# Cisco 2-Port and 4-Port Clear Channel T3/E3 Shared Port Adapters

The Cisco® I-Flex approach combines shared port adapters (SPAs) and SPA interface processors (SIPs), providing an extensible design that enables service prioritization for data, voice, and video services. Enterprise and service provider customers can take advantage of improved slot economics resulting from modular port adapters that are interchangeable across Cisco routing platforms. The I-Flex design maximizes connectivity options and offers superior service intelligence through programmable interface processors that deliver line-rate performance. I-Flex enhances speed-to-service revenue and provides a rich set of QoS features for premium service delivery while effectively reducing the overall cost of ownership. This data sheet contains the specifications for the Cisco 4-Port and 2-Port Clear Channel T3/E3 SPAs (Cisco Clear Channel T3/E3 SPAs; refer to Figure 1).

**Figure 1.** Cisco 4-Port and 2-Port Clear Channel T3/E3 SPAs

## Product Overview

Demand for high-capacity corporate backbones, for high-speed access to the global Internet, and for trunking connections for service provider internetworking has led to a growth in clear channel T3/E3 connections that has outpaced all other types and speeds of leased lines. This growth places tremendous strain on service providers and network managers who must provision and manage new T3/E3 connections. The Cisco Clear Channel T3/E3 SPAs for the Cisco 7304, 6500, 7600, and 12000 Series Routers offer high-density, highly manageable T3/E3 line connectivity and termination. With integrated line-interface data service units (DSUs) that allow T3/E3 lines to be directly terminated on a Cisco router, the Cisco Clear Channel T3/E3 SPAs simplify T3/E3 line management, reduce provisioning costs, and make valuable rack space available.

The Cisco Clear Channel T3/E3 SPAs are designed to provide direct connectivity to T3/E3 lines for full-duplex communications at the T3 rate of 44.736 MHz or E3 rate of 34.368 MHz. They are available in 2- and 4-port options. The ports are configurable as either all T3 or all E3. To support the widest range of operational environments and to offer the greatest flexibility in provisioning clear channel T3/E3 connections, the Cisco Clear Channel T3/E3 SPAs take a groundbreaking

step and bring together proprietary subrate and scrambling features of T3/E3 DSU vendors Quick Eagle Networks (formerly Digital Link), Larscom, ADC Kentrox, Adtran, and Verilink. Subrate support in the Cisco Clear Channel T3/E3 SPAs maximizes the application of these products in service provider environments for tiered T3 services. By simultaneously supporting interoperability with a wide range of third-party DSU vendors, the Cisco Clear Channel T3/E3 SPAs offer the flexibility to support installed equipment without committing customers to a proprietary solution.

The Cisco Clear Channel T3/E3 SPAs are hot-swappable and support service-transparent online insertion and removal (OIR), allowing removal of the SPA without impacting the interface processor and other SPAs.

## Applications

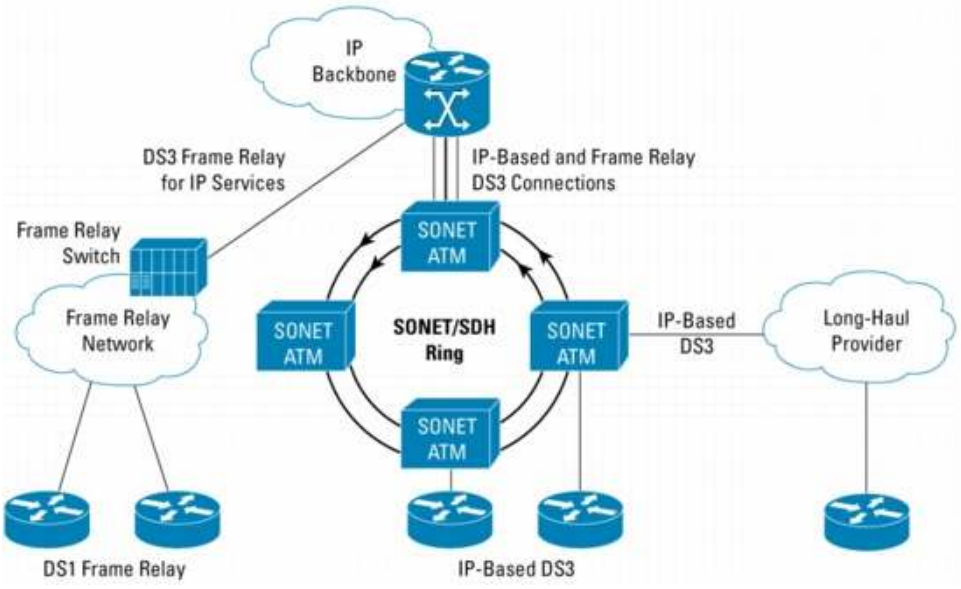
The Cisco Clear Channel T3/E3 SPAs can be used to provide direct customer access or network-to-network connections. In some cases, T3/E3 offers the only high-speed service to remote points of presence (POPs) or customer installations that cannot obtain optical channelized service.

