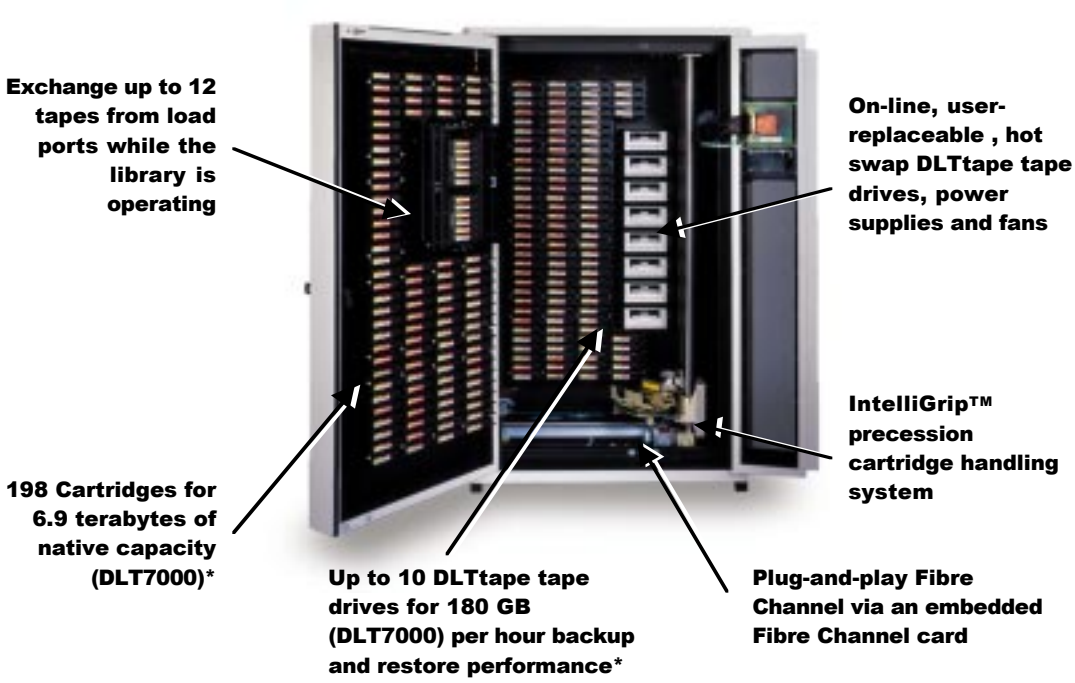
P2000 Series Automated DLTtape Libraries

Setting the standard for mid-range enterprise-class libraries, the P2000's high-availability, scalability, performance, capacity, upgradability and ease of operation make it a global leader in enterprise tape automation. Built for users demanding continuous availability, the P2000 is the best choice for data-intensive applications from data warehousing to image archiving. No other library approaches the P2000's enterprise features, including a future-proof architecture, a broad array of redundant components and the industry's most advanced -- yet easy to operate -- user interface. If you are considering Fibre Channel, just add an embedded Fibre Channel interface to the P2000 and attach it to your Storage Area Network (SAN). No other library approaches the power, flexibility and investment protection of the P2000 from Quantum | ATL.

Features and Benefits

- Fibre Channel or SCSI interface, field upgradeable
- Up to 10 DLTtape™ drives for 180 GB per hour backup performance*
- Up to 198 DLTtape tape cartridges for 6.9 terabytes of native capacity*
- Scalable capacity and performance for up to 52.5TB of native storage and 1.33 TB per hour*
- Redundant AC power cords, AC power controllers, power supplies and fans
- Hot swap, hot-plug and user-replaceable DLTtape drives, power supplies and fan modules
- Prism Storage Architecture™ featuring two PCI and six CPCI expansion slots
- Twelve cartridge load port with two removable magazines for quick loading and unloading
- Touch screen GUI control panel with browser look and feel
- WebAdmin™ software for remote administration from anywhere on the web
- Support for future drive technology including SDLT and LTO Ultrium™**



* All tape drive capacity and throughput values reflect DLT7000 specifications. Future tape technologies will increase both capacity and throughput.
** Check with your ATL representative for availability

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RAID-like Packaging Delivers High-Availability and Serviceability[†]

