

## Packet over SONET/SDH Port Adapter for the Cisco 7200 and 7500

THE PACKET OVER SYNCHRONOUS OPTICAL NETWORK (SONET)/SYNCHRONOUS DIGITAL HIERARCHY (SDH) PORT ADAPTER (PA) IS A SINGLE-PORT, SINGLE-WIDE OC-3C/STM1 PORT ADAPTER FOR THE CISCO 7200 AND 7500.

The PA-POS-OC3MM, PA-POS-OC3SML and PA-POS-OC3SMI are now End of Sales (EOS) as of July 31, 2006 for all supported platforms. For more details, please see product bulletin:

[http://www.cisco.com/en/US/products/hw/modules/ps2033/prod\\_eol\\_notice0900aecd80224b94.html](http://www.cisco.com/en/US/products/hw/modules/ps2033/prod_eol_notice0900aecd80224b94.html)

### Overview

The POS PA is supported on the NPE-150 and NPE-200 in the Cisco 7200, and the VIP2-50 in the Cisco 7500. The POS PA is available in three physical interfaces: OC-3c/STM1 Multimode (MM), OC-3c/STM1 Single-Mode Intermediate Reach (SM-IR), or OC-3c/STM1 Single-Mode Long Reach (SM-LR).

Using the Point-to-Point Protocol (PPP), the POS PA maps IP packets into SONET/SDH frames in hardware and transports them over the optical SONET/SDH network. PPP was designed as a standard method of communicating over point-to-point links. The POS PA supports both RFC 1619, "PPP over SONET/SDH" and RFC 1662, "PPP in HDLC-Like Framing."

### Superior IP Performance

As IP traffic in Service Provider and Enterprise networks continues to grow at an incredible rate, high-performance is essential. A major advantage of mapping IP packets directly into SONET/SDH technology is the ability to provide superior performance.

Specifically designed to maximize distributed switching performance, the POS PA provides line-rate OC-3c/STM1 throughput for average size packets in the VIP2-50. In addition, a single POS PA/VIP2-50 configuration in a

Cisco 7500 provides an aggregate throughput of up to 138,000 packets-per-second in each direction using 64 byte packets. A POS PA in a Cisco 7200 with an NPE-200 provides an aggregate throughput of up to 94,000 packets-per-second in each direction using 64 byte packets.

### Platform Flexibility and Increased Port Density

The Packet over SONET/SDH port adapter (POS PA) provides the same level of high switching performance as the existing Packet over SONET/SDH Interface Processor (POSIP) in a single-wide port adapter design. This allows more flexible high-performance networks to be designed with greater port density. In addition, different port adapter technologies such as serial, multichannel, Ethernet and Fast Ethernet, can be combined with the POS port adapter on the same platform.

The POS PA is designed to provide maximum switching performance when a single POS PA is installed in a single VIP2-50. For applications that require maximum port density and/or lower system cost, the VIP2-50 also supports any combination of port adapters including dual POS PAs. Though a single POS PA alone can utilize the entire switching capacity of the VIP2-50, dual port adapters in the same VIP2-50 share the switching and bandwidth capacity.

The POS PA extends the benefits of Packet over SONET/SDH connectivity to the Cisco 7200. Providing tremendous network flexibility, the POS PA can be deployed on the Cisco 7200 in SONET/SDH networks that require a large number of distributed multi-service edge routers. Up to three POS PAs can be installed in the same Cisco 7200.

### Fault-Tolerant Backbone Connectivity

SONET Automatic Protection Switching (APS), also known as SDH Multiplex Section Protection (MSP), is a mechanism designed to provide fault-tolerance through fiber cable redundancy in SONET/SDH networks. Defined in the specification developed by Bellcore, APS allows rapid switchover from the working fiber to the protection fibers in case of a fiber cut or module failure, signal failure, or signal degradation, thereby increasing the network overall survivability and robustness.

The POS PA supports APS (and MSP) for network designs in which the Cisco 7200 or 7500 is connected directly to SONET/SDH equipment that also support APS such as Add/Drop Multiplexors (ADM).

### Improved Payload Scrambling and Error Detection

In addition to supporting the payload scrambling defined in RFC 1619, the POS PA also supports the more robust ATM Forum scrambling technique defined in the RFC 1619 addendum. This is an optional scrambling feature for the POS PA that allows synchronization to be maintained and SONET errors to be avoided. This hardware-based capability is transparent to the user and adds to overall network stability.

The POS PA also supports both CRC-16 and CRC-32 for error detection in transmitted data. Either CRC-16 or CRC-32 can be optionally enabled, and can either operate concurrently with the ATM Forum payload scrambling. In general, CRC-16 provides backward compatibility with existing equipment, while CRC-32 provides more robust advanced error detection.

### Network Management

The following protocol and management information base (MIB) are supported:

- SNMP agent v1 (RFC 1155-1157)
- MIB II (RFC 1213)

### Interface Specifications

Interface	Rate (Mbps)	Conn Type	Cable Type (um)	Wavelength (nm)	TX Power (max)	TX Power (min)	RX Power (max)	RX Power (min)	Max Distance
OC-3c/STM1 Multimode	155.52	SC	62.5/125	1260 to 1360	-14 dBm	-20 dBm	-14 dBm	-30 dBm	2 km
OC-3c/STM1 SingleMode Intermediate Reach	155.52	SC	9	1261 to 1360	-8 dBm	-15 dBm	-8 dBm	-28 dBm	15 km
OC-3c/STM1 SingleMode Long Reach	155.52	SC	9	1280 to 1335	0 dBm	-5 dBm	-0 dBm	-35 dBm	40 km

## POS PA LED Indicators

The POS PA provides the following LED indications:

POS PA LED	Function
Enabled	Indicates the POS PA is powered and active.
RX Carrier	Indicates that optical signal is sensed on the interface.
RX Packets	Indicates that a data packet was received on the interface.

## Specifications

### Standards Compliance

- Bellcore GR-253
- ITU-T G.957
- ITU-T G.958
- RFC1619—Point-to-Point Protocol over SONET/SDH
- RFC1662—Point-to-Point Protocol in HDLC-Like Framing
- RFC1157—SNMP MIB
- RFC1213—TCP/IP MIB

### Environmental Conditions

- Operating temperature: 0 to 70 C
- Storage temperature: -40 to 85 C
- Relative humidity: 10 to 90%, noncondensing

### Regulatory Certifications

- UL 1950
- CSA C22.2 No. 950-M29
- IEC 950
- EN60950

### Electromagnetic Emissions Certifications

- FCC Class A
- EN55022A Class B
- CISPR-22 Class B
- VCCI Class 2

### CE Mark

- IEC 801-2, 3, 4, 5, 6, 11



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