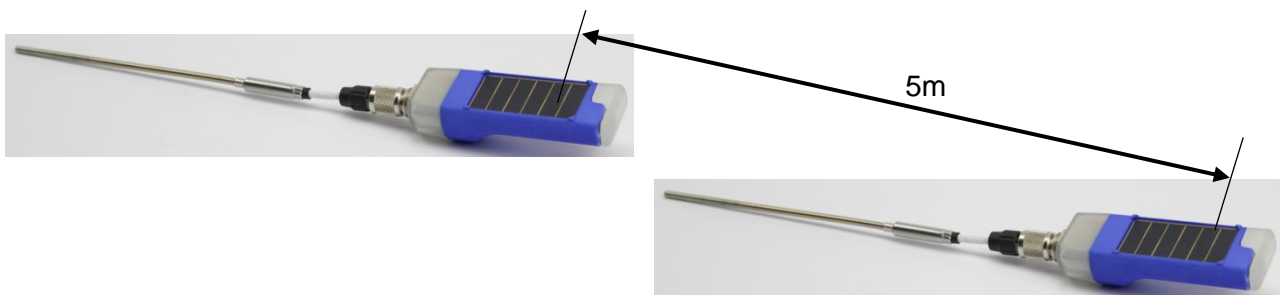


Topic:

Distance measurement using low bandwidth wireless network communication.

Motivation and Goal:

Time of flight measurements are necessary for triangulation to localize sensor nodes. Localization becomes more and more important for security, measurement and maintenance. Even or especially on low cost mass marked systems the demand is vital. The resolution of these measurements relies on the bandwidth of the communication channel. For Bluetooth Low Energy (BLE) the time resolution is $1\mu\text{sec}$ based on the bandwidth. This results in a line of sight distance resolution of roughly 300m. On an adapted hardware, where sampling rate of pulses and measuring rate are individual rates, the distance should be evaluated by the use of statistical methods. It is expected to reach an accuracy below 300m. As a first step a test implementation has to be developed with hard and software part at a very coarse level to analyze the concept.



Part-1: Hardware development

Adaption of clock generation to individual requirements using NRF52 Hardware. As far as possible existing hardware can be adapted and a complete testbed has to be designed.

Part-2: Software implementation

The measurements have to be performed and the results statistically analyzed. A complete testbed has to be programmed with user interface, MATLAB and python interface.

Begin: ASAP (04/2018)

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