

## **Wireless sensor networks achieve industry's lowest power consumption at less than 50µA per node**



Linear Technology's Dust

Networks product group introduces the SmartMesh [LTC5800](#) [1] (system-on-chip) and [LTP5900](#) [2] (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.

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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 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."

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/> [3]), 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.

Full details on all SmartMesh WirelessHART and SmartMesh IP products, including Mote-on-Chip, PCB mote modules and Network Managers can be found at [www.linear.com/products/wireless\\_sensor\\_networks](http://www.linear.com/products/wireless_sensor_networks) [4].

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[1] [http://r20.rs6.net/tn.jsp?e=001DTkWXu4xlvb8oQb8nCrepqQr\\_2q9xoB4Im0\\_d1TQW4eU47D9I0xSO4ikBTaayx-A10\\_CRdOMuuvPQ\\_jYQWYinLnGZJfUi-ANyotdtlFpBwR-D\\_ZbbJglygWNxCv385840x19gYoqTj4=](http://r20.rs6.net/tn.jsp?e=001DTkWXu4xlvb8oQb8nCrepqQr_2q9xoB4Im0_d1TQW4eU47D9I0xSO4ikBTaayx-A10_CRdOMuuvPQ_jYQWYinLnGZJfUi-ANyotdtlFpBwR-D_ZbbJglygWNxCv385840x19gYoqTj4=)

[2] [http://r20.rs6.net/tn.jsp?e=001DTkWXu4xlvZ92U2R6hNV76IPpstkF-4smBCq-H5taff-fDNDt\\_ZJQtYU5FFojVi5NjtmXvyzUBDlx\\_uli0IXrhfxguQXjthvSzXPZGjAJT3ZzsLjVV\\_IpOK4ySt3ryEsFePNM6R5ahE=](http://r20.rs6.net/tn.jsp?e=001DTkWXu4xlvZ92U2R6hNV76IPpstkF-4smBCq-H5taff-fDNDt_ZJQtYU5FFojVi5NjtmXvyzUBDlx_uli0IXrhfxguQXjthvSzXPZGjAJT3ZzsLjVV_IpOK4ySt3ryEsFePNM6R5ahE=)

[3] [http://r20.rs6.net/tn.jsp?e=001DTkWXu4xlvZa0tcSvnyNL0NRLiQLJQVFR9jTza-sflltfhrZt0AggndiYI0EwoNnWHAIAAnNS72okOiux4KbEClb0bjigdidNOqwP5SnekyY36F5HunGFIfEPZ5cdZ3\\_w](http://r20.rs6.net/tn.jsp?e=001DTkWXu4xlvZa0tcSvnyNL0NRLiQLJQVFR9jTza-sflltfhrZt0AggndiYI0EwoNnWHAIAAnNS72okOiux4KbEClb0bjigdidNOqwP5SnekyY36F5HunGFIfEPZ5cdZ3_w)

[4] [http://r20.rs6.net/tn.jsp?e=001DTkWXu4xlvOM2KDgeVTGAsaaprK6dnyb3gedL5AFpNIXHqhDWJmvSJD9Cl1qUbzj6TkIOOXcewMhHPyyjCHRs\\_87TZS\\_TuxWWFQZHFI1dSTENWAJH3yYrF6lww66L1SZwinbi4edHdooLb\\_0VdnDDLeBynmEkDP](http://r20.rs6.net/tn.jsp?e=001DTkWXu4xlvOM2KDgeVTGAsaaprK6dnyb3gedL5AFpNIXHqhDWJmvSJD9Cl1qUbzj6TkIOOXcewMhHPyyjCHRs_87TZS_TuxWWFQZHFI1dSTENWAJH3yYrF6lww66L1SZwinbi4edHdooLb_0VdnDDLeBynmEkDP)