



Layer 1 Switch Data Sheet



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OVERVIEW

When considering a layer 1 switch you no longer have to choose between performance, features and affordability. ColdFusion is the only Layer 1 Switch to offer:



- ✓ Multimode, Singlemode, AOC, DAC, PSM4, Ethernet RJ45 SFP up to 10G
- ✓ Any speed up to 128GB
- ✓ Any protocol
- ✓ Highest scale: 256 QSFP ports up to 128 Gbps or 512 SFP ports up to 32 Gbps or 1024 ports using breakout cables
- ✓ Highest density: 12 rack units for fully populated system
- ✓ Full wire-speed unicast, multicast and broadcast mapping
- ✓ Port level diagnostics
- ✓ Affordable configurations

ColdFusion offers best in class feature-set in an affordable design.

BENEFITS

Lepton's ColdFusion L1 switch addresses the final roadblock in complete test lab automation: the physical layer. Once wired to ColdFusion, test configurations can be initiated using remote commands or API scripting to fully automate tests, eliminating the need for manual set-up. ColdFusion supports a work-from-home/low contact environment, improves CAPEX and OPEX and optimizes any test automation software deployment.



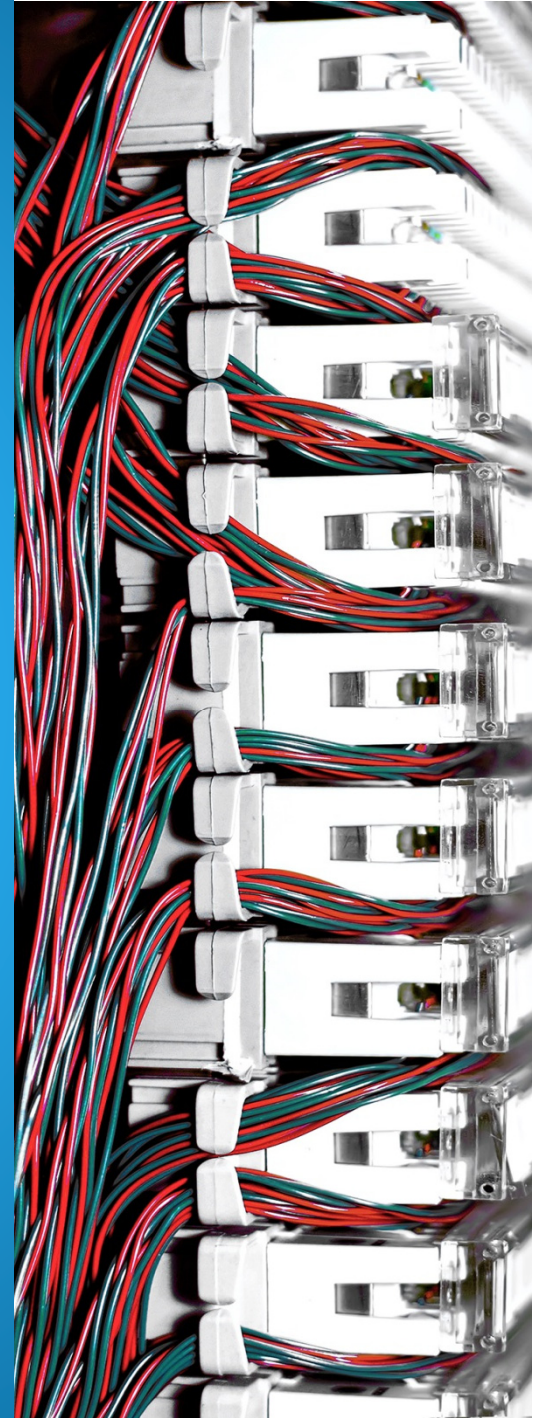
SYSTEM DETAILS

ColdFusion's Optical-Electrical-Optical (OEO) architecture is a protocol agnostic Layer 1 switch with sub 50 ms connection time, zero insertion loss, and a fixed, deterministic latency of <50ns. It intelligently connects up to 256 devices at 128G and 512 at 32GB ports in a dynamic and agile network environment.

