

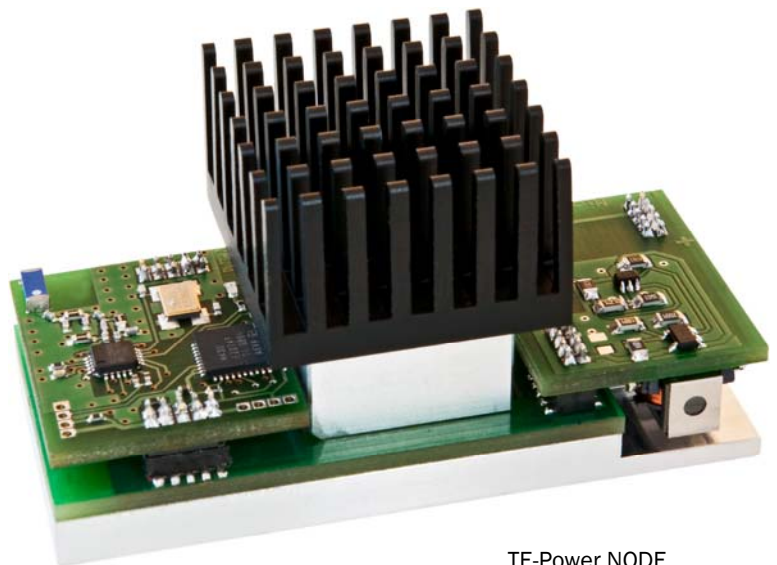
February 18, 2009

Micropelt Introduces World's First Thermoharvester-Driven Wireless Sensor Node Enables battery-free operation of sensor nodes

Micropelt GmbH, Freiburg, Germany-based specialist in thin film thermoelectrics, announces immediate commercial availability of the world's first thermo-powered wireless sensor system, the TE-Power NODE. Micropelt's built-in chip thermogenerator takes a few degrees of temperature differential and harvests that thermal energy to operate the wireless sensor node, enabling unlimited battery-free operation.

- Wireless sensor networks offer many advantages. Market growth, however, lags behind expectations as many potential users avoid the burden of having to maintain hundreds or thousands of batteries. Micropelt's TE-Power NODE fixes the issue. The TE-Power NODE evaluation kit transmits multiple channels of digital sensor data helping both users and integrators of thermoharvesters better understand many aspects of their implementation in terms of application scenarios and energy budgets.

The TE-Power NODE consists of a 60 by 27 mm footprint aluminum base plate that carries up to two Micropelt MPG-D751 thermogenerators, allowing the energy supply to be scaled for the amount needed by the designated application. An aluminum heat spreader is mounted on top of the thermogenerators and is stabilized and insulated by a PCB which also holds the receptacles for various plug-on modules. The heat spreader features threaded holes for accessing various heat sinks with minimal effort, allowing for detailed exploration of the device's thermal path and easy repair. To convert the variable incoming thermo-voltage into a battery-like constant voltage, the original TE-Power PLUS DC/DC converter was modified to supply a constant 2.4 volts and to charge a 100 microfarad (μF) capacitor to feed the duty cycle of the accompanying plugable wireless system.



TE-Power NODE

Micropelt's new evaluation kit uses widely accepted ultra-low-power technology from Texas Instruments (TI), supporting both IEEE 802.15.4 compliant and custom solutions. Dr. Joachim

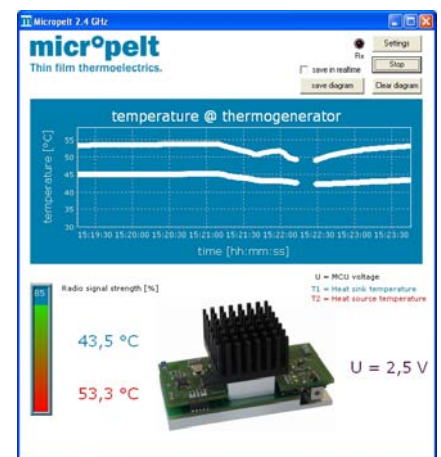
Nurnus, Micropelt's CTO explains the choice, "We wanted to ensure that the TE-Power NODE evaluation results are applicable to many existing solutions and can quickly be turned into real applications. Consequently, we selected Texas Instruments' MSP430/CC25xx technology for its wide market penetration as much as for its technical feature set and good support."

To operate the wireless sensor node, it must be attached to a suitable heat source. After a few seconds the TE-Power NODE begins transmitting information to a PC via TI's standard eZ430-RF2500 USB receiver module. Within as little as 2 milliseconds a minimized stack protocol transmits the temperature of the thermogenerator's hot and cold sides once every second along with the respective operating voltage. An additional I2C standard based digital sensor interface provides a channel for optional transmission of data such as vibration or pressure values. The information is displayed on the PC such that users can easily assess the quality and consistency of the thermal power supply.

"Micropelt's battery-free thermal energy harvesting technology can be used to power our ultra-low-power microcontrollers and RF transceivers, enabling endless possibilities in the wireless sensor market" says Volker Pruessler, EMEA marketing manager, Catalog MCU and Low-Power RF at Texas Instruments. "With increased interest for wireless sensor systems across many markets, Micropelt's solution offers a renewable source of power and freedom from traditional batteries."



TE-Power NODE with Texas Instruments eZ430-RF2500 USB



Software User Interface

Dr. Nurnus is satisfied with his team's results, "Our measurements prove that an effective 3.5°C across the thermogenerator can drive this application. This can even be achieved through harvesting body heat. The NODE's flexibility will help our customers better understand the thermal path and why it can actually take 10 or 20°C difference to make it run."

Burkhard Habbe, VP business development adds, "We wanted to prove to our customers that thermoharvesters right now represent a viable energy supply for many applications including most

IEEE 802.15.4 based systems. Even a few hundred microwatts supplied continuously can easily outperform a good set of batteries. Our new TE-Power NODE lets customers easily verify that batteries have better alternatives." As motivation for more potential users and system integrators to explore its technologies, Micropelt has lowered its prices for evaluation kits significantly. Quotes are still supplied based on clear application specifications. Mass production of devices is scheduled to start in 2010.

About Micropelt

Micropelt GmbH, a 2006 spin-off from the research cooperation between Infineon Technologies and Fraunhofer Institute IPM Freiburg, develops and markets the world's smallest and most effective thermoelectric elements for clean-tech power generation (energy harvesting) for sensing, cycling and cooling. Readily available standard products from the pilot-production plant at the company's headquarters in Freiburg, Germany are currently being evaluated by and incorporated into the products of more than 40 customers. A large scale production facility, fully financed and currently under construction in Halle, Sachsen-Anhalt, Germany is expected to raise capacity to some 10 million devices per year by mid 2010.

About Micropelt's Thermoelectric Elements

Micropelt's thermoelectric elements are based on a proprietary scalable MEMS (Micro Electro-Mechanical Systems) micro-structuring platform technology. Compared to conventional thermoelectric elements, Micropelt's unique and patented technology reduces component and feature sizes by orders of magnitude, yielding 10 times higher cooling or heating power densities. Economies of scale through volume production break the existing cost and price barriers of conventional thermoelectrics, enabling Micropelt's devices to scavenge free electric power from waste heat to replace or recharge batteries in low power wireless sensor networks.

#####

For more information contact Micropelt at +49 (0) 761 156 337 0, info@micropelt.com, or visit our website at www.micropelt.com.