



FFT, Waveform, Histogram, Point Plot

## Pocket AE-2™: Portable 2-Channel Acoustic Emission System

The Pocket AE-2 is a high performance, computerized, dual channel Acoustic Emission (AE) system packaged in a rugged, portable hand held unit. It offers all the performance features of larger, more expensive AE systems, including wide bandwidth, speed, AE features, sampling rates, waveform processing capabilities and audible AE, all in a compact, battery-operated package.

The system is an excellent field survey tool, especially in situations where power is not read-

ily available. Equally useful in the laboratory, the system carries out lab tests by utilizing its 2-channels of Acoustic Emission and 1 channel parametric input for correlating load or stress with AE activity. In addition, linear location and spatial filtering are built-in to provide more versatility.

The Pocket AE-2 performs traditional AE feature extraction signal processing as well as advanced waveform acquisition and processing. Results are displayed on an integrated color LCD touch

screen (240 x 320 pixels resolution for clear sharp graphics), able to display up to eight graphs including waveforms, FFTs, histograms, line plots, point plots linear location, and event detection. AE data files are saved in DTA files and can be transferred to your computer via compact flash cards and/or USB, for full data analysis, using our optional AEwin™ software.

### APPLICATIONS

The Pocket AE-2 can be used for many applications where portability is important. With a six hour battery life and added ability to operate the unit from battery belt or AC power, the unit can be used for long-term testing or carried into the field for short-spot inspections.

### ELECTRICAL ASSET TESTING

Transformers, GSU's and circuit breakers can be evaluated for electrical, thermal and mechanical faults while online. Early screening of transformers prevents forced outages & downtime from preventable failures.

### STEEL ROLL TESTING

Cool-down monitoring of steel rolls that are under stress from temperature and pressure, can be inspected very quickly with the Pocket AE-2. Testing for micro-cracking is not only a repair issue but also a safety issue.

### STORAGE TANK CORROSION

Real time corrosion monitoring can identify

### Key Features

- All the standard performance features as in PAC's PCI based multi-channel AE instruments.
- Hand-held portability for quick, efficient testing in the field or laboratory.
- PDA type computer using Microsoft™ Windows-CE™ compact OS, familiar and easy to use.
- Utilizes PAC standard low cost passive AE low power sensors with an internal AE preamp.
- Two AE channels with one high performance 18 bit A/D for each channel, allowing AE data processing at up to 10 MSPS.
- 16 bit A/D waveform capture and AE signal processing offers wide system dynamic range without the need for gain controls.
- 16 bit A/D parametric input to correlate AE to other process sensors.
- Integrated rechargeable battery package lasting 4 hours (continuous) or more. Batteries are easily changed and can be charged outside of the system (with optional charger).
- Numerical keyboard with function keys for quick, easy setup and control.
- 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.

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areas of concern in above ground storage tanks to prevent leaks. EPA standards require storage tanks be regularly tested for leaks that would cause ground contamination. Spot monitoring allows the inspector to schedule full inspections based on the presence of active corrosion.

## MATERIAL CHARACTERIZATION

When lab testing materials, the Pocket AE-2 can give additional information about the quality/strength of a material. With the added parametric input load or temperature trends can be plotted along with AE.

## THROUGH VALVE LEAK DETECTION

When supplied with the available leak quantification software add-on, Pocket AE-2 becomes a powerful leak testing instrument. In service valves can be tested for tightness and quantified for an estimated amount of loss; providing easy cost justification for repair or replacement cost.

## SOFTWARE DESCRIPTION

The Pocket AE-2 comes with complete AE acquisition and analysis software. The software has the ability to view waveforms, histograms, line graphs and point plots. In addition, event detection, linear location, delta-T filtering and guard channel capability is built into the system.

During acquisition or replay, the user can scroll through the graphs, viewing one graph at a time. The data is saved in MISTRAS' standard DTA file format for further analysis with AEwin™ or NOESIS™.

