

**Title:** Environmental Monitoring System Using USRP and Single Board Computer

**Authors:** R. Muralitharan

**Keywords:** GNU Radio, GPIO, Node, I2C, SPI, SD card, and USRP

**Issue date:** 13 November 2021

**Journal:** 2021, 10th International Conference on Information and Automation for Sustainability (ICIAfS)

**Publisher:** IEEE

**Citation:** R. Muralitharan, "Environmental Monitoring System Using USRP and Single Board Computer," 2021 10th International Conference on Information and Automation for Sustainability (ICIAfS), 2021, pp. 1-6, doi: 10.1109/ICIAfS52090.2021.9606036.

**Abstract:** Universal Software Defined Radio Peripheral (USRP), GNU Radio, and Raspberry Pi board (single board computer) are used to establish a simple communication network. The communication network is configured to monitor the physical quantities of the environment. The quantities such as temperature, humidity, and the luminous efficacy values can be measured by the sensors. A set of sensor modules are used to monitor the physical quantities of the environment and the values of the sensor modules will be stored in a SD card. The SD card module is attached with the sensor module. A Raspberry pi board is used as sensor node. The sensor node uses Inter Integrated Circuit (I2C) communication to transfer data [2] from the the sensors to a SD card. The mobile nodes periodically measure the physical quantities of the environment and send the information to the storage medium. The present state values of the sensor nodes are forwarded to the base station. The sensor node has states such as active, Data-On, Data-Off, and idle. The state values of the network will be sent to the base station, periodically. The energy level ratio of the rechargeable battery is measured by the sensor nodes and the information regarding the energy level ratio is sent to the USRP base station periodically. The network is used to monitor the environment, and observe the changes in the environment. Also the network can be used to perform research works, such as monitoring the changes in the physical quantities of the environment, and controlling the environment.