GLOBAL SUPPLIER OF
EFM OVER COPPER

INFONETICS
RESEARCH

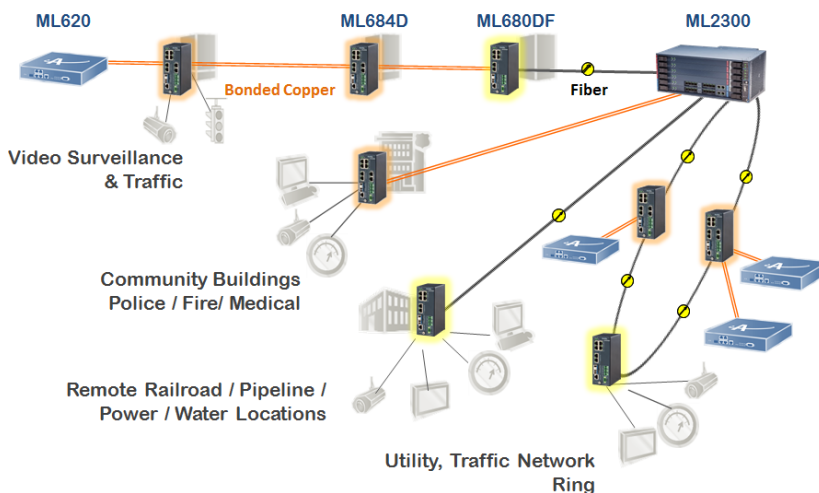No.**1** 2009
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# Reliable, Cost Effective Transport
# for Industrial Networks Using Copper or Fiber

Actelis offers a reliable, flexible, and cost effective high speed Ethernet transport solution that is designed to get all the bandwidth you need wherever you need it, while seamlessly integrating into the existing industrial networks of Traffic, Railways, Utilities, Municipalities, Campus and Enterprise networks.

Leveraging fiber where you have it or a mere two copper pairs where you do not, the Actelis solution provides a hardened, fanless, compact DIN-rail mount Layer 2 switch that provides up to 30 mbps over 2 pairs or 60 mbps over 4 pairs, and supports multiple Ethernet and legacy interfaces at each node in a ring or daisy chain architecture.



ML620        ML684D    ML680DF        ML2300

Bonded Copper            Fiber

Video Surveillance
& Traffic

Community Buildings
Police / Fire/ Medical

Remote Railroad / Pipeline /
Power / Water Locations

Utility, Traffic Network
Ring

Quickly and cost effectively accommodate the bandwidth requirements of new HD cameras, advanced sensors, legacy and new controllers, surveillance devices and WiFi as well as enabling higher speed communication and information streaming across the network.

| The Main Challenges | The Actelis Solution |
|---|---|
| • Leverage the existing fiber or copper network<br>• Cost optimize the network | • Hybrid fiber and copper Ethernet switches<br>• Cost optimizes with copper<br>  » Leverages fiber when and where you have it |
| • Get more bandwidth to more locations<br>• Support HD cameras, controllers, sensors<br>• Support network specific devices - kiosks, electronic signs<br>• Future proof the network | • Uses ubiquitous copper using G.SHDSL EFM - high bandwidth transport<br>• Extended reach for remote locations<br>• Offers 30 Mbps over 2 pairs, 60 Mbps over 4 pairs and up to 100 Mbps over 8 pairs |
| • Implement ultra-reliable low maintenance solutions<br>• Survive environmentally challenging installations | • Hardened solution: $-40^0$C to $+75^0$C or $-40^0$F to $+165^0$F<br>• Highest link and equipment reliability<br>• Best in class transmission over copper |
| • Minimize field maintenance costs | • Hardened, fanless, field proven performance<br>• Full Remote management Advanced trouble shooting<br>• Easy and quick to install<br>• Automated provisioning and management |
| • Fit into space constrained cabinets or vaults | • Extremely compact, fanless<br>• Full front access (ML680D)<br>• Easy DIN[1] rail mounting that can easily fit within existing locations |
| • Support various network topologies and interfaces<br>• Integrate existing and legacy devices<br>• Support Ethernet or serial interfaces | • Ring, Daisy Chain architecture with Drop and Continue<br>• Repeaters for extra distance where needed<br>• Fiber, Copper or hybrid solutions<br>• Multiple Ethernet interfaces<br>• Serial Interface[2] to support legacy equipment |

(1) DIN connector is supported by ML684D/ML680DF          (2) Serial Interface - Future support

**Actelis Networks™**

| Type | Platform | Description | High Level Details |
|---|---|---|---|
| **Ethernet Aggregation Switch** | **ML2300** | **Point-to-Multipoint** scenarios using bonded copper (G.SHDSL) as well as fiber. | Large aggregation platform, Modular, plug in cards<br>Up to 256 pairs and 128 links<br>Equipment Redundancy for high availability |
| | **ML230** | | Medium aggregation platform, Modular, plug in cards<br>Up to 128 pairs and 128 links<br>Equipment Redundancy for high availability |
| **Ethernet Switches with Drop and Continue** | **ML680D<br>ML680DF<br>(fiber only)** | **Drop-and-continue** over bonded copper (G.SHDSL) or fiber.<br><br>Rings over copper | **ML684D:** drop and continue over copper (2+2) or fiber<br>**ML680DF:** fiber only<br>Very compact, Fanless DIN railing unit. 24/48V or AC<br>6x Ethernet 10/100BaseT;<br>2x Fiber SFPs 100/1000BaseFX<br>1x Serial interface RS232/485[1] |
| | **ML680** | ERPSv2 ring over fiber (ML680D/ML680DF) | ½ 19", 1U high unit. 48 VDC or AC<br>ML688: 4+4 drop and continue<br>ML684: 2+2 drop and continue<br>5x Ethernet 10/100BaseT;<br>1x Fiber SFPs 100/1000BaseFX |
| | **ML690** | **Small Aggregation.** PTMP or drop-and-continue over copper (G.SHDSL) or fiber | ½ 19", 1U high unit. 48 VDC or AC<br>ML698: 8 pairs, up to 4 links<br>5x Ethernet 10/100BaseT;<br>1x Fiber SFPs 100/1000BaseFX |
| **Ethernet Switch - Termination unit** | **ML620** | **Copper** (G.SHDSL) **and fiber switch** | ½ 19", 1U high unit. 48 VDC or AC<br>ML628/ML624/ML622: 2-4-8 pair variants,Single Link<br>5x Ethernet 10/100BaseT;<br>1x Fiber SFPs 100/1000BaseFX (some models) |
| | **ML620i** | **Copper** (G.SHDSL) **switch** | ½ 19", 1U high unit. 12/24 VDC or AC<br>ML624i/ML622i: 2-4 pair variants, Single Link<br>5x Ethernet 10/100BaseT |
| **Extended Reach** | **XR-239** | **Repeater** (G.SHDSL) | Up to 9 hops; 2 pair in-2 pair out<br>Remotely powered |
| **Management** | **MetaASSIST EMS** | **Full set of management and OAM capabilities** allowing full remote access and easy integration into other management systems. | Scalable EMS. Core management capabilities, including fault, configuration, performance, and security Management |
| | **MetaASSIST View (MAV)** | | An intuitive Graphical User Interface (GUI) for complete Operation, Administration, Maintenance and Provisioning (OAM&P) of Actelis systems |

(1) Serial Interface - supported by future product versions

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