

Wireless Sensor Networks Achieve Industry's Lowest Power Consumption



Linear Technology's Dust Networks product group introduces the SmartMesh LTC5800 (system-on-chip) and LTP5900 (module) families, the industry's lowest power IEEE 802.15.4E compliant wireless sensor networking products. SmartMesh ICs and modules enable tiny sensor "motes" to be designed with a battery life of over 10 years, while companion network manager components enable the development of highly robust and secure wireless sensor networks (WSN).

SmartMesh networks use a "triple-play" of wireless mesh technologies—time diversity, frequency diversity, and physical diversity—to assure reliability, resiliency, scalability, power source flexibility and ease-of-use. At the core of this technology is an intelligent mesh network with advanced algorithms and power saving technologies that enable powerful features unavailable from other WSN providers. These include deterministic power management and optimization, auto-forming and self-healing mesh technology, zero collision low power packet exchange and scalability to large, dense, deep networks.

Two communication standards are supported: the SmartMesh IP version is compliant with the 6LoWPAN standard, providing native IPv6 addressability to every node. The new SmartMesh WirelessHART IEC62591 compliant products double the battery life over the prior release.

The SmartMesh family consists of several products to simplify system development. The LTC5800 system-on-chip (SoC) includes robust sensor networking software in an easy-to-integrate 72-pin 10mm x 10mm QFN package. The LTC5800 integrates

Wireless Sensor Networks Achieve Industry's Lowest Power Consumption

Published on Wireless Design & Development (<http://www.wirelessdesignmag.com>)

all radio circuitry components, including an onboard power amplifier and an ARM Cortex M3 32-bit microprocessor, requiring only power, ground and an antenna for robust wireless connectivity. The LTP5901/LTP5902 mote modules provide an easy-to-integrate surface-mount printed circuit board (PCB) that has undergone FCC, CE and IC modular radio certifications. The LTP5901 module includes an onboard chip antenna, while the LTP5902 module includes an MMCX antenna connector.

Joy Weiss, President of Linear Technology's Dust Networks product group, stated, "Our primary goal is to enable our customers to confidently place sensors anywhere data needs to be gleaned. The advent of SmartMesh WirelessHART systems and the addition of IP-enabled wireless sensor networks reflect Linear Technology's continued commitment to that goal."

Bob Karschnia, Vice President, Wireless for Emerson Process Management, and business leader of its SmartWireless product line, stated, "Dust Networks is unique in its intense focus on simultaneously delivering ultralow power and extremely reliable wireless networks. We have over 1 billion hours of successful operation of Emerson's SmartWireless instruments in the field, utilizing Dust Networks' SmartMesh WirelessHART components. We are very excited about the promise of the LTC5800, providing twice the battery life and enabling new applications within the industrial process market."

Mark Housley, CEO of Vigilent, stated, "The data center environment is extremely harsh to RF, and our customers demand that our energy management and data center analytics systems are deployed with minimum disruption to the data center. Dust Networks-based wireless sensors help ensure that Vigilent technology will continue to deliver solutions for mission-critical facilities with no impact on data center operations."

SmartMesh WirelessHART was purpose-built to serve the extraordinary low power and reliability requirements of the industrial process market. These attributes serve the needs of many diverse applications, and SmartMesh IP maintains comparable performance while adhering to the 6LoWPAN standard.

Professor Steven Glaser, with University of California, Berkeley, is responsible for the ambitious SierraNet program (<http://systems.berkeley.edu/wsn/>), enabling measurement of temperature, humidity, snow depth, soil moisture, and solar radiation levels in remote environments using SmartMesh-enabled sensors. He stated, "Our goal is to provide accurate, remote environmental monitoring to track the status of California's water supply. With a SmartMesh IP IPv6 routing node able to run at under 50µA average power consumption, SmartMesh IP represents a new paradigm for sensor networking, combining the ease of web programming with the long life and reliability of Dust Networks' industrial products."

All SmartMesh networks are centrally managed, which provides comprehensive security and network management capabilities. The SmartMesh WirelessHART manager (LTP5903) can support up to 500 nodes per network, SmartMesh IP managers can support up to 100 nodes per network, and multiple instances of SmartMesh subnetworks can be deployed side-by-side to create very large

networks.

Summary of Features: LTC5800 & LTP5900 Family

- Time-Synchronized, Channel Hopping Networks that Deliver Ultralow Power & High Reliability in Harsh Environments
- Self-Forming, Self-Healing Mesh Networks
- Rx Current: 4.5 mA
- Tx Current @ 0 dBm : 5.4 mA
- Tx Current @ +8 dBm: 9.7 mA
- IEEE 802.15.4, 2.4 GHz (2400-2483.5 MHz), Direct Sequence Spread Spectrum
- AES-128-Bit Encryption
- Over-the-Air Software Update Capability Built-In
- Sub-millisecond Accurate Time Stamp Available at Every Node in the Network
- Full On-Chip RF Integration, Including Power Amplifier (PA), Balun & Antenna Matching Circuitry
- ARM Cortex M3 32-Bit processor
- 72-pin 10mm x 10mm QFN Package (LTC5800)
- 42 mm x 24 mm PCBA Module (LTP5901) with Onboard Chip Antenna
- 37.5 mm x 24 mm PCBA Module (LTP5902) with MMCX Antenna Connector
- LTP5903 WirelessHART Network Manager, 102.9mm x 55.6 mm PCBA Module with MMCX Antenna Connector. Requires 150 mA Average at 5V

For more information, visit www.linear.com [1].

October 10, 2012

Source URL (retrieved on 02/01/2015 - 12:09pm):

<http://www.wirelessdesignmag.com/product-releases/2012/10/wireless-sensor-networks-achieve-industrys-lowest-power-consumption>

Links:

[1] <http://www.linear.com>