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Find the *Alcatel-Lucent DDM-2000* at our website: *Click HERE*

Lucent Technologies
Bell Labs Innovations

DDM-2000 Multiplexer

A Service-Ready SONET Multiplexer Solution



When you're managing a growing network, you need to keep one eye on the present, and the other on the future. If you simply meet your near-term needs today, you may limit your options for future growth. On the other hand, 'over-building' today can be more costly than necessary, especially in the short-term.

Lucent Technologies has the optimal answer: our DDM-2000 Multiplexer Solution. The solution consists of a flexible, and highly efficient system that helps you to optimize your current network while providing a graceful and cost-effective path to growth and enhancement.

The DDM-2000 solution is a widely deployed, field-proven, powerful platform that enables you to deliver the services your customers need. The DDM-2000 uses Unidirectional Path Switched Ring (UPSR) capabilities to support SONET ring applications.

Engineered for Flexibility

The DDM-2000 Multiplexers help you to satisfy a wide variety of applications today, with systems that can be smoothly upgraded and expanded as your network topologies grow more complex.

Helping to enable you to deliver data services ... today!

Service Providers are looking for economical, reliable solutions to provide data services — without having to create an overlay network. Lucent has developed a data services solution that takes advantage of the highly reliable SONET-based ring networks of today. Simply by adding new data circuit packs to the DDM-2000, you are now able to offer your customers a full portfolio of data services.

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The new DDM-2000 Broadband Data Interface enables you to connect the DDM-2000 to any commercially available ATM edge switch.

Increasing bandwidth, easily

In those instances where bandwidth demand has exceeded expectations, Lucent Technologies has developed an innovative solution to increase bandwidth of existing DDM-2000 equipment. Today, DDM-2000 OC-3 is capable of increasing the bandwidth to OC-12 simply by replacing the optic packs on the OC-3 multiplexer.

In the same manner, DDM-2000 FiberReach can increase the bandwidth from OC-1 to OC-3 simply by adding OC-3 on OC-1 optics. DDM-2000 FiberReach will support OC-12 on OC-1 in the future.

More bandwidth, please!

The DDM-2000 is also an integral part of Lucent Technologies Optical Networking Solution. In instances where you are fiber-constrained or in need of larger amounts of bandwidth, the Lucent Optical Line System (OLS) delivers Dense Wavelength Division Multiplexing (DWDM) capabilities.

The DDM-2000 Solution

The Lucent Technologies DDM-2000 solution consists of three SONET multiplexers: An OC-1 system, an OC-3 system and an OC-12 system. Each product may be used in SONET ring, linear or hubbed topologies.

DDM-2000 FiberReach

DDM-2000 FiberReach is the Lucent Technologies OC-1 (51.84 Mb/s) SONET multiplexer. The 9” high shelf consists of a narrowband and a wideband shelf. The narrowband shelf supports a multitude of DS0 based services based on Lucent Technologies digital loop carrier system circuit packs for the SLC®-2000 Access System. Each narrowband shelf can support up to 48 DS0 services.

The wideband shelf supports up to 28 DS1’s and a DS3 in a single shelf.

DDM-2000 OC-3 Multiplexer

The DDM-2000 OC-3 (155 Mb/s) Multiplexer provides up to three DS3 (84 DS1) equivalents in a single 8.5-inch shelf space. The DDM-2000 OC-3 supports DS1, DS3, EC-1, OC-1 and OC-3 low speed interfaces and is typically used in loop (access), interoffice (transport) and customer location applications.

DDM-2000 OC-12 Multiplexer

The DDM-2000 OC-12 (622 Mb/s) provides 12 DS3 equivalents in a 14-inch shelf space. DDM-2000 OC-12 supports DS3, EC-1 and OC-3 low speed interfaces and is typically used in loop (access), interoffice (transport) and customer location applications.

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The DDM-2000 Multiplexer Solutions at a Glance

DDM-2000 FiberReach Multiplexer	DDM-2000 OC-3 Multiplexer	DDM-2000 OC-12 Multiplexer
Applications: • loop (access) • customer location	*Applications:* • loop (access) • interoffice (transport) • customer location • transmux	*Applications:* • loop (access) • interoffice (transport) • customer location
High Speed Interfaces: • OC-1 (51.84 Mb/s) • OC-3 on OC-1 (155 Mb/s) • OC-12 on OC-1 (622 Mb/s) (future)	*High Speed Interfaces:* • OC-3 (155 Mb/s) • OC-12 on OC-3 (622 Mb/s)	*High Speed Interface:* • OC-12 (622 Mb/s)
Network Topologies: • ring	*Network Topologies:* • ring • point-to-point • hubbing	*Network Topologies:* • ring • point-to-point • hubbing
Low Speed Interfaces: Wideband Shelf: • DS1 • T1 • HDSL • TMA-LAN (Future) Narrowband Shelf: • DS0	*Low Speed Interfaces:* • DS1 • HDSL • EC-1 • DS3 • OC-1 • OC-3 • IMA-LAN (Future) • T1EXT (Future)	*Low Speed Interfaces:* • DS3 • EC-1 • OC-3
Physical Compactness: • Shelf Height: 9”	*Physical Compactness:* • Shelf Height: 8.5” • Systems per 7’ bay: 6	*Physical Compactness:* • Shelf Height: 14” • Systems per 7’ bay: 3

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The OLS can support up to 16 times the bandwidth of a Time Division Multiplexed solution.

The Lucent Technologies DWDM solution has been proven cost-effective and efficient in both metropolitan and long distance applications. The OLS, when used with the DDM-2000 and other SONET, asynchronous, or ATM-based systems, can solve your bandwidth concerns.

