

Pocket AE-1: Hand-Held Acoustic Emission System

The **Pocket AE-1** Acoustic Emission (AE) system is a computerized hand-held instrument for AE testing and leak detection applications. Due to its portable nature and full AE features and functions capabilities, this system can be used in any remote, short term AE application and evaluation, making it an ideal NDT test tool. It performs traditional AE feature extraction based AE signal processing, as well as advanced waveform based acquisition and processing. Text and graphic results are displayed on the Quarter-VGA (240 wide x 320 high pixels) sized color LCD screen. AE data files are saved in traditional PAC, DTA files and are transferrable to a desktop or notebook computer via compact flash cards and/or the USB bus, for full data analysis using PAC's AEWin™ software.

Key Features

- ◆ Single channel AE instrument with similar performance features found in PAC's PCI based multi-channel AE instruments.
- ◆ Hand-held portable unit for quick, efficient testing in the field or laboratory.
- ◆ Microsoft™ Windows-CE™ compact operating system, which is familiar and easy to operate
- ◆ Uses PAC standard low cost passive AE sensors with internal AE preamplifier or new low power integral preamp sensors.
- ◆ 16 bit A/D waveform capture and AE signal processing offers wide system dynamic range.
- ◆ 16 bit A/D parametric input to correlate AE to other process sensors.
- ◆ Integrated rechargeable battery pack, lasting up to 4 hours, and easily replaced.
- ◆ Numerical keyboard and color LCD screen for showing graphical and text data.
- ◆ Internal flash memory for storing setups and data files.
- ◆ Permanent digital record of the test results in standard DTA, PAC data files, compatible with AEWin™ Software for detailed data analysis and data visualization.
- ◆ Compact Flash card and USB port for data transfer to laptop or desktop PC.



The Pocket AE-1 uses an architecture much like that used in hand-held PDA (Portable Data Assistant) and utilizes Microsoft Windows-CE™ operating system. Win-CE is a compact version of Microsoft Windows™ with most of the same features and graphical user interface for instant familiarity.

The unit is a high performance, wide bandwidth, single-channel AE system, with 16 bit A/D conversion and other key features that are found in PAC's DiSP systems. There is even a 16 bit parametric input channel to correlate AE with other external process variables.

Applications

Capable of performing any AE testing where one channel of Acoustic Emission monitoring is required, the portability of this instrument makes it ideal for field testing in applications such as leak detection, AE characterization of materials and processes, and screening tests to determine if further action needs to be taken using a larger AE system. Additionally, with the Pocket AE-1's built-in parametric processing circuitry, AE can be correlated with other sensors and process stresses.

Pocket AE-1 - Portable, One Channel Acoustic Emission System

Software Description

The Pocket AE-1 comes with a complete working AE software program to perform a variety of AE tests. This program is configured just like any other Microsoft Windows program with a typical menu structure and the familiar menu selections such as "File," "Setup," "Run" and "Help."

The end-user configures the unit in preparation for an AE test. He/she can set up multiple graphs for viewing, one at a time via the user screen, with 200 x 200 pixel resolution for clear, sharp graphs. Included in the software is the ability to view waveforms, histograms, line graphs and point plots in the traditional anything versus anything style. During acquisition or replay, you can scroll through the graphs, viewing one graph at a time. The data is saved in a standard PAC defined DTA file for further analysis with AEWin™ or software programs such as NOESIS™.

System Components

The Pocket AE-1 comes complete with the hand-held, single-channel AE unit, an R15 α (alpha) passive AE sensor, 1 meter sensor cable, 2 meter parametric cable with BNC connector, and a battery eliminator DC power supply, all inside a foam lined plastic carrying case with user documentation. Optionally, an external battery charger, extra battery pack, compact flash cards and AEWin™ Replay Software for desktop or notebook based analysis are available at an additional cost.



The Pocket AE-1 System comes with hand-held, single-channel AE unit, R15 α AE sensor, 1 meter sensor cable, 2 meter parametric cable with BNC connector and a battery eliminator DC power supply (case not shown).

Specifications

- **Size:** 9.5" H x 3.5" W x 1.4" D (241 mm x 89 mm x 36 mm)
- **Weight (with batteries):** 1.5 lbs. (0.7 kg)
- **Display:** 3.52" Color LCD, QVGA portrait mode, 240 pixels wide x 320 high Transflective with LED backlight
- **Display Touchpad:** Built-in touchpad on screen for use with stylus and on-screen processing
- **Storage Memory:** 64 Mbytes Flash for OS and data storage
- **External Interfaces:** Compact Flash port, USB 2.0 Port
- **Power Consumption:** Approximately 3 Watts
- **Power Requirements:** External DC adapter OR Internal 7.2V NiMH battery pack, rechargeable in-situ or optional external charger
- **Battery Life:** 4 – 6 hours intermittent use
- **Operating Temperature:** 23° to 113° F (-5° to 45° C)
- **Storage Temperature:** -4° to 140° F (-20° to 60° C)
- **Connectors:**
 - **AE Input**
 - **Parametric Input**
- **AE Channel Description:** Single channel AE Input using SMB Connector input. Low voltage (5 volt) Phantom power is available on the AE input connector for powering an external low voltage preamplifier or integral preamplifier sensor
- **AE Frequency Response:** 1.0 kHz to 1.0 MHz
- **Software Selectable Filters:** 4th Order Butterworth filters
 - **High Pass Filters:** 1, 5, 20, 100 kHz
 - **Low Pass Filters:** 1 MHz fixed
- **Digitizing:** 0.1 x sample rate variable
- **Digital Signal Processing:** 16 bit, 10 MSPS maximum
- **Performed by dedicated Feature Extraction Processor**
- **Extracted Hit Features:** Typical AE features including Time of 1st Threshold Crossing (Time of Hit), Distance (Inches), Counts to Peak, Peak Amplitude, Envelope Strength, Duration, Rise Time, Counts, True Energy, RMS, ASL, Parametric Input
- **Parametric Input:** Single parametric input via an SMB connector, +10V input range, sampled by a 100kSPS, 16 bit A/D converter

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