





one channel for another input. When using 7 channels his data acquisition time is cut in half. "That's a tremendous advantage," says Faby. "A multi-channel system for this particular kind of field application isn't necessary because I don't acquire all the signals simultaneously." Basically, he excites one point and then runs the accelerometers over the geometry of the part.

The frequency range covered is 0 to 5 kHz, which pretty much handles most of the testing. Says Faby, "Sometimes the engineers want data at 10 kHz, and I ask why. Not much happens at 10 kHz on a mechanical structure, and I am reluctant to take unnecessary data." At the other end of the spectrum, no one really measures 5 Hz or less. And if they did they would probably not be satisfied with the resolution. Faby says he would have to do something differently, but he is rarely concerned about anything in that range.

ZonicBooks are rugged. "We try to be careful with them," says Faby, "but sometimes we work in the middle of a generator stator frame where it is quite dark. We try to put our ZonicBook in a safe place, and just when we think we have, it slips to the level below. So I can tell you that it does withstand some pretty good g forces."

The data Faby collects is more than satisfactory, and he has had no hardware problems. The only thing seen are the classical signal acquisition problems that everyone deals with such as cable routing, connector integrity, electrical noise tables, and so forth. Also, he doesn't usually have a problem with electromagnetic fields interfering with the accelerometers, because most often, the equipment is not running when acquiring data. However, when he does an operating deflection shape, the machine would be running, and the only worry is whether 60 or 120-Hz signals are being picked up. If they are, he shields the sensors, and that generally takes care of the problem. Or he might add a ground wire from the box itself to some external ground. That usually takes care of the noise, but interference is certainly something the engineers always look at very closely.

## Conclusion

Turbine and combustion generator manufacturers test component parts such as rotating blades, stationary blades, or an entire segment of a generator frame in the lab. At Siemens Westinghouse, these measurements are collected by an IOtech ZonicBook data acquisition system. It helps engineers verify their design calculations and lets them fine tune their finite element models so they can run even

more accurate calculations on the following design job. Part of the testing includes rapping the component with a hammer and recording the vibrations for analyzing vibration modes, frequency response, and coherence. This allows them to determine the natural frequencies, modal shapes, and numerous other signal components needed to ensure a safe, robust MW turbine generator.

## ZonicBook

The ZonicBook™ allows you to record, playback, analyze, and archive vibration or acoustic data in both time and frequency domain. ZonicBook provides real-time display of up to 16 channels, including real-time FFT displays. Other PC-based vibration analyzers record only frequency-domain information, making it impossible to play back time-domain waveforms and perform post-acquisition analysis.

### Features

- Perform vibration measurements and real-time analysis with this portable, integrated hardware and software solution
- View real-time frequency-domain and/or time-domain data while streaming gapless data to your PC's memory and hard drive
- Replay acquired data for post-acquisition annotation, peak labeling, and easy generation of professional looking reports
- Export acquired data in a variety of report formats for further analysis and report generation
- Available in either 4-, 8-, or 16-channel configurations
- One 16-bit Sigma Delta A/D per channel provides low-noise, linear phase measurements
- 51.2 kHz max sampling per channel
- All input channels are sampled simultaneously for excellent phase matching
- Analysis frequency: 4- and 8-channel, DC to 20 kHz; 16-channel, DC to 10 kHz
- 92 dB stop-band filter per channel
- Inputs are isolated from ground and PC to eliminate ground loops
- Includes high-speed PC-Card (PCMCIA) interface to notebook or desktop PC's
- DBK70 vehicle bus option (J1850 VPW, J1850 PWM, J1939, ISO-9141, CAN) enables simultaneous measurement of vehicle bus parameters along with vibration measurements
- Powerable from AC line or 12 VDC for in-vehicle applications
- Optional battery module for portable applications
- Operates under Windows®



### Optional eZ-Analyst™ Software

- Provides real-time frequency- and time-domain analysis capability
- Easy-to-use graphical interface requires no programming skills
- View waveform data in real-time, in both time and frequency domain simultaneously, including strip chart and waterfall plots
- Wide selection of real-time analysis features, including FFT's, integration/differentiation, averaging, and much more
- Export facility supports a wide variety of data formats
- Report generation capability includes peak annotation, zooming, and copy/paste into other applications including Microsoft Excel

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