

AED-2010V
Virtual Instrument
Product Description & Specifications



The Acoustic Emission Consulting, Inc. **AED-2010V Virtual Instrument** is a package and feature variation of the popular AED-2010 series of hand-held Acoustic Emission detection instruments. As a small, bench-top AE instrument, the AED-2010V provides a few local operator controls, such as the RMS time constant, and the audio alarm; otherwise, the keypad and LCD module are absent and the instrument is totally operated from a host computer using the AED software package included. Hence, the Virtual Instrument classification. The same proven pc board set is used as in the other AED-2010 instruments, and some additional features are populated.

On this bench-top version of the AED-2010, external BNC connections are provided for the amplified/filtered AE signal output, RMS signal output, and a trigger output. Also included are two channels of 12 bit, 0 – 5Volt parametric input, three CMOS level alarm outputs, and a logic level hold input. These added features enable the AED-2010V to be used in applications where parametric variables such as temperature or pressure must be simultaneously monitored and alarm enunciators controlled.

The AED-2010V is ideal for small laboratory testing programs, academic research, online monitoring of industrial processes, leak detection, partial discharge monitoring, and industrial process control or automated testing applications. It is also popular in the computer hard disk manufacturing industry for monitoring of head-disk contact and motor drive operation.

Specifications

Refer to the AED-2010 Operations Guide, Appendix A for the primary specifications of the basic AED-2010. The variations and additions follow:

- Dimensions: 5.6”W x 2.5”H x 8.0”D (142 mm W x 62 mm H x 202 mm D)
- Parametric inputs: Range 0 – 5Volts, 12 bit digitization.
- Alarm/Control logic outputs: 3 lines, CMOS logic levels.
- Hold input: 1 line, CMOS logic level input.

Front Panel Description

The following describes the various items on the front panel.

- Sensor BNC: AE sensor input connection. This connector can have +12VDC or +24VDC on it when an integral preamplifier sensor is used.
- RMS tc Switch: Selects one of two RMS time constants, fast or slow.
- RMS Out BNC: RMS signal output in DC volts (0-5 VDC).
- Activity LED: This LED flashes when the AE signal exceeds the selected voltage threshold level.
- Audio connector: Audio output. This is a stereo connector with the channels commoned internally.
 - True audio output for signal content 1 kHz-20 kHz
 - Demodulated audio for signal content > 20 kHz
- Sig Out BNC: Output connector for the amplified/filtered AE signal. May be used for viewing the signal with a scope or capturing the signal with a digital data acquisition system.
- Power on LED: Indicates the AED-2010V is powered.
- Alarm Section
 - LED alarm lights to indicate if each of three different alarm conditions have been exceeded
 - Beeper on/off switch—controls audio alarm beeper

Rear Panel Description

The following describes the various switches and connectors on the rear panel.

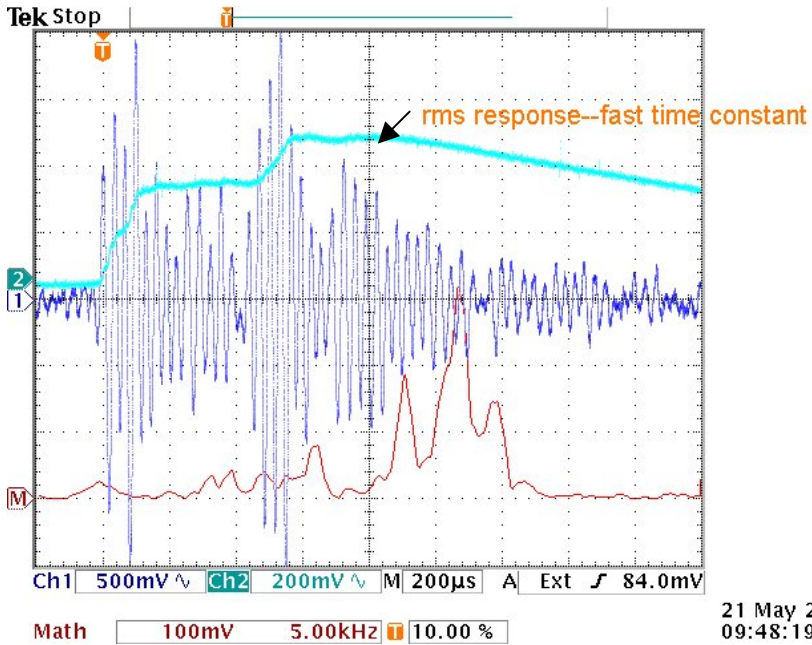
- PARA 1 & 2 BNC: These are the parametric inputs. 0 – 5V DC range, 12 bits, 1.2 mV resolution.
- LINK connector: Mini-B USB connection to host computer.
- Trig Out BNC: Output of the threshold comparator providing a logic transition (0-5 V, low true) for each threshold crossing.
- ALM 1-3 BNC connectors: three independent alarm lines out, 0-5V CMOS level output (high true)
- Hold input BNC connector: 0-5 V CMOS level (low true). Disables AE signal processing while hold is enabled.
- Preamp PWR switch (3-position): The preamp power available at the Sensor input connector on the front panel can be set to +12VDC, +24VDC, or turned off in those cases where a self-powered preamp or other signal source is used.
- POWER ON switch: Controls power applied to the unit.
- 9VDC connector: Input from the AC adapter.