## SENSORS FOR POCKET AE-2

The Pocket AE-2 has an internal AE pre-amplifier and the capability to power a low power line of external preamplifiers and integral preamplifier sensors. The user can select between the use of the internal and external preamplifier via software. When in internal preamplifier mode, standard, passive (non-amplified) sensors can be attached directly to the AE inputs of the Pocket AE-2 system. The Pocket AE-2 is shipped with R15α (Alpha) sensors and a cable for connecting the sensors to the system. MISTRAS' Alpha series sensors are low cost, general purpose sensors and come in many frequency ranges for any application.

Additionally, the Pocket AE-2 system can be switched to external preamplifier mode. When in this mode, power is supplied to an external preamplifier or integrated preamplifier sensor. These sensors allow for driving long distances from the unit to the sensor. To maximize battery life a specialized line of low power, integral



preamp sensors called the PK series with Automatic Sensor Test (AST) for sensor verification and are made for the Pocket AE product line.

## SYSTEM COMPONENTS

The Pocket AE-2 comes complete with the handheld 2-channel unit, two R15α (Alpha) passive AE sensors, two 1-meter sensor cables, one 2-meter parametric cable with BNC connector, a 1GB CF card 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 packs & AEwin™ Replay Software for desktop or notebook based analysis are available separately.

**For more information, call 1-609-716-4000 or visit us on the web at [www.mistrasgroup.com](http://www.mistrasgroup.com)**

## Pocket AE-2 Specifications:

**Size:** .....9.5" H x 3.5" W x 1.4" D(241 mm x 89 mm x 36 mm)  
**Weight:**.....2.5 lbs. (1.13 kg) - with batteries  
**Display:**.....3.52" Color LCD, QVGA portrait mode, 240 pixels wide x 320 high transfective with LED backlight  
**Display Input:**.....Built-in touchpad for use with stylus and on-screen processing  
**Memory:** .....128 MB Flash for OS and data storage  
**External Ports:** .....Compact Flash port, USB 2.0 Port  
**Power Use:**.....Approximately 4 Watts  
**Power:**.....External DC adapter (12 V @ 1A) OR Internal 7.2V NiMH battery pack, rechargeable in-situ or optional external charger  
**Battery Life:** .....4 – 6 hours intermittent use  
**Operating Temp:** .....23° to 115° F (-5° to 45° C)  
**Storage Temp:** .....-4° to 140° F (-20° to 60° C)  
**Connectors:**  
    **AE** ..... 2 - SMB (Plug) connectors  
    **Parametric** ..... 1 - SMB (Receptacle) connector  
**AE Channel Description:** Dual channel AE Input using SMB Connector inputs. Low voltage (5 Volt). Phantom power is available for an external low voltage preamplifier or integral preamplifier sensor  
**AE Freq. Response:** .....1.0 kHz to 1.0 MHz +/- 1.5 dB

**Software Selectable Filters:** The Pocket AE system comes with multiple digitally synthesized High and Low Pass filters in addition to software-selectable High Pass analog filters, providing exceptional filtering characteristics for maximum noise rejection and optimal signal to noise ratio.  
**Digitizing:** .....18 bit, 20 MSPS ADC  
**Digital Signal Processing:** Real time FIR low pass filter. Each extracted feature processed by a dedicated real-time pipeline processor  
**Extracted Hit Features:** Typical AE features including Time of 1<sup>st</sup> Threshold Crossing (Time of Hit), 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 (Receptacle) connector,±10Volts input range, sampled by a 100kSPS, 16 bit A/D converter  
**AST:**  
**Internal Preamplifier:** Pulse-Through, pulsing to crystal with programmable tone burst.  
**External Preamplifier:** Trigger for external preamplifiers available on Phantom power.  
**Audible AE:**.....Built-in Audio AE capability with internal speaker. Audio menu for selecting volume

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