

August 1, 2018
Slide Sentinel Progress Report
Gray Lunn, OPEnS Lab OSU

Hi Dr. Selker, Dr. Udell,
Here is an update on the Slide Sentinel project for today's meeting:

This Last Week's Findings

1. Hit a road block hard. Discovered timing of RTK string data is VERY fast and was causing issues where the process would not be able to read any RTK data while it was still sending the last string via LoRa. LoRa packet size is too small to send/receive a full RTK string anyways.
2. Implemented a large buffer on both rover and base to perform blocking reading and writing. Buffer takes about 1.5 kB of memory on the base and 1 kB on the rover.
3. Got first RTK position correction via wireless!!!
 - a. Still only medium-level corrections, 50% of points landed within .18m radius over 100 measurements. Not bad, could and should be better.
 - b. About 2/3 of the RTK strings are lost when transmitting
 - c. Need to work on base transmission timing

Issues to Solve

1. Some RTK strings are not being sent from the rover M0 to the rover GPS.
 - a. I believe this is because the buffer takes time to fill (and write via serial), and in this time the M0 is missing some LoRa messages from the base.
 - b. Two possible solutions I can think of:
 - i. Include small delay on the base, or transmission timer, to slow the speed of incoming transmissions. This is my first choice because it's easier to implement.
 - ii. Buffer all incoming messages on rover (instead of one at a time) before sending them. This is the more challenging option because it requires looking at the timing of incoming messages.

There is no guarantee of number of messages transmitted, so I may just have make (another) timer in the rover and wait until there are no more incoming messages for a period and then write the RTK data to the GPS. This also requires a larger buffer (more memory usage).