

## Smart-Meter Chipset Delivers Increased Flexibility, Accuracy and Cost Savings



As installations of smart meters in homes and businesses accelerate globally, STMicroelectronics has unveiled a new set of metering chips that offer the industry's most accurate and cost-effective solution for next-generation smart meters.

Unlike traditional induction Watt-hour meters, which are vulnerable to wear and fraud and provide only limited features, smart meters, or electronic meters, are intelligent devices that have no moving parts and can support sophisticated tamper detection and two-way communication for improved grid management and billing.

More specifically, smart meters allow automatic remote meter readings by power utility companies and make energy consumption transparent and directly manageable for consumers. Some eight million smart meters were shipped in the US in 2009, while Asia is predicted to become the world's largest market by 2014, and large projects in Italy, France and Spain should help drive European installations beyond 100 million units by 2015.

Smart Grids and Power-Line Communications Smart meters are a key enabler for the 'Smart Grid', a term that is widely used to describe the next generation of intelligent and digital networks that will add functions of monitoring, analysis, control and communication to the electricity grid to improve the reliability and efficiency, control costs and increase capacity. Smart grids are being designed to help meet the energy challenges of the 21st century, such as reducing consumption, managing energy from renewable sources, and handling the charging needs created by the increasingly widespread use of hybrid and electric vehicles.

In addition to smart meters, a key technology required to enable these intelligent and reliable networks is Power-Line Communications (PLC). ST's PLC chip solutions have already been massively employed in major national smart-metering infrastructure deployments, along with state-of-the-art metrology chips, or 'measurement' chips.

Modulation and Metrology in Modular Meters Smart meters include two main functions: a high-accuracy modulator for sensed current and voltage signals and a dedicated metrology processor to calculate energy consumption. In the next few

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years, smart-metrology functions are also expected to be widely adopted in home appliances, air-conditioning and power-supply systems. Single-phase metering chips such as ST's existing solutions - the STPM01, STPM10 and STPM11/12/13/14 chips - effectively integrate these functions in a single component.

However, in three-phase, or poly-phase, smart meters for industrial applications, a modular approach that separates the current/voltage sensing from the metrology section can improve accuracy and economy. The modulator ICs in the sensing circuitry can be mounted closer to the measurement transducers to reduce the effects of noise. In addition, the same design can be re-used cost-efficiently in a range of metering products without redesigning the metrology section, simply by adding the required number of modulators.

Together, ST's new STPMC1 and STPMS1/S2 create the industry's most cost-effective chipset for modular smart meters, supporting 50-60Hz IEC and ANSI standards for up to 0.2-class AC Watt meters. The STMPC1 metrology IC, which has five input channels, accepts measurements from three phases with the option of using the fourth channel for tamper detection or temperature sensing, and the fifth channel to accept magnetic field information from a Hall sensor. The device can be configured and calibrated for any international distribution standard.

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