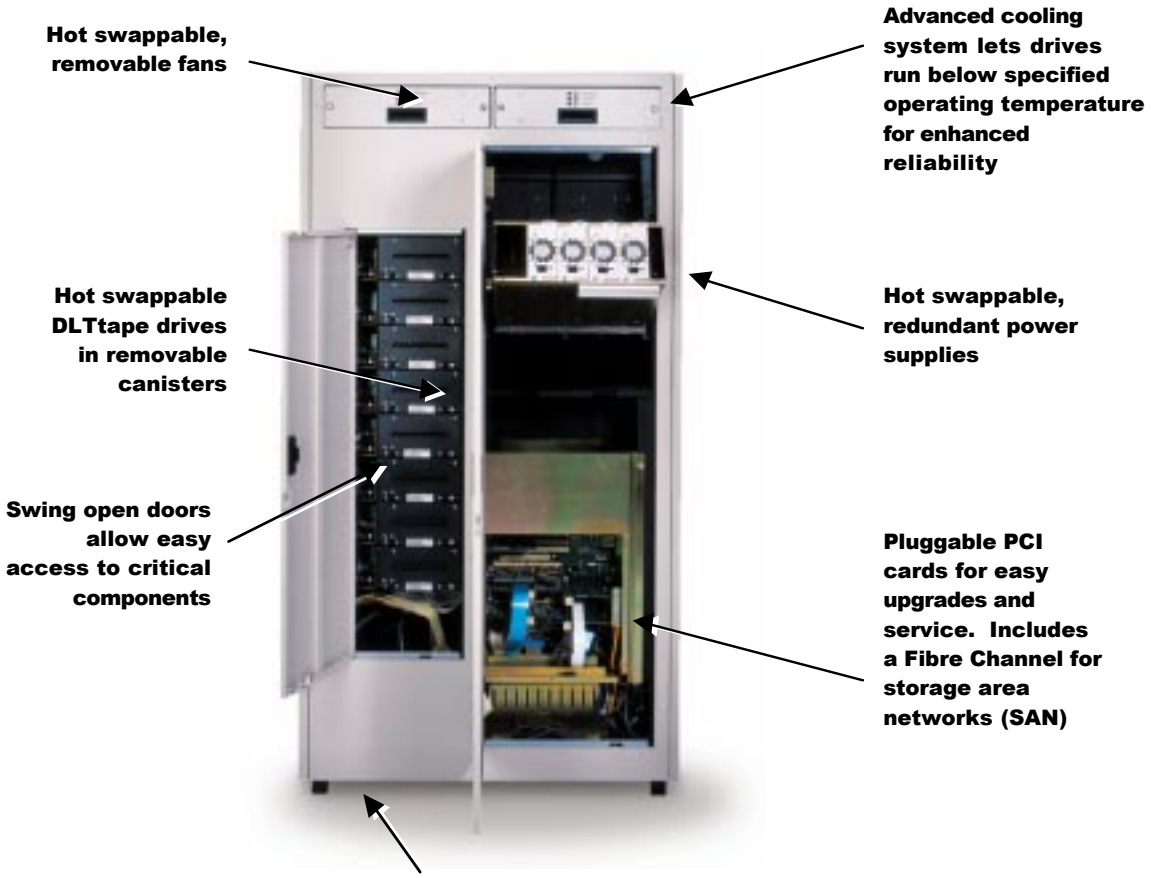
Setting a new standard for tape library packaging, the ATL P2000 Series library delivers new levels of availability and serviceability. The P2000 can tolerate component failure with redundant AC power cords, power supplies and fans. In addition, the tape drives, power supplies and fans can be replaced on-line (hot swapped) to ensure continuous uptime.

Easy serviceability is achieved with friendly local and remote graphical user interfaces available to assist operators. Plus, hardware upgrades and service are simplified with cable-less, user replaceable, hot swap tape drives, power supplies, fans and PCI card modules.

Single-connector hot swap DLTtape drive module

P2000 RAID-like packaging features and benefits:

- Redundancy to tolerate component failure
- On-line replacement (hot swap) for continuous uptime
- Cable-less, hot pluggable, user replaceable modules simplify service
- High Availability option includes twice the cooling capacity needed to assure unabated operations
- Friendly local and remote interfaces designed for easy operation



[†] Presumes fully configured unit

Advanced Power System Enhances Reliability

Designed to provide continuous power to your library system, the ATL P2000 series has a highly reliable power system. Utilizing power factor corrections, the P2000 power supply system prevents shutdowns and assists in maintaining continuous on-line operations. In addition, the P2000 power modules are hot swappable and redundant (available in N, N+1 or 2N), enabling the library to continue operations through a power supply failure. Furthermore, the P2000 includes 120-240 volt AC auto-switching power supplies assuring that the P2000 will work regardless of where you are in the world.

Easy Serviceability from Hot Swap Components

The P2000 was designed with easy to remove single-connector components to allow quick user swaps should components be upgraded or need replacement. Unlike other library manufacturers, there is no need to take the entire system off-line when replacing a tape drive. Parts such as the library controller card, actuator driver card, host interface card, touch-screen control panel and the power supply are easily replaced in minutes. The tape drives in the P2000 are factory installed in hot swap drive modules that can be quickly removed and replaced without interrupting activity of any other drives.

In addition, the P2000 touch screen provides enhanced service functions that include:

- Exercising the robot
- Setting password protection
- Performing system tests
- Performing diagnostics
- Configuring drives / library

Load Port for On-line Tape Exchange

The P2000 load port allows users to swap up to 12 DLTtape/SDLT or LTO tapes in two removable six-packs without interrupting library operations. For example, if data is being backed up to all the drives in the unit and a user needs to put more tapes in the library, they simply need to open the load port and insert tapes -- the robot will do the rest. Once the load port is closed, the robotic system will inventory the tapes and transfer them to a home in the storage bins, all without interrupting the data recording taking place at the same time. Additionally, the load port can provide 12 extra cartridge slots to the P2000 library.

