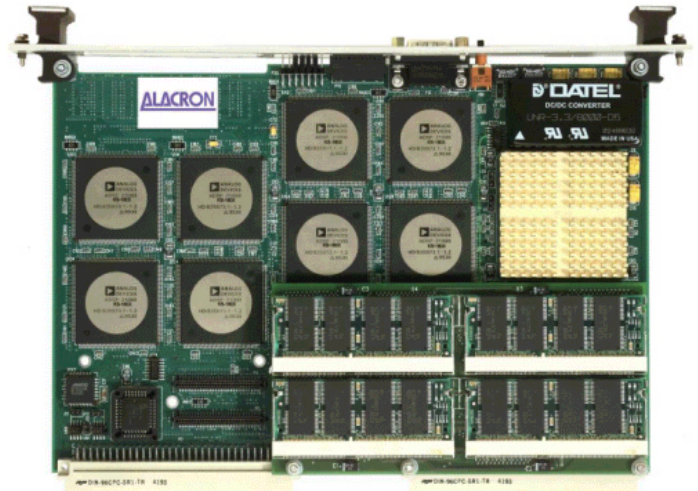


The FT-P5 series is a family of highly scalable, high performance computing subsystems based on Analog Devices ADSP-2106x SHARC (Super Harvard Architecture Computer). A single FT-P5 provides nearly one GFLOP performance in a desktop workstation environment.

Interconnected using their PMC dataports, Alacron's FT-P5s serve as nodes on a Myrinet System or Local Area Network. Alacron's FT-P5 delivers high levels of performance for imaging, graphics, simulation, DSP, document processing, and pattern recognition applications.

The FT-P5 series is ideal for adding scalable capability to existing systems and for developing new systems from the ground up.



## Features

- 1,2,4,8 ADSP-2106x (SHARC) processor array
- Intel Pentium P5 control processor
- 960 MFLOPS peak performance
- 640 MFLOPS sustained
- 132 MB/sec+ peak I/O
- Dedicated Dual Ported RAM
- PMC dataports

## ADSP-2106x SHARC Processor Array

The FT-P5's compute engine is an scalable array of up to 8 ADSP-2106x processors, interconnected using Alacron's Dual-Ported Local Memory (DPLM) architecture. The DPLM design eliminates processor contention for off-chip memory, allowing the memory bandwidth of the SHARC array to scale linearly with the number of SHARC processors. A two-dimensional DMA engine isolates the SHARC array from the system bus, shielding it from the impact of system bus traffic and data movement.

In Single Instruction Multiple Data (SIMD) mode, Alacron's application libraries distribute processing tasks over several processors. All processors can access their private RAM banks simultaneously at 80 MB/sec. In Multiple Instruction Multiple Data (MIMD) mode, tasks are distributed to individual processors, with Alacron's RT operating environment controlling multiple threads.

## Pentium P5 Control Processor

The FT-P5's performance is maximized by employing a Pentium P5 control processor to perform all operating system functions, thereby off-loading the ADSP-2106x processor array for data

processing. The P5 supports multitasking operating systems and provides sophisticated memory management.

## PMC Data Ports

PMC dataports provide the FT-P5 with tremendous I/O and expansions capabilities. These dataports are compatible with all standard PMC cards.

## Myrinet Connectivity

PMC dataports allow the FT-P5's ADSP-2106x processors to DMA directly to the Myrinet, providing full duplex communication in excess of 1 Gb/sec. In this manner, FT-P5s can be employed in in-cabinet clusters connected by a Myrinet System-Area Network (SAN) or serve as compute nodes in large distributed systems connected by a Myrinet LANs.

## Performance

The FT-P5 series offers excellent performance for compute intensive algorithms. Representative performance of a single FT-P5 with from 1 to 8 ADSP-2106x processors on specific SIMD algorithms from Alacron's libraries are shown:

Number of ADSP-2106x	1DCFFT (1K) (msec)	2DCFFT (1Kx1K) (msec)	CONV3 (512x512) (msec)	CONV5 (512x512) (msec)
1	0.457	1045	72	205
2	0.260	527	36	103
4	0.130	272	18	52
8	0.072	138	9	23.5

ADSP-2106x CPU Performance	
Single	80/120 MFLOPS 40 MIPS
Dual	160/200 MFLOPS 80 MIPS
Quad	320/480 MFLOPS 160 MIPS
Octal	640/960 MFLOPS 320 MIPS

**Specifications**

**Multiprocessors**

Processor ..... Analog Devices 2106x  
 Number of ..... 1, 2, 4, 8 ADSP-2106x  
 Clock speed..... 33 or 40 MHz  
 Global DRAM ..... 2 to 384 MB  
 Dual ported..... 1 MB/processor DRAM  
 External I/O ..... 132 MB/sec peak  
 Link ports..... Six per ADSP-21060/2  
 Link port topology ..... Software selectable  
 Data bus ..... 128-bit internal, 32- or 48-bit external  
 Cache ..... 32 x 48  
 DMA ..... 10 channels, 240 MB/sec, External ports (4), Serial ports (4), Link ports (2, 4 shared)  
 Precision ..... IEEE floating point, 32/40 bit precision  
 On chip SRAM ..... 4 Mb ADSP-21060, 2 Mb ADSP-21062, 1 Mb ADSP-21061

**VME**

Nonvolatile ..... 512K - 2 MB memory

**VME Bus Specifications**

Bus specification ..... Full VME 64 implementation

Control registers ..... I/O mapped  
 Global memory ..... Memory mapped

**Electrical and Environmental**

Power ..... +5 volts at 10A  
 Dimensions ..... PCI: 107 mm x 312 mm x 12.06 mm, VME: standard 6U  
 Operating temp..... 0-50 degrees centigrade  
 Relative humidity ..... 95% noncondensing  
 Air flow ..... 200 linear ft./min.

**Software Support**

Alacron's FT-P5s are supported by an extensive suite of application specific libraries for image processing, DSP and graphics applications:

- Vector Numerical Library (VLIB)
- Real-time Image Processing Library (RIPL)
- Parallel Library Toolset (PARTOOL)

**Development tools**

A full suite of ANSI development tools for C is available. Compilers support general purpose and numerically intensive applications. Both a JTAG and software GUI based debugger and profiler are available.

**Processing environments**

Alacron's RT Operating Environment provides several processing models. Applications can run as a simple attached process on the FT-P5 and as stand alone task on the host, or interactively with separate tasks on hosts and on the FT-P5. Alacron's RT supports Microsoft DOS, Windows 3.1, Windows NT, Windows 95/98, Solaris/Unix, LynxOS, and VxWorks.

