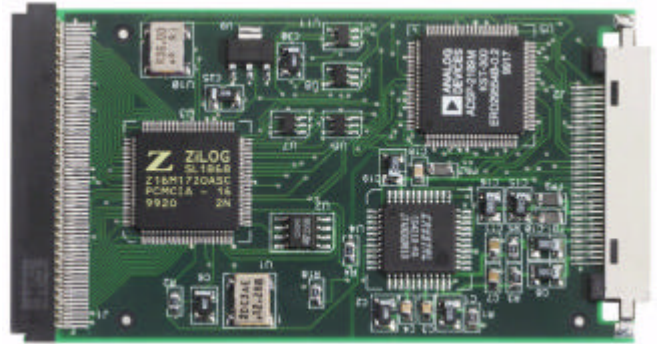




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HummingBird-89

The HummingBird-89 is a **PCMCIA Type II card** for audio Digital Signal Processing (DSP). It uses the Analog Devices **ADSP2189** processor which is a 16 bit, **75 MIPS** DSP processor with **192 kbytes** of on-chip RAM, and high speed serial interfaces.

The HummingBird provides a **high quality stereo** analog interface, and control from a portable PC using the PCMCIA bus.

The HummingBird provides a convenient way to add real time **DSP for portable computing devices**. Its low power consumption makes it suitable for hand held as well as lap top computers.

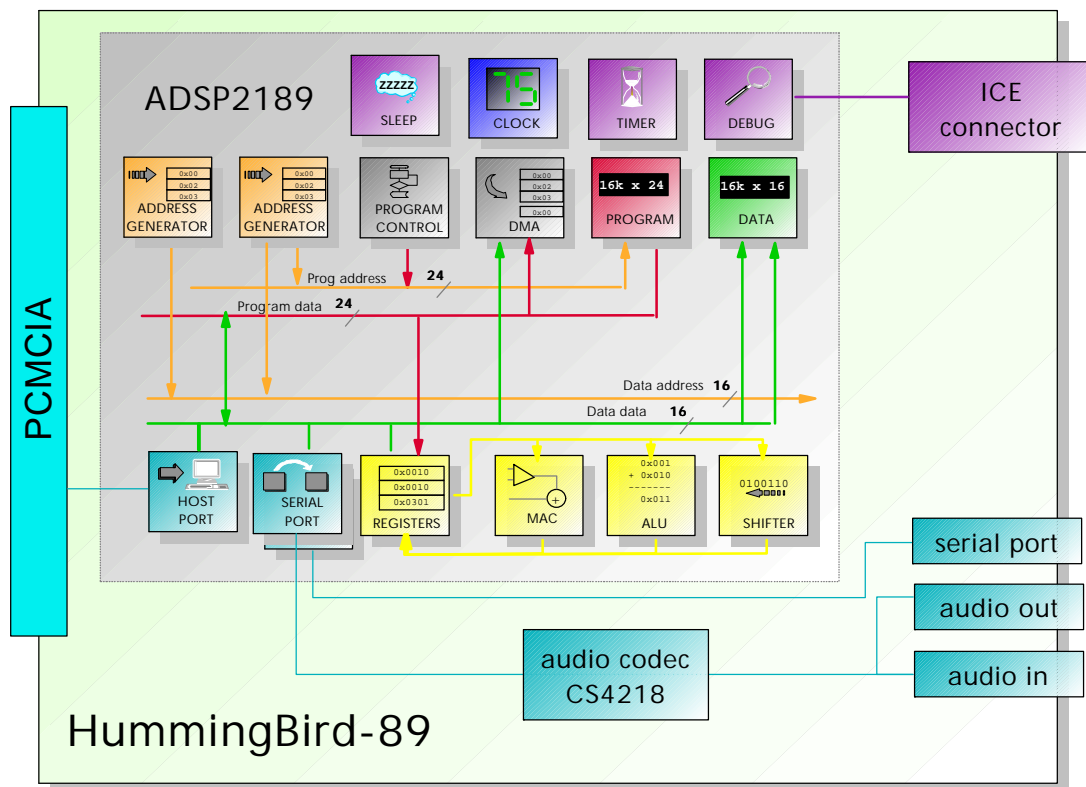
The HummingBird brings connections out to the card connector for In Circuit Emulation (ICE), and the serial port signals as well as the audio connections.

The HummingBird can also be used as a convenient portable computer software **development system** for the **ADSP2189**.

Plug'n'Play drivers are provided for Windows 95 and 98, and the HummingBird is supported by Momentum's QEDesign filter code generation software.

