Abstract

Soil is an important component as a growing medium for plants. [25] Most of the plants are able to grow when the presence of soil. Each type of plants, require different soil water content. In vegetable crops such as potatoes, require ± 70% soil water content. [1] While in pepper, require 50% -60% of soil water content. [2] In the case of plants, according to Lukman Arifin (2012) requires varies of soil moisture. Some require dry soil, moist, and even watery. In euphorbia plants need dry soil, plants plumaria / cambodia require moist soil, and the Aglonema plants need watery soil. Besides that, plant owners sometimes forget to water the plants soil or even lazy to, so that the desired soil moisture content that plants need won't meet, and also they can't knowing the state of the soil water content in the plants when they're traveling. In addition, the owner of the plant as well as watering plants soil manually (using a water hose, they actually cannot measure the value of the moisture which is needed by some plants. Because all of that matters, prototype soil water content measurement using a telemetry system was made.

What is being examined in this study is the use of telemetry system is to measure the water content of the soil in the plant and perform automatic watering based on moisture sensor readings. Devices that are used to build a measurement system that uses soil moisture sensors, microcontroller Arduino, APC220 communication modules, actuators which can drain water on the sensor node. On the server side there APC220 communication module to receive and process data from sensors in the data for later upload to Google Cloud Messaging to be sent to the farmer or end user a notification message.

The accuracy testing result from the sensor shows a result comparison of the measurement accuracy between alluvial soil and andosol, the measurement results differ by 1%. Tests on the effect of temperature on the sensor measurement results show that the temperature does not affect the accuracy of the sensor measurements. Response time testing of the system shows that the average response time of the system is 2818.8ms which is obtained from average delay sensor to server which is 84.55ms and the average smartphone delay which is2734.3ms. Considering the system is not an urgent system and doesn't have a disaster element, the response time is still acceptable. While testing with the barrier wall, the optimal distance from the sensor node to the server is 75meter.

Key Word: Android, Soil Moisture Sensor, Telemetry, APC220, soil measurement