



Providing Asset Protection Solutions

Products, Systems & 24/7 Online Monitoring Solutions





MISTRAS Group, Inc. is a leading global provider of technology-enabled asset protection solutions used to evaluate the structural integrity of critical energy, industrial and public infrastructure. MISTRAS combines industry-leading products and technologies, expertise in mechanical integrity (MI) and non-destructive testing (NDT) products, services and proprietary data analysis software to deliver a comprehensive portfolio of solutions, ranging from routine inspection to complex, plant wide asset integrity assessments and management.



Our Products & Systems division designs, manufacturers, sells, installs and services our asset protection products and systems.



Our Surface Mount machine, for electronic printed circuit boards, is a key part of the NDT products that we develop and manufacture.



Our AE sensors are available in various sizes, shapes, frequency and temperature ranges, and packaging styles in order to meet the diverse needs of the application and environment.

Products & Systems

We build our products and systems in our 50,000 square foot building in Princeton Junction, N.J. under an ISO 9001:2008, National Quality Assurance (NQA) certified quality system. MISTRAS Group was founded in 1978 as Physical Acoustics Corporation, an Acoustic Emission [AE] NDT instrument developer and manufacturing firm. Due to its success over

the years, the business grew dramatically, while adding a comprehensive and impressive list of NDT services, products and innovative systems to its product mix. In the process, the company evolved into a much larger organization, which has been organized under MISTRAS Group, Inc. As a result, MISTRAS has become one of the world's leading providers and technology innovators with a full range of NDT products, systems and services with more than 2000 employees in 60 offices across 15 countries.





Sensors/Preamplifiers

The single most important factor in AE testing is the selection of the AE sensor. We pride ourselves on our ability to continually design and manufacture a diverse line of quality high sensitivity/low noise sensors to meet your particular needs. We manufacture a large range of sensors to meet your requirements including:

- Airborne
- Rolling
- Under Water
- High Temperature
- High Radiation
- Miniature
- · Wide-band
- General Purpose
- Unidirectional Coolant Coupled
- Integral Preamplifier
- Low Frequency
- Differential



Multichannel AE Systems

By offering systems with two channels to hundreds of channels, MISTRAS can combine these AE boards into specialized turn-key data acquisition systems. Whether you have an industrialized field project or an advance research lab, MISTRAS has a chassis solution for you.

Intrinsically Safe Sensors

We provide a complete range of Certified Intrinsically Safe AE sensors, preamplifiers and systems for use in the most hazardous environments.



AE Boards

MISTRAS AE boards are complete AE data acquisition systems with full on-board signal processing. With 2, 4 and 8 channel boards, they are specifically designed to capture accurate waveforms, at higher bandwidths and sampling rates for any application. Using the latest and fastest processors available and with top sampling rates up to 40 million samples/second, standard DAQ cards can't top these speeds. The combination of three different high performance AE boards with six different chassis solutions, allows us to provide a system meeting the unique needs of our customer.

Acoustic Emission Products & Applications

MISTRAS Products & Systems Division's line of Acoustic Emission (AE) products incorporates application specific sensors and systems that utilize proprietary software to perform extensive signal analysis.

AE testing provides a powerful method of examining the behavior of materials under stress conditions. The MISTRAS AE equipment "listens" to the sounds from the materials being tested and interprets them even in high ambient noise environments.

The leader in AE data acquisitions, software, and sensors and the authority for AE applications.



Hand-held Units

The Pocket AE[™] Series is a full-featured high power AE hand-held system. Due to its portable nature and full AE features and function capabilities, this system can be used in any remote, short-term AE application and evaluation, making it an ideal NDT test tool.

FieldCAL

A low cost, small hand-held battery powered AE signal generator, the FieldCAL can produce all the AE signals necessary to verify the correct operation of AE sensors, preamplifiers and AE systems.



USB AE Node

Plugging into a USB port of a computer, our USB AE Node is a full-featured, low cost Acoustic Emission System. The AE System has all the capabilities, features and performance you can expect from your larger systems.





Leak Detection

Created for use in hazardous environments such as oil, gas and petrochemical plants, power generating plants and offshore platforms, the VPAC[™] II IS is a dedicated intrinsically safe acoustic leak instrument for through valve loss control. Using the same technology and sensors as our successful VPAC[™], the VPAC[™] II IS, for example, can determine the loss of hydrocarbons to flare in hazardous areas and save millions of dollars for the plants.



Portable UT Systems

The Pocket UT® is a battery-operated, handheld, stand alone, UT full A, B or C-Scan data acquisition system. With its portability (its only 2lbs!), ease of use and coupled with its full C-Scan capability, the Pocket System is ideal for on-site inspection, including rope access inspection, applications. Also, ask about our TOFD option.

With built-in motor drive capability for motorized scanning applications, the Pocket UT® is available with companion scanners and other compatible devices.



