

Insuring Vehicle Integrity with Acoustic Emission Testing

Acoustic Industrial Multichannel System (AIMS) is a combination of a Physical Acoustics model Transportation Tester and Aerial Device Testing Instrument (ADTI). The system is capable of testing both railroad tank cars and bucket trucks (ADTI).

Acoustic Emission (AE) testing provides a cost-effective and technically superior method to evaluate structural integrity of man-lift devices. This method of testing has grown in popularity and is presently in use by many utilities. AIMS instrument and the ADTI software that runs on it have been specifically designed to meet the requirements of ASTM F914-85. The test is performed by applying mechanical stress to the aerial man-lift device while "listening" for acoustic emissions (stress waves) that are generated by the sudden movement of material in areas that have been degraded by corrosion, crack growth, etc. Up to 24 sensors are mounted at strategic locations on the device. Signals from the sensors are measured and converted into numerical descriptions by the front-end hardware of the AIMS. The system then stores the numerical data and generates color displays that show regions of the aerial man-lift device that are producing emissions and, therefore may contain structurally significant defects.

Such features as color graphics, up to 24 channels of AE, menu-driven software and simplified graphics provide the capability for testing many different configurations of vehicles and devices.

Features:

- 4 digital AE channels on each full-size PCI card
- PCI bus, providing AE data transfer rates of up to 132 Mb/sec to PC
- 16-bit, 10 MHz A/D converter provides >82 dB dynamic range without the need for gain settings
- 4 High Pass, 4 Low Pass filter selections for each channel, totally under software control
- High performance, 32-bit, floating point, Digital Signal Processor (DSP) on board, offering up to 50 MFLOPS performance
- Up to 8 parametrics on the first PCI/DSP-4 (master board) with update rates up to 10,000 readings/second (when attached to hit data)
- Designed with multiple FPGAs (programmable gate arrays) and ASIC ICs, to provide extreme performance and minimize components and cost



Figure 1: 16-channel Digital AIMS. Optional 24-channel system not

Applications:

- Bucket Trucks
- Material handlers
- Cranes
- Digger derricks
- Fire truck ladders

Specifications:

- **Bandwidth:** 10KHz - 2.1 MHz (at 3dB points)
- **Sensors:** Low frequency, R6I (60 kHz)
High frequency, R15I (150 kHz), and R50I & WDI (500 kHz)
- **AE Features:** Amplitude, counts, duration, events (hits), time
- **Collection Mode:** 1st hit, All hits
- **Amplitude:** 10-100 dB
- **Threshold:** 15-99 dB
- **Computer:** PC with internal CD-RW (call for complete specifications)
- **Graphics:** 1024 x 768
- **AC Power:** 110/220VAC, 3 amps
- **Physical:** **16 Channel** - 17" W x 6.25" H x 17" D, 35 lbs.; **24 Channel** - 14.25" W x 8.13" H x 21.5" D, 42 lbs.

Call (609) 716-4000 Today for more information, email us at sales.systems@mistrasgroup.com, or visit www.mistrasgroup.com