ABSTRAK

Krisis air merupakan tantangan serius yang dihadapi oleh banyak masyarakat di seluruh dunia. Di tengah kebutuhan akan manajemen sumber daya air yang berkelanjutan, banyak perumahan menghadapi kesulitan dalam menjaga dan mendistribusikan air secara efisien kepada para penghuninya. Oleh karena itu, diperlukan solusi inovatif yang mampu mengatasi permasalahan tersebut dengan memanfaatkan teknologi internet of things untuk untuk memantau, mengatur distribusi air, dan mengetahui pemakaian air dari sisi pengguna dan pengelola. Curug Garden Residence mempunyai air fasum yang dikelola mandiri oleh warga, namun pengoprasian masih manual yaitu pengguna harus berjalan ke tempat penampungan dengan jarak bervariasi antara 5 – 200m. Dengan kondisi diatas maka perlu alat monitoring untuk mengatasi masalah tersebut. Alat monitoring prototipe yang dibuat terdiri dari komponen input: 1 unit *Real Time Clock* (RTC) DS3231, 2 unit sensor *water level ultrasonic* AJ-SR04M , 2 unit sensor *water flow* YF-S201. Komponen proses: mikrokontoller ESP32. Komponen output: 2 unit *solenoid valve* 2W-160-15 dan pompa pendorong 1 unit 220VAC. Aplikasi *blynk* untuk monitoring debit air, level ketinggian air, total pemakaian air dan perintah remote manual. Hasil pengujian linieritas sensor *water level ultrasonic*, mendapatkan nilai persamaan garis regresi = 1,017x ditambah dengan konstanta 0.4787 dan koefisien Determinasi R^2 = 0.9998 dan sensor *water flow*, mendapatkan nilai persamaan garis regresi = 0,9929x ditambah dengan konstanta 0.1657 dan koefisien Determinasi R^2 = 0.9965. Dengan hasil pengujian tersebut nilai mendekati 1, sehingga sensor layak digunakan. Pengisian wajib pada pukul 04.00 – 07.00 bekerja dengan baik secara bergantian dan pengisian remote manual diluar pengisian wajib bekerja secara bergantian. Sensor *water level ultrasonic* dapat mendeteksi kondisi ketinggian air dengan baik, sehingga *solenoid valve* dan pompa pendorong bekerja sesuai perintah mikrokontroller. Sensor *water flow* mendeteksi debit air dengan baik. Aplikasi *Blynk* dapat memonitor hasil pembacaan sensor *water flow* dan *water level ultrasonic* dengan baik melalui *smarthphone* secara *real time.* Alat *prototipe* sudah beroperasi dengan baik dan sesuai dengan perancangan.

Kata kunci : distribusi air, skala perumahan, monitoring, *blynk*

ABSTRACT

The water crisis is a serious challenge that many people around the world are facing. Along with the need for sustainable water resource management, many residences are struggling to maintain and distribute water efficiently to their residences. Therefore, an innovative solution is needed that is able to overcome these problems by utilizing internet of things technology to monitoring, managing water distribution, and know the water usage from the user and the administrator's side. Curug Garden Residence has a water facility that is managed independently by the community, but the operation is still manual, where users must walk to the storage area with a distance varying between 5 - 200m. Under the above conditions, a monitoring tool is needed to solve the problem. The prototype monitoring tool made consists of input components: 1 unit of Real Time Clock (RTC) DS3231, 2 units of ultrasonic water level sensors AJ-SR04M, 2 units of water flow sensors YF-S201. Process component: ESP32 microcontroller. Output components: 2 units of 2W-160-15 solenoid valves and 1 unit 220VAC booster pump. Blynk application for monitoring water discharge, water level, total water usage and manual remote commands. The results of testing the linearity of the ultrasonic water level sensor, get the value of the regression line equation = 1.017x plus a constant of 0.4787 and the coefficient of determination R2 = 0.9998 and the water flow sensor, get the value of the regression line equation = 0.9929x plus a constant of 0.1657 and the coefficient of determination R2 = 0.9965. With these test results the value is approaching 1, so the sensor is feasible to use. Mandatory filling at 04.00 - 07.00 is working properly alternating and manual remote filling out of required filling works alternately. The ultrasonic water level sensor can detect water level conditions properly, so that the solenoid valve and booster pump work according to the microcontroller command. The water flow sensor detects the water discharge properly. The Blynk application can monitoring the reading results of the water flow sensor and water level ultrasonic well through smarthphone in real time. The device prototype has operated properly and in accordance with the design.

Keywords: water distribution, residence scale, monitoring, blynk