Position Measurement & Control - December 2002 (S050I)

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APPLICATION FOCUS

Flexible Displacement Sensors Monitor Flexible F-18 Wings

Modified F-18 Active Aeroelastic Wing Research Begins

NASA, the US Air Force, and Boeing are using Series 160 displacement sensors to monitor the motion of the F-18 Active Aeroelastic Wing (AAW) during ground and flight tests. The flexible nature of the Series 160 units make them ideal for the flexing wing research program.

The AAW program seeks to determine the advantages of twisting flexible wings for primary maneuvering roll control at transonic and supersonic speeds, with traditional control surfaces such as ailerons and leading-edge flaps used to induce the twist. The program intends to develop data and structural modeling techniques and tools to help design lighter, more flexible high aspect-ratio wings for future high-performance aircraft, which could translate to more economical operation or greater payload capability.

The F-18 Active Aeroelastic Wing will be monitored with Series 160 displacement sensors.

For more information on NASA's Active Aeroelastic Wing research, visit http://www.dfrc.nasa.gov/PAO/PressReleases/2002/02-57.html.

Ohio State Formula SAE Team Has Measured Success

Series 150 Displacement Transducers Help Improve Vehicle Dynamics

Editor's Note: The Ohio State Formula SAE team took advantage of our Educational Transducer Program. Below is a letter summarizing their experience with SpaceAge Control position transducers.

OHIO STATE

October 18, 2002

The Ohio State University Formula SAE Race Team thanks SpaceAge Control for your donation of string pots that are used for shock displacement measurement. We used the string pots effectively this year to record data from all four shocks simultaneously during real event maneuvers throughout the testing months.

In the past, we used large LVDTs that required complicated mounting and a whopping 30 V input power. The size and weight of the additional batteries required for power disrupted the balance of our small vehicle and interfered with the driver's consistency. SpaceAge Control's string pots were easy to mount on all four shocks because of their small size, low weight and low voltage requirement.

Testing our vehicle with your products went quickly and efficiently. Problems arising could be diagnosed easily and the shock tuning could quickly meet our design requirements. As a result, our skidpad times dropped 0.4 seconds moving us from 20th place last year to our 3rd place finish this year. The vehicle's handling was more predictable and we were able to fix a wheel lift problem.

Because of their small size, easy mounting, and low voltage requirement, we are looking to use them in additional applications this fall and next year in testing. Different measurement applications include chassis flex, wheel travel, and shift linkage travel. With your string pots, will be able to learn exactly what our chassis and suspension does while it's pushed to its limits without driver distraction. We hope to continue our relationship in the future. Thank you.

Respectfully,

Craig Derian
Captain/Suspension Leader
Ohio State Formula SAE

Left: Series 150 displacement units measure shock travel.
Right: The Ohio State Formula SAE race car as viewed by the racetrack.

APPLICATION CORNER

The Application Corner answers your questions about using position transducers in specific applications. If you have an application question you would like answered, please contact us by phone, fax, e-mail, or Web form.

Selecting the Optimum Displacement Sensor

Q. How can I determine if your position transducers are appropriate for my application?

A. Take one or more of these actions:

- Read the Selecting Position Transducers article to get familiar with displacement measurement technologies.
- Study the String Potentiometers and String Encoders Engineering Guide to understand what benefits cable-type position transducers offer.
- Contact an Application Engineer to discuss your application.
- Try a product at no-risk using the Evaluation Transducer Program.

B Circuit (Bridge Circuit)

Q. We need to connect your position transducer to a strain gage data acquisition system. Do you provide a full bridge output from your position transducers?

A. The new 300866 signal conditioner provides easy, compact, rugged bridge circuit signal conditioning. This signal conditioner gives full adjustment of zero and span, easy-connection screw terminals, and affordable pricing. For complete technical details, view the 300866 drawing (pdf format).

Application-Specific Designs

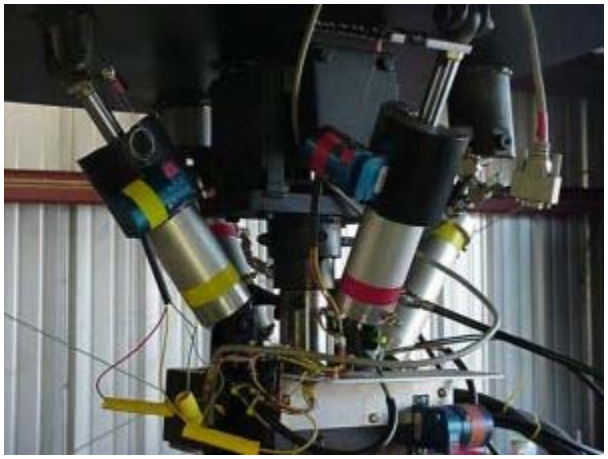
Q. Your cable-type sensor is perfect for our application. However, we have some special requirements such as radiation immunity and submersibility. Do you have products meeting these types of requirements?

