

Actelis XR239 EFM Repeater



Carrier Ethernet over Copper™

The Actelis XR239 EFM Repeater is the world's first repeater for 2Base-TL Ethernet in the First Mile systems. Used with Actelis' Carrier Ethernet over Copper equipment, the repeater extends the reach of high capacity Ethernet to cover over 98% of loop lengths. Repeaters can be linked together and used to extend the reach of Carrier Ethernet over Copper services beyond 25 miles (40km). The repeaters are fully standard and spectrally compliant.

Actelis' Carrier Ethernet over Copper equipment already delivers the best performance over bonded EFM copper links. Actelis' patented *EFMplus™* technology uses advanced signal processing to obtain the greatest rate and reach performance over voice-grade copper cabling. Actelis' *EFMplus* delivers symmetrical service up to 5.7 Mbps per pair, and over 45 Mbps using 8 pair bonded links in excess of one mile (1.6km).

The Actelis XR239 EFM Repeater extends the reach of Carrier Ethernet over Copper by regenerating the signal up to 8 times between the carrier CO and subscriber CPE. The XR239 now extends the distance to over 25 miles (40km). *EFMplus* delivers 5.7 Mbps per pair for over a mile. Repeaters enable the full 5.7 Mbps per pair or a full 45 Mbps per 8 pairs for over 10 miles (50kft/15km).

The XR239 is compliant with IEEE 802.3ah EFM standards as well as global and regional spectral requirements. The XR239 can be used in Carrier Ethernet in the First Mile networks safely and reliably to significantly extend the reach of Carrier Ethernet services.

Environmentally Hardened for Outside Plant or Indoor Use

The XR239 is designed for deployment in the outside plant or indoors. It plugs into a single slot in any industry-standard 239 mechanics enclosure. Within buildings, the repeater can be quickly deployed in existing electrical facilities. For outside plant deployment, the XR239, in an environmentally hardened enclosure, supports a variety of field installations, including cabinet, pole, or building mounts. In either installation, the repeaters are line powered from a remote power feeding unit and have no additional electrical or environmental requirements.

Operations, Administration and Maintenance (OAM) Features

The XR239 is fully IEEE 802.3ah Ethernet in the First Mile compliant. Extensive loopback capabilities allow simple troubleshooting and fault isolation in repeater links, providing full sectionalization capability. The XR239 fully supports ITU-T G.991.2 Performance Monitoring. The XR239 is transparent to the 802.3ah OAM and 991.2 EOC messages, including support for the OAM loopback, Remote Fault Indication (RFI) and Dying Gasp.

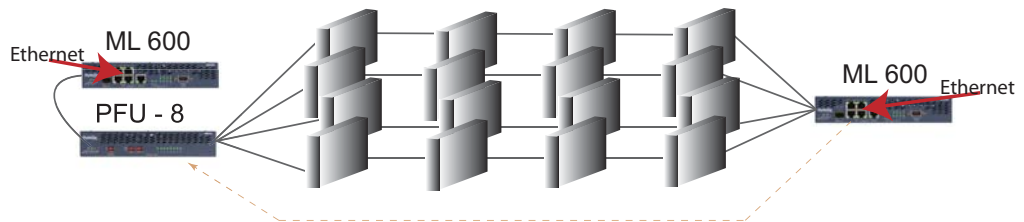
Power Feeding Units

The XR239 EFM Repeater is remotely powered from a PFU-8, power feeding unit. Actelis' PFU-8 supplies power to up to 4 repeaters in a span, across 8 pairs, for a total of 16 repeaters. Should additional repeaters be required, a second PFU-8 can be installed at the remote end of the link, providing power for an additional 4 repeaters, for a total of 9 segments. The PFU-8 is UL and NEBS level-3 approved and meets the most stringent carrier environmental and safety requirements.

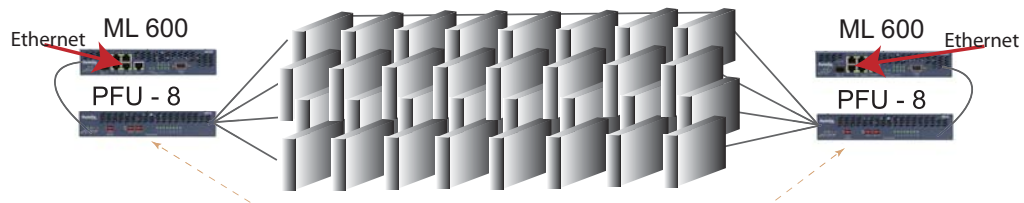
Highlights

- Designed for IEEE 802.3ah Ethernet in the First Mile (EFM) 2 Base-TL systems
- Covers over 98% of loop lengths
- Extend service reach over 25 miles (40km)
- Delivers best performance over bonded EFM copper pairs
- 45 Mbps per 8 pairs for over 10 miles (50kft/15km)
- Fully standard and spectrally compliant
- Fully supports ITU-T G.991.2 Performance Monitoring
- Transparent to the 802.3ah OAM and 991.2 EOC messages
- Environmentally hardened

Actelis XR239 EFM Repeater



Single-end powering - Up to 4 repeaters



Dual-ended powering - Up to 8 repeaters



Specifications

XR239 Repeater

High Speed Link (HSL) Interfaces

Protocol	IEEE 802.3ah 2Base-TL
Linecode	ITU-T G.991.2 rev. 2
Bandwidth	Up to 5.7 Mbps/pair
Connectors	12 pin edge connector (239 mechanics)

Number of Copper Pairs	2 pairs in, 2 pairs out
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LED Indicators

Network and subscriber-side status for each pair

Physical Dimensions

Single 239 Mechanics Slot
1.8" H x 9" D x 6.3" W
(4.6 cm H x 23.0 cm D x 16.0 cm W)
Weight: Approximately 12 ounces

Power Requirements

Power	80-250 VDC
Consumption	< 4W, 60-260VDC
Input	Line powered via PFU-8 -190 VDC or \pm 130 VDC

Regulatory Approvals/Certifications

GR-1089 A3 voltage safety class

PFU-8 Power Feeding Unit

High Speed Link (HSL) Interfaces

Links	8 Pair Copper links and link to ML CO and CPE equipment
Capacity	Supports up to 4 repeater segments across 8 pairs, up to a total of 16 repeaters
Connectors	Terminal block for Copper links and DB-25 for link to ML devices

Management

- Dip-switch configuration
- Fault reporting - via AUX port, daisy-chaining PFUs or via Alarm contacts
- LED Indicators - front panel

Physical Dimensions

1.6" H x 11" D x 8.4" W
(4 cm H x 28 cm W x 21.3 cm W)

Power Requirements

Power	+/- 120 VDC, -190 VDC
Consumption	< 125W (-48V Nominal)
Output	Non-simplex powering, \pm 130 VDC, -190 VDC

Regulatory Approvals/Certifications

GR-1089 A3 voltage safety class



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