

ABSTRACT

Drip Irrigation System, which is a method of watering plants that uses low level water intensity in *Urban Farming*, where most of the operations still use manual methods by opening and closing irrigation water canal is still traditional and the water intensity used is not controlled as desired. *Drip Irrigation* control system based on the *Internet of Things (IoT)* using the *Firebase RTDB (Real Time Database)* as the Application Development Database and the *Arduino Mega 2560*, microcontroller, is a system designed to monitoring plant conditions and controlling water distribution to plants using internet signals with Smartphones as controller. This *final* project uses the *Firebase RTDB* as the Application Development Database and the *Arduino Mega 2560* as a Microcontroller in its series of tools. Programming the *Arduino Mega 2560* on the Visual Studio Code to receive digital calculations from the soil moisture sensor and soil pH sensor which then appear on a Smartphone (managed on RTDB Firebase) which is sent via the Internet network by the Wi-Fi Module ESP8266. Smartphones can also control the opening or closing of *Drip Irrigation* according to the data received and processed. All evaluations and validations are carried out through simulation and assembly of tools by taking into account the realistic environmental parameters of Indonesia.

The test results are generated, the system performs automatic watering according to time. Reading and sending of pH and Humidity values was successful with the data according to the classification results. The result of the error rate value between the temperature sensor and room temperature is 2.22% (good quality). The results of the QoS Delay of this system can reach the network very good from a distance of 0 m to 15 m according to the datasheet and Throughput value is greater if the distance of the device from the access point is getting closer. In this way, a correlation is achieved, If the resulting delay is lower, the throughput becomes higher.

Keywords: *Drip Irrigation, Internet of Things (IoT), Urban Farming, RTDB Firebase, Arduino Mega 2560.*