UT Scanners and Components

We design and manufacture a variety of manual and automated scanners. Scanners, coupled with a Pocket UT® System or a conventional, portable PC-based system, such as our MicroSonic (with notebook PC), provide full C-Scan (with B-Scan) data acquisition.





UT Boards

We design and fabricate ultrasonic (pulser/receiver and analog to digital converter) and motion control boards. These ultrasonic boards are used for the majority of our ultrasonic inspection system applications and available for OEM applications.

Non-Contact Inspection

We have successfully demonstrated the use of Non-Contact Ultrasonic Testing (NCUT) for a variety of applications. NCUT is available for system upgrades in the field and can also be adapted to new systems.

Ultrasonic (UT), Non-Contact & Line Scan Thermography

Our Ultrasonic Group designs *AND* manufactures all the major components of our systems in-house, allowing us to have total control over specifications, pricing, system performance and customer satisfaction. We also support large system integration.

We offer a full range of Ultrasonic products and inspection systems to diverse testing markets.



Precision UT Systems

We offer the most advanced line of ultrasonic scanners with mechanical scanning precision at high speeds and linear motor technology. This enables the use of higher frequency and ultrasonic data acquisition equipment for those applications that require testing in the range of 1 - 150 MHz.





UT Immersion Systems

We provide a wide range of immersion multi-axes systems from mini-lab scanners to large industrial hardened immersion tanks, including turntable and bar rotator fixturing. These systems meet the industry requirements, inspecting a broad range of materials from metallic to composite structures.





Line Scan Thermography

Line Scanning Thermography (LST)TM is a dynamic thermography technique used for detecting regional alterations in the thermal properties of materials inspected. This makes it possible to find defects like laminate delaminations, impact damage and inclusions hidden inside structural components. Using LSTTM in boiler tubes has been effective in detecting thinning in carbon steel and thick layers in advanced composites.



Operating Software-AEwin

AEwin is real-time operating software used with our Acoustic Emission systems. The software has advanced graphing, location, waveform processing, remote monitoring, filtering, data export capabilities and easily interfaces with LabView, Word and Excel. This software is based on more than 30 years of AE software experience and incorporates features from world renowned experts, giving AEwin the most comprehensive functions and features from small and simple applications to complex research laboratory needs.



Loose Parts Monitoring Software

Loose Part and Valve Flow monitoring software is designed to meet the strict requirements of the nuclear power industry. The LPM system employs seven layers of alarm discrimination and decision tree logic to identify metal-to-metal impact while minimizing false alarms to the control room. The VFMS identifies leak and flow conditions in critical valves throughout the nuclear reactor cooling system. The self-monitoring design alerts engineering of system maintenance needs for software and hardware, in the control room and within containment.



Advanced Analysis Software-NOESIS

NOESIS is a post processing, neural network and statistical analysis program. The systems extract over 23 different features of the AE signal such as amplitude, duration, energy, frequency centroid, partial powers and reverberation frequency. NOESIS is the ideal analysis program to find a solution when a multivariate classifier is needed. NOESIS successfully solved granulation end point prediction of pharmaceutical products and crack detection of high noise areas in roller coasters, inflight helicopter gear boxes and gas turbine stator cracking.

Application Based Software



We provide a comprehensive portfolio of standard NDT software, such as AE and UT acquisition and analysis software and application-specific customized software products. Our software product line covers a broad range of testing and analysis methods, including neural networks, pattern recognition, wavelet analysis and moment sensor analysis.

Providing software solutions for our clients.



Automated UT and Imaging Analysis Software (UTwin[™] and UTIA[™])

UTwin[™] is a 32-bit, true Windows[™] data acquisition, imaging and analysis software package, including full motion control and data acquisition programming for immersion and gantry ultrasonic systems.

UTwin is packed with features, such as real-time A/B/C-Scan display capability and powerful post processing modes like RF storage, pan, zoom, size and characterization of indications with mathematical statistic and clustering modules.

UTwin[™] supports up to 8 Ultrasonic channels from multiple NDTA AD-1210-IPR PCI cards, NDTA 4/8 channel multiplexers and many other external pulser receivers, while displaying multiple gate outputs on individual C-Scan pages, mix zoomed plots and customized 3D and 4D views. It's all built in! Do your needs call for a back wall follower?

How about Phase gate detection? Use your imagination and let UTwin[™] do the work! Mix any combination of C-Scans, B-Scans, A-Scans

and numeric plots, even enhanced 3D views! Just click, add and size. UTwin also features report generation and supports data exporting to many popular formats.





AE Wireless Technology

We have significant experience in applying wireless AE to Crack and Leak detection, as well as process monitoring, impact detection and the analysis of composite materials in concrete and metal bridge structures.

