Q&A for Tech Talk Topic: Max Performance on BLE

Q: Thank you for providing this great series! My question is about AoA - is there a known maximum amount of beacons that may send asynchronous CTE semi-simultaneously?
A: There are a lot of factors that determine the maximum AoA assets that can be tracked. Please contact us and we will be happy to review your specific scenario with you.

Q: Is it possible to connect BG22 kits together by BLE without any other external components?
A: Yes, absolutely. You can do this with any of our BLE kits.

Q: In the DEFAULT_BLUETOOTH_HEAP() macro, each connection uses 472bytes. But, if I am going to only synchronize in connectionless periodic advertising, can I use less RAM by changing DEFAULT_BLUEOOTH_HEAP() macro for each connection?
A: The periodic advertisement uses a little bit less memory than a connection but still requires about 200bytes per periodic advertisement, as we still need the RAM for the receive buffer as well the hopping sequence etc. So it takes a little less RAM than a connection, but still requires some.

Q: Is it possible to enlarge the MTU for Bluetooth Mesh?
A: Not at this time. Bluetooth mesh uses advertising packets based on v4.0 of the standard which was prior to any of the advertising extensions added in Bluetooth v5.0. The exception is for Proxy nodes, which use GATT, and the MTU size can be configured.

Q: Is there a Bluetooth dependency for the BG22 oscillator - can it use the internal RC oscillator and still function?
A: You will always need the HFXO (38.4MHz) but the internal PLFRCO can be used instead of an external LFXO (32.768kHz).

Q: We have the 2M PHY working with our BGM13P but we a have problem with the 2M PHY in iOS13 in the HID "Keyboard Emulation" profile connecting/disconnecting - sometimes dropping down to the 1M PHY. Any suggestions? This is only for the HID profile. Custom GATT Server is fine with 2M PHY.
A: We can help you troubleshoot this. Please submit a support ticket at www.silabs.com/support

Q: Comparing 802.15.4 vs. BLE, with the same TX power settings, which will have more range?
A: 802.15.4 uses spread spectrum encoding which provides an additional few dB of sensitivity, thus a larger link budget, compared to 1Mbps GFSK used by BLE. So, with all other things equal it should provide longer range. However the LE Coded PHY can almost double the range of the 1Mbps PHY, providing longer range than 802.15.4. It's important to note that this is dependent on the specific chip in question.

Q: Did you say there is a way to allow +20dBm BLE in Europe? If so can you expand on this?
A: Yes. To use +20dBm Tx in Europe, AFH and the Channel Selection Algorith#2 from Bluetooth v5.0 is required. See: https://docs.silabs.com/bluetooth/latest/general/system-and-performance/tx-power-limitations-for-regulatory-compliance-etsi-fcc

Q: Does BGM13P have the hardware crypto engine?
A: Yes. The BGM13P is based on the EFR32BG13 SoC which has two crypto engines - one dedicated for the protocol stack and one which is free for application usage.

Q: Does the BG22 support the Zigbee protocol?
A: For Zigbee you will need to use the MG22 instead of the BG22. Zigbee is supported in our Mighty Gecko ICs and modules, not Blue Gecko.

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Q: Are there any results for indoor performance of Silabs BLE5 SoC in a building with concrete structures? At our company we are tested SoCs from another vendor and indoor range decreases drastically.
A: It's normal for indoor range to be reduced compared to outdoor range due to multipath, obstructions, and interferers. But range is also highly dependent on the Tx power, sensitivity and selectivity (blocking performance) of the radio. We believe that with our superior performance in all three factors we have the best RF performance in the BLE market. We would encourage you to do some additional site testing with one of our development kits to compare with the results you are getting today.

Q: Please re-display the slide about estimation of the BT range. I want to copy a link to that tool.
A: https://www.bluetooth.com/learn-about-bluetooth/bluetooth-technology/range/

Q: Where can we get a copy of this presentation?
A: A copy of the presentation and a video replay will be available within 24 hours at https://www.silabs.com/support/training

Q: Does the LE Coded PHY (long range) use more power than 1M PHY?
A: It does. With the additional data encoding, it takes longer to send an equivalent amount of data compared to the 1M or 2M PHY, meaning the Tx and Rx are active longer.

Q: If I build the same humidity sensor using different technologies: BLE vs Zigbee vs Thread, which protocol will have longer life time on the same battery? Assume responsiveness and TX power are all the same.
A: If the sensor data is just broadcast in BLE advertising packets and did not use connections, then it would use fewer packets than Zigbee, Thread or a connected BLE device, and thus would likely have longer battery life. But of course this might not be a realistic scenario for your application, and there are too many other considerations to cover in a short answer.

Q: Given that a high slave latency value needs a stable oscillator to keep synchronization, how big can the slave latency be for a connection between two BG22 modules?
A: In this scenario, the internal PLFRCO might not be the best option for the sleep clock due to the 500ppm accuracy. With an external XTAL, you can get accuracy at 20ppm or less, allowing you to use a shorter Rx window with long connection intervals. We provide modules which support either option.

Q: For acknowledged operations, is the ACK all the way to the protocol, or only to the radio?
A: There is both a radio acknowledgement and GATT layer acknowledgement.

Q: The user guide mentions an external debug port thru another gecko dev board. What gecko dev broads are compatible?
A: The BG22 Thunderboard has an on-board debugger, so an external debugger is not necessary. However you can also connect it to the full WSTK development kit baseboard if you wanted access to extra features like the Energy Profiler or Network Analyzer.

Q: Does the SDK provide support for Bluetooth Direction Finding as of today?
A: This is only supported through a limited release. To gain access you will need to contact your local Silicon Labs Sales representative.

Q: Are there any devices that can bridge between Z-Wave and BLE?
A: There are no ICs which can do this today, so two ICs would be needed.

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Q: Is there a preferred antenna for BLE long range?

A: The LE Coded PHYs (for long range) don't require a special antenna.