

RANCANG BANGUN SISTEM IRIGASI OTOMATIS BERBASIS SENSOR KAPASITIF KELEMBAPAN TANAH

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Abstract	<p>Precise and measurable water availability is an important aspect for optimal plant growth. It is necessary to monitor soil moisture continuously as a basis for watering. This paper presents the design of a soil moisture measurement system and testing of a capacitive type soil moisture sensor to obtain a calibration model on various types of soil. The measurement system is based on an Arduino-Mega microcontroller consisting of a soil moisture sensor, timer module, memory card module, keypad, LCD and irrigation actuator. In this research, five capacitive soil moisture sensors were tested on three types of soil, namely sand soil, and organic soil. Sand soil comes from the coast in Adipala Village, Cilacap Regency and organic soil comes from dry land in Kedungrandu Village, Banyumas Regency. The calibration process is based on the capacitive soil moisture sensor voltage (V) and soil water content (KA) values determined using the gravimetric method. The calibration model obtained for each soil is $KA = 34.23 \times V^2 - 182.84 \times V + 249.45$ (sandy soil), and $KA = 2389 \times V^2 - 9252.6 \times V + 9012.9$ (organic soil). Soil moisture outputs, time data, and irrigation status are stored in the memory card.</p>
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