Multivendor Interworking

Lucent Technologies is delivering on the original promise of SONET. Lucent is an active member in the SONET Interoperability Forum, a group of telecommunications service providers and vendors focused on advancing the deployment of SONET.

The DDM-2000 MultiplexerSolution has been tested with many other vendors' SONET multiplexers. Your Lucent Technologies Account Executive has a complete list of DDM-2000 certified vendors.

Suitable for Inside or Outside Plant

All of the DDM-2000 Multiplexers can operate equally well in standard central office environments, or in the uncontrolled environment of outside plant. The DDM-2000 Multiplexers meet Electromagnetic Compatibility (EMC) and Underwriters Laboratories, Inc. (UL) standards for all applications, including customer premises. Additionally, the DDM-2000 meets Canadian Standards Association (CSA) Certification Standard C22.2 No. 225-M90.

Easy Installation and Operation

The DDM-2000 Multiplexers are designed for easy installation and operation. A full set of single-ended control and maintenance features allows you to centralize operations in a single remote location. Test capabilities and default provisioning are built-in and greatly simplify installation. In fact, the DDM-2000 OC-1, OC-3 and OC-12 multiplexers can be fully tested and installed without using external test equipment. Most tasks can be performed using Light Emitting Diodes (LEDs), displays, and controls on the faceplates.

Coordinated software upgrades

Software download is now quick and easy. When new software is released for the DDM-2000 Multiplexers, a built-in software copy capability allows new software to be downloaded from a personal computer to the DDM-2000 system while the previous version is still running. The new software can be

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initiated automatically — on command, or on a prearranged schedule — allowing you to coordinate the cutover of several network elements in the subnetwork.

Protection Against Service Outages

Today's businesses cannot afford to have their data, voice and video service go out. DDM-2000 can help protect against service affecting failures at the path (fiber) and node (office) level.

Protection against line failure
To minimize outages and service degradations in your network, the DDM-2000 OC-1, OC-3 and OC-12 provide protection switching features that can automatically switch traffic to a protection path in the event of a fiber cut, signal failure, or signal degrade.

Protection against nodal failure

- *Dual-Homed Topologies*
  To support the higher-reliability needs of demanding network applications, the DDM-2000 OC-1, OC-3 and OC-12 multiplexers provide dual home access topologies such as OC-1 on OC-3, and OC-3 on OC-12, which can protect service even in the event of a catastrophic add/drop node failure.

Protection against catastrophic office failure

- *Dual-Ring Interworking (DRI) topologies for enhanced reliability*
  Both the DDM-2000 OC-3 and DDM-2000 OC-12 multiplexers provide a "drop-and-continue" feature necessary on DRI path-switched rings to add or drop the same data at two separate locations. Since the two identical data streams are added/dropped at physically separate locations, you can protect services not only from fiber and equipment failures, but also from office failures such as fires or floods.

Operations Support Systems

No SONET solution would be complete without an Operations System (OS) to help manage and maintain the network. Lucent Technologies offers two operations support systems; Integrated Transport Management (ITM) Subnetwork Controller (SNC) and CPro-2000.

The ITM SNC supports larger networks with many subnetworks, and ITM SNC performs configuration management and interfaces with fault management and provisioning OSs. It can also support multivendor networks.

CPro-2000 supports smaller networks or subnetworks of up to 50 network elements at a time. The PC-based product uses real-time information about the network elements to provide configuration and inventory management of the Lucent DDM-2000 Multiplexer Solutions, the FT-2000 OC-48 Lightwave System, the SLC-2000 Access System (SONET subsystem only) and the (OLS).



Broadband Data Interface Function Unit

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Summary of New Feature Enhancements

	OC-1	OC-3	OC-12
Intraoffice LAN provides a 10 Mb external connection allowing you to incorporate ITM SNC for software downloads and data transfer. It also helps to enable faster download of software rather than dispatching craft personnel to each multiplexer.		•	•
Multivendor Interworking: TARP with 2.6 compliant stack helps to enable the DDM-2000 to operate in a multivendor interworking network.	•	•	•
Integrated High Data Rate Symmetric Digital Subscriber Line Circuit Pack allows you to obtain more distance from copper cable without repeaters. It uses 2BIQ encoding and supports 2 HDSL ports per circuit pack.	•	•	
OC-12 Optics on OC-3 enables you to upgrade an OC-3 ring to an effective capacity of OC-12 without adding a new shelf.		•	
OC-3 Optics on OC-1 enables you to upgrade an OC-1 ring to an effective capacity of OC-3 without adding a new shelf.	•		
Broadband Data Interface (DS3) Circuit Pack enables you to offer data services over your SONET network. A new circuit pack on DDM-2000 allows you to connect to any commercially available ATM edge switch.		•	
Transmux Circuit Pack allows for efficient and economical support of DS1-DS3 transmultiplexing — eliminating the need for asynchronous M13 multiplexers.		•	
Inverse Mux over ATM (IMA) LAN provides a 10/100 Mb/s Ethernet LAN service directly on the DDM-2000 OC-3 shelf or FiberReach shelf.	•	•	

Lucent Technologies and Its Bell Laboratories Innovations

Many of the advances that are driving today's telecommunications industry were developed by Lucent Technologies and its innovative Bell Labs team. The DDM-2000 Multiplexer Solution is a prime example of a forward-looking solution — a solution that can meet your needs today, while allowing for a smooth transition to more advanced network topologies in the future.

To learn more about the DDM-2000 Multiplexer Solution, please contact your Lucent Technologies sales representative.

Visit our web site at http://www.lucent.com

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