MISTRAS
A World of NDT Solutions
Products & Systems Division

PHYSICAL ACOUSTICS CORPORATION

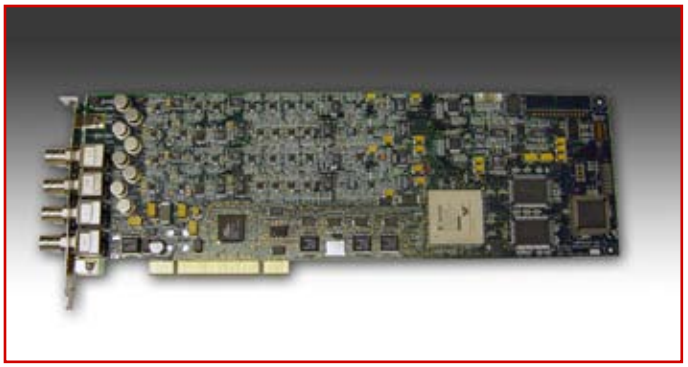
EC-PCI2: Digital Eddy Current System on a PCI Card

In the first-of-a-kind scanning Eddy Current system developed for a U.S. Army project, Physical Acoustics Corporation now offers an Eddy Current system on a PCI card (EC-PCI2) that can be integrated with motion control to build automated EC/UT inspection systems. This new low cost system offers a high level of performance with digital signal processing for generating 48 bit Eddy Current measurements, at a rate of +40 MSPS.

The EC-PCI2 is low noise, low drift and will meet the needs of eddy current laboratories and will allow easy integration into small computer systems and automated Eddy Current systems for field testing.

Key Features

- Provides two independent Eddy Current (EC) channels
- Offers full compatibility with standard industrial EC probes
- Measures conductivity and coating thickness
- Detects 0.5 mm EDM notches in steel, aluminum and titanium
- Generates an excitation signal (10 mv to 10 Volts) with integral digital waveform generator (100 Hz to 2 MHz)
- Allows fast, multi-frequency operation because the frequency can be changed on the fly (during measurement)
- Offers simultaneous multi-frequency measurement capabilities through frequency mixing
- Provides high-speed data transfer utilizing DMA and bus mastering
- Supplies improved signal-to-noise ratio of the excitation signal with selectable, analog smoothing filters (100 Hz to 2 MHz)
- Configurable input bridge circuit that can be programmed by software
- Delivers best possible sensitivity with ultra low noise analog front end EC receiver
- Performs real-time digital signal processing (not conventional analog) for all EC measurements via EC receiver
- Performs EC signal processing and feature extraction using 1 million gate FPGA
- User programmable arbitrary signal waveform allows experimenting with different excitation techniques (e.g. pulsed EC)



Specifications:

Data Acquisition/Analysis Board

• **Type:**	Full size PCI card
• **Size:**	13.415" x 4.20" x 0.70"
• **Power Consumption:**	< 20 watts
• **Interface:**	PCI bus mastering using PLX 9056 Interface chip
• **Independent EC Channels:**	2
• **Simulation Frequencies:**	4 per channel
• **Bridge Impedance:**	100 ohms

Excitation Waveform

• **DAC:**	14 bit, 40 MSPS
• **Frequency Range:**	100 Hz to 2 MHz, DDS controlled
• **Excitation Amplitude:**	100 mv to 10 Volts

Receiver

• **ADC Digitizing:**	14 bit, 40 MSPS ADC
• **Bridge:**	Absolute, relative, reflective and calibration
• **Bridge Offset:**	16 bit DAC
• **Instrument Amp Gain:**	x10 (20 dB)
• **Filter Type:**	Bessel
• **High Pass Filters:**	DC, 4 Hz, 20 Hz, 100 Hz
• **Low Pass Filter:**	100 kHz, 1 MHz, 5 MHz, bypass
• **Digital Signal Processing:**	Dedicated feature extraction processors built from a 1 million gate FPGA

- *ANSI/ISO/ASQ Q9001-2000 (Certificate No. US96/0561 by SGS)*
- *BS EN ISO 9001: 2000 (Certified in UK, No. 6022 by NQA)*
- *CE (Every instrument and sensor)*
- *Intrinsically Safe (BASEEFA, CENELEC, FM, DNV & CSA)*

CE ISO 9001

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Due to continuing improvement we reserve the right to amend specifications without notice. *#26-07*