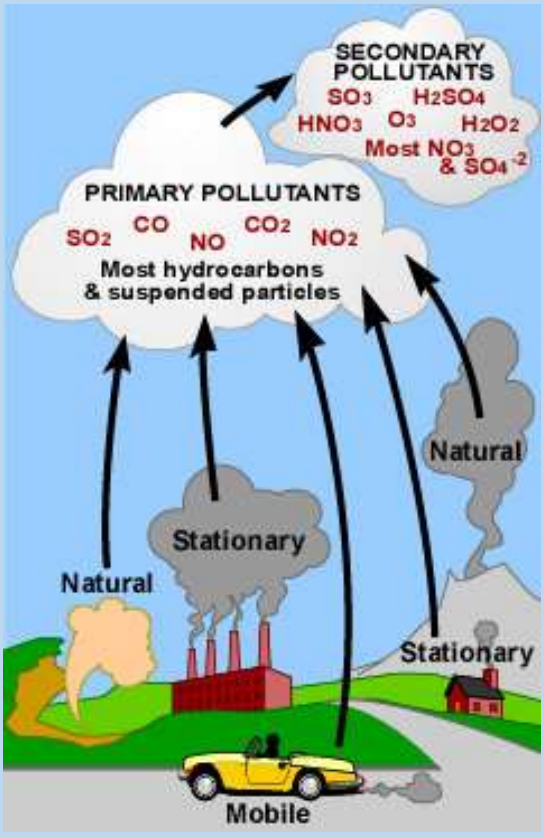
Air Pollution Monitoring 5G Testbed Powered by Solar Energy Harvester

ABSTRACT

A prototype for a 5G capable environmental air pollution monitoring system. The system measures concentrations of NO2, ozone, CO and SO2 using semiconductor sensors. Further, the system gathers other environmental parameters like temperature, humidity, PM1, PM2.5 and PM10. The prototype is equipped with a GPS sub-system for accurate geo-tagging. The board communicates through Wi-Fi and NB-IoT. The board is also equipped with energy harvesting power management, and is powered through solar energy and battery backup.



INTRODUCTION

Global air pollution is one of the major concerns of our era. Improved monitoring systems are needed, which will be having superior precision, high sensitivity, and require less laboratory analysis. Also it should be less power consuming and energy efficient one.

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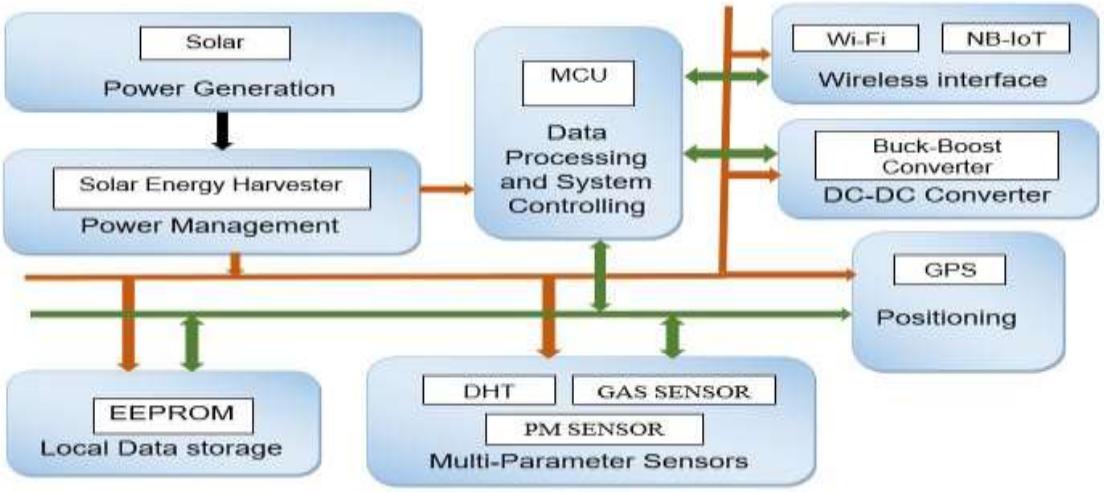
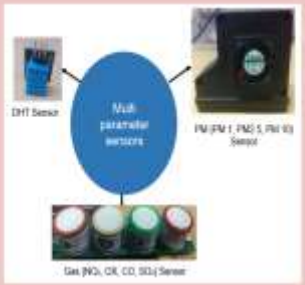
SYSTEM OVERVIEW





