

Open extensive IoT research and measurement infrastructure for remote collection and automatic analysis of environmental data

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Abstrak

ABSTRAK

Internet of Things devices that send small amounts of data do not need high bit rates as it is the range that is more crucial for them. The use of popular, unlicensed 2.4 GHz and 5 GHz bands is fairly legally enforced transmission power above power limits cannot be increased. In addition, waves of this length are very difficult to propagate under field conditions e.g. in urban areas. The market response to these needs are the LPWAN Low Power WAN type networks, whose main features are far reaching wireless coverage and low power measurement end nodes that can be battery powered for months. One of the promising LPWAN technologies is the LoRaWAN, which uses a publicly available 868 MHz band in Europe and has a range of up to 20 km. This article presents how the LoRaWAN network works and describes the installation of the research and measurement infrastructure in this technology which was built in the Gdansk area using the Academic Computer Center TASK network infrastructure. The methodology and results of the qualitative and performance studies of the constructed network with the use of unmanned aircraft equipped with measuring devices for remote collection of environmental data are also presented. The LoRaWAN TASK has been designed to support the development of other research projects as an access infrastructure for a variety of devices. Registered users can attach their own devices that send specific metrics that are then collected in a cloud based database, analyzed and visualized.