# Why dual-mode Bluetooth makes sense

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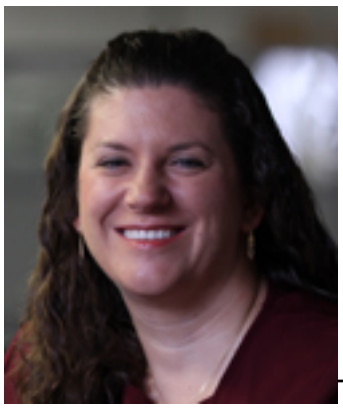

Traditionally, Bluetooth has been associated with hands-free calling and peripheral applications requiring short-range wireless connectivity. After the introduction of the Bluetooth v4.0specification in 2010, which standardized Bluetooth low energy operation, a large amount of the industry buzz has been on Bluetooth low energy applications for coin-cell battery operated devices and sensor nodes. However, another aspect of the Bluetooth v4.0 standard is the creation of dual-mode capabilities that allow for classic Bluetooth operation as well as Bluetooth low energy support – the best of both worlds.

So, why is dual-mode Bluetooth support so crucial? The majority of smartphones and tablets on the market today do not include Bluetooth low energy support. Apple has truly embraced Bluetooth low energy from the iPhone 4S and iPad3 and newer products. Released and upcoming Windows 8 devices will include Bluetooth low energy and most Android manufacturers are migrating their devices to include Bluetooth low energy as well. With support coming in new devices and many users who have older devices, there are more years before Bluetooth low energy is more ubiquitous and almost all smartphone and tablets will continue to do support Bluetooth “classic.”

Beyond its smartphone and tablet penetration, Bluetooth classic support in single-mode or dual-mode form will continue to be needed in applications as well. Bluetooth dual-mode can connect to all Bluetooth devices because Bluetooth low energy cannot be used for all functions. Bluetooth classic is still needed for higher data-rate or long-range applications.

So if you are thinking about adding Bluetooth to a current or future design, which one do you chose – dual-mode, classic-only or Bluetooth low energy? If your device is a wireless speaker or audio headset, it needs to have classic support to maintain the data rate and quality of the audio transmission. If you are creating a peripheral like a Bluetooth mouse or keyboard, your device may need to communicate with classic devices in addition to Bluetooth low energy, so dual-mode would give you the maximum number of attaches. If you are developing an accessory that monitors a MEMS sensor to report temperature, blood pressure, positioning or use other

profiles, then Bluetooth low energy makes sense given its low-power performance.

Once you have decided on which type of Bluetooth you need, the next step is deciding how to implement Bluetooth in your design. The options range from stand-alone devices, integrated system-on-chips and modules. Which you should choose depends on your level of RF expertise, how much available memory and MCU power you have, etc. Regardless of your level of expertise, you should look for a provider that has support services, sample applications, reference designs and more.

Bluetooth technology has made great strides in the past few years with diverse growth from many areas including Bluetooth wireless speakers, Bluetooth low energy heart rate monitors and more. While there is crossover of some Bluetooth and Bluetooth low energy applications one thing is for sure – Bluetooth classic devices aren't going away anytime soon, and dual-mode Bluetooth will be needed for years to come.

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