ATL's Prism Storage Architecture™

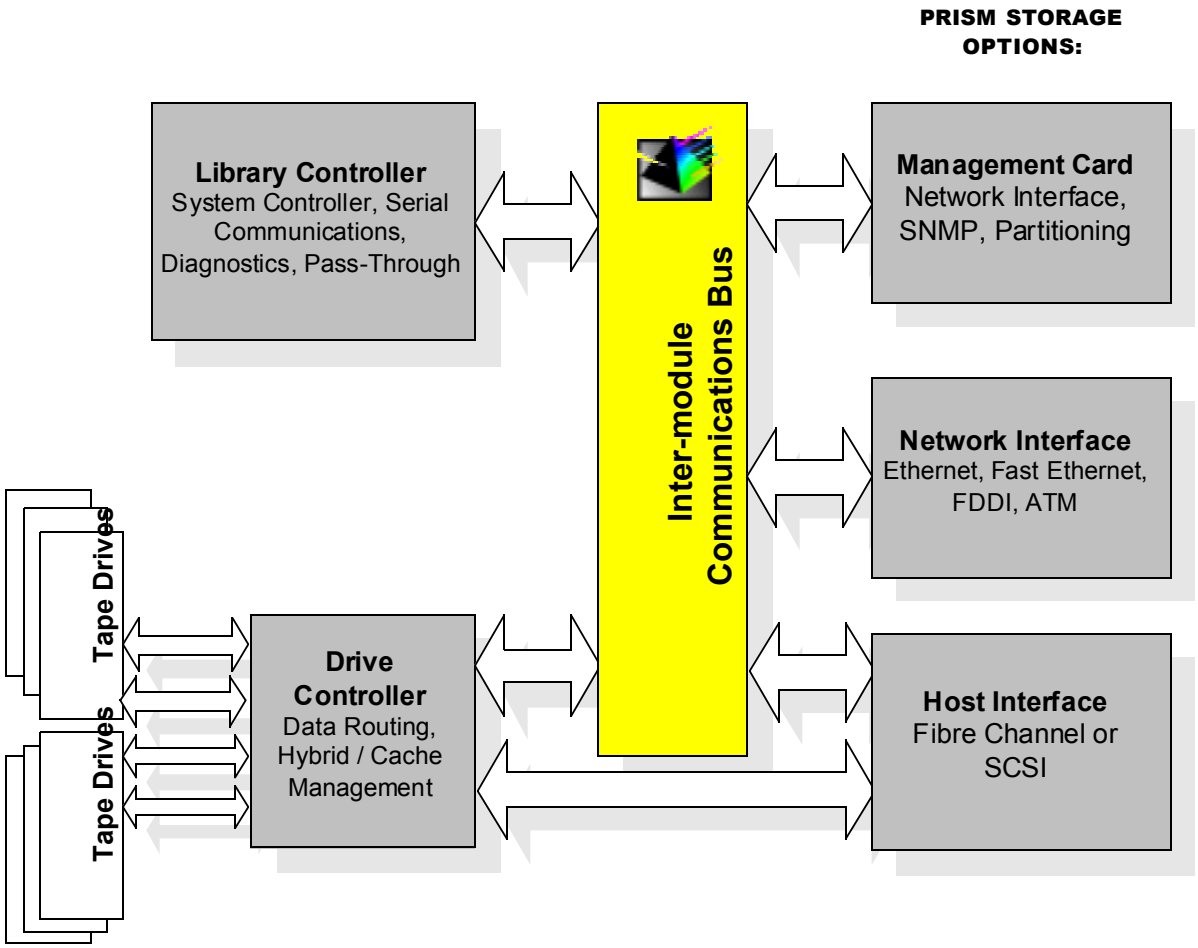
ATL's Prism Storage Architecture is a metaphor for expanding the spectrum of library capabilities. Based on a modular and scalable open architecture, Prism Storage Architecture improves upgradeability, serviceability, performance and reduces the total cost of library ownership. It is elegantly accomplished with a PCI expansion bus and other standard interfaces that are cost effective and supported by leading industry storage vendors including IBM, Veritas, Computer Associates and Legato.

P2000 electronics are implemented using pluggable cards including the library controller and SCSI or Fibre Channel host bus adapters

Features and Benefits of Prism Storage Architecture:

- Uses an industry-standard open architecture found in millions of PCs, workstations and servers
- Pluggable cards are easy to upgrade and service
- Host, network and channel adapters permit upgrades from SCSI to Fibre Channel by simply replacing cards
- Optional CPCI cards provide advanced on-board capabilities

Prism Storage Architecture Block Diagram:



Prism Storage Options[ϕ]

ATL's Prism Storage Options deliver tools for leveraging and integrating the P2000 into enterprise infrastructures. Enterprise IT departments can use these options to complete their vision of storage management and dramatically enhance the functionality of their library investment.

Prism Storage Options are powered by the on-board Prism Management Card

Storage Consolidation Option

The Prism Storage Consolidation Option allows users to create and manage up to ten "virtual libraries" from within a single P2000 library. It is a turnkey library partitioning solution that establishes and manages the virtual libraries, completely transparent to operating systems and data management applications.

Features and benefits:

- Lowers total cost of ownership for automated DLTtape storage, allowing a single library to be shared among multiple platforms and hosts such as UNIX, NT and legacy backup servers
- High performance data throughput with Fibre Channel or Fast-Wide SCSI connections between library drives and backup servers
- Transparent to operating systems and data management applications for complete compatibility
- Web-based administration console for easy configuration from anywhere on the Internet
- Turnkey library sharing

Library Management Option

The Prism Storage Management Option provides library monitoring and remote management. It combines an SNMP agent that integrates with major network management frameworks and includes a direct e-mail failure notification capability.

Features and benefits:

- Monitors critical system components and instantly reports anomalies
- Automatically alerts IS managers of library failure via e-mail
- Interfaces with major network management frameworks for easy, real-time monitoring
- Includes browser based interface for ease of use

HP OpenView

Tivoli

Unicenter TNG

SUN MICROSYSTEMS Solstice

The Library Management Option integrates with major network framework applications including HP OpenView, IBM Tivoli, Computer Associates Unicenter TNG and Sun Microsystems Solstice

