



# SPS-1000 Signal Processing System

## Carrier-Grade Voice and Modem Data Bridging

### A Flexible, Affordable Alternative

For network operators seeking cost-effective voice and modem data bridging alternatives, the Sycamore Networks Signal Processing System (SPS-1000) offers flexible solutions for performing telecom functions, including Supervisory Control and Data Acquisition (SCADA) and telemetry applications. The SPS-1000 serves as a building block for a variety of digital signal processing based applications, many of which are no longer adequately supported by alternative solutions due to cost or legacy product obsolescence issues.

When the SPS-1000 is used with Sycamore Networks DNX-11/88 Cross-Connects, the combined solution delivers up to 496 protected channels (DSOs) or 992 unprotected channels of conferencing/bridging capacity. Integration with the DNX-11/88 enables device-level and T1/E1 link-level APS protection for high availability, and the DNX embedded diagnostics (BERT, loopback, and link performance statistics) further enhance network availability. The SPS-1000 also minimizes up-front capital and footprint costs, while providing proven reliability and application flexibility.

### The SPS-1000 System

The SPS-1000 system is housed in a 19" rack-mountable chassis that occupies only two rack units (2 RU) of vertical space. A space-efficient, NEBS Level 3 compliant, and fault-tolerant architecture houses up to four Octal T1/E1-DSP41 application modules, and power, cooling, and resource monitoring functions. The Intelligent Chassis Management Module (ICMM) monitors power supply output voltages, individual fan speeds, and chassis temperature; and sends alarm notifications via SNMP traps, e-mail, pager, acoustic signal, and status LEDs. Optional redundant hot-swappable power supplies and GUI-based management interfaces for configuration and diagnostics further enhance system reliability. Downloadable system software supports software upgrades using the TFTP protocol, simplifying the process of adding new functions and ensuring investment protection.

### Octal T1/E1-DSP41 Module Set

The Octal T1/E1-DSP41 module set terminates eight software-selectable T1/E1 spans, and consists of a front Application Module (AM) and a rear Interface Module (IM), both hot swappable. Equipped with a digital signal processing (DSP) mezzanine card, the Application Module delivers:

- Up to 192/248 DSOs of bridging per module
- 496 protected or 992 unprotected members per unit
- 80 three-member conferences per module (320 for the unit)
- 32 members per conference
- Ability to detect Trunk Conditioning patterns and exclude them from a conference

### Features and Benefits

- SCADA/Telemetry Bridging
- Hoot 'n' Holler Voice Conferencing
- Automatic & Manual Ring Down (ARD/MRD) Conferencing
- Mixed Automatic & Manual Ring Down (Mixed ARD/MRD) Conferencing
- Call/Answer Supervision Conferencing for Meet-Me Dial-In
- Redundancy and Protection Options
- Scalable Design, Proven Reliability



The SPS-1000 supports highly specialized voice bridging and conferencing features important to utility network operators, the global financial industry, government agencies, and wireless service providers.

Individual bridge members are configurable for Manual (transmit and receive) Gain Control and Automatic Gain Control; noise filtering (squell) on inbound signals; and the dynamic addition and removal of conference participants. The Octal T1/E1-DSP41 module set provides software-configurable voice and modem data bridging modes for Summing/Distribution (analog split data), Multi-Way (each leg hears every other leg including itself), and Multi-Way with Output Isolation (each leg hears every other leg excluding itself). The module also enables operators to backup and restore the database and create user accounts with different privilege levels.

### Voice Conferencing

The SPS-1000 offers superior performance in specialized applications required by brokerage firms and commodities traders; oil, gas, electric, and water utilities; news media, weather bureaus, mass transit, and many other industries for operator-unassisted voice conferences.

