High Performance
High Quality

Specifications

Interfaces

Ethernet (Network/User)

• 10/100Base-T	4 ports
Connector:	RJ45, Auto-MDIX
• 100Base-FX/1000Base-FX	1 port (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	1- 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) ETSI TS 101 524 (Annex E) ANSI T1.417, T1.426 NICC ND1602 (ANFP) BIPT BRUO 2005
• Sealing Current	48VDC/4mA 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
• VLAN Tagging	IEEE 802.1Q
• Double Tagging	Q-in-Q
• MSTP, RSTP, STP	IEEE 802.1d
• EFM OAM, CFM	IEEE 802.3ah, 802.1ag

Quality of Service

• Classes of Service	4
• Scheduler	WFQ, SP
• Classification	L2 802.1p/Q priorities L3 ToS/DiffServ

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
• IEEE 802.1ag CFM	

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 +74°C
• Storage Temp.	-40° to +74°C
• Relative humidity	Up to 95%, non-cond.

Regulatory Approval/Certifications

Metro Ethernet Forum

- MEF 9, 14, 18* (* some ML600 models)

NEMA

- NEMA TS-2

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

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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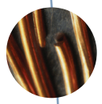
Intelligent Transportation
Ethernet Access Devices

High Bandwidth

Extended Rate and Reach

Intelligent Traffic Systems

Cities and counties rely on a network of copper cables to interconnect their traffic control signaling systems. The low-speed analog modems used in these interconnects can typically support only the most basic traffic signaling functions due to performance limitations. Recent advancements in high-speed communication technology, including DSL and Ethernet in the First Mile (EFM), can now provide in excess of 10 Mbps symmetrical data service per pair over the same copper interconnect network.

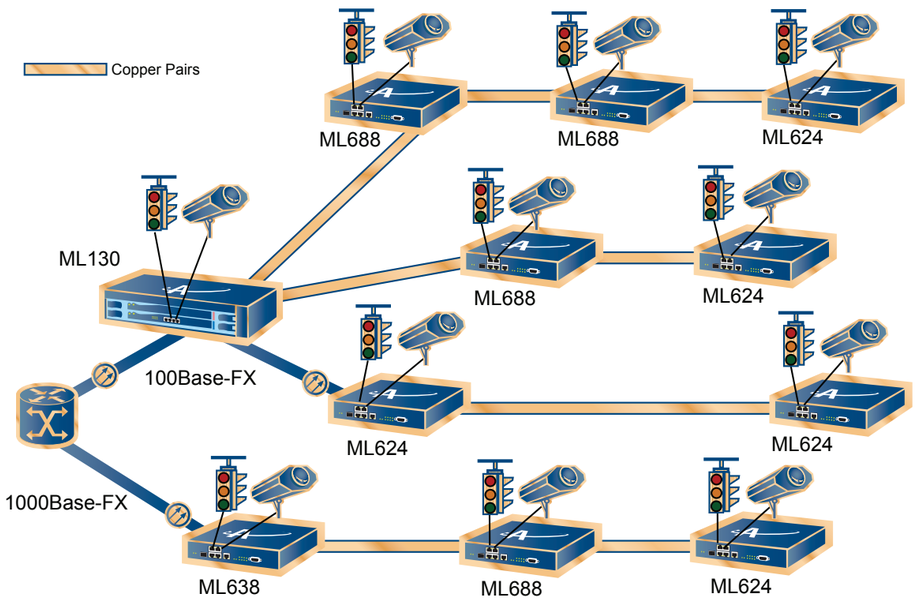


Actelis Networks' meets and exceeds this performance with our award-winning EFM*plus*™ Ethernet over copper platforms that can bond up to eight copper pairs together to deliver up to 100 Mbps of data transport, supporting a whole new generation of bandwidth-hungry applications. By deploying Actelis EFM solutions, city traffic departments can enhance their remote command, control and communication, providing innovative new traffic and telecommunications applications that include remote security camera surveillance, wireless network connectivity, and others without the cost of deploying expensive fiber-optic networks.

The Actelis solution enables cities to add Intelligent Transportation System Traffic Controllers and support citywide Wi-Fi initiatives in the most cost-effective way. Additionally, these new applications can be supported at higher data rates and with better security, when compared to wireless backhaul alternatives. Deployed in more than 35 countries, Actelis Networks provides high-performance Ethernet over copper transport platforms that are being used in metropolitan centers worldwide, supporting some of the most demanding telecommunications and municipal applications.

ML600 Ethernet Access Devices

Available in 2 to 8 copper pairs and fiber configurations, the ML600 family of EADs can be deployed in a Point-to-Point configuration, optional copper Add-Drop Chain, or in a Point-to-Multipoint configuration with Actelis' EFM switches. All ML600 models provide 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 four traffic classes, RSTP/STP, bandwidth monitoring and Multicast/Broadcast limiting. With its superior performance, extensive functionality and low cost, the ML600 platforms offer rapid service delivery and allow for complete utilization of the existing network infrastructure.



ML130/1300/2300

The ML130, ML1300 and ML2300 are Point-to-Multipoint EFM aggregation switches, delivering symmetrical Ethernet services over multiple voice-grade copper pairs They offer up to 100 Mbps per customer over copper and up to 400 Mbps over fiber. Architecturally, the ML1300 and ML2300 units can serve as a Traffic Operations Center (TOC) aggregator for multiple Actelis platforms. A variety of SDU and MLU cards exist, supporting different numbers of Ethernet and modem ports. Small Form Factor (SFP) ports accept standard 100Base-FX, 1000Base-FX, and 1000Base-T modules, providing redundant uplinks to Ethernet networks.

Comprehensive Element Management

The Actelis platforms 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 3rd party Network Management Systems (NMS).

Copper Add-Drop EADs

The Copper Add-Drop EADs allow multiple nodes to be connected to each other over copper in a linear chain or ring configuration. Each node has the full switching capabilities of the ML600 EAD, and can drop and add Ethernet traffic at each location while passing the rest of the traffic through. With up to 100 Mbps aggregated traffic, the copper Add-Drop EAD is a powerful tool for distribution of Ethernet traffic across linear/ring copper networks. A choice of optical interfaces accommodates short and long distances as needed with speeds of 100 Mbps or 1000 Mbps with connections over the existing copper and fiber infrastructure. These optical interfaces provide an evergreen investment by allowing a smooth migration to higher service speeds over fiber without changing the EADs at the customer premises.

Product	Product Group	Model	Number of Pairs	Description
Ethernet Access Devices	ML620	ML622	2	4x10/100M copper Ethernet ports
		ML624	4	4x10/100M copper Ethernet ports and a 100Base-FX optical SFP* port
		ML628	8	
	ML630	ML638	8	4x10/100M copper Ethernet ports and a 100/1000-FX optical SFP* port
	ML640	ML644	4	4x10/100M copper Ethernet ports and 100Base-FX optical SFP* port with Advanced QoS features supporting 3-tiered hierarchical QoS, two-rate three-color traffic management per EVC
		ML648	8	
	ML650	ML658	8	4x10/100M copper Ethernet ports, 4x E1/T1 ports and a 100Base-FX optical SFP* port
Copper Add-Drop EAD	ML680	ML688	8	4x10/100M copper Ethernet ports and a 100/1000Base-FX optical SFP* port
				*SFP modules - optional, including DS3/E3 SFP

Carrier Ethernet over Copper™

Ethernet Solutions