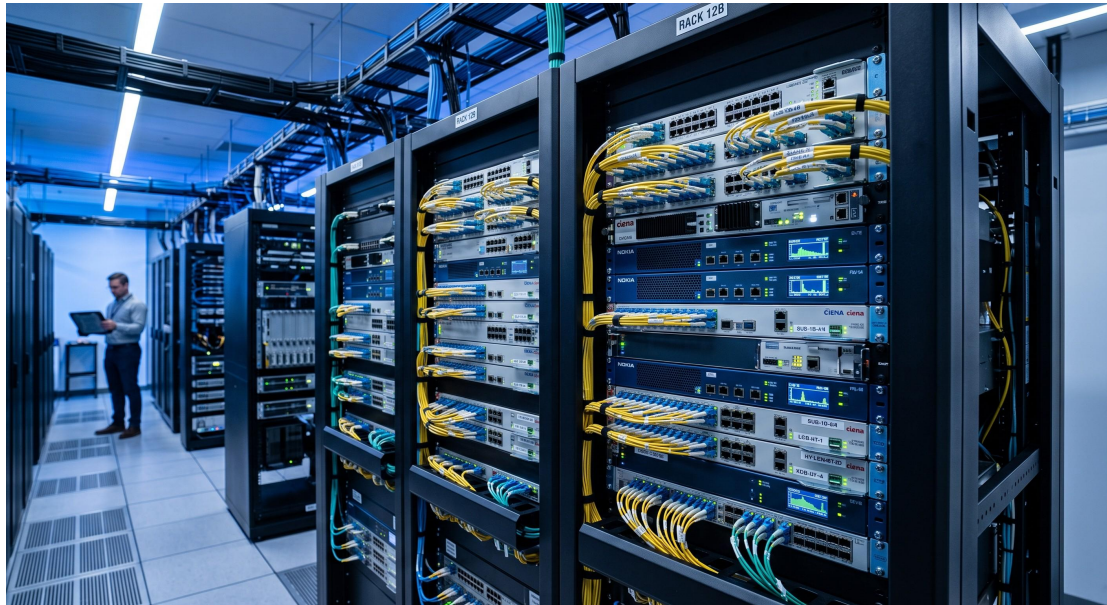


Submarine Cable Terminal Equipment - Official Technical Overview & Hardware

Datasheet

PRODUCT IDENTIFICATION

The Submarine Cable Terminal Equipment (SCTE) platform represents the apex of optical transmission engineering, purpose-built to serve as the terrestrial demarcation point for high-capacity submarine fiber optic cable systems. This carrier-grade hardware series is designed to interface seamlessly with wet-plant repeaters and branching units, providing the essential electrical-to-optical conversion, signal regeneration, and performance monitoring required for transoceanic and regional subsea networks. The SCTE series bridges the gap between long-haul submerged infrastructure and terrestrial core networks, offering a comprehensive suite of transmission, multiplexing, and protection capabilities that ensure the integrity and availability of critical global data traffic.



SYSTEM HARDWARE TOPOLOGY

The SCTE platform is architected around a high-availability, fully redundant hardware topology. The core chassis is a modular 7RU frame that houses redundant power supply units (AC or DC), a pair of active/standby system control modules, and up to twelve pluggable tributary and line interface cards. The chassis backplane incorporates a non-blocking switch fabric with a total switching capacity of 3.2 Tbps, enabling any-to-any connectivity between line-side and client-side interfaces. The system is designed for both 1+1 and N+1 equipment protection schemes, with automatic failover mechanisms that route traffic through the protection path in under 50 milliseconds upon detection of a fault. The hardware topology emphasizes spatial separation of critical components, with front-access removable fans and power supplies that support hot-swappable maintenance without service interruption.

