

Energy-harvesting to power IEEE802.15.4, ZigBee and 6LoWPAN wireless sensor networks

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- New demonstration platform developed by Jennic with leading energy-harvesting partners
- Harvests energy from vibrations, thermal gradients, light and radio frequency waves
- Energy-harvesting for IEEE802.15.4 standards-based wireless sensor networks
- Replaces battery power with a sustainable, zero-maintenance energy source

Sheffield, UK, 16th July 2009: Jennic, a manufacturer of innovative 32-bit wireless microcontrollers and modules, announces a demonstration platform that successfully harvests thermal, solar, radio frequency (RF) and vibrational energy, to power wireless sensor networks based on the IEEE802.15.4 standard such as ZigBee PRO and 6LoWPAN.

The platform demonstrates how wireless sensor networks based on the IEEE802.15.4 standard can eliminate the potential maintenance overheads of conventional battery power by harvesting energy from sustainable sources.

Jennic has partnered with key technology vendors in the field of energy harvesting: Micropelt GmbH, a leader in thermogeneration, converting temperature gradients into electrical energy; Cymbet, an expert in energy storage and solar power conversion; AdaptivEnergy, for harvesting mechanical energy, such as impulse, shock, vibration and footfall, using piezo-based DC power supplies and Powercast, for RF energy harvesting.

By working closely with the chosen partners, Jennic has developed an ultra low power sensor solution based on the JN5139 and JN5148 wireless microcontrollers, that interfaces to each harvesting source to obtain the power needed to make periodic sensor measurements and transmission of the same over the wireless network to a central controller.

Jennic's wireless microcontrollers offer exceptionally low-current operation, and with advanced software based monitoring and control of the energy source, they are able to achieve the extreme efficiency demanded by systems powered by sustainable energy sources.

Jimi Simpson, Jennic Product Marketing, explained, "Harvesting energy from sustainable sources presents designers with the ultimate power challenge: the energy supplied is not necessarily continuous and is available at relatively low levels. This means that every element of the design, from the sensor to the microcontroller, must be considered and managed to achieve the highest levels of power efficiency."

The 32-bit RISC processor in Jennic's wireless microcontrollers provided the processing capability to implement a software-controlled charge-and-fire energy management process, in which the microcontroller periodically wakes to measure energy levels, and then measures and transmits data when sufficient energy is available.

"The JN5148 wireless microcontroller undoubtedly sets the benchmark for ultra-low power IEEE802.15.4 based wireless in energy harvesting; featuring sleep current levels of <math><1\mu\text{A}</math>, an active transmission

current of 15mA and a receive current of 18mA. This ultra-low current consumption enables the JN5148 to utilise the smallest of energy stores including super capacitors and rechargeable cells, to allow for the lowest cost BOM to be realised.”

The range of energy harvesting technologies demonstrated in the solution caters for the diverse spectrum of application scenarios found in wireless sensor networking; including applications in Energy and Environmental Management, Building Management, Process Control, Condition Monitoring, Logistics and Asset Tracking.

For further information, please contact Jennic at harvesting@jennic.com

About Jennic

Jennic is a fabless semiconductor company leading the wireless connectivity revolution by providing wireless microcontrollers for a broad range of applications in the energy, environment, asset tracking and consumer markets. The company's products include state-of-the-art low power wireless microcontrollers, modules, development platforms, protocol and application software, with a focus on IEEE802.15.4, ZigBee and 6LoWPAN standards. Headquartered in Sheffield, UK, Jennic provides first-class sales and support worldwide. For more information, visit www.jennic.com

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