ϕ For more information, contact your ATL sales representative

Fibre Channel Option for Storage Area Networks

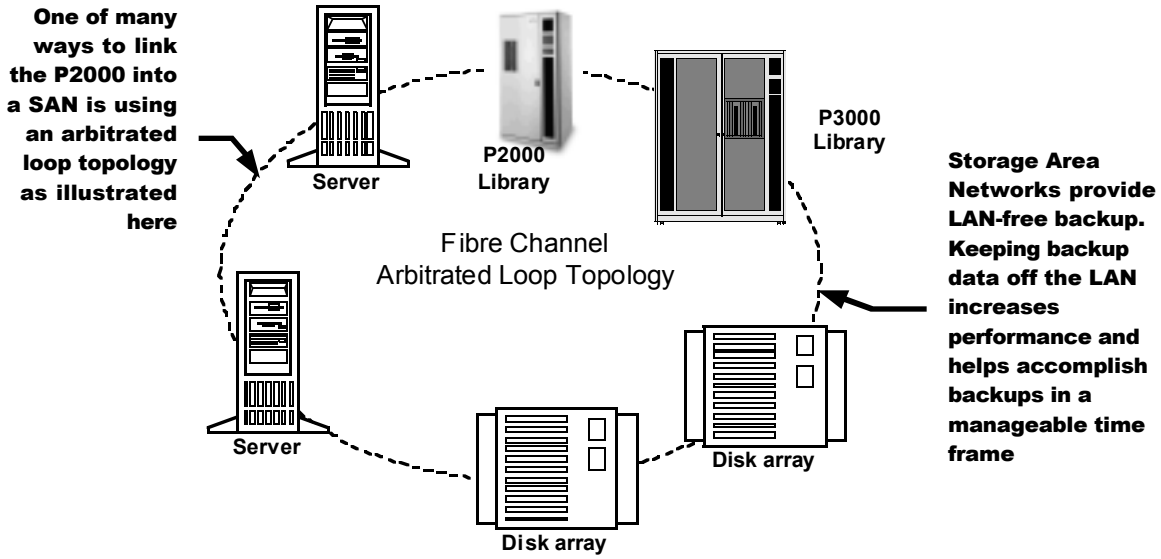
The P2000 Series library is able to plug directly and immediately into Storage Area Networks (SANs), providing significant performance and availability benefits. A SAN is a special purpose network that incorporates multiple servers with high performance network technologies -- usually Fibre Channel -- as its central means to link servers to storage devices. Storage devices typically found on a SAN include RAID arrays and tape libraries.

Fibre Channel module easily plugs into the P2000's Prism Storage Architecture

With its Prism Storage Architecture, ATL has pioneered a new class of open, intelligent storage subsystems that incorporate industry-standard PCI and CPCI expansion buses to support advanced features such as Fibre Channel connectivity. The P2000 uses Prism technology coupled with an internal SCSI-to-Fibre-Channel bridge to quickly connect to a SAN. ATL's SAN Certification Lab tests, certifies and documents popular SAN hardware and software combinations with ATL products to aid customers in successful library SAN implementations.

The embedded Prism Fibre Channel option provides numerous benefits including:

- Support for longer distance between servers and a tape library - up to 10 kilometers away!
- Easy library sharing across multiple host systems storage management
- High performance for rapid data recovery and backups
- Scales as your performance needs grow
- Reduced total cost of ownership via more effective management and improved scalability
- Connects to most Fibre Channel topologies including hubs and switched fabric



For more information about ATL's SAN strategy, visit our web site at http://www.atlp.com/san/

Scalability Option

For storage-intensive applications, only the P2000 can scale to a configuration of five library modules – in any combination of P2000 or P3000 libraries. In its maximum configuration, the P2000 can scale to a total native capacity of 52 terabytes and native performance up to 1.3 TB per hour. Appearing to backup applications as a single library, the P2000 scalability option brings massive performance and storage capacity to your enterprise.

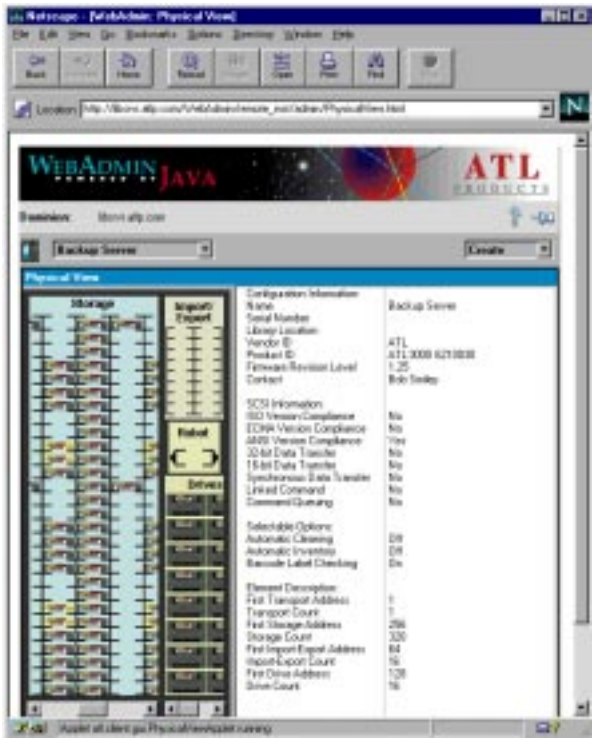
By adding expansion modules to your existing ATL library investment, the P2000 will grow with you as your needs expand. The P2000 is the only tape library in the world that offers modular hot swap components, redundant power and an advanced cooling system to keep it operating around the clock. Positioned as the highest performance, highest reliability and easiest to operate library in its class, the P2000 also has a unique modular upgrade path for future drive technology including SDLT and LTO Ultrium.**

# of Library Modules	Library Model	Total Drives	Total Slots	Total Throughput*	Total Capacity*
1st	P2000	10	198	180 GB/hr.	6.9 TB
2nd	P3000	24	518	432 GB/hr.	18.1 TB
3rd	P3000	40	844	720 GB/hr.	29.5 TB
4th	P3000	56	1,170	1.01 TB/hr.	41.0 TB
5th	P3000	72	1,496	1.3 TB/hr.	52.4 TB

* Tape drive capacity and throughput values reflect native DLT7000 specifications. Performance and capacity may be doubled with 2:1 data compression.
** Check with your ATL representative for availability

Remote Library Administration with WebAdmin Software

Included with the ATL P2000 Series library is ATL's Java-based WebAdmin™ 3.0 library administration software. Using a Java-enabled web browser, users can remotely monitor and administer all of their ATL libraries, with appropriate security, from anywhere they have access to the Internet.



