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## Empirical evaluation of LORA link performance for smart city/smart campus environments (Article)

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### Abstract

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The Concept Of Smart City Become Undeniable Mission By All The Major City In The World To Improve Human lifestyle, assets and resources efficiently. Smart city concept really depends of advancement of network technology, to be specific internet of things (IoT). One of the recent innovations that enable smart city concept to be operated with low power consumption and low cost is LoRa (long range). LoRa's advantages such as convenience, low cost, high efficiency and strong scalability might be a reliable gateway for sensors, transducers and monitoring devices to establish a seamless connection with centralized monitoring system [11]. This report aims to provide data analysis on implementation of LoRa technology as gateway for smart city. In the report, LoRa gateway link performance will be tested using RF1276 LoRa modules from Appcon Wireless for Kuala Lumpur smart city and International Islamic University Malaysia Gombak Campus for smart campus. The performance metrics to be used are the Packet Deliver Rate (PDR), Data Extraction Rate (DER), the number of dropped packet, delay, Node Energy Consumption (NEC) and Ping Statistics. The study is expected to consider the effect of foliage specifically for the smart campus environment. Furthermore, the overall channel effect, payload size and different LoRa PHY transmit configurations (different bandwidths and coding rates) will be quantified in terms of the performance metrics mentioned above. Initial tests were carried out in IIUM Gombak campus indicated severe degradation due to foliage effect, hence, the report will focus on its effect on the link performance. Several LoRa physical parameters will be studied including the bandwidth and spreading factor. © BEIESP.

### Author keywords

[Empirical evaluation](#) [LoRa](#) [LoRaWAN](#) [Smart city](#)

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