

Wi-Fi® + Bluetooth® Low Energy Gateways for Smart Homes and Building Automation



What are your visions of a smart home and smart buildings? And how would you bring your vision to reality?

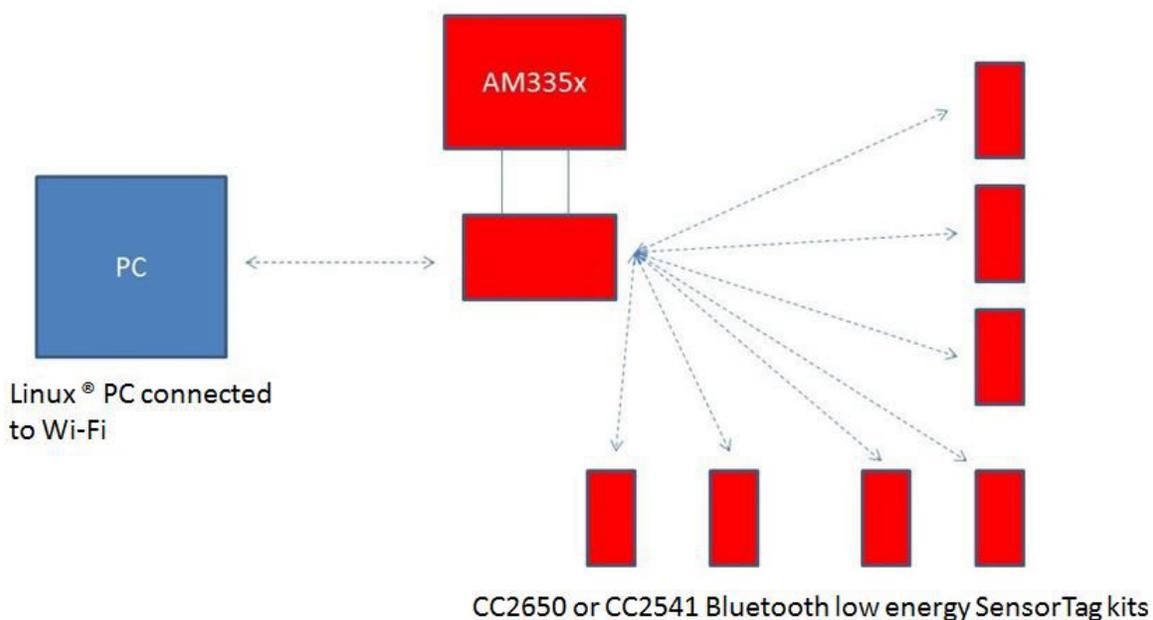
In this post, I want to present and give insights for use cases for a wireless gateway using TI's [WiLink™ 8 Bluetooth® low energy + Wi-Fi® combo modules](#) (WL183x) and available [hardware and software](#) for quickly setting up such a system.

The variety of possible applications in the building automation sector is huge and for sure, wireless connectivity is an important topic that must be considered here. There are use cases as simple as accessing washing machines, refrigerators, heating devices and other appliances in your household with a smart phone or a tablet – regardless whether you are at home or at work or participating in leisure activities. In this example, you might be able to achieve your goal by simply using your home's wireless local area network (WLAN).

For more complex and automated applications where data from multiple sensors is needed, adding Bluetooth low energy connectivity to your design can further improve your system. Especially if a multitude of cost-sensitive wireless devices with longer battery life operation is needed, a Bluetooth low energy interface with TI's [SimpleLink™ Bluetooth low energy CC2640 wireless microcontroller](#) (MCU) is beneficial for such devices or sensors where high data rates and long range is typically not required. A single Bluetooth low energy-Wi-Fi [gateway](#) can then gather all the information provided by the Bluetooth low energy nodes and serve as interconnection to Wi-Fi connected devices and cloud services.

The picture below shows how such a system can be set up with a [BeagleBone Black Sitara™ AM335x processor board](#), a [WiLink 8 cape](#) (WL1835/7 module daughter card for BeagleBone Black) and Bluetooth low energy CC2640 device-powered sensor nodes.

WiLink™ 8 is connected to up to 10 *Bluetooth®* low energy sensors + Wi-Fi® providing access to data



The key features are:

- Provides a connection to up to 10 Bluetooth low energy SensorTag kits
- Can track data from 100's to 1000's of Bluetooth low energy broadcasters (no connection needed)
- Drivers, stack and application code availability
- Full Documentation [here](#)

Another example of a dedicated use case is the control of rollers, shutters, blinds, HVAC devices and lights in a conference room, class rooms and similar depending on the inputs of various Bluetooth low energy sensor nodes providing data about ambient light, temperature, humidity, CO₂ concentration, air quality, presence detectors, outdoor weather and more.

The gateway collects the sensor data and forwards the information via Wi-Fi and the local network to a central unit that coordinates the control of the appropriate actuator devices. Those actuators might have a wired or a wireless interface and a Wi-Fi-Bluetooth low energy gateway might be used vice versa to control actuators wirelessly.

Another interesting application is in shopping centers for beaconing purposes. The gateway detects all nearby products broadcasting relevant details via Bluetooth low energy (product, price, ID, size). This information is shared with the sales staff through Wi-Fi helping to more easily track the amount of available products and the area where it can be found.

Additional Resources:

- **Learn more** about [BeagleBone Black](#) Development Board (Sitara™ AM335x ARM Cortex-A8 processor)
- **Learn more** about [TI's WiLink™ 8 solutions](#)
- **Order** the SimpleLink™ Bluetooth low energy/Multi-standard [SensorTag](#) kit
- **Learn more** about [building automation](#) in this overview
- **Learn more** about [Cloud solutions](#) that support TI devices

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