Extending Your Reach

Powerful, yet easy to use, WebAdmin 3.0 provides library monitoring, event logging, predictive failure analysis, notification and remote service from a web browser. Its features include:

Around-the-Clock Monitoring

WebAdmin continuously monitors your library, enabling you to be aware of your library's status without physically being there. Information can be delivered through your browser software, via e-mail or through a text-based pager.

SNMP Integration

WebAdmin includes an SNMP agent for monitoring an ATL library along with other enterprise equipment from a centralized management console such as IBM Tivoli or CA Unicenter.

Advanced Monitoring

WebAdmin provides real-time information regarding critical library components. For example, the robot, tape drives, load port, tape bins, cartridges, fans, power supplies and AC lines are all monitored. Should a problem occur, users are notified via WebAdmin, e-mail or pager.

Predictive Failure Analysis

WebAdmin tracks and analyzes changes so IT staff can take proactive measures to prevent problems from occurring. When there is a high probability of a critical event occuring, WebAdmin notifies key staff members of the imminent problem in real time.

Remote Service

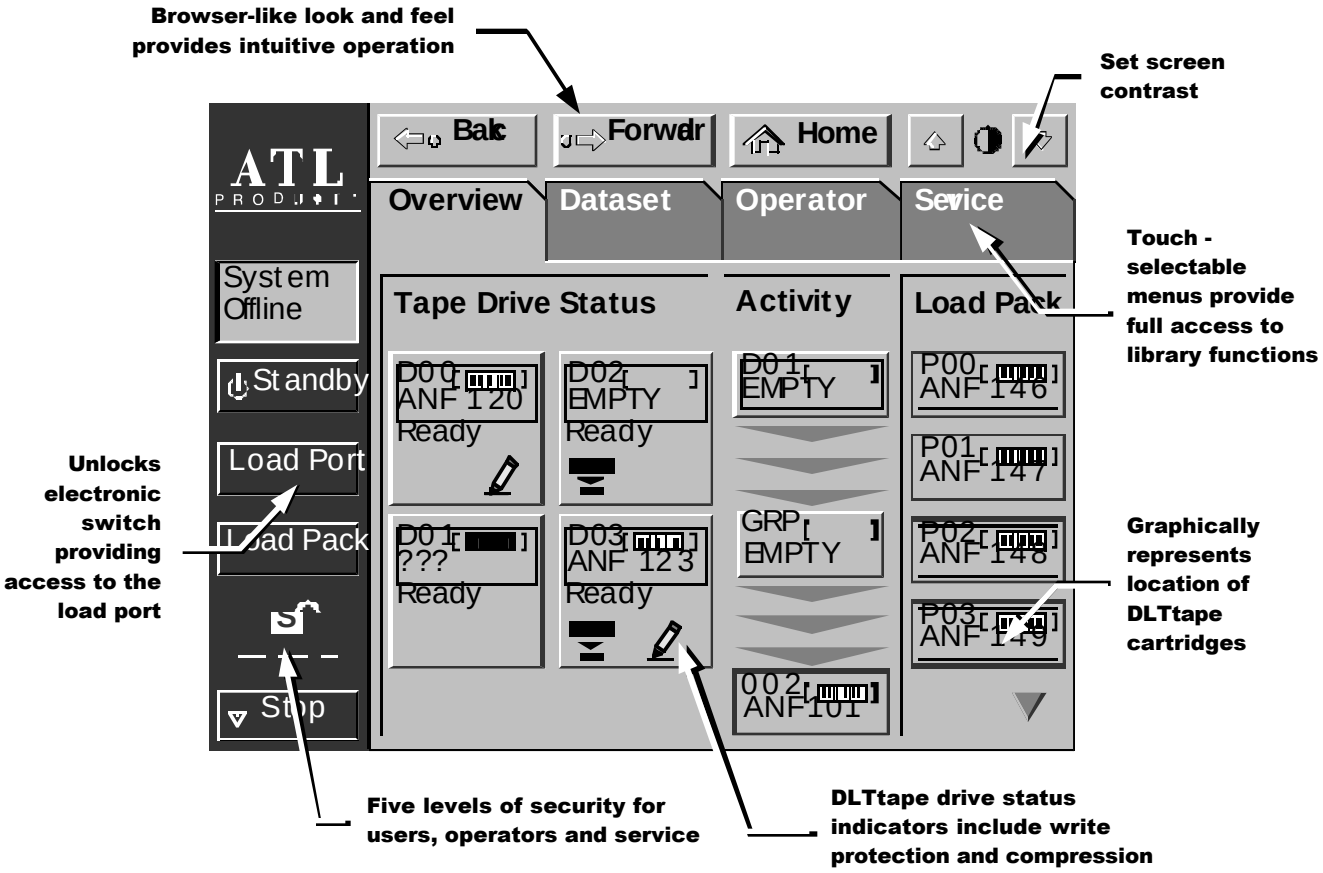
Troubleshoot and diagnose problems remotely with WebAdmin. Now users can run tests, exercise the library or upgrade firmware remotely and securely from anywhere on the Web.

Complete Library Management from a Friendly User Interface

The P2000 was designed to eliminate the need for a highly trained system administrator, enabling any user to control the library's vital functions. Through a highly sophisticated, user-friendly interface, the P2000 makes library management a painless procedure.

