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Subject Area	Wireless Communications

## LoRaWAN IoT Development Kit for HSRvote Case Study

Feasibility study of implementation and deployment of HSRvote as an IoT node, development of a versatile evaluation platform

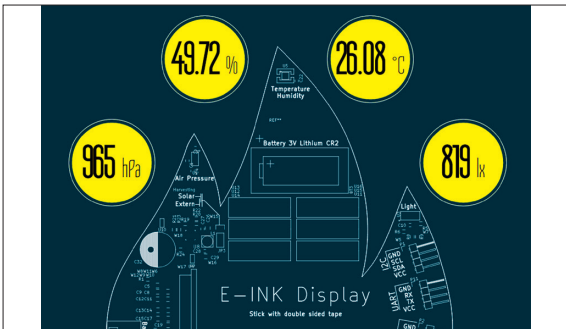


LoRa on Fire Logo

**Problem:** HSRvote is an educational polling and voting system developed at HSR Rapperswil. The reliability of the batteryless system has been proven in the field. Handsets are distributed to every participant, transmitting data to a USB receiver. The latter prohibits mobile usage. The provided software solution is not cross-platform friendly and can lead to difficulties on systems with limited user permissions or for inexperienced users.

**Proceeding:** The popularity of Internet of Things (IoT) applications is rising and the deployment of IoT networks is progressing quickly. It will be evaluated if the HSRvote handsets can be realized as Internet of Things nodes, eliminating the need for individual USB receivers and proprietary software. Platform-independent web technology could be used instead. As IoT networks usually are not designed for such use cases, various aspects have to be analyzed in order to decide whether an IoT-based solution can fulfill given requirements, leading to a practical, deployable solution with good user experience. An open experimentation platform shall be developed to conduct the analysis. It shall facilitate the evaluation of peripherals and power sources and encourage other interested parties to gain experience with IoT technology.

**Solution:** A feasibility study was conducted simultaneously with the development of a demonstration kit. Possible major issues such as transmission delays, lack of channel capacity and regulatory issues were analyzed and discussed. Being crucial for mobile devices, a special focus was laid on power supply and energy harvesting. To conclude the study, a total deployment cost estimation was performed. A versatile demonstration kit featuring sensors, E-Ink-display and a hybrid power supply solution with energy harvesting was developed along with a real-time web-based demo application. The demonstration kit is easy to extend, a ready-to-use SDK is included.



Screenshot of the sensor demo web application

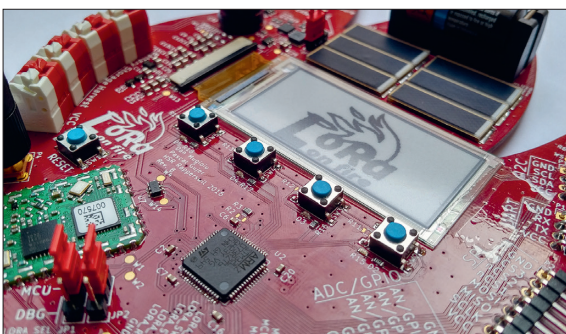


Photo of the LoRa on fire PCB