

LAN Extender Family

Ethernet First Mile Extender



EFM-10, EFM-20, EFM-40

The EFM-X0 is an Ethernet Network Extender designed to provide bonded, high-speed services over SHDSL on existing copper infrastructure using standards based on EFM (Ethernet in the First Mile) technology (2Base-TL). EFM, also known as IEEE 802.3ah, is a collection of protocols specified in IEEE 802.3, defining Ethernet in access networks, i.e. first or last mile. With Wide, Metro and Local Area Networks already standardized, EFM allows a continuous Ethernet network across the globe, eliminating non-native transports such as Ethernet over ATM from access networks. EFM also addresses other issues, required for mass deployment of Ethernet services, such as operations, administration & management (OAM) and spectral compatibility with existing technologies such as voice, ASDL, VDSL and SHDSL. The EFM-X0 is a bridge mode modem that delivers Ethernet services with symmetrical bandwidth at rates up to 22.8Mbps with four bonded copper pairs. This "Pure Ethernet" solution provides a seamless integration into today and tomorrow's networks. The modem operates in point-to-point connections between remote office and enterprise headquarters, providing business-class Ethernet service at symmetrical high-speed connectivity that is ideal for small-to-medium enterprises.

Features

- Extends Ethernet services to sites with existing copper infrastructure
- EFM Bonding (PAF, PME Aggregation Function) up to 22.8Mbps (4 pairs)
- Flexible configuration as CPE or CO
- Supports EFM OAM complying with IEEE 802.3ah
- Low Delay, Jitter and Packet Loss for delay sensitive applications
- Comprehensive and easy OAM&P functions for provisioning and management
- QoS feature for guaranteed Ethernet service
- Web-based GUI for setup, configuration and management
- Menu-driven interface for local control via console or telnet
- Password protected management and access control list for administration
- Supports firmware upgrade via web

Specifications

Ports	<ul style="list-style-type: none"> • Connector : RJ45, 8 pins
WAN Interface	<ul style="list-style-type: none"> • SHDSL.bis: ITU-T G.991.2 (2004) Annex AF/BG • Encoding scheme: 16-TCPAM, 32-TCPAM • 2BASE-TL, 64/65-octet encoding • EFM bonding (IEEE 802.3ah PAF) • Maximum data rate is 22.8Mbps for 8-wire mode (5.7Mbps/Port x 4Ports=22.8Mbps) • Impedance: 135 ohms
LAN Interface	<ul style="list-style-type: none"> • Four RJ45 Connectors • 4-ports switching hub • 10/100 Base-T auto-sensing and auto-negotiation • Auto-MDI/MDIX (Auto-Crossover) • 802.1d Transparent Bridging
QoS	<ul style="list-style-type: none"> • Ingress Rate control • Egress Traffic shaping • Classification based on Port Base / VLAN Tag / DSCP • 4 Priority Queues • WRR(Weighted round-robin)/ BE(Best Effort) / SP(Strictly Priority)
VLAN	<ul style="list-style-type: none"> • 802.1Q Tag-Based VLAN • Port-Based VLAN • Port-Based Q-in-Q • Priority Re-mapping • VLAN Trunk mode
Management	<ul style="list-style-type: none"> • Easy to use web-based GUI for quick setup, configuration and management • Menu-driven interface/Command line interface (CLI) 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
LEDs	<ul style="list-style-type: none"> • WAN Link/Activity, LAN Link/Act/Speed • System: Power, Alarm and Management
Memory	2MB Flash Memory , 4MB SDRAM
Standard	ITU-T G.991.2, IEEE802.3, 802.3u, 802.3ah, 802.3ad
Power	DC 9V via AC power adapter
Power Consumption	9W
Dimensions (D x W x H)mm	168 x 195 x 48mm
Weight	1.3Kg
Temperature	0~50°C (Operating) , 0~70°C (Storage)
Humidity	10~90% non-condensing
Certification	CE, FCC, RoHS
MTBF	35,000 hours

Typical Ranges (26 AWG)

Data Rate [kbps]	1-pair		2-pair		4-pair	
	[km]	[mi]	[km]	[mi]	[km]	[mi]
192	8	4.9	8	4.9	8	4.9
512	6.4	3.9	6.7	4.1	6.7	4.1
1536	5.7	3.5	6	3.7	6.5	4
2048	5.1	3.1	5.7	3.5	6.4	3.9
4096	3.9	2.4	5.1	3.1	5.7	3.5
4608	3.5	2.1	5	3	5.5	3.4
5696	2.9	1.8	4.6	2.8	5.1	3.1
11392	---	---	2.9	1.8	4.6	2.8
17088	---	---	---	---	3.5	2.1
22784	---	---	---	---	2.9	1.8

Ordering Information

- **EFM-10** 4 port LAN extender, 2 wire, 5.7Mbps, AC power required
- **EFM-20** 4 port LAN extender, 4 wire, 11.4Mbps, AC power required
- **EFM-40** 4 port LAN extender, 8 wire, 22.8Mbps, AC power required