ATL introduced the **world's first** touch-screen graphical user interface located directly on the front of the library. Through a browser-like, icon-based interface, users can easily configure, operate and diagnose the library by simply touching the screen with their finger. Users can easily identify components of the system including the DLTtape drives, cartridges, load port and their status such as reading, writing or ready. In addition, a graphical display allows users to easily identify which bins are empty or occupied and what type of tape is in each location. Additional features include:

- Import/export cartridges
- Load/unload tape drives
- View library status
- Generate statistics
- Perform diagnostics
- Set security levels for various users based on their needs

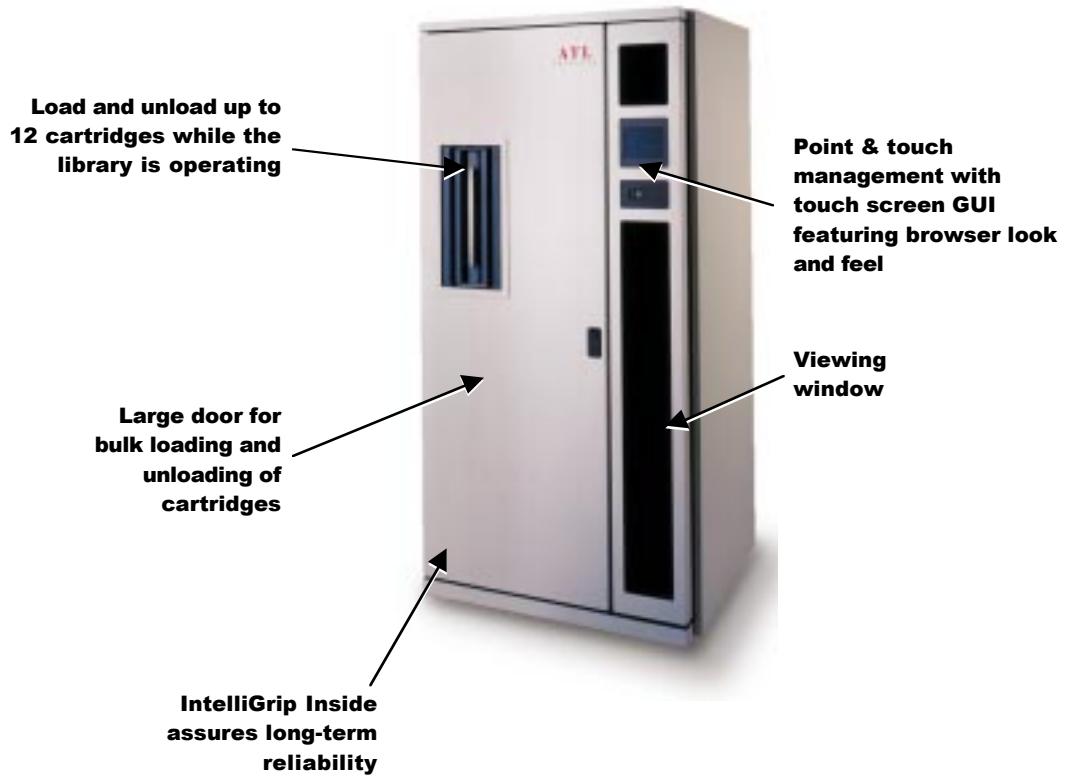


Family Overview

The ATL P2000 series is configurable to meet the growing client/server storage needs of today and the future. Models vary based on the quantity, type and performance of DLTtape drives as well as the maximum cartridge count. With native capacities ranging from 3.7TB to 6.9TB and native performance ranging from 72 GB/hour up to 180 GB/hour*, the ATL P2000 series supports a broad range of storage and high-performance requirements. High-availability options include redundant power (N, N+1, or 2N) supplies and fans.

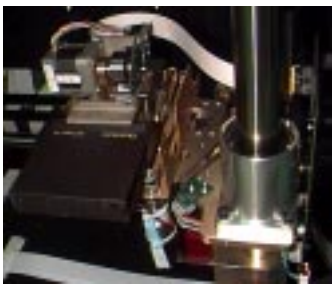
ATL P2000 Series – DLTtape Configuration Options

	P2000	P2000	P2000	P2000
DLT Tape Drives	4	6	8	10
Max. Cartridge Count	198	198	198	192
Min. Cartrdige Count	100	100	100	100
Native Storage Capacity (DLT7000)	3.5 to 6.9 TB	3.5 to 6.9 TB	3.5 to 6.9 TB	3.5 to 6.9 TB
Max. Native Throughput (DLT7000)	72 GB/hour	108 GB/hour	144 GB/hour	180GB/hour
Max. Native Throughput in 8 Hours (DLT7000)	576 GB	8.6 TB	1.1 TB	1.4 TB



* Performance and capacity may be doubled with 2:1 data compression.

Advanced Robotics System



The degree to which the human hand is emulated is the yardstick of an advanced robotic system. Issues such as range of movement, sensory capabilities and control over the force of a grip are critical components of a good robotic system. Through years of research and testing, ATL designed a highly precise cartridge handling system called IntelliGrip™, capable of firmly grasping and gently swapping cartridges for millions of cycles.

IntelliGrip™ Inside - 1,000,000 Swaps and Counting

Extraordinary precision in loading and unloading cartridges can significantly contribute to measured tape drive reliability and uptime. Similarly, the high glass content of tape cartridge housings require gentle and precise handling to minimize contact surfaces. ATL's IntelliGrip tape handling system ensures the accuracy needed to reliability ensure continuous access to your most valuable resource -- your data. Its features include:

Self-Calibration

The IntelliGrip robot uses targets on the tape drives, storage bins and the load port to calibrate itself. If a new component is installed, a self-calibration routine can be easily initiated eliminating the need for manual precision alignment.