The Hoot 'n' Holler, Automatic (ARD) and Manual (MRD) Ring Down functions on the SPS-1000 are ideal for instantaneous communication between multiple parties in situations where immediate verbal responses are important, such as utility operations, brokerage firms and banks. Hoot 'n' Holler conferences are always connected and do not require any signaling, which makes them well-suited for broadcasting information to various locations. ARD signals automatically, causing distant end phones to ring when the local end phone is taken off-hook. With MRD, the participants are always connected, but a caller has to manually initiate signaling to ring distant end phones. In addition to standalone ARD/MRD conferencing options, Mixed ARD/MRD allows the ability to conference in both ARD and MRD members in the same conference, eliminating the need to perform signaling conversion.

Utilities rely on simultaneous, multi-party communication between field units and a command center for day-to-day issue management. Brokerage firms use ring down circuits to transact trades quickly and communicate critical market information to the entire global trading organization at one time. ARD and MRD can also facilitate disaster recovery for financial traders and utilities. In this scenario, dedicated private ring down lines are delivered simultaneously to both primary and secondary customer locations.

Call/Answer Supervision on the SPS-1000 enables creation of Meet-Me conferences. Participants gain access to the conference by dialing a predetermined number provided by the Class 5 voice switch the SPS sits behind. This feature is particularly valuable to government service providers and mobile operators.

### Modem Data Bridging

In host-listener poll-able networks, the host (i.e., a central computer) sequentially polls listeners (e.g., analog modems)

before allowing them to send data. The SPS-1000 allows operators to configure a poll-able multipoint circuit, whereby individual listener data stations transmit to the central host after a protocol prompt from the host.

Modem data bridging configurations are needed in the SCADA data collection networks used by transportation authorities (road, rail, air, and water), oil and gas pipeline operators, water and sewage plants, power delivery plants, banking and finance. Other applications include the control of remote banking ATMs, ticket reservation systems, and automatic credit card verification systems.

**For more information about our intelligent networking products and solutions, please contact your Sycamore Sales Representative.**

## SPECIFICATIONS HIGHLIGHTS

### Chassis

- Mechanical: 441 mm W (17.3") x 359 mm D (14.1") x 88 mm H (3.5")
- Mounting/Design: 19" rack-mount, mid-plane architecture
- Module Capacity: Up to four (4) 8-port application modules
- ICMM (Intelligent Chassis Management Module)
  - Monitor P/S Voltages, Fan Speed, and Temperature
  - Alarm Notification (e-mail, TRAPs, Audible Alarms)
  - Access (RS232, Telnet, WEB Browser)
- Power Supply Options: Redundant AC or DC with dual independent feeds
- DC Power: Rear terminal block, -38 to -72 VDC, 230W per supply
- AC Power: 47 to 63 Hz, 100 to 240 VAC, 300W per supply
- Power Output: 25 amps @ 3.3 volts, 25 amps @ 5 volts
- Airflow/Cooling: Left to right, hot-removable fan tray
- Environment: Operating: 0° C (32° F) to 50° C (122° F), Storage: -20° C (-4° F) to 80° C (176° F)

### Module

- Interface: T1/E1, 8 x RJ48 on rear transition module, ITU-T G.703 (physical/electrical)
- Impedance: 100 ohms (T1), 75 ohms unbalanced (E1), 120 ohms balanced (E1)
- Frequency: 1.544 MHz, 2.048 MHz
- Framing: ESF and D4 (T1), CAS and CCS (E1)
- Line Coding: AMI, B8ZS, HDB3
- Digital Signal Processing: 3 x TMS320C5441 with MPC8245 controller
- Power Consumption: 3.0 amps @ 3.3 volts
- Environment: Operating: 0° C (32° F) to 50° C (122° F), Storage: -20° C (-4° F) to 70° C, (158° F) 10 to 90% non-condensing (humidity)

### Compliance

- FCC Part 15 Class A, IC ICES-003, EN 55022, EN 55024, EN 300 386-2, AS/NZS 3548
- UL 60950 (UL and cUL marks), EN 60950, IEC 60950 (CB), AS/NZS 60950.1
- FCC Part 68, Industry Canada CS-03, CE Mark
- Designed for Telcordia GR-1089-CORE/GR-63-CORE Level 3

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