CISCO SYSTEMS

Packet-over-E3 Port Adapter Modules
Cisco 7200, 7301, 7304, 7500, and 7600 Series

CISCO'S PA-E3 AND PA-2E3 PACKET-OVER-E3 PORT ADAPTERS FOR THE CISCO 7200, CISCO 7301, CISCO 7304, CISCO 7500, AND CISCO 7600 SERIES ROUTERS

Cisco's PA-E3 and PA-2E3 Packet-over-E3 port adapters for the Cisco 7200, Cisco 7301, Cisco 7304, Cisco 7500, and Cisco 7600 Series router offer high-density, highly manageable E3 line termination. Demand for high- capacity corporate backbones, high- speed access to the global Internet, and trunking connections for service provider internetworking has led to growth in clear-channel E3 con- nections that has outpaced all other types and speeds of leased lines. This growth has placed tremendous strains on the abilities of service providers and network managers to provision and manage new E3 connections. With integrated line interface units data service units (DSUs) that allow E3 lines to be directly terminated on a Cisco router, the Cisco PA-E3 and PA-2E3 port adaptors simplify E3 line management, reduce provisioning cost, and free valuable rack space.

E3 PORT ADAPTERS SIMPLIFY E3 LINE CONNECTIVITY

To support the widest range of operational environments and to offer the greatest flexibility in provisioning clear- channel E3 connections, the PA-E3 and PA-2E3 port adapters take a groundbreaking step and bring together proprietary subrate and scrambling features of E3 DSU vendors Digital Link, Larscom, and ADC Kentrox. Subrate support in the PA-E3 and PA-2E3 port adapters maximizes the application of these products in service provider environments for tiered DS3 services. By simultaneously supporting interoperability with a wide range of third-party DSU vendors, the PA-E3 and PA-2E3 port adapters offer the flexibility to support installed equipment without locking customers into a proprietary solution.

The PA-E3 and PA-2E3 one- and-two port E3 port adapters provide direct connectivity to E3 lines for full- duplex communications at the E3 rate of 34.368 MHz. Each E3 port consists of a pair of 75-ohm BNC coaxial connectors, one for transmit data and one for receive data,

along with six LED indicators for line status. Using the PA-2E3 port adapter on the Cisco 7500 or RSP7000 platforms, up to four E3 ports can be operated simultaneously on each Versatile Interface Processor (VIP2-40 and higher). On the Cisco 7200 platform, up to six E3 ports can be supported.

Ordering Information	
PA-E3 PA-E3=	One-port clear-channel E3 port adapter *Recommended for high-performance uplink and trunking applications*
PA-2E3 PA-2E3=	Two-port clear-channel E3 port adapter *Recommended for high-density or E3 line aggregation applications*

SPECIFICATIONS

System Configurations

- Up to four E3 ports cards per VIP2-40 and higher (two PA-2E3)
  VIP performance limitations may apply to configurations with multiple E3s

- Up to six E3 ports per Cisco 7200 Series router (up to four E3 ports, two PA-2E3 port adapters, if Cisco 7200 Fast Ethernet input/output [I/O] controller used)
  PA-E3 and PA-2E3 port adapters are classified as high speed port adapters for the Cisco 7200 Series router

- Carrier card option required for support on the Cisco 7304 Series router, and the Enhanced FlexWan provides support on the 7600 series router

- Full online insertion and removal (OIR) support on Cisco 7200; OIR of VIP only on the Cisco 7500

E3 Specifications

- G.703 level interface with dual female 75-ohm BNC coaxial connectors per port (separate RX and TX)

- Full-and half-duplex operation at E3 rate (34.368 MHz)

- Scrambling and Subrate (22 Kbps to 34 Mbps data rate) support of major DSU vendors

- Line build-out: 450 feet (135 meters) of 75-ohm type 728A or equivalent coaxial cable

- Remote and local loopback support

- Unframed or G.751 (software selectable—G.751 default)

- HDB3 line coding

- 16- and 32-bit cycles redundancy check (CRC) supported. (16-bit CRC default)

- Software-setable E3 national service bits

- 24-hour history maintained for error statistics and failure counts

- E3 alarm/event detection (once per second polling)

  RCLK: receive clock signal

  AIS: alarm indication signal

  OOF: out of frame state

  FERF: far-end receive failure

- Serial encapsulation:

  HDLC: High-Level Data Link Control

  PPP: Point-to-Point Protocol

  Frame Relay

  ATM-DXI: ATM Data Exchange Interface

LEDs per port
- RCLK LED (Green) to indicate the port has detected a receive clock signal

- AIS LED (Yellow) to indicate the port is receiving an AIS

- OOF LED (Yellow) to indicate the port is in a receive OOF state

- FERF LED (Yellow) to indicate the port is receiving a FERF

- Local Loop (Yellow) to indicate E3 port looped locally

- Remote Loop (Yellow) to indicate the far-end E3 port is looped

Physical Specifications
- Occupies one port adapter bay on any VIP2 model or one port adapter slot in any Cisco 7200 series router

Environmental Specifications
- Operating temperature: 32 to 104° F (0 to 40° C)

- Storage temperature: -4 to 149° F (-20 to 65° C)

- Relative humidity: 10 to 90%, noncondensing

Compliance
- E3 physical layer

  CCITT G.703

  CCITT G.751

  CCITT G.753

  CTR 24

  CCITT G.823
- Safety

  AS/NZS 3260 (Australia/New Zealand)

  EN60950/EN41003 (Europe)

  IEC 950 (National Deviations)
- Emissions

  AS/NZS 3548 (Australia/New Zealand)

  EN55022 (CISPR 22) Class B (Europe)

- Immunity

  IEC 1000-4-2 (ESD)

  IEC 1000-4-3 (Radiated)

  IEC 1000-4-4 (Fast Transients)

  IEC 1000-4-5 (Power Line Surge)

  IEC 1000-4-6 (Injected RF)

  IEC 1000-3-2 (Harmonic Distortions)

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