Front panel of AED-2010V Virtual Instrument

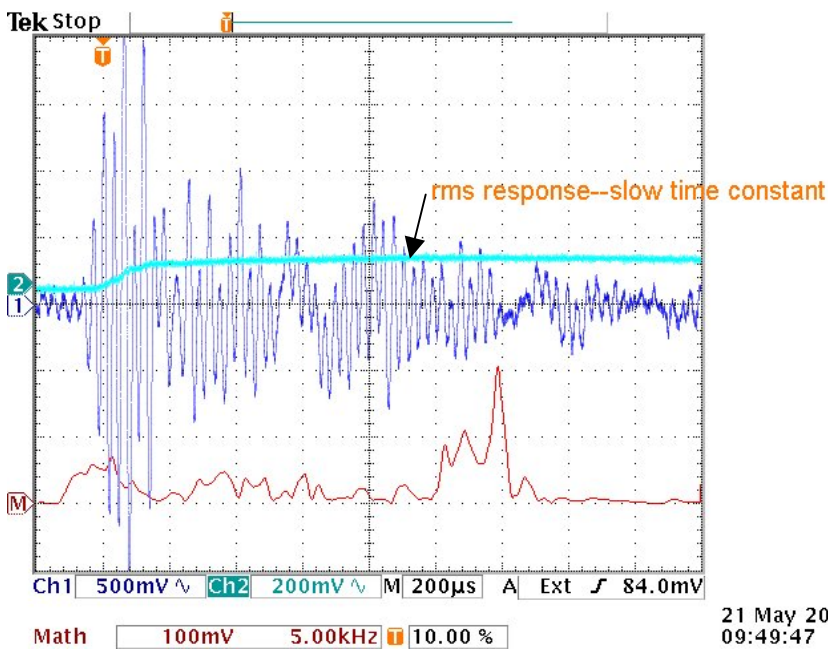


Rear panel of AED-2010V Virtual Instrument



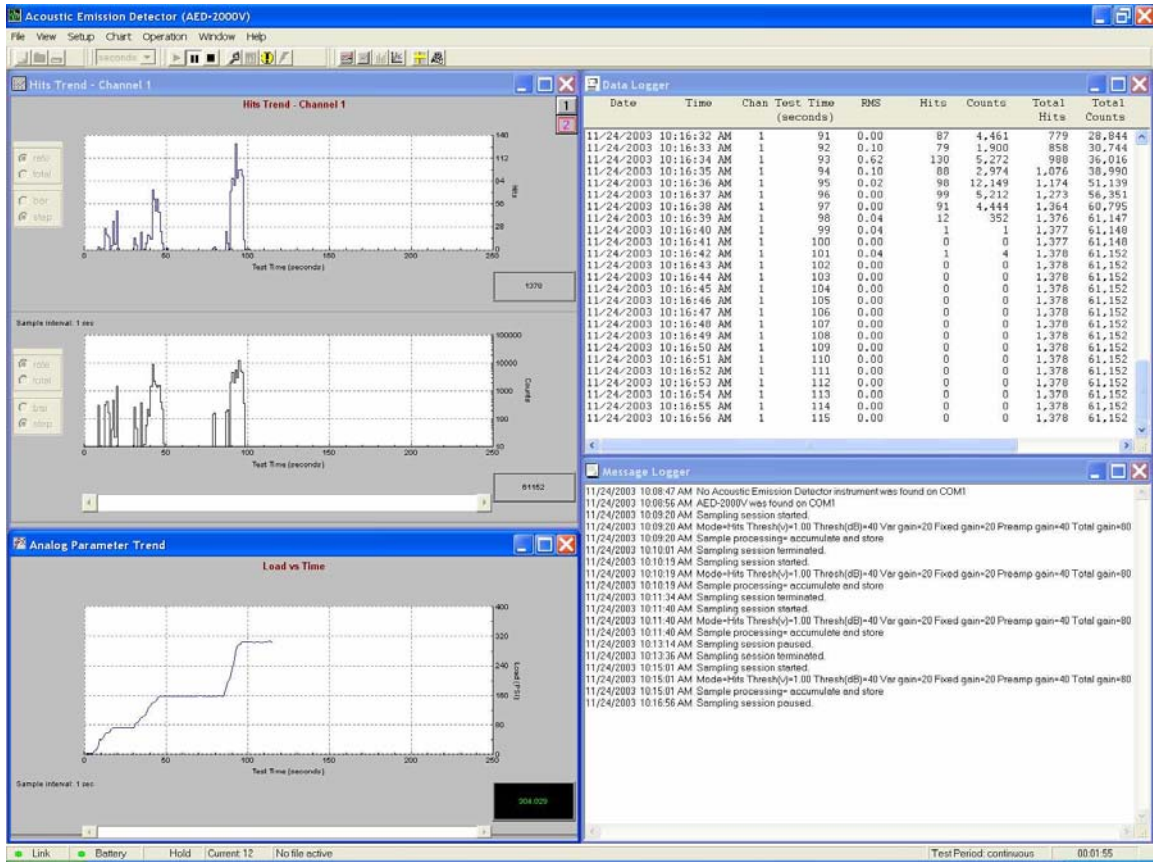
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Example of the fast time response selection for RMS superimposed on the AE signal waveform (dark blue) and the waveform spectrum (red). The RMS envelope responds quickly to changes in the signal shape. This demonstration is on a 40 kHz signal waveform.

