



G.bis EFM DSLAM

ForeFront™ 3310P

Patton's ForeFront 3310P EFM IP DSLAM provides 24 G.SHDSL.bis ports of symmetric broadband, premium access channels, each up to 5.7 Mbps. Bond multiple ports for bandwidth aggregation up to 22.8 Mbps.

Built-in Business Class Support

G.SHDSL.bis high-bandwidth (5.7 Mbps per pair, TC-PAM 32). Multicast support and QoS traffic management.

High Bandwidth Access Channels

EFM bonding (2BASE-TL) increases available data-rate per customer maintaining max distance of a single-pair.

1 Pair	5.7 Mbps
2 Pair	11.4 Mbps
3 Pair	17.1 Mbps
4 Pair	22.8 Mbps

Over Standard Copper Lines

Operates on standard copper (Cu) lines at near fiber speeds.

4 x GigEthernet Uplink Ports

Multiple Gbit pipes for uplinks to multiple networks, public and private, offers additional traffic isolation.

Quality of Service

Traffic classification with shaping and policing; 802.1p VLAN priority; ToS/DiffServ stripping and priority queuing; VLAN-stacking ("Q-in-Q")

Management Features

G.SHDSL.bis high-bandwidth (5.7 Mbps per pair, TC-PAM 32). Multicast support and QoS traffic management.

Patton's EFM ForeFront Model 3310P is a compact, 1U high, EFM DSLAM aggregating 24 individual copper pair per G.SHDSL.bis. With each copper pair supporting up to 5.7 Mbps, bonding 2, 3, or 4 pair maintains the same reach while multiplying the maximum symmetrical data rate up to a 22.8 Mbps.

The FF3310P EFM DSLAM L2/L3 switch functions offers individual end-user link management for complete network control. Configuring QoS and ToS/DiffServ is the key for controlling each end-user's link requirements. Traffic is shaped and policed and ToS/DiffServ bits may be re-stripped to enforce and to maintain quality service for the end-user.

Proper VLAN creation isolates the end-users' flows from other customers and also may isolate traffic types within an end-user's access link. Management of traffic with QoS and VLANs assists in more efficient use of available bandwidth.

VLAN stacking (Q-in-Q) is a technique for the FF3310P to define its own VLANs in the uplink while simultaneously deliver the encapsulated VLANs to the end-users. The clearest example is in port reselling.

With QoS, VLANs, ToS/DiffServ serving to deliver the end-user's service, ACL is a tool for protecting the end-user's network from unauthorized access and other types of external probing. Traffic filtering and port blocking, work together in creating the needed protection.

Traffic may be filtered on a per end-user link basis by IP address, MAC address, and port numbers (Layer 4).

EFM is the most efficient service delivery by leveraging Ethernet for carrier-class services to the end-user. Ethernet is a bridging technology; when essential the FF3310P also performs as static routing. VLANs are likewise configurable on a per port basis. Bridged traffic can be tagged and prioritized according to user defined parameters.

The FF3310P is easily installed and configured with through the Command Line Interface (CLI) via Telnet, SSH, or local console port, or the graphical, browser-based management via HTTP(S).