A. More than likely, we can either address your requirements or refer you to an appropriate sensing technology. You can give us your requirements by completing our Custom Solutions form or by calling us at 661-273-3000 Ext. 500.

IN ACTION

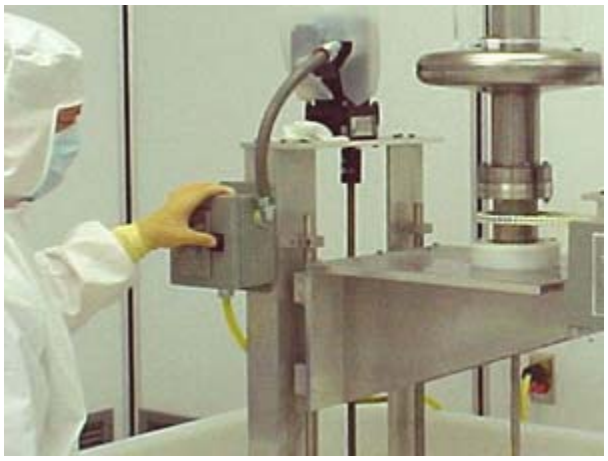
Every month we see numerous fascinating applications of our position transducers. Here are a few recent ones:

Helicopter Simulator Feedback Custom-designed SpaceAge Control position transducers now give feedback to helicopter simulators worldwide. Replacing a low-reliability prior solution, these position transducer install in seconds and do not require perfect alignment with the simulator actuators.



Flexible installation and small size allow string pots to go where other sensors cannot go on helicopter simulators.

Cleanroom Clean Series 160 position transducers are Class 100 cleanroom compatible and are used in a range of critical manufacturing processes for data collection and process control.



Clean rooms often require non-outgassing sensors.

Fire and Forget, 3-2-1 Liftoff Rocket and missile actuation and control systems rely on a range of SpaceAge Control position transducers to give precise, reliable sensing in high vibration, high acceleration environments. On November 20, 2002, the first Delta IV rocket lifted off from Cape Canaveral, Florida USA using SpaceAge Control position transducer for feedback to the actuation control system,

First Delta IV rocket launches on November 20, 2002 with actuation control inputs from SpaceAge Control displacement sensors.

NEWS YOU CAN USE

AS9000 Compliance Verified

SpaceAge Control's ISO 9001-compliant quality system is now AS9000 compliant also. Based on a recent intensive 2-day customer audit, SpaceAge Control's quality system was deemed to meet the requirements of AS9000.

What is AS9000? AS9000, Aerospace Basic Quality System Standard, is the aerospace version of ISO 9000, was hammered out by a consortium of aerospace prime contractors. It is a streamlining of current aerospace quality standards. The document is garnering support from diverse industry groups including prime contractors, the Federal Aviation Administration (FAA), and the Aerospace Industries Association (AIA).

The document was developed by a committee formed jointly by the AIA and the American Society for Quality Control (ASQC). Companies represented on the committee included AlliedSignal, Allison Engine, Boeing, General Electric Aircraft Engines, Lockheed-Martin, McDonnell Douglas, Northrop Grumman, Pratt & Whitney, Rockwell-Collins, Sikorsky Aircraft, and Sundstrand.

The aerospace industry has long lacked uniformity. There are a multiplicity of requirements imposed on an aerospace supplier today. From the Department of Defense (DOD) through the FAA, to each prime contractor and subcontractor, the unique requirements and interpretations of standards and specifications have created a huge burden on the supply base with little value-added. Standardizing the quality processes provides substantial quality improvement to the industry.

AS9000 takes ISO 9000 verbatim and adds 27 aerospace-specific clauses and 8 notes to ISO 9000. Why add to ISO 9000? Prime contractor quality assurance does not believe that ISO 9000 alone is sufficient to define quality system requirements for the aerospace industry. The FAA finds that AS9000 alone is not adequate to meet existing regulatory requirements and expectations.

For more information on AS9000, visit AS9000: A Standardized Definition of Aerospace Quality.

Poll Update

Our current poll question is "What is your primary responsibility?". To vote, go to the upper left-hand column of any page on our Web site (including this page).

You can also view the results of the last poll ("What type of electrical termination do you prefer?").

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URL: www.spaceagecontrol.com/pmc1202.htm?print_page=y

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