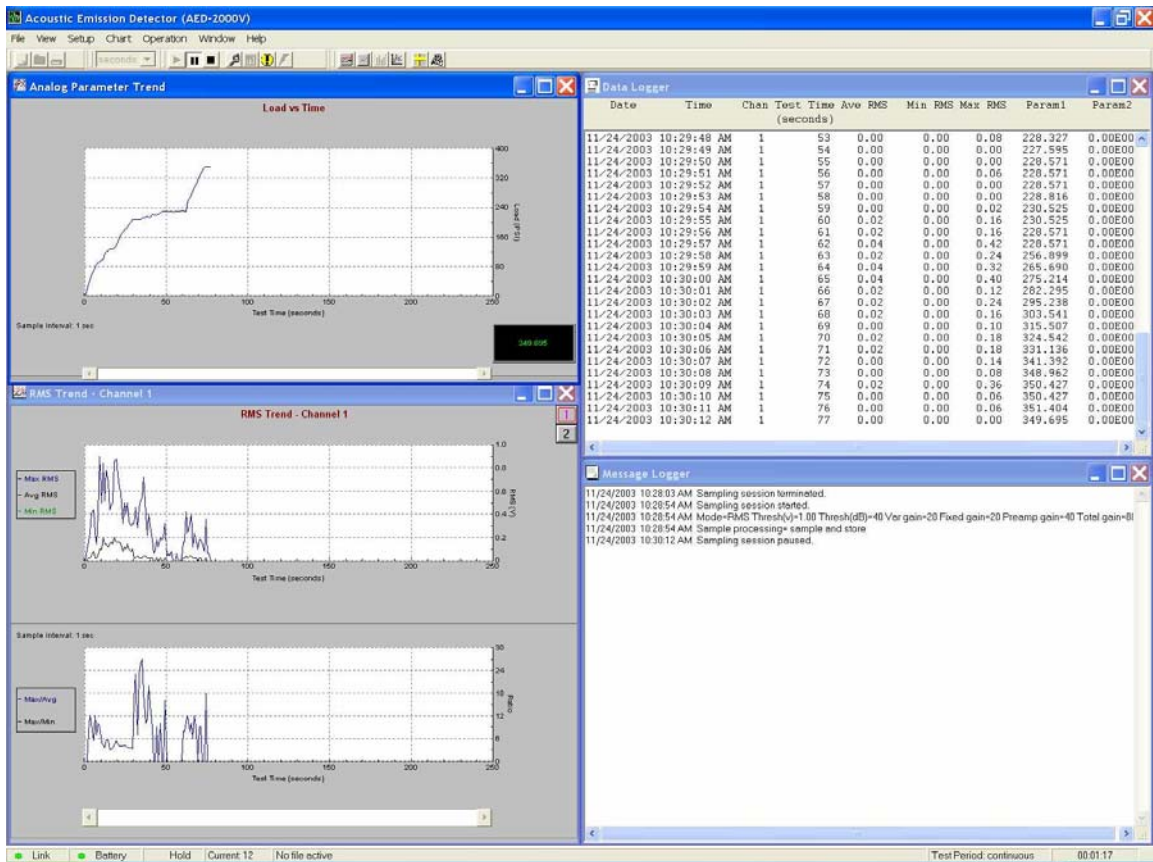


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Example of the slow time response selection for RMS superimposed on a similar 40 kHz waveform. The RMS envelope responds more slowly to the changes in signal shape, and is used to measure average changes in the signal background.



Example of AED ver 3.1 software acquisition data and graphics outputs in the “hits” thresholded processing mode. Upper left shows hits and counts trend graphics. Bottom left shows parametric (load vs time). Upper right shows the data logger window with each 1 second data output from the AED-2010V (data is stored in ASCII CSV format to file). Bottom right shows the message logger window, detailing all significant actions during the test .



Example of AED ver 3.1 software outputs in the RMS signal processing mode. Data logger and message logger windows are in the upper right and lower right windows, respectively. A parametric (load vs time) is shown in upper left. The RMS trend plots consist to two graphics (lower left). The top graphic shows the min, max and avg RMS voltage vs time. The bottom graphic shows the Max/Avg RMS ratio, and the Max/Min RMS ratio.