DATA & CONTROL PLANE CAPABILITIES

The SCTE hardware architecture separates data and control planes to optimize performance and resilience. The data plane, driven by a high-performance optical engine, leverages advanced coherent detection technology supporting dual-polarization QPSK up to 64-QAM, delivering per-wavelength capacities of 200G, 400G, and 600G over ultra-long-haul distances. The control plane is managed by a redundant pair of embedded processors running a hardened real-time operating system, which handles topology discovery, wavelength assignment, and automatic power balancing across the fiber pair. The platform supports a full complement of GMPLS-based control plane protocols, enabling dynamic restoration, and is fully compatible with SDN frameworks via NETCONF/YANG for centralized network management and provisioning. This dual-plane design provides deterministic performance for both control traffic and high-volume data payloads.

COMPONENT BREAKDOWN

A detailed component breakdown illustrates the modularity and scalability of the SCTE series. The line interface cards support a range of optical amplifiers and line monitoring equipment. The power distribution system implements an

advanced energy-efficient design with 80 PLUS Platinum-rated AC rectifiers, supporting both grid and battery backup feeds. The timing and synchronization unit, compliant with ITU-T G.8262 for Synchronous Ethernet and with provisions for IEEE 1588v2 PTP for high-precision time distribution, ensures network synchronization for latency-sensitive applications. Environmental sensors are embedded throughout the chassis to monitor temperature, voltage, and fan status, providing granular data for the fault management and performance monitoring systems. A dedicated craft interface with an LCD panel enables local provisioning and diagnostics, while integrated remote management is available through a dual Ethernet management port setup.

Parameter	Specification
Form Factor	7RU Modular Chassis (19-inch rack mount)
Switching Capacity	3.2 Tbps (Non-blocking)
Power Supply	1+1 or 2+2 Redundant, -48V DC / 100-240V AC
Fiber Interfaces	Support for SMF-28, G.652 and G.655
Modulation Formats	DP-QPSK, 8-QAM, 16-QAM, 64-QAM
Wavelength Range	1528.77 - 1563.86 nm (C-Band)
Wavelength Grid	50 GHz ITU-T G.694.1
Forward Error Correction	SD-FEC, HD-FEC, Concatenated FEC

Survivability	Automatic Protection Switching (<50ms)
Management Interfaces	SNMP, TL1, NETCONF, RESTCONF
Environmental	Operating: 5°C to 40°C Storage: -40°C to 70°C
Relative Humidity	5% to 85% (Non-condensing)
Safety Certifications	UL 60950-1, CSA 22.2 No. 60950-1, EN 62368-1
EMC Compliance	FCC Part 15 Class A, EN 55032, EN 55024

OPERATIONAL SPECS MATRIX

Parameter Specification

Form Factor 7RU Modular Chassis (19-inch rack mount)

Switching Capacity 3.2 Tbps (Non-blocking)

Power Supply 1+1 or 2+2 Redundant, -48V DC / 100-240V AC

Fiber Interfaces Support for SMF-28, G.652 and G.655

Modulation Formats DP-QPSK, 8-QAM, 16-QAM, 64-QAM

Wavelength Range 1528.77 - 1563.86 nm (C-Band)

Wavelength Grid 50 GHz ITU-T G.694.1

Forward Error Correction SD-FEC, HD-FEC, Concatenated FEC

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Management Interfaces SNMP, TL1, NETCONF, RESTCONF

Environmental Operating: 5°C to 40°C | Storage: -40°C to 70°C

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Safety Certifications UL 60950-1, CSA 22.2 No. 60950-1, EN 62368-1

EMC Compliance FCC Part 15 Class A, EN 55032, EN 55024

REGULATORY COMPLIANCE

The SCTE platform is designed to meet the most stringent global regulatory standards for telecommunications equipment. It fully complies with Telcordia GR-63-CORE and GR-1089-CORE for NEBS Level 3 certification, ensuring superior reliability and survivability in diverse environmental conditions. The platform also conforms to the European Union's RoHS directive on hazardous substances and REACH regulations. Network equipment building system (NEBS) readiness guarantees the hardware's capability to withstand seismic events, temperature and humidity extremes, and electrical disturbances. Furthermore, the equipment's laser safety features are certified as Class 1 laser products under the US FDA 21 CFR 1040.10 and IEC 60825-1, ensuring safe operation in manned facilities. The platform also carries the CE mark and is approved for use in markets requiring ETSI ETS 300 019 environmental compliance.