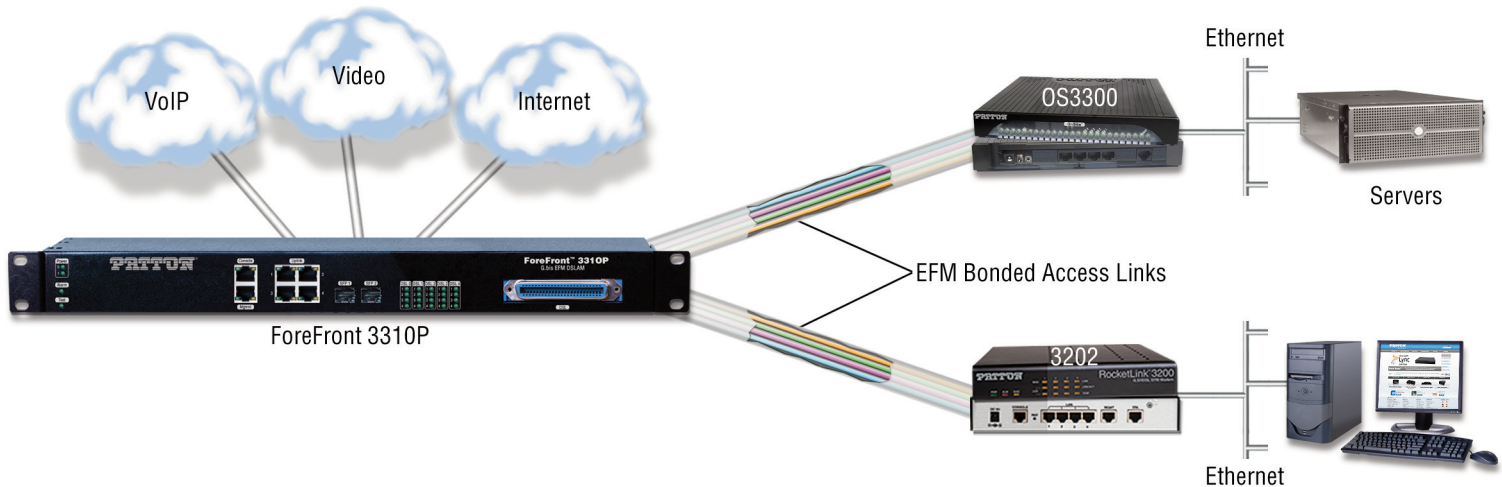
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Typical Application

EFM bonding over copper wires multiplies the bandwidth of a single twisted-pair link to provide the end-user with a very high-speed uplink and maintain the same distance of the single pair.

EFM is the next-gen replacement for E1/T1 and a cost-effective solution over fiber.



The end-user's uplink may be from 5.7 Mbps max with one pair up to 22.8 Mbps max with 4 bonded pairs.

Specifications*

G.SHDSL Ports

24 ports configurable per ITU-T • 991.2.bis including Annexes A, B, F & G (per port)

Bonding (5.7 Mbps per wire pair)

1 pair (2 wire)—5.7 Mbps
2 pair (4 wire)—11.4 Mbps
4 pair (8 wire)—22.8 Mbps

Modulation

TC-PAM 16/32

Ethernet Ports

Four Gig Ethernet uplink ports with two alternative SFP interfaces • One Gig Ethernet management port (All are 10/100/1000 and auto-negotiating) 802.1ad Link Aggregation and LACP

EFM Support

IEEE802.3ah OAM • Multi-pair bonding up to 4 pairs (2BASE-TL)

VLAN & Bridging Support

IEEE 802.1Q including per interface tagging • IEEE 802.1p priority queuing and re-stripping • VLAN stacking or "Q-in-Q" • Support up to 512 VLANs • VLAN tag

insertion and stripping selectable on per-port basis • Spanning Tree (802.1D) • RSTP (802.1w) • MSTP (802.1s/Q) • MAC address filtering (8 per VLAN) • QoS Traffic Scheduler

Network Functions

DHCP Client • DNS Client/Server/Relay • ARP

Management Service

CLI SNMP, Telnet Ethernet, RS-232 Console or Craft Port, SYSLOG Client, Software upgrade via TFTP • SNMPv1, SNMPv2c, MIB II, NTP Client, TACACS+ Login

Alarm Reporting

Configurable alarms • Remote SNMP traps • Front panel LEDs

Compliance

UL-1950 • CSA per 22.2-No. 950 • FCC Part 15 Class A • CE Mark • EN55022 • EN61000 • RoHS Compliant

Operating temperature

0 to 50°C (32 to 122°F)

Relative Humidity

5 to 90% non-condensing

* Specifications subject to change without notice.

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