CALIENT'S OPTICAL CIRCUIT SWITCH

Datasheet | CALIENT Solution Brief

Features and Benefits

With data transmission and network speeds transitioning to 100 Gb/s, 400 Gb/s and beyond, Calient offers the lowest price per port of any switching technology. The explosion of data driven by cloud, AR/VR, and new high-bandwidth services is accelerating the demand for flexible, scalable, high-bandwidth networks. As a direct consequence, Data Centers and Network Service Providers are under constant pressure to deliver more bandwidth and computing power at lower and lower cost per bit.

CALIENT's optical circuit switches (OCS) – S320 play a unique and important role in addressing these challenges by enabling the dynamic interconnection and sharing of high-value compute, network, and test resources at the optical layer. The OCS is transparent to data speed and is protocol agnostic. Consequently, it offers very high bandwidth and configuration flexibility as networks grow in speed from 40 and 100 Gbps to 400 Gbps and beyond.

At a Glance

- Small Size: 320 ports (TX/RX pairs) in 7RU chassis (LC Connectors).
- Low Power Operation: 45 W typical.
- Low Cost: Supports deployment in data center, service provider, and government networks.
- Ultra-Low Latency: All-optical connectivity adds negligible latency.
- Scalable: Supports all data rates to 200 Gbps and beyond.
- Reliable: Based on proven MEMS design deployed in over 750,000 fiber terminations worldwide.
- Simple to Install, Integrate, and Use: GUI driven, comprehensive set of northbound APIs.
- Low Loss: 1.8 dB typical insertion loss.
- Built-In Power Monitoring: Every in/out fiber is monitored, providing powerful network diagnostic capabilities.

Applications

The S Series provides the scalable and protocol-independent automated optical switching and management infrastructure for a wide range of Data Center, Service Provider, and Government applications.

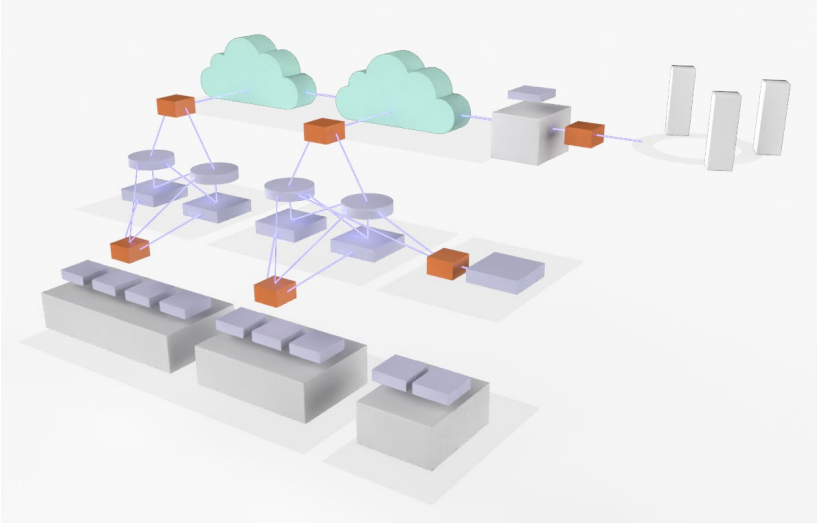

Figure 1. Selected S-Series OCS Applications

Specifications

Optical

- 320 Ports (each port is TX/RX pair)
- Insertion loss (EoL): 0.8 dB min, 1.5 dB typical,
- 3.0 dB max (O, S, C Bands)
- Single-mode fiber, wavelength range: 1260-1700 nm
- Latency: <30ns
- Channel setup time: <50 ms
- Switch reconfiguration time (all ports): <200 ms
- Input dynamic range: +5 dBm to -20 dBm
- Switching cycles: 10^12
- Optical cross-talk: -60 dB
- Return loss (EoL): 41 dB typical, 35 dB min.

Environmental

Operating

- **Temperature**: 5° to 55° C (41° to 130° F)
- **Humidity:** 5% to 90%, non-condensing
- **Altitude:** <4000 meters

Non-operating

- **Temperature:** -40° to +70° C (-40° to 158° F)
- **Humidity:** 5% to 95%, non-condensing
- **Altitude:** <12,000 meters

Key applications include:

- **DevOps/Test Automation** – Dynamic sharing of high-value test, compute, and network resources.
- **Wireless Networks** – Capacity optimization in optical backhaul and fronthaul networks
- **Cloud, Enterprise & Colocation Data Centers** – Scalable, on-demand compute resource optimization and optical topology management.
- **Disaster Recovery** – Rapid recovery from multiple network failure scenarios.
- **Subsea Cable Networks** – Remote network configuration and restoration.
- **Fiber to The Premise (FTTP) Networks** – Automated activation and testing.
- **Cybersecurity** – Protection of critical network infrastructure from cyber-attacks.

Description

The S-Series Optical Circuit Switch is an all-optical (OOO) switch that establishes, monitors, and changes connections between single-mode optical fibers using Micro-Electro-Mechanical Systems (MEMS) optical switching. Connections are made between fibers carrying signals with any data rate or protocol. Any input fiber can be connected to any output fiber.

Based on field-proven MEMS technology, which CALIENT has deployed in more than 750,000 optical connections worldwide, S-Series switches deliver the high reliability, small form factor, low power consumption, low cost, and ease of use that make the significant benefits of true all-optical switching readily available to a variety of applications.

A 320-port (S320) version of the switch is offered, with each port representing a TX/RX fiber pair. Both feature low insertion loss (3 dB max) and ultra-low latency (30 ns worst case). 100-to-240 VAC and -48 VDC powered versions are available, with dual feeds (A and B) for maximum redundancy.

Specifications

Power

- DC variants are equipped with dual (A and B) -48 VDC power modules
- AC variants are equipped with dual (A and B) 100-to-240 VAC power modules
- Optional Front or Rear mounting of A and B power feeds Field-replaceable power modules
- Power dissipation: 45 W typical.

Mechanical

- **Size:** 17.5"w x 12.2"h x 19"d (445 x 310 x 483 mm)
- **Weight:** 45 lbs. (20.5kg)
- **Shipping weight:** 95 lbs. (43.2kg)

Regulatory Compliance

- **Safety:** UL 60950, EN 60950-1, CSA 69950
- EMI/EMC: FCC Part 15 Subpart B, GR-1089-CORE, EN 55022, Class A, EN 55024
- **Environmental:** GR-63-CORE (NEBS), EN 300019 Eye safety: CFR Title 21 Part 1040 Class 1
- I/P voltage: ANSI T1.315-2001
- Directive 2011/65/EU

Management

- **Physical Interfaces:** Dual Gigabit Ethernet Ports, Serial Console Port, External Alarm Contacts
- **User Interfaces:** Web GUI, TL1 Command Set, SNMPv3, CORBA, OpenFlow and REST APIs

Users manage and communicate with S-Series switches by means of redundant, high-reliability Control Processors. TL1 command sets and SNMPv3 are supported in addition to a CORBA interface and a Web-based Graphical User Interface. REST, OpenFlow, and other APIs are also available

About Calient

CALIENT Technologies is the industry leader in optical-layer virtualization, providing systems that enable dynamic resource sharing, optimization, and automation for optical transport networks, next-generation data centers, high-performance

computing facilities, and DevOps test automation. Originating from research at UC Santa Barbara and Cornell University, CALIENT's switches are deployed at scale in Tier 1 Cloud and Communication Service Provider networks worldwide, with many years of demonstrated reliability.