ANALISIS EFISIENSI KONSUMSI DAYA PENGOPERASIAN MIKROKONTROLER ESP PADA IMPLEMENTASI SISTEM *MONITORING* PERTANIAN BERBASIS *IOT*

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ABSTRAK

ESP merupakan mikrokontroler yang sudah berbasis *Iot*. Salah satu pemanfaatannya yaitu pada sistem pertanian persisi, merupakan kegiatan untuk *monitoring* kondisi lahan pertanian untuk menghasilkan hasil tani yang baik, namun wilayah pertanian yang jauh dari sumber listrik membuat energi mikrokontroler terbatas. Kesulitan tersebut dapat tanggulangi dengan mode *deepsleep* yang merupakan sistem hemat energi pada mikrokontroler. Pengujian yang dilakukan yaitu menguji tiga jenis mikrokontroler ESP untuk mengetahui tingkat efisiensi pada mode *deeepsleep* untuk sistem *monitoring* pertanian. Pengujian dilakukan dengan mengambil sebanyak 100 sampel data arus dan tegangan pada ketiga ESP saat mode *deepsleep* dan normal. Hasil efisiensi daya yang didapat pada mikrokontroler ESP yaitu ESP 32 DEVKIT V1 WROOM 87.10883974%, ESP 32 DF Robot FireBeetle 99.87277596%, dan ESP 8266 NODEMCU 80.2693633%. Waktu pakai pada implementasi *monitoring* sistem pertanian didapatkan hasil ESP 32 DEVKIT V1 WROOM 20 hari 5 jam 38 menit, ESP 32 DF Robot FireBeetle 186 hari 15 jam 40 menit, dan ESP 8266 NODEMCU 24 hari 1 jam 53 menit.

Kata Kunci: Mikrokontroler ESP, *Deepsleep,* Konsumsi Daya, dan *Monitoring*

ANALYSIS OF POWER CONSUMPTION EFFICIENCY OF ESP MICROCONTROLLER OPERATION IN THE IMPLEMENTATION OF IOT-BASED AGRICULTURAL MONITORING SYSTEMS

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ABSTRACT

ESP is an IoT-based microcontroller. One of its uses is the precision farming system, which is an activity to monitor the condition of agricultural land to produce good agricultural products, but agricultural areas that are far from power sources make the microcontroller's energy limited. This difficulty can be overcome with deep sleep mode which is an energy saving system on the microcontroller. The tests carried out were testing three types of ESP microcontrollers to determine the level of efficiency in deep sleep mode for agricultural monitoring systems. The test was carried out by taking as many as 100 samples of current and voltage data on the three ESPs during deep sleep and normal mode. The power efficiency results obtained on the ESP microcontroller are ESP 32 DEVKIT V1 WROOM 87.10883974%, ESP 32 DF Robot FireBeetle 99.87277596%, and ESP 8266 NODEMCU 80.2693633%. The usage time for monitoring the implementation of agricultural systems resulted in ESP 32 DEVKIT V1 WROOM 20 days 5 hours 38 minutes, ESP 32 DF Robot FireBeetle 186 days 15 hours 40 minutes, and ESP 8266 NODEMCU 24 days 1 hour 53 minutes.

Keywords**:** *ESP Microcontroller, Deepsleep, Power Consumption, and Monitoring*