TRANSDUCER PLAYS KEY ROLE IN NEW RIG DESIGNED TO TEST AEROSPACE COMPONENTS

A TorqSense transducer from Sensor Technology of Banbury is playing a key role in Automated Technologies' new aerospace componentry dynamometer test rig.

As the rig needed to be capable of 3,000-hour continuous testing (day and night for over four months), chief engineer Chris Baxter knew that not only would it have to be very robust, but that simplicity would improve the overall reliability.

So, a motor drives the test piece against a load in a closed loop control system and the TorqSense provides feedback by measuring its performance in terms of torque and speed. Variations in the performance data over time indicate the level of wear and tear the component is experiencing, and from this safe working lifetime profiles can be developed. The data is logged to a database to allow trending to be mapped; and a web based real-time display allows live parameter viewing remotely.

TorqSense transducers comprise two thin metal electrodes, in the form of interlocking 'fingers', on a piezoelectric substrate such as quartz. When an RF signal of the correct frequency is applied to the transducer, surface acoustic waves are set up and the transducer behaves as a resonant circuit. If the substrate is deformed, the resonant frequency changes – so, when the transducer is attached to a drive shaft, the deformation of the substrate and hence the change in resonant frequency will be related to the torque applied to the shaft.

Since the transducers operate at radio frequencies, it is easy to couple signals to them wirelessly. Hence, the TorqSense sensors incorporating the SAW transducer technology can be used on rotating shafts, and can provide data continuously.

Thanks to simple wireless operation, the test runs can be set up quickly and easily and, in long-term tests, a radio frequency link is likely to prove more reliable than a slip ring, the company explains.

Given the long duration of the test regimes, Baxter was concerned that the dynamometer would end up consuming a large amount of electricity. He was, however, able to mitigate this to a large degree by using a generator as the driven load. The power thus created could be fed back to the motor in a closed loop configuration, reducing the motor's power draw from the mains.

An Invertek variable speed drive is used to alter the speed of the motor, and thereby the operating conditions of the component. Speed profiles can be used to emulate the cyclic nature of use experienced during multiple flights, or to subject the components to extreme testing to determine their failure mode characteristics.

Sensor Technology
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IP68 RATED DISPLACEMENT SENSORS

Now available from TTI are Vishay's ultra-thin UFPMA/UFPMC series displacement sensors. These, the company explains, are suitable for use in defence, aerospace and space applications in Europe.

The components are flexible potentiometer membranes and are said to represent a new generation of linear or angular position measurement. These benefit from a very high integration capacity for applications such as industrial actuators.

Being highly durable and rated to IP68, the sensors are suitable for use in harsh environments. Of additional benefit, they offer good repeatability of the signal and simplify the design of some applications requiring protection from dust and water.

Customised versions with specific electrical and mechanical features are available upon request.

TTI
www.ttieurope.com

STREAMING MILITARY DATA

New from Avionics Interface Technologies (AIT) is eDAQ-1553, a compact, simple-to-use network appliance for streaming MIL-STD1553 bus data over Ethernet local area networks (LANs).

According to the company, there is no complicated setup – just apply power, attach the 1553 and Ethernet connections, configure the UDP address, and the eDAQ-1553 runs by itself. Since the output Ethernet stream conforms to the industry standard IRIG 106 Chapter 10 format, any Chapter 10 analyser software that can monitor and display 1553 data can be used.

Features of the device include the ability to monitor 100% MIL-STD-1553 databus traffic from two channels simultaneously. The solution handles 100% bus load on two MIL-STD-1553 channels and converts it into two IRIG 106 Chapter 10 streams, consuming 3Mbps to 4.6Mbps combined bandwidth on the LAN. It is also compatible with any IRIG 106 Chapter 10 monitoring software. The eDAQ-1553 generates standard streams, so the output can be used by any third party Chapter 10 analyser software.

Avionics Interface Technologies **www.aviftech.com**

INFRARED DETECTOR ENTERS PRODUCTION

Sofradir has announced that the Daphnis-HD MW, a 10µm 16:9 format infrared detector, is to enter production.

"High-end optronic equipment is required to carry out increasingly more functions in constrained volumes. From this standpoint, the reduction in pixel pitch size of Daphnis FPA enables improved performance across all dimensions of an ISTAR mission: information, surveillance, target acquisition and reconnaissance, without compromising the compactness of the optronic product. This is another strong market request," said Thierry Dupoux, R&T director at Safran-Sagem.

Daphnis has a 4.8µm spectral cut off wavelength, which allows unsurpassed signal over noise ratio, even in a low temperature scenario, the company explains. With its improved recognition range, DAPHNIS is suitable for applications such as gimbals, high-end vehicle sights, and infrared search and track systems. Moreover, the ability to obtain an HD image format from a detector whose size fits previous platform generations is a real benefit as it facilitates customer system upgrades.

Key features of Daphnis include: higher resolution, 1280 x 720 pixels; it achieves up to 55% DRI range improvement on the preceding generation of IR detectors; it has a wider field of view; and it is fully compatible with HD screen formats and visible or SWIR camera channels.

Sofradir
www.sofradir.com