Embedded Thermoharvesting Wireless Sensor from Micropelt and IMST Offers Life-long Self-sustaining Status Monitoring

Waste Heat Replaces Batteries, ZigBee-Compliant Platform Supports Multiple Applications

Freiburg/Kamp-Lintfort, Germany, February 27th, 2012 – TE-CORE/RF – a new, modular, self-sustaining wireless sensor kit is announced by Micropelt, German specialist of chip thermogenerators and thermal energy harvesting micro power sources, and IMST, German specialist in low power wireless solutions.

An embedded Micropelt thermogenerator which converts heat from a warm surface into electricity provides the system power. A difference of 10 °C (18 °F) or more between surface and air temperatures drives the ZigBee module iM222A, member of the family of WiMOD radio modules of IMST, to transmit data every 2 seconds. The pre-certified iM222A uses Texas Instrument's Z-Stack protocol.

The temperature difference across the thermogenerator and its resulting output voltage are determined by the TE-CORE/RF eval kit's internal sensors. Those measurements will be transmitted to a PC via the included iM222A USB transceiver stick. The updated GUI software TE-Power SCOPE records and visualizes both momentary and historical data. The software also allows for balancing a virtual system power consumption, based on configurable duty cycle settings, against currently measured harvested power.

TE-CORE /RF – thermoharvesting eval-platform with USB receiver and PC-Software

Depending on actual temperature difference and heatsink efficiencies 150 microwatts to over 10 milliwatts of harvesting power are available. A constant delta T of 25 °C (45 °F) generates an energy quantity comparable to 3 to 4 AA batteries. “Battery powered sensors usually have to operate several years with that energy budget,” explained Heinz Syrzisko, IMST’s product manager Wireless Solutions. “With Micropelt’s energy harvesting solution providing a 3 years budget every year, we can reduce latency, do more measurements, increase wireless range or increase data payload.” As a result the lifecycle cost of a wireless sensor is reduced, although its functionality is improved.

“Many customers have been hesitant to invest in developing a thermal path, an efficient power conditioning and a matching wireless configuration. These thresholds are now eliminated,” said Burkhard Habbe, VP business development at Micropelt. “The TE-CORE /RF is well suited to perform pilot studies and generate small series products with little engineering required to make the heat flow through an environmentally proof housing,” he continued.

Habbe refers to the so-called thermal path, which includes all parts of a thermoharvesting solution that conduct heat. Thermal energy must be funneled through the thermogenerator, ideally without heating up anything else. The heatsink, typically a part of the housing, preferably dissipates the heatflux to ambient air without getting hot itself.

Micropelt offers support to their customers particularly in all aspects of thermogenerator integration and thermal concerns. IMST supports customers in integration of wireless technologies, antenna optimization and certification services for complete systems.

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