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## **MTS SENSORS' MAGNETOSTRICTIVE TECHNOLOGY REPLACES LINEAR ENCODERS IN DYNAMIC CLOSED-LOOP CONTROL**

CARY, NC (January 11, 2011) - MTS Systems' Sensors Division's magnetostriuctive sensors now provide the performance level that make them preferable alternatives to linear encoders in certain applications. The sensors can be utilized as encoders because they offer the performance and reliability needed for dynamic closed-loop control. They provide continuous, precise position feedback that permits velocity and position-controlled movements at very high or very low speeds.

"Magnetostriction offers several benefits over other technologies to provide reliable and accurate positioning," said Matt Hankinson, marketing manager, MTS Sensors. "One of the key benefits it offers over incremental linear encoders is inherent absolute positioning. If a linear encoder drops below a minimum speed, it will create a cogging effect that forces the amplifier to speed up until the next signal is received. The result is an uncontrolled jerky movement not acceptable in most of the low-speed applications."

In addition, according to Hankinson, magnetostriuctive position sensors do not have a maximum or minimum speed limitation because they are absolute position devices; they continue sampling absolute position at a fixed rate and resolution regardless of the application velocity.

Another benefit of absolute position sensors is that they eliminate the need for moving to a reference mark or home position after a power reset. At any point in time, the absolute position sensor can report where it is without requiring a movement. "Many applications are now moving beyond incremental encoders and are advancing to absolute position feedback for improved safety and productivity," said Hankinson.

"Performance was also previously a factor in some cases," he continued. "Optical linear encoders have a range of performance that at the upper end could achieve resolutions and accuracy that magnetostriuctive sensors could not meet in the past. However, advancements in magnetostriuctive technology over the years

have now increased the overlap in performance so they now fit into applications that could previously only use linear encoders.”

Magnetostrictive sensors provide precise, dynamic measurement of absolute position and velocities and are capable of measuring signals in the sub-millisecond range. They can reach sub-micrometer resolutions which permits displacements at very low speeds of only 0.5 mm/s; measurement cycle times down to 100 microseconds to track fast motion; a linearity of  $<\pm 0.01\%$  and typical repeatability of 2.5 microns. Real-time linearity correction is available to get measurement accuracy down to 20 micrometers or better.

Another advantage of magnetostrictive technology is that it is not sensitive to contamination in harsh environments. An optical encoder's reading head, a piece of glass and a laser that's counting the marks, can be contaminated by dust or oil, causing loss of the optical signal which means the reader is unable to count the marks.

The magnetostrictive sensor's parts are enclosed within the sensor, and the magnet provides non-wear technology that ensures robustness of the sensor for the life of the equipment. Also, whereas magnetostrictive sensors have historically been used inside hydraulic cylinders in harsh environments and encoders were externally mounted on machine tools, magnetostrictive sensors are now available with many options for mounting on machine tools and offer many interfaces, such as an absolute SSI interface.

“There are still applications that are best suited for linear encoders because of specific requirements, but today's magnetostrictive technology is increasingly meeting the needs of a wide range of applications and provides significant productivity and cost of ownership benefits,” said Hankinson.

For more information about Temposonics linear-position sensors and liquid-level measurement, please contact: MTS Systems Corp., Sensors Division, 3001 Sheldon Drive, Cary, NC 27513. Phone: +1-919-677-0100, E-mail: [sensorsinfo@mts.com](mailto:sensorsinfo@mts.com) or visit <http://www.mtssensors.com>.

MTS Sensors, a division of MTS Systems Corp., is the global leader in the development and production of magnetostrictive linear-position and liquid-level sensors. MTS' Sensors Division is continually developing new ways to apply Temposonics® magnetostrictive sensing technology to solve critical applications in a variety of markets worldwide. With facilities in the U.S., Germany, Japan and China, MTS Sensors Division is an ISO 9001 certified supplier committed to providing our customers with innovative sensing products that deliver reliable, cost-effective sensing solutions.