

### GENERAL DESCRIPTION

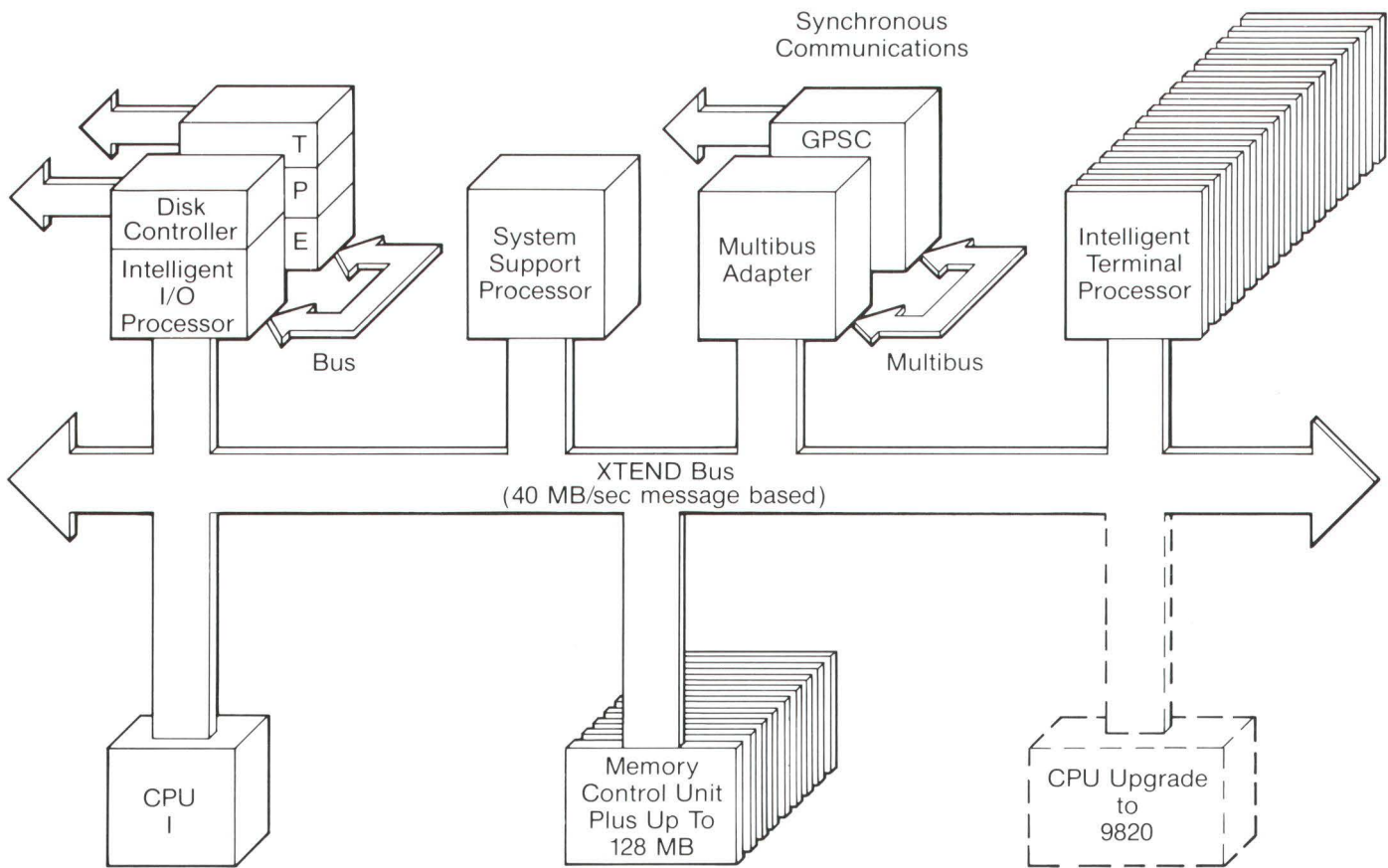
The 9810 is Pyramid Technology's most powerful single processor system. It provides you with a high-performance platform for your database, software development, office automation or network server applications.

The 9810 uses an advanced RISC central processing unit and high-speed intelligent I/O subsystem to deliver balanced system throughput. Along with Pyramid's dualPort OSx™ operating system, optimizing compilers, and extensive networking capabilities, the 9810 allows you to effectively support large multiuser, multitasking applications.

If upgradability and expansion are important in your application, the 9810 can grow with your needs. You can add up to 128 megabytes of memory and over 15 gigabytes of disk storage to the 9810. If you need more processing power, the 9810 can be easily field-upgraded to our symmetric dual processor 9820 system.

