Multichannel D/A Converter Drives Productivity in Process Control I/O Systems in Industrial Applications

Analog Devices, Inc. today introduced a multichannel DAC (digital-to-analog converter) with innovative dynamic power control circuitry including ADI's leading dc-to-dc switching converters and diagnostic features. This new DAC can enable increased system productivity, while simultaneously lowering power use without affecting safety and reliability.

ADI's highly integrated AD5755 data converter is a complete, multichannel control IC (integrated circuit) that incorporates four precision 16-bit DACs with programmable voltage or 4 to 20 mA output drivers, along with dynamic power control. The dynamic power control feature works by continually sensing the load impedance and delivering the required power to the load while minimizing power loss in the rest of the system. This reduces self-heating and temperature elevation. The unparalleled combination of features and performance supports four times more channels than any other integrated converter, enabling up to four times more terminals at twice the performance in a single analog I/O module. The new converter also lowers power consumption by 80 percent and net thermal rise (silicon temperature minus ambient temperature) by 75 percent compared to other control driver technologies.

The 16-bit AD5755 offers a full channel spec with a maximum total unadjusted error of 0.05%, a relative accuracy of 0.003% max, and does not require system calibration, which shortens development time and reduces system maintenance costs. In addition, the single chip architecture combines multiple converters, power management, linear and other functions, increasing MTTF (mean time to failure) and improving reliability. Also included are various diagnostics for real-time fault analysis, including communication, connection, and interface alerts, which simplify the design task and boost operational up-time.

The device, which supports standard industrial voltage and current output ranges, can be used with standard HART (Highway Addressable Remote Transducer) protocol modems. Also integrated on-chip is a 5-ppm degree/C internal reference, user-accessible offset and gain registers and a 30 MHz SPI (serial peripheral interface) compatible interface. The device is specified over the extended industrial temperature range of -40 degreeC to +105 degreeC and is housed in a 9 mm x 9 mm LFCSP (lead-frame chip scale package.

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