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CTRL Advances Technology Capabilities with the New Resonance-2 Ultrasonic Sensor

CTRL Systems, Inc. (Westminster, Maryland) – CTRL Systems, a high-tech firm specializing in ultrasonic, non-destructive, condition-based monitoring sensors and software, has announced the demonstration of a new ultrasonic device, **Resonance-2 (R-2)**, and of methods to do instantaneous tests in mechanical, electrical, hydraulic, pneumatic, and vacuum systems.

Originally designed to detect and locate internal leaks in aircraft hydraulic systems, the R-2 can also be used to:

- 1) Assess the condition of
 - threaded and non-threaded connections in mechanical assemblies (e.g., bolts, rivets and, some welds)
 - engines, motors, gears, ball bearing and valves
- 2) To detect:
 - leakage, turbulence in hydraulic and pneumatic systems
 - corona discharges in high voltage electrical systems
 - cavitations in hydraulic systems

The new sensor is one of the second-to-none tools developed by CTRL over the last ten years to perform tests and measurements by utilizing ultrasound's unique properties. Phenomena such as friction, shocks, turbulence, and electrical discharges are usually accompanied by ultrasound emissions, whose parameters are correlated with the ones of the original phenomena. Ultrasound carries information about the condition of components to the surface of the equipment. "Thus, by measuring and analyzing ultrasound parameters on the surface one can determine the internal condition of the unit under testing and, in many cases, predict its future," says Dr. V. Herman, CTRL's Vice President for R&D.

Condition monitoring by ultrasound methods allows the detection of equipment deterioration earlier than with well-known methods such as temperature and vibrations monitoring. Variations of ultrasound parameters will be detected before these deteriorations will cause changes in temperature, or generate vibrations.

Thanks to its sustained commitment to R&D, CTRL has developed a new generation of ultrasound tools, which combine unequalled signal-to-noise ratio, sensitivity, selectivity and dynamic range. R-2 is a portable receiver-measurer of ultrasonic vibrations. It can be used for a broad variety of tasks. This new sensor performs high-sensitivity resonance reception and measurement of ultrasonic vibrations on the hard surface of the area in contact with its probe. It can operate at two different ultrasonic frequency bands. The prototype sensitivity at resonance frequency corresponds to the amplitude of the monitored surface vibrational displacement of approximately 4×10^{-15} meters (1.6×10^{-13} inches). The device adjusts itself to the level of the input signal within a dynamic range of 100 dB. An embedded self-control system can perform an exhaustive checking of the instrument within five seconds. From a practical standpoint, the 3 kg prototype is able to detect and pinpoint subtle internal leaks in hydraulic systems of a large commercial airplane in the noisy environment of an airport. The search takes less than 20 minutes.

“Several millions dollars will have been invested since inception to bring this new capability to the market,” says Bob Roche, President of CTRL Systems. He indicates that this early announcement of the prototype is prompted by its exceptional capabilities and the urgent need in several industries. This portable, non-invasive device is the continuation of CTRL’s product line of ultrasonic sensors and instruments. “We feel that we are just beginning to understand the full range of capabilities of our new product named **Resonance-2**,” stated Mr. Roche.

Other products developed by the company include the **CTRL UL101***, CTRL’s first and current entry-level ultrasonic device; and **DACTRL**, a deviation analysis software, which allows the automation of monitoring activities by comparing the condition of components to their self-generated base lines. All CTRL’s products are linkable to **CTRL Series CMMS**, a modular maintenance management application.

CTRL Systems, Inc. is a leading developer and manufacturer of non-destructive, predictive/preventive maintenance technology including ultrasonic inspection devices and maintenance management software. The company provides cost-saving solutions to engineering, operations, safety, quality control, and maintenance departments in several industries - including aerospace, aviation, health, petrochemical, pulp and paper, railroad, automotive, manufacturing, and the military. CTRL' growing reputation among these industries is built on its commitment to quality, and the company's philosophy of developing long-term relationships with its customers in order to better meet their specific needs. CTRL Systems stands firmly dedicated to the advancement of new technologies that promote the effectiveness of reliability and maintenance programs.

CTRL Systems has recently moved to larger facilities in Westminster to accommodate the company growth. For inquiries, please visit www.ctrlsys.com.

* The CTRL UL101 was previously marketed as the ULTRAPHONIC 101.