1.866.ACTELIS | Tel. 1.510.545.1045
Fax. 1.510.545.1075
email: sales@actelis.com

©2009 Actelis Networks Inc. and the Actelis Networks logo are registered trademark of Actelis Networks, Inc. MetaASSIST, EFMplus and Carrier Ethernet over Copper are trademarks of Actelis Networks, Inc. Actelis Networks reserves the right to change product specifications at any time without notice. All Rights Reserved.

Note: *Future Release