The Cisco Clear Channel T3/E3 SPAs support three different Layer 2 encapsulations of packets:

- Point-to-Point Protocol (PPP)
- High-Level Data Link Control (HDLC)
- Frame Relay

By supporting these three encapsulations, the Cisco Clear Channel T3/E3 SPAs help enable the Cisco 7304, 6500, 7600, and 12000 Series Routers to offer high-speed, IP-based direct access, or IP-over-Frame Relay deployments (Figure 2).

**Figure 2.** IP-Based Direct Access or IP-over-Frame Relay Deployments




## Features and Benefits

The Cisco Clear Channel T3/E3 SPAs offer many advantages, including:

- 2- and 4-port clear channel T3 or E3 options
- Integrated DSU functions

- Interoperability with all Cisco T3/E3-capable products and products from other leading T3/E3 DSU and Frame Relay equipment vendors
- Full-duplex, full-rate, and subrate support

The Cisco SPA/SIP portfolio offers the following additional advantages:

- Highly modular, flexible, intelligent interface processors
  - Superior flexibility, supporting a combination of interface types on the same interface processor for consistent services, independent of access technology
  - Pioneering programmable interface processors that provide flexibility for the service diversity required in next-generation networks
  - Innovative design that supports intelligent service delivery without compromising on performance
- Increased speed to service revenue
  - The scalable, programmable Cisco architecture extended to 10 Gbps dramatically improves customer density, increasing potential revenue per platform.
  - Interface breadth (copper, channelized, POS, ATM, and Ethernet) on a modular interface processor allows service providers to roll out new services more quickly, helping ensure that all customers large and small receive consistent, secure, and guaranteed services.
  - High-density Small Form-Factor Pluggable (SFP) interfaces are featured for high-port-count applications with reach flexibility. Future optical technology improvements can be adopted using existing SPAs.
- Dramatically improve the financials of your routing purchase
  - Improved slot economics and increased density reduce capital expenditures (CapEx).
  - The ability to easily add new interfaces as they are needed enables a "pay-as-you-grow" business model.
  - SPAs are shared across multiple platforms, and can be easily moved from one to another, providing consistent feature support, accelerated product delivery, and a significant reduction in operating expenses (OpEx) through common sparing as service needs change.

## Product Specifications

**Table 1.** Product Specifications

| Features | Descriptions |
|---|---|
| **Product Compatibility** | • Cisco 7304 Router<br>• Cisco Catalyst 6500 Series Switches<br>• Cisco 7600 Series Routers<br>• Cisco 12000 Series Routers<br>• Cisco XR 12000 Series Routers<br>• Cisco ASR 1000 Series Router<br>• Cisco ASR 9000 Series Router<br>• Cisco CRS Carrier Routing System |
| **Port Density per SPA** | 2- and 4-port options |
| **Physical Interface** | • 1.0/2.3 RF connector (75-ohm impedance)<br>• 1.0/2.3 RF to BNC adapter cable option |

