

Enabling ZigBee's Smart Energy 2.0 with Advanced Wireless Modules

Dennis McCain, Director of Marketing for Murata Wireless Solutions



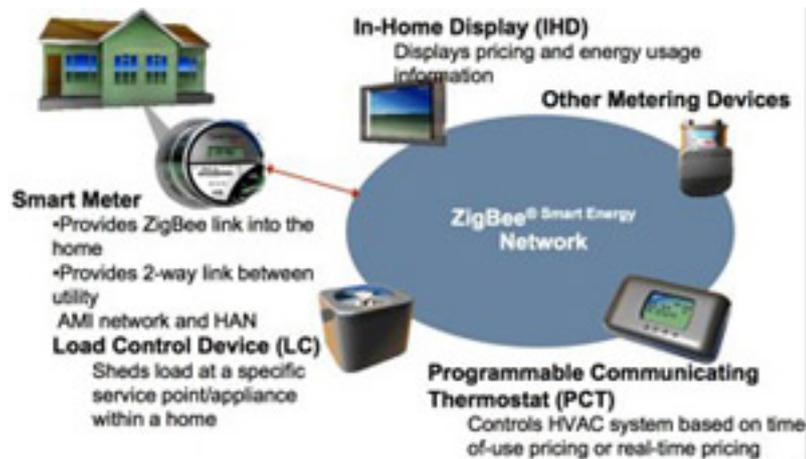
Smart Meters, a key part of the modernization of the electric grid system coined "Smart Grid", are now smarter with the deployment of the ZigBee Alliance's Smart Energy (SE) version 2.0 application profile. Nearly all Smart Meters are mandated by the nation's utilities to support ZigBee SE. However, most of the older ZigBee solutions on the market are only able to support SE version 1.0. The benefits of the all-IP SE version 2.0 are numerous and include several meter-related features such as the installation, configuration, and firmware download for Home Area Network (HAN) devices. Thankfully, Murata Wireless Solutions (MWS) already provides ZigBee hardware that is both FCC/IC/CE certified and supports Smart Energy 2.0 with the SyNode Device (SN3020).

There are several key factors in determining the best ZigBee SE version 2.0 module for smart meter applications. The first, as with most electronics, is size. Modules tend to pack a lot of functionality into one package but this no longer means that performance suffers. Today, even modules as small as 420mm² provide reliable performance.

As smart energy and smart meters are all about saving energy, the ZigBee SE 2.0 wireless module should also enable low power operations. Choosing a module with the ability to transmit and receive signals using the lowest power (a good bench mark is 165mA@20dBm in transmit mode and 31mA in receive mode) is important in all smart energy applications. In addition, the module should include a very low current sleep mode to achieve even greater energy and cost savings. This should be 1.2µA or less.

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The 2-way, low power wireless connectivity between Smart Meters and the HAN is the hallmark of the ZigBee module as it provides important energy use details to consumers, time-of-day pricing, and demand response event information. Studies have shown that consumers who have visibility of their real-time energy usage reduce their consumption by 10 to 15 percent, which benefits them not only in terms of lower bills but also the nation's over-stressed electrical grid. In turn, utility companies can benefit by implementing demand response programs to reduce peak network loads, helping to manage network capacity.

Another important factor to consider when picking a ZigBee SE 2.0 wireless module is the time-to-market. Utility companies nationwide are rolling out smart meter programs at a fast pace, so the module must be FCC/IC/CE certified and properly calibrated and yielded to ensure it is available for Smart Meter integration in time for these deployments.

Flash memory and the ability to work in additional ZigBee applications like home automation are the other important features that should be considered when choosing a ZigBee SE 2.0 wireless module. The serial flash memory allows for over-the-air firmware updates enabling the seamless transition from SE 1.0 to SE 2.0 and beyond. Also, the module design is ideal for more than just Smart Meters, finding simple integration with other smart energy devices like thermostats, in-home displays, load-control switches, lighting control solutions, as well as alternative energy applications like wireless monitoring and control of photovoltaic systems.

As we move to a smarter electrical grid, Smart Meters and other smart energy products alike will need to quickly adapt to changes in the market in order to keep up with rising demand, new applications, and technology advancements. Everything from sensors to modules have an important role to play in this developing industry so it is critical that the components and modules used are trusted, innovative, and capable of adapting to new standards and regulations.

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