For requirements of difficult and remote access measurements, we have a wide range of battery powered wireless units. These are used for remote monitoring of multiple AE channels and parametric information in applications on bridges, pipelines, aircraft and valves.



On-line Asset Integrity Monitoring

The Sensor Highway System[™] is an AE/Vibration Monitoring System that provides plant and infrastructure personnel the ability to detect and track defect growth in materials and structures at an early stage. Designed for unattended and remote use for both asset integrity and condition monitoring applications, the system supports up to 16 high speed and 16 parametric input channels expandable to over 100 and is designed for operating in extreme weather and rugged factory conditions. The key feature of the system is its highly flexible sensor fusion interface for input and processing using a variety of sensors such as AE, ICP Accelerometers and sensors



with current voltage outputs through the use of standard industrial, DIN Rail Mounted Signal Conditioning Modules, with options for Proximity Probes, Tachometers, Pressure Transducers, Load Cells, Thermocouples, Environmental Sensors, Strain Gages, etc. It has several communication interfaces for data communication and remote control including wireless Ethernet 10/100, telephone modem, RS-232/485, USB host and device, 4 – 20 ma and digital I/O, and relay outputs for alarm and control purposes.

This system is ideal for situations where a customer requires remote analysis and desires Internet access for asset status, activity, trend monitoring and data visualization by MISTRAS.

Wireless & Remote 24/7 Unattended Monitoring Applications

Acoustic emission has been proven to be a highly effective method of on-line asset management.

Our line of monitoring systems are designed for unattended and remote assessment of critical materials, structures, machine components and processes.

Remote Monitoring Solutions for Static and Rotating Assets.



Asset Condition Monitoring System for Rotating Machinery

The ACMS (Asset Condition Monitoring System) is an online, real-time condition monitoring system that incorporates the industries best of breed features and functions. This includes the most unique feature, a single sensor that integrates conventional vibration with acoustic emission sensor technology. This combination allows for early detection of the onset of component wear and damage.

ACM Features:

- Vibration +AE technology: Early wear, fault detection & fault isolation.
- Dual Function Sensor: True accelerometer and AE sensor, recording low frequencies (less than 20 kHz) and high frequencies (greater than 200 kHz) simultaneously in one sensor body.
- All signal processing, e.g. FFT, feature extraction, and alarm determination, is performed within the ACM module requiring only a limited data set to be moved across network connections.
- Local direct laptop connection and display capability through the ACM module.
- Sensor Data Fusion: Integrates and correlates analog & digital signals (Parametrics).
- Web based system access with configurable Windows© display and navigation.
- Local & remote operator and analysis display access.
- For detecting dynamic loading, electrical faults, rotor imbalance, bearing and shaft surface defects, lubrication and mechanical wear.





Vibration Sensing Products

We manufacture innovative and patented solutions for the predictive maintenance community with applications in the most demanding of environments for industrial, military and scientific applications.

Holding the patent in ISO shielding for high noise rejection of accelerometers, we are a world leader in supplying a full line of high sensitivity, accelerometers for rotating and industrial use, seismic and structural measurements.





General Purpose Instrument Monitoring

We offer a complete line of Industrial Monitors which display displacement, velocity and acceleration units, as well as temperature models. Systems feature 4-20 mA output, (2) relays for warning or shutdown protection, sensor analog output and powering standard ICP accelerometers. Options include high/low pass filtering, 10/100/500 mV/g input and Peak/RMS mode. The units can also be integrated to DCS, PLC or SCADA systems via the 4-20 mA output.

Industry standard small size and low cost assure these monitors will fit a variety of applications.

Vibration Products & Solutions

We engineer and manufacture vibration monitoring systems and vibration condition monitoring sensors for the predictive maintenance community with every product designed, manufactured and calibrated in-house.

Research & Development of New NDT Technologies & Applications.

Research Contracts & Applications

Driven by the need to support our corporate services and customer requirements in engineering and applications, the MISTRAS, Research, Contracts & Application (RC&A) group was formed in 1992. This group has now grown to become respected by our customers as an important part of the MISTRAS team.

The RC&A group employs a talented group of experts in the field of NDT technology. The accomplishments in RC&A have led to many innovations in the field of Acoustic Emission, Ultrasonic, Eddy Current, Thermography and Resistivity science.

To help with technology transfer, the RC&A group is capable of performing basic contract research and engineering applications. This group also coordinates all PAC research worldwide and works with universities and industries on various contracts.







Over the years, we have been continuously improving our core technologies as part of an effort to offer the best field solutions to our customers. This effort includes a wide variety of industries from food to aerospace and defense to biomedics.

RC&A has developed specialized NDE techniques and systems through projects with many of our commercial customers and the government in a wide variety of industries and applications.

RC&A also offers comprehensive training and applications in acoustic emission, advanced ultrasonics, thermography and advanced NDT systems and software.



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