MISTRAS
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Products & Systems
Division

PHYSICAL ACOUSTICS CORPORATION

Product Bulletin

PCI-8™: 8-Channel Acoustic Emission System on a Board

The **PCI-8** "**AE** System on a Board" provides 8 channels of simultaneous waveforms and AE features. This new digital data acquisition AE system resides on a full-size PCI card and is very cost effective. Through the high performance PCI bus and Direct Memory **Access (DMA) architecture, significant** AE data transfer speeds can be attained (up to 132 Mb/sec.), assuring a wide bandwidth bus for multi-channel AE data acquisition and waveform transfer. Digital acquisition circuitry virtually eliminates drift, thereby achieving high accuracy and reliability.

PCI-8™ AE System on a Board

PCI-8™ AE Subsystem boards occupy one full-size PCI slot in a computer chassis and can be implemented inside most standard PC computers or inside one of PAC's four (4) rugged, multichannel PAC SAMOS™ (Sensor based Acoustic Multichannel Operation System) system chassis, which include SAMOS-112/48/32 and μSAMOS™. Due to advances in surface mount technology and high density FPCA's devices, PAC has been able to provide this single AE System on a Board with 8 complete high speed, AE channels of acquisition waveform processing and transfer, 2 analog parametric input channels and 8 digital input and output control signals.

Key Features

- Low power consumption.

- 8 digital (16-bit A/D) complete AE channels on one full-size PCI card.

- PCI-bus provides AE data transfer rates of up to 132 Mb/sec to a PC computer.

- 4 High Pass, 4 Low Pass filter selections for each channel, totally under software control.

- Up to 2 parametrics on each PCI-8 board with update rates up to 10,000 readings/second (when attached to hit data).

- Designed with multiple FPGA's and ASIC IC's, to provide extreme high performance and minimize components and cost.

- Hit LED drivers are built within the PCI-8 board so that AE activity LED's can be attached directly.

- Built-in AE feature extraction provides high speed transient data analysis at high hit rates.

- Built in waveform processing with DMA & Bus Mastering transfer for high speed transfer of waveforms on all 8 AE channels.

- Digital signal processing circuitry virtually eliminates drift, thereby achieving high accuracy and reliability.

μSAMOS™ Chassis for up to 24 Channels of AE

PCI-8™ Board Sample Specifications:

Physical Specifications:

- **Size:** 13.415" L x 4.8" H x 0.7" T
- **Weight:** 1.1 lbs.
- **Power Consumption:** 10 Watts (w/o Preamps)
- **DC Power:** +12.0 volts, 0.4 amps
  -12.0 volts, 0.1 amps
  +5.0 volts, 1.0amp

Electrical Specifications:

- **AE Inputs:** 8 channels
- **Input Impedance:** 50 Ohms
- **Preamplifier Power:** 28V Phantom Power Power & Signal on Coxial Connection
- **Sensor Testing:** AST built-in
- **Frequency Response:** 1 kHz - 400 kHz (at -3 dB points)

Signal Processing:

- **AE Signal Gain:** 0, 6 dB computer selectable
- **Filters:** 4 High Pass computer **selectable filters - 1 kHz,** 5.0 kHz, 20 kHz, 100 kHz, 4th order Butterworth

  4 Low Pass computer **selectable filters - 50 kHz,** 100 kHz, 200 kHz, 400 kHz, 4th order Butterworth

- **Max. Signal Amplitude:** Up to 100 dB AE Up to 99 dB ASL
- **ADC Type:** 16 bit, 3MSPS per channel maximum
- **Waveform Sample Rate:** Computer selectable 100 kSPS, 200 kSPS, 500 kSPS, 1MSPS, 3MSPS
- **Extracted AE Features:** Time of 1st Threshold Crossing, Time to Peak, Peak Amplitude, Envelope Strength, Duration, Rise Time, Counts, True Energy, RMS, ASL, Parametric 1 & 2

Analog Parametrics:

- **Parametric Channels:** 2
- **Parametric A/D Res.:** 16 bits
- **Parametric Sample Rate:** 10 kHz sample rate for each analog parametric
- **Time Driven Data Rate:** Controlled by software 10 msec. to 60 seconds
- **Time Parametrics:** All parametrics are available in time data set

Additional I/O:

- **Digital I/O:** 8 Digital Inputs 8 Digital Outputs
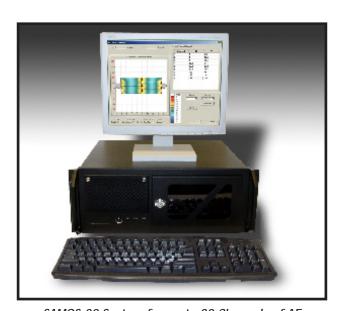- **Audio Monitor Interface:** Analog switch and buffer to select desire channels to be routed to PAC audio monitor board
- **LED Activity Monitor:** On board LED driver to directly drive LED's on front panel. LED minimum on time is 0.05 seconds

SAMOS-32 System for up to 32 Channels of AE

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