

EFM LAN Extender

EFM-10/20/40



EFM is an Ethernet Network Extender designed to provide bonded high-speed Ethernet First Mile services over SHDSL on existing copper infrastructure. It is a bridge mode modem that delivers Ethernet services with symmetrical bandwidth at rates up to 22.8 Mbps (4 Pairs, Standard mode with TC-PAM 32) and 61 Mbps (4Pairs, Enhanced mode with TC-PAM 128). Implemented on IEEE 802.3ah EFM standards for advanced performance and management features. EFM ensures high reliability, low expense and maximum throughput. The introduction of EFM copper bonding technology allows delivery of higher bandwidth to longer distances over multiple copper pairs, enabling a good alternative in place where fiber is not economical to deploy. This Ethernet-pure solution provides a seamless integration into today and tomorrow's networks. EFM extends the reach of Ethernet services to the sites by using bonded copper pairs. Up to 4 pairs can be bonded together for aggregated bandwidth over 45Mbps (Enhanced mode with TC-PAM 128 line coding technology). Designed with standard-based EFM technology (2BASE-TL), deployment of Ethernet services with EFM is quick and simple on the existing copper plant. It operates mainly in Point-to-Point connection between remote office and enterprise headquarters, providing symmetrical high-speed connectivity that is ideal for large and small-to-medium enterprises to deliver business-class Ethernet service.

Features

- Extending Ethernet Services to sites with existing copper infrastructure
- Support TC-PAM 32 for 5.7 Mbps over single pair copper
- EFM Bonding up to 61 Mbps (4 pairs, TC-PAN 128)
- Flexible and Rapid Service Deployment
- Flexible configuration as CPE or CO
- Support EFM OAM complying IEEE 802.3ah
- Low Delay, Jitter and Packet Loss for delay sensitive applications
- Comprehensive and easy OAM & P functions in provisioning and management
- QoS feature for guaranteed Ethernet service
- Future-proof Ethernet traffic management and QoS features

Specifications

Network Interface

LAN

- 4 port switching hub
- Auto MDI/MDI-X
- 10/100BASE-T auto-negotiation & sensing

WAN

- ITU-T G.991.2.(2004)
- EFM bonding (IEEE 802.3ah PAF)
- 2BASE-TL
- Data Rate:
 - N x 64 Kpbs (N=3~89) using TC-PAM 16/32
 - Max. 5.696Mbps (1-Pair)
 - Max. 11.392Mbps (2-Pair)
 - Max. 22.784Mbps (4-Pair)
 - N x 64 Kpbs (N=3~239) using TC-PAM 64/128
 - Max. 15.296 Mbps (1-Pair)
 - Max. 30.592 Mbps (2-Pair)
 - Max. 61.184 Mbps (4-Pair)
- Support of Annex A , Annex B , Annex AF & Annex BG

LAN Protocols

- 802.1d Transparent Bridging
- Up to 2K MAC Address learning bridge

Hardware Interface

- DSL : RJ-45 x 1
- MGMT: RJ45 x 1
- Reset Button : Load Factory Default
- LAN : RJ45 x 4
- Console Port x 1
- DC Power Jack x 1

Indicator

- LAN : Link/Act, 10/100 per port
- System: Power, Alarm, MGMT
- WAN: Link per loop

Management Interface

- Easy to use web-based GUI for quick setup, configuration and management
- Menu-driven interface for local console and telnet access
- Password protected management and access control list for administration
- SNMP v1/v2 (RFC1157/1901/1905) agent and MIB II (RFC1213/1493)
- EFM OAM (IEEE 802.3ah)
- Software upgrade via web-browser / TFTP

VLAN Support

- IEEE 802.1q VLAN Tagging
- Port Based VLAN
- Up to 8k 802.1q VLANS (ID Range 1~4094)
- VLAN Stacking (Q-in-Q)

QoS Support

- Rate limiting by rule-based/port-based
- Traffic classification based on port/802.1p/ DSCP
- WRR (Weighted Round Robin) / SPQ (Strict Priority Queuing) scheduling algorithm

Environment

- Operating Temperature: 0°C ~ +50°C
- Storage Temperature: -40°C ~ +85°C
- Relative Humidity: 98%, non-condensing

Regulatory

- ISO 9001 Quality Management
- CE Approval

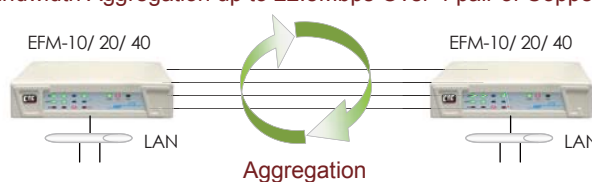
Physical / Electrical

- Dimension : 195 x 48 x 168mm (D x W x H)
- AC Power Adapter (100 ~ 240VAC with 50 ~ 60Hz)
- Weight: 1300g

Memory

- 2MB Flash Memory , 4MB SDRAM

Bandwidth Aggregation up to 22.8Mbps Over 4 pair of Copper wires



Ordering Information

Model Name	Description
EFM-10	2W, 2Base-TL EFM LAN Extender with 4x10/100TX
EFM-20	4W, 2Base-TL EFM LAN Extender with 4x10/100TX
EFM-40	8W, 2Base-TL EFM LAN Extender with 4x10/100TX

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Example: EFM - 10