

SIMULASI PINTU AIR OTOMATIS PENGAIRAN SAWAH BERBASIS MIKROKONTROLER ARDUINO

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ABSTRAK

Peningkatan dalam pengelolaan pertanian sangat dibutuhkan saat ini. Sistem buka tutup pintu air saat ini masih menggunakan cara manual dalam pengoperasiannya, sehingga dapat menyebabkan meluapnya air karena pintu air tersebut tidak segera dibuka. Banyaknya kejadian gagal panen pada musim hujan disebabkan terjadi banjir pada persawahan. Kurangnya pengawasan sistem irigasi membuat debit air saat curah hujan tinggi, menyebabkan tanaman padi rusak terkena arus air. Seiring permasalahan ini, dibuatlah prototipe sistem pintu air otomatis berbasis Arduino. Sistem ini bekerja dengan prinsip buka tutup pintu air menggunakan sensor HCSR04 yang menggunakan gelombang ultrasonik untuk membaca ketinggian air. Modul sistem pintu air otomatis terdiri dari sensor HCSR04, motor servo, LED dan LCD. Dari hasil penelitian diperoleh, jika tinggi air ≤ 10 cm pintu air akan terbuka setengah. Jika tinggi air > 10 cm, pintu akan terbuka penuh. Jika tinggi air ≤ 4 cm pintu air tertutup.

Kata kunci: irigasi, mikrokontroler Arduino, pintu air otomatis, sensor HCSR04

AUTOMATIC SLUICE GATE SIMULATION OF PADDY IRRIGATION BASED ON ARDUINO MICROCONTROLLERS

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ABSTRACT

Improvements in agricultural management is recently needed. Floodgates operating system has been manually operated, which might cause overflowing water due to the delay of the gate opening. The number of crop failure occurrences on rainy season was caused by flooding in the rice field. Lack of supervision on irrigation system, especially when heavy rainfall, has been caused water flow destroying rice plants. To overcome this problem, prototype system of Arduino based automated sluice had been constructed. The prototype works by automatically opens the floodgates and simultaneously detecting water level using HCSR04 sensor. This tool uses HCSR04, servo motor, LED, and LCD. If the height of water ≤ 10 cm, the sluice will be half opened. If the height of water > 10 cm, the gate will be full opened. While if the height of water ≤ 4 cm, the gate will be closed.

Keywords: irrigation, Arduino microcontroller, automatic sluice gate, HCSR04 sensor