The basic chassis includes four integrated fabric control components, and two replaceable fan units mounted on the back panel which operate at the same variable speed, and adjust automatically with the system temperature. ColdFusion supports four redundant, hot-swappable AC power supplies.



Each ColdFusion chassis supports up to eight modular blades for scalable applications. There are two types of blades available. The 32 QSFP Blade has 32 configurable QSFP28/SFP28 ports for a total of 256 128G ports/system. Additionally, each data port partitions into four 1G to 28G lanes for 1024 data streams using breakout cables. The 64 SFP Blade supports any MSA compliant SFP up to 10G, or 32G Fibre Channel rates including native support for Ethernet, RJ45 copper SFPs. This combination of blades positions ColdFusion as the only Layer 1 switch to support 10M to 128G ports in the same chassis.

ColdFusion is managed via one system control module with a front panel that provides status LEDs, an IP status text display, and management interface ports for remote and local access. ColdFusion is controlled via CLI commands or GUI. Automation can be performed using Python API, or RESTful scripting language. Test lab automation software offered by Qualisystems (CloudShell) and Spirent (Velocity) also supports ColdFusion.



MODULAR INTERFACE BLADES

ColdFusion Layer 1 switch offers two chassis types; an 8 slot and a 2 slot chassis. Each slot can be independently populated with one of the following Line Card options:

	32 QSFP Based Interfaces	64 SFP Based Interfaces
		
Maximum number of Ports in 8 slot chassis	256 ports using any MSA compliant QSFP module. 1024 lanes of up to 32Gbps using breakout cables	512 ports using any MSA compliant SFP module
Supported Ethernet Rates	100M, 1G, 2G, 5G, 10G, 25G, 40G, 100G	10MB, 100MB, 1G, 2.5G, 5G, 10G, 25G
Supported Fibre Channel rates	1G, 2G, 4G, 8G, 16G, 32G, 128G	1G, 2G, 4G, 8G, 16G, 32G
Supported Firewire types	No	1394 Firewire A and B
Native Support for Ethernet, RJ45 SFP	No	YES, up to 512 ports
Media Conversion	SM to MM fiber	<ul style="list-style-type: none"> SM to MM 100Mbps through 10Gbps copper to fiber SM or MM

SPECIFICATIONS - 8 SLOT CHASSIS

Physical Specifications

Dimensions	21" H x 17.25" W x 17.5" D 53.34 cm x 43.815 cm x 43.815 cm
Rack Mounting	19" with mounting ears, 12RU
Weight (fully loaded system)	120.9 lbs/54.84 kg
System controller Interfaces	Ethernet RJ45 (remote), 2 x USB, HDMI (local monitor), serial port

Optical Characteristics

Ports	256 QSFP28 sockets.(QSF Blade) Each port partitions into four 1G to 28G lanes using break-out cables. 512 SFP ports (SFP Blade)
Physical Media	<ul style="list-style-type: none"> • Single Mode, Multi-mode (Including media conversion between mapped ports) • Active Optical Cable (AOC) • Direct Attach Cable (DAC) • PSM4 • Ethernet RJ45
Application Data Rates	100M to 128G
Application Protocols	Including, but not limited to: Ethernet, Fibre Channel, OTN, and InfiniBand. ColdFusion supports any other serial data communication protocols within the range of 1G to 128G
Fixed Latency (port-to-port, maximum)	<50ns at 128G
Insertion Loss	0 dB
Switching Time	<50ms
Pluggable Fiber-optic Transceivers (Provided by user)	Must comply with FDA CDRH performance standards.
Mapping	<ul style="list-style-type: none"> • Full wire-speed unicast, multicast and broadcast • Link/port flapping simulation - user-defined parameters
Port level diagnostics	TX power, RX power, LOS, temperature