### FEATURES & BENEFITS

- An advanced RISC Architecture with 528 registers and pipelined execution improves application performance.
- Intelligent Terminal and Communications Processors communicate over a 40MByte/sec message-based bus for fast response times.
- Intelligent I/O Processors (IOPs) support over 15 Gigabytes of disk storage using overlapped seeks, rotational position sensing, and virtual disk partitioning to improve database performance.
- A high-speed Tape/Printer/Ethernet (TPE) controller reduces back-up times and provides local area network and printer support in every system.
- A broad communications offering including RS-232C, Ethernet™, RJE-HASP, X.25, and Hyperchannel™ connects you with PCs, workstations, mainframes, and public data networks.
- The Network File System (NFS™) permits transparent access to files and directories across a network of systems.
- Pyramid's optimizing C, FORTRAN, Pascal, and COBOL compilers, and EMACS full-screen editor provide a powerful software development environment.
- Pyramid's OSx operating system provides a complete dualPort of both the Berkeley 4.2BSD and AT&T System V versions of UNIX® operating systems concurrently.
- A sophisticated System Support Processor provides local and remote diagnostic capabilities for increased serviceability and uptime.
- A one-year warranty backs our commitment to reliability.
- Compact packaging preserves power and floor space, and reduces your cost of ownership.
- The 9810 can be easily field-upgraded to a symmetric dual processor 9820 system.



**9810 Architecture**

**HIGH-PERFORMANCE RISC CPU**

The Pyramid 9810 features a high-performance RISC (Reduced Instruction Set Computing) central processing unit. This advanced RISC architecture uses pipelined execution to allow most instructions to execute in a single 100ns cycle. Our RISC CPU contains 528 32-bit registers arranged in a unique windowed register stack. A 16 Kilo-byte instruction cache and 64 Kilo-byte data cache significantly improve memory access times, and a high-speed Arithmetic Accelerator Unit (AAU) speeds floating point operations.

**MESSAGE-BASED XTEND™ BUS**

The 9810 RISC CPU communicates with main memory and intelligent I/O processors over the 40 Megabyte per second, 32-bit XTEND bus. Because all of Pyramid Technology's I/O and communications controllers have their own intelligent processors, the XTEND bus transfers only short, high-level messages between the central processing unit and controllers. This message-based communication reduces bus activity and prevents I/O bottlenecks.

**INTELLIGENT I/O SUBSYSTEM**

Each Pyramid 9810 contains a proprietary I/O processor (IOP) and

Tape/Printer/Ethernet controller (TPE) subsystem. This intelligent I/O subsystem features a 5-MIP AMD 29116 processor and 14 parallel Direct Memory Access (DMA) channels to provide an aggregate I/O throughput of 11 Megabytes per second per subsystem.

The IOP disk controller supports up to 4 Pyramid disk drives with transfer rates up to 2.5 Megabytes per second. Overlapped seeks and rotational position sensing (RPS) allow high transaction rates in multiple drive configurations.

The TPE subsystem includes a high-speed tape interface, a long-line or short-line printer interface, and one

of the industry's fastest Ethernet controllers. Each controller has its own DMA channel which allows simultaneous data transfers without I/O bottlenecks.

The 9810 can also support a variety of other I/O controllers via an intelligent Multibus™ Adapter.

### **MEMORY**

Physical memory may be configured from 16 to 128 Megabytes using either 4 or 16 Megabyte modules. All memory arrays come with Error Correcting Code (ECC) logic which corrects single-bit memory errors and detects double-bit errors.

Virtual memory is byte addressable and allows each UNIX operating system process to use up to 4 Gigabytes of virtual address space.

### **VIRTUAL DISK FACILITY**

The 9810 includes a virtual disk facility which provides a transparent mapping between logical and physical disk volumes. You can combine several physical disk drives into one logical disk, allowing large databases to span multiple spindles (concatenation). You can also increase the performance of your disk I/O by evenly partitioning file access over several physical drives (striping). The virtual disk facility even allows you to allocate a portion of high-speed memory to act as a virtual disk location for frequently used files or database indices. All of the virtual disk facility features are implemented in a manner transparent to user programs through the use of a virtual disk configuration file.

### **dualPort OSx OPERATING SYSTEM**

The 9810 runs Pyramid Technology's dualPort OSx operating system, a unique implementation of both the 4th Berkeley Software Distribution and AT & T System V versions of UNIX operating systems. DualPort OSx gives you maximum flexibility in developing and executing programs.

You can choose either the Berkeley or AT & T universe as your login environment, and can also switch universes with a single command. In addition, you can call a Berkeley utility from the AT & T universe and vice versa.

### **NETWORKING AND COMMUNICATIONS**

The 9810 can communicate via a variety of desktop and mainframe protocols. Intelligent Terminal Processors (ITPs) allow you to support up to 256 RS-232C lines while offloading most terminal processing functions from the central processing unit.

Each 9810 comes standard with an Ethernet local area network controller, and will also support X.25 (Certified for Telenet and DDN), bisync and Hyperchannel communications. The DARPA (TCP/IP) family of protocols, RJE-HASP, and Ethernet support for the Britton Lee IDM are some of the networking options offered with the 9810.

At the network applications level, Pyramid offers the Network File System which allows users to transparently access files across a network of Pyramids and workstations. Other network applications include mail, remote logins and file transfer programs.

