EGU22-940, updated on 30 Mar 2023
https://doi.org/10.5194/egusphere-egu22-940
EGU General Assembly 2022

A simple low-cost Arduino based LoRaWAN automatic weather station

Tom Müller[1], Bettina Schaefli[2], and Stuart N. Lane[1]
[1]University of Lausanne, Institute of Earth Surface Dynamics, Faculty of Geosciences and Environment, Switzerland (tom.muller.1@unil.ch)
[2]University of Bern, Institute of Geography, Bern, Switzerland

With a rapid increase in the use of low-cost DIY Arduino solutions, many companies are providing low cost sensors for practically any environmental applications and new users can also benefit from a rich virtual community proposing diverse solutions and tutorials. Nowadays, these new hardware solutions, as well as more robust communication protocols, allow to design very simple almost plug-and-play automatic dataloggers.

In this talk we will discuss three simple datalogger solutions developed in the framework of a field campaign in a harsh proglacial environment in the Swiss Alps. The first solution consists of a simple autonomous datalogger (based on *Seeeduino Stalker* board) designed to record piezometric heads in wells, even during the winter cold season. The second station consists of two alternative main boards (*SODAQ* and *CubeCell*) that were used to develop a connected LoRaWAN automatic weather station to monitor air temperature and precipitation on the glacier. Connected to a base station LoRaWAN gateway (*Dragino*), this system successfully allowed for a remote monitoring of those parameters.

In a first step, we will quickly go through the main components of each system and detail the basic LoRaWAN architecture. We will then mostly focus on the practical deployment of these solutions in the field and discuss their potential and challenges. We will try to show a live demonstration of their functioning and will insist on the relative technical simplicity and low-cost of such solutions, which could be replicated for many other environmental applications. We will finally discuss the pros and cons of these solutions compared to professional senor companies.