Cartridge 'Life-Enhancing' Gripper Mechanism

IntelliGrip selects cartridges the way they were designed to be gripped, from the top and bottom, enhancing cartridge life. Gripping cartridges from the sides reduces support surface, increases the pressure on the cartridge and can reduce cartridge longevity. The advanced design of the gripper allows it to handle DLTtape as well as SDLT and LTO Ultrium cartridges.*

Controlled Timing and Force

If a tape cartridge is removed too quickly from its drive, it can unravel. In addition, if a cartridge is inserted into a drive too forcefully, internal drive damage may occur. Utilizing precision timing and a highly controllable amount of force, IntelliGrip inserts and removes cartridges in a way that reduces drive stress and increases reliability.

No-Slide Tape Insertion

Other designs pick and place cartridges by sliding them across a type of guide mechanism. Due to the high glass content in tape cartridge housings, sliding the cartridges across any contact surface creates dust particles that can cause read/write errors and hinder performance. IntelliGrip precisely picks and places cartridges directly into the drive, increasing loading reliability, drive reliability and performance.

Automatic Tape Inventory

IntelliGrip makes sure your software is always aware of the current contents of the library. Each time the unit is powered on or any user intervention takes place, IntelliGrip's moving beam laser scanner inventories the entire cartridge array, load port and tape drives. In a matter of minutes, the IntelliGrip robot can inventory all tape cartridges and tape drives.

*Check with your ATL representative for SDLT and LTO Ultrium availability

ATL-Specified DLTtape Drives

The DLT7000 is an advanced half-inch tape device able to store up to 35 gigabytes of uncompressed data per cartridge. Utilizing a linear serpentine recording mechanism, a single DLT7000 drive is able to stream data at native speeds of up to 5 MB/second. With its built-in data compression, the DLT7000 can store up to 70 GB per cartridge with a throughput of up to 10 MB/second.* In addition, the DLTtape drive utilizes an adaptive cache buffering system that adjusts to the streaming rate of the host, maximizing data transfer speeds. Furthermore, the DLTtape tape drive is extremely reliable, with an average head life of 500,000 tape passes. Because the DLTtape drive was not originally designed with automation in mind, ATL specified a unique version to ensure compatibility and reliability within a robotics environment. The DLTtape drives used in ATL libraries have a reliability rating 300% higher than standard DLTtape drives.**

Advantages of the ATL-Specified DLTtape Drive

Automated Cleaning

Cleaning an ATL-specified DLTtape drive is a lights-out operation. When DLTtape drives experience excessive read/write errors they signal they need cleaning. Using a dedicated RS-422 interface, the ATL-specified DLTtape drive requests a cleaning from the robot. Without user intervention, IntelliGrip replaces the data cartridge with a cleaning cartridge and performs the procedure, returning the data cartridge when the cleaning is complete.

Controlled Tape Ejection Distance

The ATL-specified DLTtape drive assures IntelliGrip can successfully pick a DLTtape cartridge by controlling the cartridge ejection distance. Without this feature, a robotic mechanism may need to make multiple attempts to select the cartridge, reducing overall system performance. ATL's process of controlling ejection significantly reduces leader fatigue -- a critical requirement for high-cycle automation environments.

Modified Timing

To ensure complete rewinds and cartridge de-coupling, the timing of various drive operations are modified to enhance automated cartridge loading and unloading.

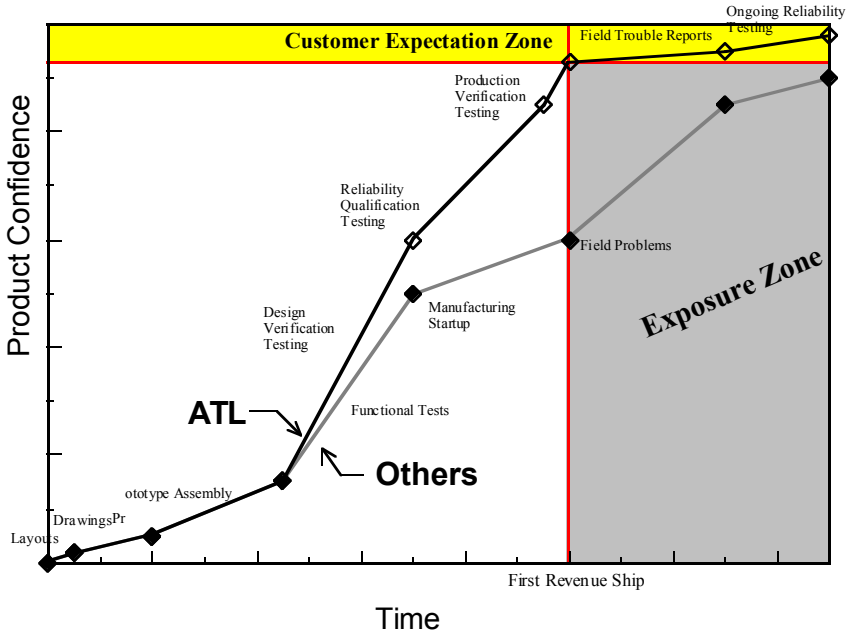
Coming Soon: SDLT & LTO (Ultrium) Drives***

* Assumes 2:1 data compression. Actual capacity and performance may vary
** Based on published Quantum DLTtape specifications
*** Contact your ATL representative for availability

ATL Design Philosophy: Keeping You Out of the Exposure Zone

Many products are introduced with reliability specifications that are not proven. The result is customers are exposed to lower reliability than the product's specified rating. ATL keeps you out of the exposure zone by adhering to a strict regimen of tests. The process builds a high degree of confidence that ATL's products meet their specified reliability before entering the market.

Confidence Improves with Learning Events (Primarily Tests), Not with Time.



