

Demodulator Extends Range Of Telemetry Systems

This PCM/FM demodulator improves detection efficiency in airborne telemetry systems by 3 dB.

PCM/FM is the modulation scheme of choice in most airborne telemetry systems. In other applications, it is simply referred to as binary FM, or BFSK. To take advantage of the large installed base of systems, Nova Engineering (Cincinnati, OH) has developed the Hypermod FMD11 demodulator for improved detection efficiency. The demodulator, which supports data rates from 1 to 11 Mb/s, provides 3-dB

This approach takes advantage of the "memory" inherent in a PCM/FM waveform. Upon examining the wave-

better performance than the best previously available PCM/FM demodulators.

The new demodulator features a standard 70-MHz IF interface, an integral-bit synchronizer, and a real-time FM eye-pattern display on the front panel. Typically, demodulators of this type have the eye-pattern output in the back of the unit, which requires the connection of other equipment, such as an oscilloscope, for monitoring. The integral-bit synchronizer provides a synchronized clock signal at the demodulator's output ports, along with the demodulated data.

When using conventional methods, adding 3 dB to detection efficiency required either doubling the Tx power (resulting in a larger box and more heat to dissipate) or doubling the receive-antenna area (raising costs). In contrast and in a departure from traditional single-symbol techniques, the FMD11 uses a multiple-symbol detection algorithm for enhanced data recovery, analyzing the received signal across several symbols to recover the data.

form, for instance, approximately 80 percent of the energy is centered in one symbol, but it is also affected by the adjacent symbols. By considering five symbols, approximately 90 percent of the otherwise-ignored energy can be harvested to yield 3-dB better performance than a single-symbol approach.

The Hypermod FMD11 implements the multisymbol demodulation technique through an advanced FPGA architecture. The use of multiple Virtex 2000E FPGAs from Xilinx, Inc. (San Jose, CA) helps to improve performance for current systems, and to also provide enough headroom to support multiple demodulation schemes into the future.

The rack-mountable Hypermod FMD11 measures 19 × 16 × 3.5 in. (48.26 × 40.64 × 8.89 cm). P&A: \$24,500.00; 6 to 8 wks. Nova Engineering, Inc., 5 Circle Freeway Dr., Cincinnati, OH 45246-1201; (513) 642-3000, FAX: (513) 642-3300, e-mail: sales@nova-eng.com, Internet: www.nova-eng.com.

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