

ABSTRACT

In modern plant cultivation, hydroponic techniques are currently developing rapidly. The type of plant that can be used as hydroponic growing material is the kale plant. The pH level and concentration of the nutrient solution must be regulated and maintained so that the plants can harvest successfully. Nutrient solutions, which are important in hydroponic planting, also present challenges. In hydroponic systems the pH and concentration of the solution must be controlled and monitored using regulatory mechanisms. From these problems, a system for regulating pH levels and nutrient solution concentrations in hydroponic kale plants was made. The system uses NFT (Nutrient Film Technique) to maintain the amount of nutrients according to plant needs. The system uses a NodeMCU ESP32 microcontroller by utilizing a TDS sensor and a water pH sensor. The fuzzy sugeno method is used for the output output issued by the Relay. As a result, the system can read the level of water released in seconds. Using a TDS sensor to detect the concentration of nutrient solution with an average error value of 0.3% to 4% and a pH sensor to measure the pH value with an average error value of 1% to 3% and from the error results obtained a sensor accuracy value above 95% so that both sensors can function properly and quite accurately. Based on the system that has been designed, pump output results are obtained in accordance with the fuzzy rules that have been designed. Then the data obtained will be sent to the Telkom IOT Platform website database.

Keywords: *Hydroponics, NFT, Water Spinach, IoT, Fuzzy.*