Wi-fi

NBIoT

Fig1. Temperature Graph

Fig2. Temperature Graph

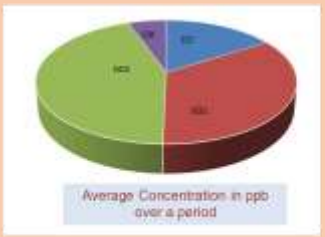


Fig3. Gas sensor data

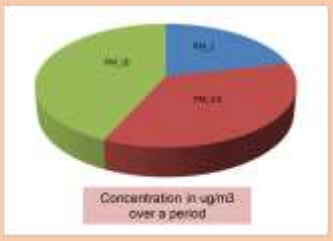


Fig4. PM sensor data

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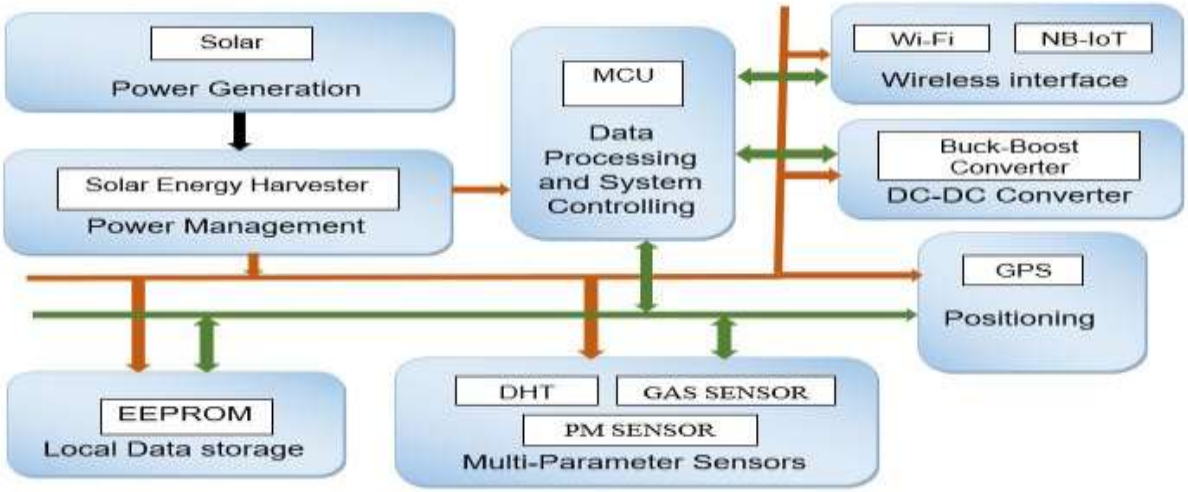
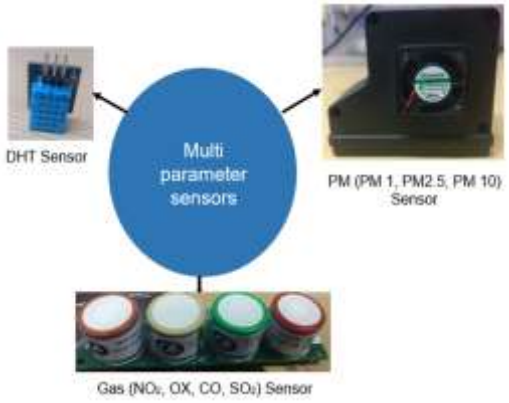


NBIoT



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