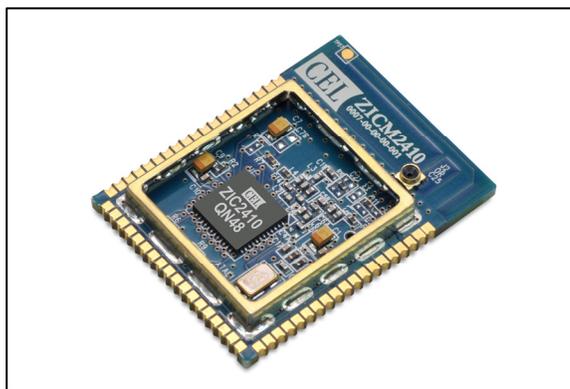# Fast ZigBee/802.15.4 Radio Offers Voice Capability

Several ZigBee and 802.15.4 transceiver modules are available for wireless sensor and mesh networks, but the MeshConnect ZICM2410P0 from California Eastern Laboratories (CEL) is unique. Designed for the usual cable replacement, wireless point-to-point, multipoint-to-point, and mesh sensor applications, it is additionally useful in HVAC monitoring and control, lighting, remote meter reading, security, irrigation, and other in-building applications. Yet further features open the door to other uses.

The ZICM2410P0 complies with the ZigBee and IEEE 802.15.4 standards. It operates in the 2.4-GHz industrial, scientific, and medical (ISM) band with 16 channels and has a typical data rate of 250 kbits/s using direct-sequence spreadspectrum (DSSS) and binary phase-shift keying (BPSK) modulation. Power output is +6 dBm when operated at 1.5 V, and the receive sensitivity is –97 dBm.

This combination provides a –103-dBm link budget, making reliable long-range communications possible. In open lineof- sight (LOS) conditions, a range up to 3000 ft is possible. Low power consumption is a given. Its sleep-mode current, which mainly determines battery life in ZigBee applications, is only 0.3 µA. The printed-circuit board (PCB) houses an F-type antenna, and an optional connector lets designers add an external antenna if greater range is needed.

The module also has some features that aren't available in other competitive devices. Using additional higher-level modulation methods, the ZICM2410P0 can be set to deliver 500 kbits/s or 1 Mbit/s in applications requiring more speed. Also, the module's full voice codec complies with a-law, µ-law, and ADPCM standards. This lets designers use the module for two-way radio walkie-talkie and intercom applications. With data compression and the higher data rates, designers can use the module for video security cameras as well.

Finally, designers can use the fully programmable module's on-chip 8051 microcontroller with 96 kbytes of flash and the software development system to customize it to their needs. The ZICM2410P0- KIT1-1 evaluation kit, which comes with two modules, a network analyzer, USB cables, AA batteries, ac adapter, and software with documentation is available. If you're looking for a fast and easy way to build a sensor network or other short-range wireless project, this module may be it. CEL also has a full line of ZigBee and 802.15.4 radios for just about any use.

"With its RF shield removed, the CEL MeshConnect module measures 1 by 1.25 in. Fully tested, it meets FCC, IC (Canada), and CE (Europe) Standards. Just add a sensor and/or an actuator, and it's ready to use".