

ABSTRAK

RANCANG BANGUN SISTEM AKUISISI DATA MONITORING KUALITAS UDARA BERBASIS MULTISENSOR SECARA NIRKABEL MENGGUNAKAN LABVIEW

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Penelitian mengenai pembuatan instrumentasi berupa *software* akuisisi data untuk memonitoring kualitas udara telah banyak dilakukan dan dikembangkan dengan beberapa keluaran parameter dan menggunakan alat komunikasi yang berbeda. Perancangan *software* sistem akuisisi data monitoring kualitas udara telah direalisasikan dan dapat digunakan untuk monitoring kualitas udara berupa suhu, kelembapan, kadar PM_{2.5}, SO₂, CO, CO₂, NH₃, dan H₂ secara nirkabel dengan menggunakan program LabVIEW. Keluaran *software* yang dihasilkan berupa nilai setiap parameter yang ditampilkan pada monitor laptop secara *real time* dengan menggunakan komunikasi modul WiFi ESP32. Berdasarkan hasil pengujian alat monitoring diperoleh perangkat yang telah direalisasikan dapat bekerja dalam memonitoring kualitas udara sesuai dengan rancangan pembuatan. Sistem akuisisi data yang telah dibuat berhasil dirancang dan mampu memonitoring kualitas udara secara *real time* dengan ralat sebesar 0% dan akurasi sebesar 100%. Dari hasil pengujian didapatkan bahwa *baud rate* berpengaruh terhadap *time average* saat proses transfer data. Sehingga, pada penelitian ini menggunakan *baud rate* 115200. Alat monitoring kualitas udara dapat di akuisisi data dengan *range* jarak sebesar 0 sampai 20 meter.

Kata Kunci: Akuisisi data, LabVIEW, Monitoring dan NodeMCU-ESP32.

ABSTRACT

DESIGN AND CONSTRUCTION DATA ACQUISITION SYSTEM AIR QUALITY MONITORING A MULTISENSOR-BASED WIRELESS USING LABVIEW

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The research on the manufacture of instrumentation in the form of data acquisition software to monitor air quality has been widely carried out and developed with several parameter outputs and using different communication tools. The design of the air quality monitoring data acquisition system software has been realized and can be used to monitor air quality in the form of temperature, humidity, PM_{2.5} levels, SO₂, CO, CO₂, NH₃, and H₂ wireless using the LabVIEW program. The resulting software output was in the form of the value of each parameter displayed on the laptop monitor in real time using the ESP32 WiFi module communication. Based on the test results of the monitoring equipment obtained device that has been realized, it can work in monitoring air quality in accordance with the design of manufacture. The data acquisition system that has been created has been successfully designed and it's able to monitor air quality in real time with a error of 0% and an accuracy of 100%. From the test results, it was found that the baud rate affects the time average during the data transfer process. By the way, in this study using baud rate 115200. Air quality monitoring tools can be obtained data with a distance until 20 meters.

Keywords: *Data acquisition, LabVIEW, Monitoring and NodeMCU-ESP32.*