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Development of a Low-Cost Transducer with Data Acquisition Software for the Continuous Measurement of Greenhouse Gas Percentages in Sri Lanka

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Abstract

Currently, there is no system in Sri Lanka for real-time measurement and transmission of data of environmental Greenhouse gases (GHG). Due to global warming and other harmful effects, these data are essential to implement environmental-control measures in a country. This study is aiming at designing a cost-effective device capable of measuring and transmitting the real-time data of components of GHG vis. CO_2, NO_2, CH_4, together with relative humidity and temperature. The proposed system consists of gas sensors (MICS-6814, MG-811, MQ4, DHT11), Real-Time Clock (RTC+storage) and Wi-Fi/GSM modules and a data logger feeding to a processing interface for visualisation and presentation. The prototype capable of measuring all of the above parameters was built, and its transducers are calibrated. The instrument was tested for its robustness in real climate conditions and feasibility of long-distance transmission of data from a base station to the server. It is planned to reproduce five more similar instruments to take simultaneous measurements of greenhouse gases percentages in different places in the country.

Keywords: Measurement of Greenhouse Gases, Greenhouse Gas Sensors