MRV Optical Communications Systems®

Datasheet

High-Bandwidth Physical Layer Optical Switch

Applications

- Network or storage equipment manufacturing test labs
- Fiber provisioning and maintenance
- Interoperability validation and network simulation
- Customer support environments
- Data Center and cloud computing networks

Highlights

- **Flexible**
  - Any data rate to 100Gbps
- **High Density**
  - Up to 320 bi-directional ports per system
- **Modular**
  - Expansion in increments of 8 ports
- **Reliability**
  - Carrier-class redundancy with proven performance
- **Transparency**
  - Fast switching time, low insertion loss

Overview

The explosion of video and other data is driving up network traffic so dramatically that companies across the globe are investing heavily in ways to boost their network bandwidth. According to market research done by the Dell'Oro Group, this growth is driving the market for 10-Gigabit Ethernet equipment from $2.8 billion in 2009 to $8.5 billion in 2014.

Network equipment manufacturers, carriers and data centers encounter challenges in keeping up with the explosion of bandwidth-hungry applications. From developing equipment to handle the increased bandwidth to expanding the network to support the traffic, flexibility is the key to success.

The Effect on Test Labs

The test lab plays an important role in a manufacturer's or service provider's organization. Whether it's new product or service development, software verification, interoperability validation, pre-sales or post-sales support, the efficiency of your test lab affects your bottom line. Bringing new products or services to market faster and solving problems more quickly gives you a competitive edge. Seamlessly demonstrating solutions to potential customers wins deals and increases revenues. Minimizing expenditures for resources or equipment increases profits. Being able to simulate network failures in an accurate and repeatable way is mandatory. An inefficient, manually run test lab, however, can easily stifle the productivity and success of any organization.

The Effect on the Network

Network operators need to provision high-bandwidth connectivity in their network to provide access to the amount of data needed by the users at the time they request it. Changes to customer demands mean the network must also be reconfigurable and scalable. From adding network agility to automating fiber management, flexibility in provisioning and bandwidth keeps data flowing and customers happy.

The Solution – Physical Layer Switch

The "wire-once" technology of a physical layer switch turns the practice of manually configuring the network or test topologies into a software process. An all-optical physical layer switch can support bandwidths up to 100Gbps! In the lab, test time and configuration errors are reduced, repeatability of tests is improved, and lab efficiency is increased. In the network, bandwidth and provisioning agility and dense any-to-any fiber connectivity allows service providers to quickly change the network to meet today's dynamic environment.

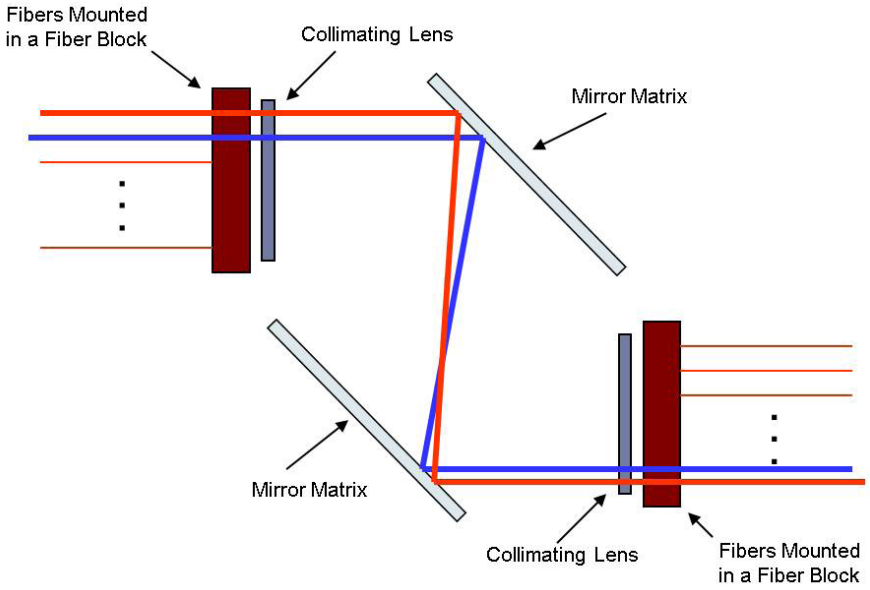
Strong Partnership

MRV, the leading provider of optical-electrical-optical (OEO) layer 1 switches compliments its Media Cross Connect (MCC) product line by offering FiberConnect, the leading all-optical (OOO) layer 1 switch developed by Calient. With this partnership, MRV can provide a layer 1 solution for T1 to 100Gbps with flexibility in any size configuration.

FiberConnect

With its core, 3D MEMS technology, FiberConnect offers the industry's highest density all-optical switch with 320 ports. FiberConnect switches just the light, so it is not rate-limited by an electronic matrix as in OEO physical layer switches. It is therefore particularly suited for applications of 10Gbps or higher, and it has been proven with 40G and 100G networks.

