Dendrometer LoRaWAN Node



Fig. 1: Dendrometer at the Green Fab Lab using local LoraWAN (Zechenfunk)

Description

A dendrometer is used to measure the time varying stem diameter of a tree. We built a LoRaWAN data transmission module which we connects a commercial dentrometer (Ecotech) to in order to transfer current data in real-time wirelessly. This prototype consists of a custom-made PCB and a commercial housing with molded water proof cable glands.

The LoRaWAN part is handled by the Heltec CubeCell Module which includes both a microcontroller for running the code and the SX1262, needed for LoRaWAN. To accurately measure the dendrometer, a 16-bit analog-to-digital converter is used. This enables the node to read the dendrometer with a resolution of 1.6 µm. The accuracy and readings of such ICs can shift when the temperature changes. That's why an accurate temperature sensor is included on the PCB. The idea is to be able to see a shift in the dendrometer reading while also seeing the temperature change. It is to be researched if it is possible to cancel out any temperature effect in post-processing. The whole node is powered by one LS17330. It is the biggest battery that fits in the case. A bigger one would make it pretty difficult to get the cables of the dendrometer in.

Here a link to the dashboard which displays the currently gathered data at the Green FabLab: Dashboard

Cross-reference

- Dendrometer Overview (More Details about this project)
- AndesFlux (Explanation of the project where this is used)
- Zechenfunk - Freies LoRaWAN auf dem Zechenturm in Kamp-Lintfort (Our public LoRaWAN infrastructure)

Tags

LoRaWAN, Dendrometer, Ecomatik, Microcontroller, PUCP, Tambopata, Andesflux

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