July 18, 2018

Slide Sentinel Progress Report

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Last Week’s Accomplishments

* Finished interrupt configuration for Slide Sentinel on the feather M0 with standby(), RTC periodic wake, and accelerometer position change interrupt
* Reconfigured code to allow non-blocking programming by changing interrupt control structure and conditional standby on a timer
* Tested different GPS antennae and collected data on time to first fix, RTK float, and RTK fix data
* Wrote RTK transmission code for LoRa – not yet working for RTK position solution. Potential causes:
  + ~~Packet~~ ~~loss via LoRa transmissions – transmissions may be coming too fast for the receiver to interpret all of them. Transmissions must be asynchronous broadcast without ACK/NACK to allow for multiple nodes and one base.~~  Ruled out as of 7/18
  + ~~Serial data may overflow from the buffer and be lost because of speed difference between LoRa and UART serial.~~ Ruled out 7/18, by comparing number of bytes read from serial to number of bytes received by node, loss of 10 bytes per 100,000 sent-received
  + RTK data may need to be received in 1 Hz format, instead of being read when available and then sent via lora (causes a single UART signal to be broken into smaller pieces)
  + Timing of RTK binary and delay from read-send-receive-write cycle may be causing the RTK data to be unusable

Something Interesting I’ve Learned

This last week I learned that multiple interrupts in a single sketch can have unintended interactions. Both RTC and accelerometer interrupts were functional on their own, but when combined into the same sketch, they caused the device to sleep indefinitely. I believe that this is because the interrupts could simultaneously trigger upon reattaching, thus causing an infinite loop. Reconfiguring the interrupts to only set flags and detach-reattach directly after the standby was a functional workaround. I will be doing a short blog post on interrupts soon.

Questions

* Is there a way to enable/disable power to an external device using the Feather? I want to power the gps EVB directly from the battery connected to the feather instead of wiring it through the voltage regulator because the current draw is high (170 mA)
* For people more experienced with LoRa: Is broadcasting LoRa binary data (base -> nodes) asynchronously a bad idea? I think that I need to do this because of the single base to many nodes relationship, but is there a better way to transfer the raw binary data reliably?

Goals for this Week

* Configure lora to work like a radio modem for RTK, have RTK position fix via LoRa
* Read NMEA (GPS info) strings and transmit them as a OSCBundle to base (hub) using the LOOM library
* Get GPS to turn off when standby() is triggered