Features:

- line level stereo **audio input and output**
- **75 MIPS peak processing speed**
- 32 kwords program, 48 kwords data memory
- Windows 95/98 **Plug'n'Play drivers**
- ICE connector for In Circuit Emulator
- PCMCIA bus
- **low power consumption for hand held devices**
- 'sleep' mode to conserve power



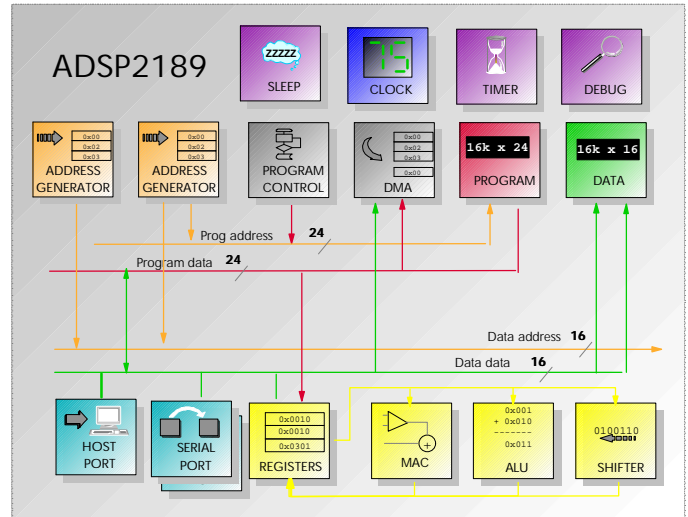
HummingBird-89 data sheet

The DSP

The **ADSP2189** is a high speed, low power consumption, **Digital Signal Processor (DSP)** with a 13.3 ns instruction cycle time. Every instruction can execute in a single processor cycle and the architecture allows multiple operations in parallel, reaching a maximum sustained speed of **75 MIPS**.

The ADSP2189 provides **192 kbytes of memory** - 32 kwords for program and 48 kwords for data - which is adequate for most **real time DSP** applications.

Programming can be in **C or assembly language** for real time programming with **concurrent I/O**.

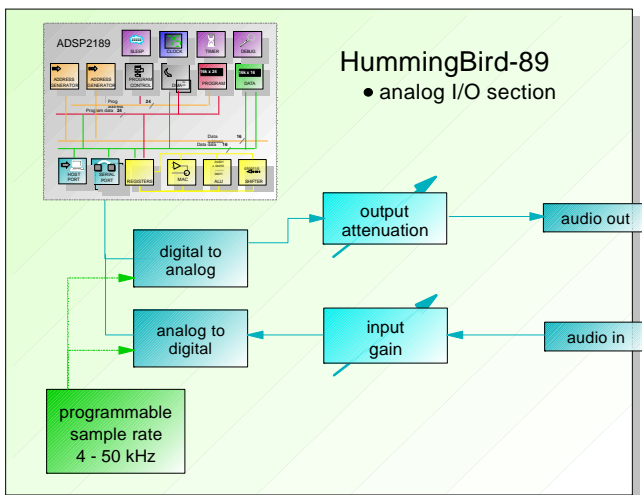


Analog interface

The **dual channel analog interface** provides high quality **16 bit** analog I/O at sample rates which are programmable between **4 - 50 kHz**. Input gain is programmable between 0 and 22.5 dB, and output attenuation can be programmed between 0 and -46.5 dB.

The HummingBird brings **line level analog audio input** and output to the PCMCIA card connector. A cable breaks out the analog lines to standard RCA connectors.

Analog signals are interfaced to the ADSP2189 processor's simple and efficient **high speed serial interface**.

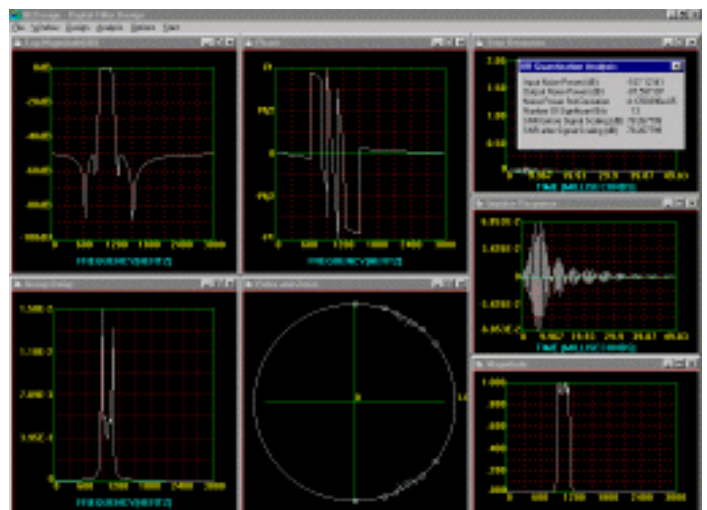


Software

Plug'n'Play software drivers are provided for Microsoft™ **Windows 95 and 98** operating system.

The HummingBird is also supported by Momentum's **QEDesign** software which **generates real time digital filter program code** as subroutines or as complete programs which can be executed straight away on the HummingBird, operating upon real time analog signals.

Program examples are provided showing how to program the analog I/O, and for typical real time DSP applications such as real time digital filtering.



HummingBird data sheet 110999.fm - preliminary, subject to change

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