3D-MEMS: *Micro-mirrors rotate to direct incoming light to any output port.*



FiberConnect does not interfere with the signal itself, preserving key aspects of the source, including frequency, waveform, signal dispersion and signal timing. This transparency makes it deployable in test lab or network environments to provide the efficiencies and flexibility of a physical layer switch. FiberConnect has a 20ms switching time – short enough to switch even the most time-sensitive network protocols such as SONET.

FiberConnect Details

FiberConnect is scalable to 320 bi-directional ports per chassis. Ports are added in increments of 8 using the 8-Port Driver card. Test ports are provided to share test equipment within the system. A multi-channel power monitor (MCPM) detects the optical input power and adjusts it for minimum optical signal loss.

Administration, configuration, and mappings are easily performed using the web-based management graphical user interface (GUI) or a TL-1 interface that can be integrated into scripting scenarios. FiberConnect interfaces are accessible either through the local RS-232 serial console port or through the RJ-45 Ethernet port using SSH or telnet protocols. FiberConnect is also fully supported by MRV's ResourceFinder management solution to provide seamless integration with the Media Cross Connect.

The FiberConnect is built with reliability and redundancy for mission-critical applications, with all key electronic cards being hot-swappable. Telcordia certified for reliability, FiberConnect has been operating networks for eight years with no in-service failures.

Datasheet

Physical Specifications	
Operating Temperature	-5°C to 50°C (23°F to 122°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Operating Humidity	5% to 90%, non-condensing
Storage Humidity	5% to 95%, non-condensing
Input Voltage	-42V to -57V DC
Input Current	4A continuous, max.
In-rush Current	7A for 8 ms
Power Dissipation	470 mW per connection (fully-loaded chassis)
Physical Dimensions	752 mm high x 445 mm wide x 318 mm deep (29.6"H x 17.5"W x 12.5"D)
Weight	40 kg (88 lbs)
Shipping Weight	75 kg (165 lbs)
Regulatory Compliances	UL 60950, EN 60950-1, CSA 69950; FCC Part 15 (Class A), GR-1089-CORE, EN 55022 (Class A), EN 55024; GR-63-CORE, EN 300019; CFR Title 21 Part 1040 Class 1; ANSI T1.315-2001
Reliability	MTBF > 12 years
Serviceability	Hot-swappable field-replaceable units (FRU)
Indicators	Standard telco alarms

Optical Specifications (O and C bands)	
Fiber type	Single-mode
Configuration time	< 20 ms
PDL	< 0.3 dB
PMD	< 10 fs
Chromatic dispersion (@1550 nm), EoL	< 0.25 ps/nm
Static crosstalk	< -65 dB
Path stability	< 0.2 dB
Repeatability	±0.25 dB
Input Dynamic range	+5 dBm to -20 dBm (customizable)
Switching cycles	10^{-9}
Insertion loss (EoL)	Minimum: 1.3 dB; Typical: 2.0 dB; Maximum: 3.0 dB
Return loss (EoL)	Typical: 40 dB; Maximum: 35 dB

Ordering Information	
FC-A640-212	All Optical Chassis, equipped with a 320x320 port matrix, LC connectors, ETSI dual -48V DC power supplies, input power monitoring and a single configuration processor. CN-FC-A640-212-00-CN-00
FC-A640-222	All Optical Chassis, equipped with a 320x320 port matrix, LC connectors, ETSI, dual -48V DC power supplies, input power monitoring, and are dundant configuration processors. CN-FC-A640-222-00-CN-00
FC-A640-112	All Optical Chassis, equipped with a 320x320 port matrix, LC connectors, ANSI, dual -48V DC power supplies, input power monitoring, and a single configuration processor. CN-FC-A640-122-00-CN-00
FC-A640-122	All Optical Chassis, equipped with a 320x320 port matrix, LC connectors, ANSI, Dual -48V DC Power Supplies, input Power Monitoring and redundant configuration processors. CN-FC-A640-112-00-CN-00
FC-SPC8-00	8 port driver card for any chassis. CN-FC-SPC8-00-CN-00
FC-SPPS-00	Soft patch power supply for spare only. Included in all chassis configurations. CN-FC-SPPS-00-CN-00
FC-CP-00	Configuration processor for spare. CN-FC-CP-00-CN-00
FC-ACRM	Rack mount adapter for FC-ACPS does not include converter, holds up to 4 converters
FC-ACPS	AC to DC converter 85-264V AC input to 48V DC output, 800 Watts

For more information on MRV's test automation products, please visit *www.mrv.com/tap* .

MRV has offices throughout the world. Addresses, phone numbers and fax numbers are listed at www.mrv.com.
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