| Features | Descriptions |
|---|---|
| **Protocols** | Serial encapsulations:<br>• HDLC<br>• PPP, RFC 1662<br>• Frame Relay, RFC 1490 |
| **Features and Functions** | • Up to 4 independent T3 or E3 ports configurable as either all T3 or all E3 only<br>• Full-duplex connectivity at T3 rate (44.736 MHz) or E3 rate (34.368 MHz)<br>• Subrate and scrambling support of Quick Eagle Networks (formerly Digital Link), Larscom, ADC Kentrox, Adtran, and Verilink DSUs<br>• Internal or network clock selectable per channel<br>• Line and payload loopback capabilities:<br>◦ Local and remote loopback at the T3 level<br>◦ Response to embedded loopback commands<br>◦ Insertion of loopback commands into transmitted signal<br>• Bit-error-rate-testing (BERT) pattern generation and detection per channel<br>◦ Selectable pseudorandom pattern up to 32 bits long, including all 0's, all 1's, 215, 220, 220 Quasi-Random Signal Sequence (QRSS), 223, alternating 0's and 1's<br>◦ 32-bit error-count and bit-count registers<br>◦ Fully independent transmit and receive sections<br>◦ Detection of test patterns with bit error rates up to 10-2<br>• 24-hour history maintained for error statistics and failure counts, at 15-minute intervals<br>• 16- and 32-bit cyclic redundancy check (CRC); 16-bit default |
| **T3-Specific Features** | • C-bit or M23 framing<br>• Binary 3-zero substitution (B3ZS) line coding<br>• T3 far-end alarm and control (FEAC) channel support<br>• Compliant with T3 pulse mask per ANSI T1.102-1993<br>• Maintenance data link (MDL)<br>• Line build-out up to 450 feet (135 meters)<br>• Alarm monitoring<br>◦ Alarm indication signal (AIS)<br>◦ Loss of signal (LOS)<br>◦ Out of frame (OOF)<br>◦ Far-end receive failure (FERF)<br>• Performance data collection<br>◦ Line coding violation (LCV)<br>◦ Framing bit errors (F- or M-bit errors)<br>◦ P-bit error counts<br>◦ C-bit error counts<br>◦ Far-end block error (FEBE) counts |
| **E3-Specific Features** | • G.751, or G.832 and unframed G.703 framing<br>• High-density bipolar with three zeroes (HDB3) line coding<br>• Compliant with E3 pulse mask<br>• Software-configurable E3 national service bits<br>• Alarm monitoring<br>◦ Alarm indication signal (AIS)<br>◦ Loss of signal (LOS)<br>◦ Out of frame (OOF)<br>◦ Far-end receive failure (FERF)<br>• Performance data collection<br>◦ Line coding violation (LCV)<br>◦ Framing-pattern errors<br>◦ FEBE counts |
| **Reliability and Availability** | • OIR<br>• Single SPA software reset |
| **MIBs** | RFC 2496 MIB (T3 MIB) and T1.231 MIB |
| **Network Management** | Simple Network Management Protocol (SNMP) |

| Features | Descriptions |
|---|---|
| **Physical Specifications** | • Weight: 0.75 lb (0.34 kg)<br>• Height: 0.8 in. (2.03 cm) (single height)<br>• Width: 6.75 in. (17.15 cm)<br>• Depth: 7.28 in. (18.49 cm) |
| **Power** | • 2-port: 7.7W maximum<br>• 4-port: 8.4W maximum |
| **Compliance and Agency Approvals** | CE Marking<br>Safety<br>• UL 60950<br>• CSA 22.2 No.60950<br>• IEC 60950<br>• EN 60950<br>• AS/NZS 3260<br>• TS001<br>EMC<br>• CFR47 Part 15<br>• ICES 003<br>• EN55022<br>• CISPR 22<br>• AS/NZ 3548<br>• VCCI<br>• EN55024<br>• EN50082-1<br>• EN61000-6-1<br>Telecom (T3)<br>• ANSI T1 107<br>• T1 404<br>• AT&T 54014<br>Telecom (E3)<br>• G.703<br>• G.751<br>• G.832 |
| **Environmental Specifications** | • Operating temperature: 41 to 104℉ (5 to 40℃)<br>• Storage temperature: –38 to 150℉ (–40 to 70℃)<br>• Operating humidity: 5 to 85% relative humidity<br>• Storage humidity: 5 to 95% relative humidity |

## Ordering Information

To place an order, visit the Cisco Ordering Home Page or refer to Table 2.

**Table 2.** Ordering Information

| Product Name | Part Number |
|---|---|
| **Cisco 2-Port Clear Channel T3/E3 Shared Port Adapter** | SPA-2XT3/E3 |
| **Cisco 4-Port Clear Channel T3/E3 Shared Port Adapter** | SPA-4XT3/E3 |
| **T3 or E3 Cable, 1.0/2.3 RF to mini BNC-Female, 10 Feet** | CAB-T3E3-RF-BNC-F |
| **T3 or E3 Cable, 1.0/2.3 RF to mini BNC-Male, 10 Feet** | CAB-T3E3-RF-BNC-M |
| **T3 or E3 Cable, 1.0/2.3 RF to Open end, 25 Feet** | CAB-T3E3-RF-OPEN |

## Service and Support

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications

to extend network intelligence and the power of your business. For more information about Cisco Services, refer to Cisco Technical Support Services or Cisco Advanced Services.

### For More Information

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