Elements of a Reliable Tape Library

Customer surveys reveal that reliability is the most important buying decision when considering a tape library. ATL's testing has shown there are three key elements that significantly contribute to library reliability:

1. **Precision Cartridge Handling**

   Tape cartridges are sensitive to the accuracy of cartridge load and unload operations. The angle of approach upon cartridge insertion and the timing of tape removal during cartridge ejection are critical control elements that are accounted for by ATL's patented IntelliGrip cartridge handling system. In addition, IntelliGrip assures data accessibility by eliminating the need for tape feeder mechanisms that slide cartridges across metal or plastic surfaces, causing debris buildup in the tape drive that in turn degrades performance.

2. **Maintaining Alignment**

   Misalignment of cartridges, drives and robotic mechanisms can be caused by shock, operating vibration and temperature changes common within a library environment. To maintain the precision alignment required of tape automation, P2000 Series libraries feature ATL's **Automatic Self-Alignment**, which assures error-free cartridge handling. In addition, the P2000 libraries are enclosed in a **Welded Frame** (not spot welded like other manufacturers) to provide a solid base for the entire library, eliminating the potential for frame movement.

3. **Quality Manufacturing Process**

   The best design in the world will fail if the assembly process is flawed. ATL implements an extensive quality assurance and burn-in process to eliminate assembly errors. ATL also addresses another common problem: tape drive failures. Through ATL's design and rigorous drive screening process, the company has achieved field reliability three times greater than the drive manufacturer's specified rating.

Software Compatibility

The P2000 is certified to run with many storage management software packages. In addition, the ATL P2000 Series is compatible with popular operating systems including Sun Solaris, Hewlett-Packard HP-UX, IBM AIX, SGI IRIX, Novell NetWare, Digital OpenVMS, Digital UNIX and Microsoft Windows NT/2000.

Advantages to Wide Spread Compatibility

1. Freedom to use virtually any software package ensures a wide range of CPU and OS support.

2. Select the optimal storage management software today, knowing that tomorrow you have the flexibility to select new solutions while preserving your ATL library investment.

3. Preserve your old software investment. Chances are good that your current software supports an ATL library.

Software Applications Supporting the P2000

HIGHGROUND SYSTEMS

LEGATO

COMPUTER ASSOCIATES

VERITAS Software

IBM

Please visit ATL's Software Compatibility Matrix at http://www.atlp.com/scm.html

ATL's Manufacturing Process

ATL's advanced electro-mechanical assembly, integration and test facility produces thousands of libraries each year under strict UL, TUV and CSA audits and adheres to ISO 9001 quality procedures and guidelines. The primary objective of ATL Manufacturing is customer satisfaction, which is achieved through quality craftsmanship, continuous improvement, flexible delivery and persistent cost reduction attempts.

Quality Assurance Testing

As a world-class manufacturer, ATL's DLTtape engineering team has developed an advanced test suite that assures that each DLTtape library works flawlessly the moment it ships from the factory. These tests include:

- Calibration Tests
- Functional Tests
- Performance/SCSI Tests
- Host Simulation Test
- Robotics Test
- DLTtape Drive Test
- Final Acceptance Test

Process Control and Process Improvement

A comprehensive quality and process control system assures ATL delivers an error-free product to your place of business, free of set-up issues and designed to provide ongoing reliability.

Component Supplier Qualification

Not only does ATL confirm the quality of libraries before they ship to you, they also qualify component suppliers before doing business with them. This ensures a high level of system-wide reliability.

Assembly to Test Ratio

More than 90 percent of ATL's manufacturing process is spent testing libraries. This allows ATL to isolate and eradicate problems before the library arrives at your place of business.

Superior Customer Service

The primary objective of ATL's service program is to deliver the highest levels of customer satisfaction by keeping business-critical information on-line. Every ATL library includes a warranty option designed to fit your needs and is serviced by world-class trained and certified ATL service technicians. In addition, special services include installation support, preventative maintenance, next day, same day and four-hour response service as well as parts sales and specialized training. With support world-wide, ATL is there where and when you need them.

ATL P2000 Series Specifications

Host Interfaces

SCSI .....Differential SCSI-3 "P" Fast & Wide, 68-pin Micro D female

Fibre .....100MB/sec, Multi-mode optical, SC connector, 1 connection for each 8 tape drives

Software .....SCSI-2 medium changer command set

Library Diagnostics

Port .....2 x 9-pin RS-232C, EIA/TIA-574 female connector (cable included)
Diagnostics .....RS-232C service port

Cabinet Characteristics

Height.....75 inches (191 cm)
Width .....36 inches (92 cm)
Depth .....29 inches (74 cm)
Weight .....985 pounds (447 kg) with 10 drives

Power Input

Electrical Rating.....100-240V, 12A-6A, 50/60 Hz
Heat Dissipation.....1200w, 4,100 BTU/Hr.
Power Cord(s).....US NEMA 5-20P male
IEC 320 C19 female
Rated 125V 20A

Environmental

Operating
Humidity.....20% to 80%, non-condensing
Temperature.....10° C to 32° C (50° F to 90° F)
Altitude.....Sea level to 10,000 ft.

Non-operating (storage & shipping)
Humidity.....5% to 95%, non-condensing
Temperature.....-40°C to 65°C (-40°F to 149°F)
Altitude.....Sea level to 40,000 ft.

Agency Approvals

Safety .....UL1950 Listed, cUL to CSA, C22.2-No. 950, TUV-EN60950, EN60825
Emission .....FCC Part 15 Class A, CE Mark (89/366 EEC, 73/23 EEC),VCCI Class A, C-Tick

Robotics Reliability

MTBF.....250,000 power-on hours
MSBF.....1 million load/unload cycles (swaps)
MTTR.....Less than 30 minutes

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