SPECIFICATIONS - CHASSIS

Power Supply Specifications

Source Input Maximum Current	11.5 Amps per power supply up to 46 Amps per system with four power supplies installed
Source Input Voltage	90-140 VAC (1000 Watts output per power supply at 115 VAC) 180-264 VAC (2000 Watts output per power supply at 230 VAC)
Power Supply Units	115 VAC source: four power supplies required, no redundancy 230 VAC source: two power supplies required, optional two redundant
Input Voltage Range	180-264 VAC = 2000 Watts output at 230 VAC 90-140 VAC = 1000 Watts output at 115 VAC
Frequency	47 Hz to 63 Hz
Maximum Input Current	11.5 Amps at 100/200 VAC
Inrush Current	50 Apk
EMI (Conducted and Radiated)	Class A
Hold-up Time	11 ms at 95% load
Nominal Output	12.2 Volts at 163.9 Amps
Standby Output	12 Volts at 3.5 Amps
LED Status	Solid Green = Main output on Blinking Amber = Standby or No AC power

Environmental Conditions

Operating Temperature (at full output power)	-17.78°F to 122°F 0°C to 50°C
Operating Humidity	< 95%, non-condensing

Safety and Compliance

	<ul style="list-style-type: none"> ● FCC Part 15 (Class A) ● RoHS Compliant ● CE Declaration of Conformity (Europe) ● Reach Compliant
Proposition 65 (California)	Lepton products may contain chemicals known to California to cause cancer, birth defects, or other reproductive harm.

Management Interface

Interfaces	GUI, CLI and SSH
Application Program Interfaces (API) and Scripting Languages	Python API, RESTful
Test Automation Software Integration	Quali Systems (CloudShell) Spirent (Velocity)

2 SLOT CHASSIS

System Details

The 2 slot chassis has a compact size of 4 rack units with an optional port count of 32, 64, 128, and 256 port configurations. It includes an integrated fabric, control components, and a replaceable fan unit mounted on the back panel which operates at a variable speed, and adjusts automatically with the system temperature. The chassis supports 2 redundant, hot-swappable AC or DC power supplies.



The ColdFusion 2-slot switch supports up to two modular data blades for scalable applications. Using the 64 SFP interface blade, the system scales up to 128 ports of SFP/SFP+ and/or SFP28 ports supporting bit rates up to 128Gbps. Using the 32 QSFP interface blade, the system scales to either 64 ports of native QSFP/QSFP+ and or QSFP28 ports supporting up to 128Gbps or, implementing industry-standard breakout cables, you can scale this system up to 256 SFP client interface ports supporting up to 128Gbps.

Physical Specifications

Dimensions	8.75" H x 17.25" W x 17.5" D 53.34 cm x 43.815 cm x 43.815 cm
Rack Mounting	4RU, 19" with mounting ears
Weight (fully loaded system)	50.9 lbs/23.08 kg
System controller Interfaces	Ethernet RJ45 (remote), 2 x USB, HDMI (local monitor), serial port

Optical Characteristics

Ports	64 QSFP28 sockets. Each port partitions into four 100M to 28G lanes using break-out cables. Or 128 SFP28 sockets. Each port supports 100M to 128G
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Power Supply Specifications

Source Input Maximum Current	5.1 Amps per power supply up to 10.2 Amps per system with two power supplies installed
Maximum Input Current	5.1 Amps at 100/200 VAC

● THE BASICS: WHAT IS A LAYER 1 SWITCH

A physical layer switch, or Layer 1 (L1) switch, operates at the physical layer of the OSI (Open System Interconnection) model. The easiest way to think of a Layer 1 switch is an electronic, programmable patch panel. It simply establishes the physical connection between ports. The connection is established using software commands and thus, allows test topologies to be automatically or remotely configured. A layer 1 switch does not read, manipulate or use packet/frame headers to route the data. L1 switches are fully transparent to the data and typically have a very low latency. Completely transparent connections between ports are important in testing environments as this allows the tests to be as accurate as if there were a patch cord between the devices.

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