Energy Management & Sustainability

Semtech's LoRa Technology Enables Robust, Cost-Effective Whole-Building Energy Management

DESCRIPTION

LoRa® devices and wireless RF technology (LoRa Technology) is making it easy and economical to retrofit nearly any existing home, apartment or other structure with energy saving smart building systems. Designed to support robust, long-range wireless communications where Wi-Fi, ZigBee and other wireless technologies cannot, LoRa Technology is becoming the technology of choice for connecting energy management systems with smart thermostats, lighting controls, smart outlet, and other energy-aware devices. LoRa Technology can also help smart buildings work in concert with smart appliances to manage peak energy consumption and schedule non-essential operations for times when energy demand, and pricing are at their lowest.

Property owners are discovering that investments in LoRa-enabled energy management solutions pay double dividends with reduced utility bills and increased occupant comfort.

BENEFITS

LoRa Technology was created specifically for applications that require competitively priced products to deliver extraordinary performance, reliability and service life. In this case, it embeds wireless sensors in a smart building so it can be remotely managed through LoRa-based gateways or public LoRaWAN™ network.

LoRa Technology's robust transmission characteristics allow wireless sensors, controllers and energy-aware devices located throughout a large building to reach through multiple walls, floors and other structural elements that other wireless technologies cannot. In cases where LoRa-enabled smart building need to communicate with a human manager or a Cloud-based management application across a public infrastructure, they can access LoRa gateways at the sensitivity up to 148dBm.

Despite LoRa Technology's superior penetration and performance, its power conserving features make it possible for a LoRa-enabled wireless sensor to operate for 10+ years on a single consumer-grade battery. This allows additional cost savings to the consumer.

APPLICATION

A smart outlet, which allows users to turn electronic devices (i.e. lamps, water heaters, humidifiers, and water dispensers) on-or-off remotely or on a prefixed schedule in order to conserve energy and maximize savings.

SEMTECH'S LoRa TECHNOLOGY FOR ENERGY MANAGEMENT AND SUSTAINABILITY

HOW IT WORKS

Semtech's LoRa Technology enables connectivity, real-time analytics, geolocation, and energy cost savings.

1 The smart home is equipped with a central control hub that communicates with embedded wireless sensors to relay data to smart thermostats, wireless sensors and lighting controllers. The home's LoRa-enabled smart thermostats can run pre-programmed energy saving schedules that allow an area to use less heating or cooling during times they are not expected to be occupied.

2 Data from the sensors is sent periodically to a LoRa-based gateway. The data allows the control hub to schedule high-demand appliances, such as washers, dryers, dishwashers, and water heaters, to run during low-demand periods when electricity pricing is low.

3 LoRa Technology's native IP capabilities make it easy for the smart home to connect to a Cloud-based management application.

4 The application server will send alerts to the homeowner's personal computer or smartphone app to let them know if they need to adjust lighting, HVAC and other functions in their home.
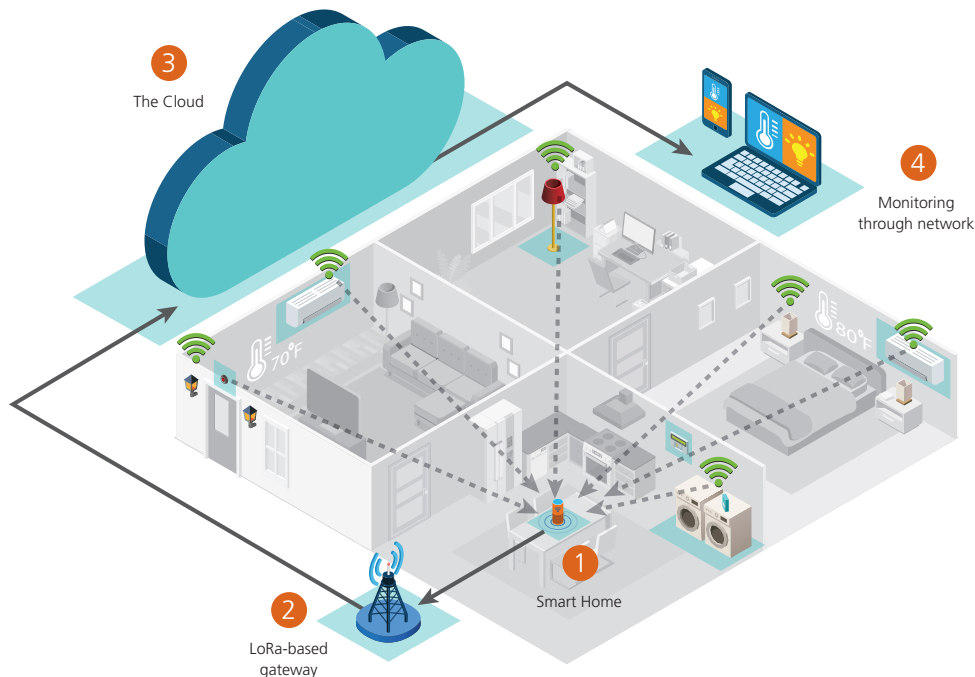
REAL USE CASE SOLUTION

When KingTingTech (YoSmart), a high-tech enterprise company focusing on smart home and life products, needed to develop its next generation smart home solutions for conserving energy, they evaluated several wireless technologies. In the end, YoSmart chose LoRa Technology as the basis for its platform because it offered a unique combination of advantages that competing solutions could not match. These include:

LOW DEPLOYMENT COST

A LoRa-based application can operate over public infrastructures when they are available, eliminating the need for large capital expenditures. For applications that require a dedicated infrastructure, LoRa Technology's robust long-range and low-power technology can penetrate several more layers of walls to connect the sensors compared to other wireless technologies, thereby minimizing the number of gateways needed to serve an area.

LOW PER-UNIT COST

Adding LoRa Technology to an end-node sensor module requires a single low-cost IC, making it easy for YoSmart to offer its products and services at highly competitive prices. LoRa gateways are equally affordable, with carrier-grade units, capable of covering a 15+ square miles service area, available for around $100-200 USD.

Semtech Products used in this application:

Sensors	*Gateway*
• SX1272/3	• SX1301
• SX1276/7/8/9	

All application elements (sensing modules, gateways, servers, software) are available through LoRa Alliance™ partners.

REAL USE CASE SOLUTION CONTINUED

LOW OPERATING COST

YoSmart and its customers enjoy minimal downtime and maintenance costs because LoRa Technology's low-power operation allows a battery-powered sensor end-node module to operate 10+ years between battery replacements.

STANDARDS-BASED

Because the LoRaWAN protocol is a globally-approved standard, YoSmart can sell products that have assured global interoperability. LoRa-based products also benefit from the economies of scale that reduce unit costs and further accelerate its adoption.

SECURE

LoRa Technology secures all communications using end-to-end AES128 encryption, making YoSmart's smart home solution system highly resistant to cyber attacks and data.

HIGH CAPACITY

A single LoRa base station can handle millions of messages, ensuring YoSmart's smart home solution is able to support large, active customer bases.

JUMP-START YOUR IOT DEVELOPMENT TODAY

TRAINING OPTIONS TO GET STARTED

Learn about Semtech's LoRa Technology platform
www.semtech.com/iot

Join the LoRa Community
www.semtech.com/LoRaCommunity

Become a member of the LoRa Alliance™
www.lora-alliance.org

Attend a LoRa Boot Camp for a full-day of training featuring LoRa Technology and real world applications
www.semtech.com/iot

Follow Semtech on LinkedIn and our LoRa Showcase page

Contact us
www.semtech.com/contact

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