INSTISARI

PURWARUPA SISTEM POHON LISTRIK BERBASIS MIKROKONTROLER *BOARD* ARDUINO UNO

Oleh

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Ketersediaan pohon pada area hijau diperkotaan masih sangat minim dari yang diharapkan, situasi ini akan membuat kualitas udara di perkotaan semakin buruk, dimana perkembangan aktivitas transportasi serta industri-industri semakin tinggi, sehingga akan meningkatkan emisi polusi udara di lingkungan sekitar perkotaan. Sistem ini mampu mengurangi kadar polusi udara dengan karbon aktif melalui proses adsorpsi dan juga mampu menghasilkan energi listrik ramah lingkungan yang tidak mengeluarkan asap polusi udara.

Pohon Listrik dirancang dengan menggunakan sensor MQ-135, karbon aktif, LCD 20x4, panel surya, *Light Dependent Resistor* (LDR), motor servo, *Light Emitting Diode* (LED), serta Arduino UNO sebagai pemrosesnya. Sensor gas MQ-135 akan mendeteksi kadar gas CO_2 pada ruang penyaringan, karbon aktif akan mengurangi kadar gas CO_2 melalui proses Adsorpsi, LCD 20x4 akan menampilkan nilai CO_2 dalam ppm, panel surya akan menghasilkan energi listrik dari panas matahari yang digerakkan oleh motor servo agar mengikuti arah datangnya sinar matahari dengan sensor LDR, LED akan bertindak sebagai lampu penerangan secara otomatis.

Hasil pengujian yang telah dilakukan mengindikasikan bahwa sistem mampu mengurangi kadar gas CO_2 dengan persentase adsorpsi melalui karbon aktif yaitu sebesar 100%, dari saat diberi media polusi udara sampai kembali pada keadaan udara normal. Sistem juga mampu menghasilkan daya dari panel surya yang digerakkan dengan solar tracker dengan peningkatan efektivitas sebesar 11,9 % dibanding tanpa menggunakan penggerak (statis), serta mampu menghasilkan lampu penerangan secara otomatis yang akan menyala pada saat malam hari dan mati saat saat siang hari berdasarkan pembacaan nilai ADC sensor LDR.

Kata Kunci : Karbon Aktif, MQ-135, LDR, Karbon Dioksida.

ABSTRACT

PROTOTYPE OF ELECTRIC TREE SYSTEM BASED ARDUINO UNO BOARD MICROCONTROLLER

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Availability of trees on the green area of the city are very measly than expected, this situation will make air quality in the city getting worse, which growth of transportation and industries activity are more highly, that it will increase air pollution emission in the urban environment. This system can decrease air pollution emission with active carbon through adsorption process and also it can produce eco-friendly electrical energy which not expend air pollution fog.

Electric tree is designed by using MQ-135 sensor, active carbon, 20x4 LCD, solar panel, *Light Dependent Resistor* (LDR), servo motor, *Light Emitting Diode* (LED), and also Arduino UNO as processor. MQ-135 gas sensor will detect gas level of CO_2 in the filtering room, active carbon will decrease gas level of CO_2 through adsorption process, 20x4 LCD will display CO_2 value in ppm, solar panel will produce electrical energy from sun heating which tracked by servo motor in order to follow direction of coming sunlight with LDR sensor, LED will be as lighting lamp automatically.

The results of the testing that has been done indicates that the system is able to reduce the levels of CO_2 gas with the percentage adsorption through activated carbon that is in the amount of 100% of the time, given the media air pollution until back on the State of normal air. The system is also capable of generating power from the solar panels that are driven by solar tracker with an increased effectiveness of 11.9% higher than without the use of an Activator (static), as well as being able to generate automatically the lighting lamp will be lit up at night and died at the moment when during the day based on the reading of the values for the ADC sensor LDR.

Keywords : Active Carbon, MQ-135, LDR, Carbon Dioxide.