### **SYSTEM EXPANSION AND PERIPHERAL SUPPORT**

The system 9810 will expand with your needs. A wide selection of disk drives, tape drives, terminals and printers can be configured to address your specific requirements. To provide room for expansion, multiple peripheral bays can be attached to the basic single bay system. A maximum system can support over 15 Gigabytes of disk storage along with multiple tape drives and printers.

### **SOFTWARE SUPPORT**

The 9810 will run all of Pyramid's languages and system software. Pyramid's system software offering

includes optimizing C, FORTRAN, Pascal, and COBOL compilers, a Franz Lisp interpreter, EMACS screen-oriented editor, and GKS graphics package.

A wide range of both commercial and technical applications software, including more than 13 of the industry's most popular databases are available through Pyramid Technology's extensive Referred Independent Software Manufacturers Program (PRISM). Pyramid systems also support a large number of Pick™ applications software packages through the use of uni-Verse™, a UNIX-based Pick operating environment.

### **SYSTEM SUPPORT PROCESSOR**

The 9810 contains an integral diagnostic and service CPU called the system support processor (SSP). The SSP is an independent microprocessor which performs diagnostic and test functions, downloads microcode for the central and I/O processors, and provides the interface to the operator through the system console.

Using the diagnostic power of the SSP, Pyramid support personnel can either locally or remotely (via an internal modem) diagnose system problems, significantly reducing mean-time-to-repair and increasing uptime of the 9810 system.

### **COMPATIBLE AND UPGRADABLE FAMILY**

The 9810 is object code compatible with Pyramid Technology's entire family of superminicomputer systems. This family offers excellent price performance with single and multiprocessor support for up to 256 users, 128 Megabytes of memory, and over 15 Gigabytes of disk storage.

The 9810 is available as an economical field upgrade from Pyramid 90x, and 98xe systems, and can also be easily field-upgraded to a symmetric dual processor 9820 system.

## 9810 SPECIFICATIONS

<b>Processor:</b>	Word Length	32 bits
	Cycle time	100ns
	Registers	528 registers, 32 bits each
	Instruction Cache	16 Kbytes
	Data Cache	64 Kbytes
	Floating Point Accelerator	Arithmetic Accelerator Unit (AAU) standard
<b>Memory:</b>	Virtual Address Space	4 Gigabytes per process demand-paged 2048 byte page size
	Main Memory Capacity	128 Megabytes in 4MB and 16MB steps
	Memory Access Time	700ns for 1st 32-bit word Up to 7 subsequent words at 100ns each
	Error Correcting Code	7 bit ECC provides single-bit error correction and double-bit error detection
<b>I/O Subsystem:</b>	System Bus	XTEND Bus
	Bandwidth	40 MByte/sec, 32-bit data path, message-based
	Hi-speed Channels	Proprietary, 11 MByte/sec throughput per channel
	Low-speed Channels	Multibus Adapter
	Disk Interface	ESMD (2.5 MByte/sec)
	Tape Interface	Pertec
	Printer Interface	Dataproducts (long or short line)
<b>Communications:</b>	Serial Ports	Intelligent Terminal Processor (ITP) interfaces 16 asynchronous RS-232C lines w/modem control at speeds to 19.2K baud Up to 16 ITPs (256 ports) per system
	Networking	DARPA (TCP/UDP/IP), RJE, Ethernet, X.25 (CCITT 1980) certified for Telenet and DDN standard at 56K bps, Hyperchannel, RS-232C async, Bisync
<b>Peripherals:</b>	Disk	Fixed media drives for expansion to over 15 Gigabytes 300MB removable media drive with cabinet Dual port option available for some drives
	Tape	1600 bpi, 100 ips, 1/2" streaming drive 1600/6250 bpi, 100 ips, 1/2" streaming drive 800/1600/6250 bpi, 45 ips start/stop drive
	Line Printers	600, 1000, and 1500 lpm models
	Operator Console	14" monochrome or color video display terminal
<b>Software:</b>	Operating System	dualPort OSx (ATT System V and Berkeley 4.2BSD UNIX® Operating Systems) Optional Network File System distributes file access
	Languages	Native C, FORTRAN 77, ANSI Pascal and ANSI 74 COBOL compilers Franz Lisp interpreter/compiler system
	Application Software	Broad range of UNIX and Pick applications available through PRISM
<b>Cabinet: (per bay)</b>	Height	51" (130 cm)
	Width	24" (61 cm)
	Depth	41" (104 cm)
<b>Electrical: (per bay)</b>	AC Current	30 Amps @ 208 volts 50/60 Hz AC (max)
	AC Power	6.0 KW (max)
	Heat Dissipation	18,000 BTU/hour (max)
<b>Warranty:</b>	Base system warranted for one year against defects in materials and workmanship; peripherals and options warranted for ninety (90) days against defects in materials and workmanship; optional maintenance contracts available	

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Ethernet is a trademark of The Xerox Corporation.  
NFS was originally developed by and is a trademark of Sun Microsystems, Inc.  
Multibus is a registered trademark of Intel Corporation.  
Hyperchannel is a trademark of Network Systems Corporation.  
uni-Verse is a trademark of VMark Computer, Inc.  
Pick is a trademark of Pick Systems, Inc.



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