Project Description

In a wireless sensor network, several sensor nodes obtain local data and communicate among themselves in order to create a global vision of an object of study. The idea of a self-managed network of low-power, autonomous devices, that collects data from an environment and propagates information through a wireless link brought about several new challenges and requirements in application run-time and hardware support. System requirements for sensor networks include basic operating system functionality, power management, field reprogramming mechanisms, sensing hardware abstraction, and a configurable communication stack.

In this context, the EPOS-Mote project aims at developing an open-source tiny mote for wireless sensor network applications. The first phase of the project was based on the MeshBeans2 ZigBit platform and focus on agriculture of precision, where the main requirements for applications in this area, in a general way, are:

- Low Power Consumption: the lower is the power consumption, the more will be the mote's life time. Very often, collecting such sensors for in-lab battery change is unpractical, due to huge amount of motes or to hard environment conditions. It is an essential feature to consume low energy.
- Medium-Long Radio Range: in an agriculture of precision application is needed to monitor a large area of the environment. The radio in this case should have a good range.
- Environment Monitoring Capabilitites: monitoring the environment changes is crucial in the agriculture field. In this sense, the platform should support several different sensors (e.g. humidity, temperature, etc) to cover the application's needs.

Key Features

- **Hardware** (Hardware Details)
  - ATMega1281 microcontroller
  - Integrated Sensors (humidity and temperature)
  - 802.15.4 radio compliant
  - Tiny size
- **Software** (Software Details)
  - EPOS Operating System support
  - Configurable MAC protocol (C-MAC)
  - Sensors abstractions
Architecture Overview