

# ADI's 50 MSPS per channel ADC gives National Instruments the capacity for high-end, real-time measurement



Precision applications such as experimental physics, nondestructive ultrasound testing, and medical imaging require data access that can span tens or hundreds of channels, requiring not only a system with high channel density but also the performance and flexibility to effectively process data in real time. Utilizing ADI's AD9252 analog-to-digital converters (ADCs), with 14-bit resolution and 16 simultaneous 50 MSPS channels, the National Instruments (NI) NI 5751 digitizer adapter module for its NI FlexRIO FPGA system enables real-time data acquisition and processing capability for self-contained complex research applications to large scale deployments. By utilizing the Analog Devices AD9252 octal ADC in one small-sized, low cost package, the NI 5171 delivers exceptional performance and density to each channel at a greatly reduced cost.



NI 5751

The NI design team's challenge was to develop an I/O module with an exceptional sampling rate and low power consumption at a very competitive cost. The design team selected the 9 mm × 9 mm AD9252 because of its small size and its 93.5 mW power-per-channel, which satisfied the NI FlexRIO hardware module's power consumption specifications of six watts total per module. Due to its small size and low power, two AD9252 ADCs were used, enabling the 16 channel simultaneous sampling goals to be achieved. With high resolution and a sampling rate of 50 MSPS per channel, the AD9252's energy efficiencies ensured low power consumption without impacting the NI 5171's system-level performance.

The NI FlexRIO FPGA chassis supports a range of interchangeable modules for a high performance I/O system design. The AD9252 complements the system's expansion flexibility with its built-in synchronization capability, enabling multiple channels to perform transparently as one device. To ensure low levels of distortion and noise, the NI 5171 uses the ADI ADA4932 high performance, low power differential ADC driver. The low offset and excellent dynamic performance of the ADA4932 make it well suited for data acquisition applications.

Whether it is a non-destructive testing application capturing a picture of life deep below the ocean's surface or scanning an airplane's wing for unseen cracks, these ADI products ensure that National Instruments NI 5171 digitizer adapter module has the performance and design flexibility to bring new, innovative solutions to its customers.

“We had very specific performance, power consumption, and cost goals for this design, and the AD9252 gave us what we need, but also the flexibility to support our specifications.”

**Kristi Hummel, Hardware Group Manager,  
National Instruments**