ARB-1410 Arbitrary Waveform Generator Board and WaveGen1410 Software

September 2004, Princeton Junction, NJ—Physical Acoustics Corporation (PAC) introduces the New ARB-1410 arbitrary waveform generator card. A PCI-bus based, highly precise (14-bit), high speed (100 MSample/sec) unit, the ARB-1410 is used in conjunction with WaveGen1410 Software to provide an extensive variety of simple or complex acoustic emission waveforms of all shapes and amplitudes up to +/- 150 Volts.

The ARB-1410 interfaces to the AE system via the PCI-bus, which is the de-facto industry standard for today's PC computers. The board uses digital synthesis to generate an analog output waveform. With 512K Word memory buffer, and high speed 14-bit digital-to-analog converter, the ARB-1410 performs at rates up to 100 MSamples per second. It can be used alone or in conjunction with a PAC DiSP, PCI-2, SAMOS, MISTRAS, LAM, SPARTAN, NDT Automation AD-1210-PCI UT A/D card, or other data acquisition system, to form an Acousto-Ultrasonic analysis system.

With the provided user-friendly WaveGen1410 software, the ARB-1410 can be used to:

- Synthesize waveforms for Acousto-Ultrasonics signal generation or Guided Wave Inspection
- Serve as an AE-system calibration or verification source (AE-CAL)
- Test the response of the AE System utilizing it as an AE waveform signal simulator
- Replay captured waveforms from your AE system using the import function and process AE waveforms from files
- Act as a high performance electronic signal generator or synthesizer

WaveGen software provides Windows based tools to setup and control the ARB-1410 Arbitrary Waveform generator Board. Optional LabView or C++ software development kits are also available for custom programming. WaveGen enables the user to program and generate various types of waveforms using an easy-to-use setup menu. The waveform view provides a simulated waveform, so that the user can verify the type of waveform being programmed. Waveforms are generated based on an external trigger input, gate input or internal computer generated trigger with programmable repetition rate. The FPGA provides the complete on-board circuit and timing control for precise waveform generation and repetition rate control. Additionally, the FPGA controls the output amplitude and offset via additional DAC's (including the Amplitude Control DAC and the DC Offset Control DAC).

The output digitized waveform is smoothed by passing it through 1 of 8 software selectable filters that vary in frequency cutoff between 10 kHz to 40 MHz. The output amplitude range is controlled by the 0/20/40 dB attenuation stage through the output buffer and the AC/DC output coupling selection. This provides the standard path for generating +/-10 Volt signal outputs, the typical range of AE signal outputs. Optionally, a 4 channel Multiplexer Output is available. Also, one of two higher voltage options can be provided, including a +/-35 Volt full-power output for up to 2 MHz waveforms or the +/- 150 Volt full-power output for output frequency waveforms up to 700 kHz full-power bandwidth.

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