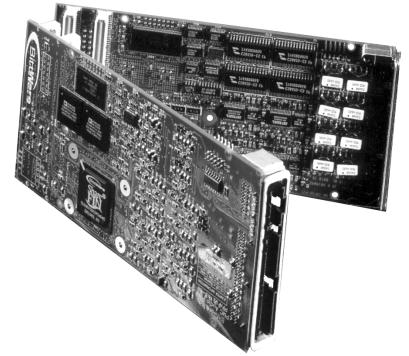# Audio-PMC+

8-Channel 96 kHz Analog and Digital Audio I/O Board

Flexible Audio Interfacing

BittWare's Audio-PMC+ board is an extremely versatile audio I/O board that provides analog and digital audio interfaces, two ADSP-21065L SHARC DSPs with embedded interface programs, SharcFIN™ ASIC technology, and a 64-bit, 66 MHz PCI interface – all on a PMC+ format board. The flexible Audio-PMC+ board offers many options for interfacing, clocking, and routing audio data. A PMC+ format board, it attaches to any PMC capable carrier board and to BittWare's PMC+ capable carrier boards, or it can operate standalone.

Analog Audio Interface

The Audio-PMC+ provides four pairs (eight channels) of audio inputs, each of which can independently switch between analog and digital. It also provides eight channels of simultaneous analog and digital audio output. Using high-quality 24-bit, 96 kHz audio converters from AKM Semiconductor, the analog audio interface provides eight differential channels of A/D and eight differential channels of D/A.

Digital Audio Interface

The digital audio interface consists of four 24-bit Crystal Semiconductor AES/EBU transceivers with integrated input sample rate converters. The four input and four output streams are compatible with both AES, SPDIF, and optical interfaces.

Powerful ADSP-21065L DSPs With Embedded Interface Software

The Audio-PMC+ board features two Analog Devices ADSP-21065L 60 MIPs DSPs with embedded programs that route audio data to and from any of the board's interfaces: the analog and digital audio interfaces, the PCI interface, and the PMC+ interface. The board requires no programming since the interface software is embedded in the DSPs; however, complete development tools are available for additional programming. The board is controlled and configured via the RS-232 and PCI interfaces, and the DSPs can also be used for delay buffers or other user application requirements.

PMC+ Interface

The PMC+ interface consists of four connectors: three standard PMC connectors to provide the PCI interface and an additional PMC+ connector that provides a serial TDM bus from the ADSP-21065L DSPs to the carrier board. The Audio-PMC+ PCI interface incorporates BittWare's SharcFIN ASIC, which provides a flexible interface between the 64-bit, 66 MHz PCI bus and the 32-bit, 30 MHz SHARC bus.

Features

- 8 channels of 96 kHz audio input: 24-bit analog and/or AES digital
- 8 channels of 96 kHz, 24-bit audio output with AES analog and digital outputs
- Input sample rate converters
- Lock to master AES input, external word clock, or local oscillator
- Supports SPDIF connections
- RS-232 control port
- 4-signal TDM serial port host interface on PMC+
- 2M × 32 SDRAM processing/delay buffer
- Dual embedded 60 MHz ADSP-21065L SHARC DSPs
- 1MB FLASH memory with auto-boot for standalone operation
- SharcFIN 64-bit, 66 MHz PCI interface
- Drivers for Windows and Linux with additional development tools available

![BittWare logo]

Specifications

BOARD ARCHITECTURE

Analog Audio Interface
- Four 24-bit, 96 kHz A/D-D/A converters, each with two differential input and output channels

Digital Audio Interface
- Four 24-bit, 96 kHz audio transceivers, each with a single differential AES/EBU output channel and a single differential AES/EBU input channel and input sample rate converter

Audio Connector
- Single 60-pin high-density ribbon cable header

PCI/PMC Interface
- 64-bit, 66 MHz PCI rev. 2.2 compliant interface
- Universal 5V/3V PCI signaling
- Provides 64-bit, 66 MHz master/slave (120 MB/s peak transfer rate) access to the SHARC processors

PMC+ Interface (Optional)
- Provides serial TDM bus connection from ADSP-21065Ls to host board

RS-232 Control Port
- RS-232 port connected via SharcFIN
- Standard 10-pin header with DB-9 adapter available

Clocking Options
- On-board oscillator (44.1 kHz standard)
- AES receive stream
- External word clock

Optional Breakout Board
- 48 RCA jack, breakout board for use with Audio-PMC+ card

Power
- +5V required, 1.5 A

Size
- 149mm × 74mm (5.9″ × 2.9″)

Processors
- Two Analog Devices ADSP-21065L SHARC DSPs running at 60 MHz (180 MFLOPs peak, 60 MIPS)
- One I²S serial port per processor is routed to AES/EBU and A/D-D/A audio interfaces
- One serial port per processor is routed to the PMC+ interface via a serial TDM bus
- 32/40-bit floating point, 32-bit fixed point arithmetic

External Memory
- 2M words × 32 SDRAM (8 MB total) available to the ADSP-21065L at 60 MHz
- 1MB FLASH RAM for hostless boot or non-volatile storage

SOFTWARE SUPPORT

Host Interface
- BittWare's software development kit for Windows® 95/98/NT/2000 and Linux contains a C-callable library of board control and communications routines
- Porting kit available for other operating system platforms

Development Tools
- Analog Devices' VisualDSP tools: C compiler, assembler, linker, simulator, and debugger
- BittWare VisualDSP Target for on-board debugging from host without an ICE
- White Mountain DSP ICE emulators
- Eonic Systems' Virtuoso™ operating system
- MATLAB Simulink® and Real-Time Workshop®
- BittWare SharcLAB interface to MATLAB Simulink® and Real-Time Workshop®
- BittWare SpeedDSP function libraries

Ordering Information

AUPM-21-1   4-Channel Audio Board with 2M SDRAM
AUPM-21-2   8-Channel Audio Board with 2M SDRAM
AUBK-00-08   Optional Breakout Board

Optional build available without these components