ABSTRAK

Air bersih adalah kebutuhan utama makhluk hidup. Semakin banyak makhluk hidup di satu daerah menimbulkan pencemaran lingkungan dari rumah tangga dan juga industri. Hal tersebut mengakibatkan kualitas air tanah menjadi menurun dan tercemar. Sehingga air perlu diolah dahulu sebelum digunakan untuk kegiatan sehari – hari. Penggunaan filter air sudah umum, kendalanya adalah polutan pada air membuat filter kotor dan mampat.

Di pasaran jenis filter air konvensional yang tersedia, tidak dapat mengukur kualitas air, mendeteksi kondisi filter, melakukan *backwash* otomatis ketika filter kotor serta tidak dapat dipantau di mana saja. Dengan bantuan logika *fuzzy*, kondisi filter dapat ditentukan serta melakukan *backwash* jika diperlukan.

Dari penelitian yang kami lakukan, sensor *Turbidity* memiliki *response time* 120,67 ms dengan ketelitian 2 angka di belakang koma dan TDS memiliki *response time* 154,33 ms dengan ketelitian 3 angka di belakang koma. *Backwash* otomatis dengan waktu kurang dari 1 detik. Jarak antara alat dengan akses poin harus kurang dari 6 meter. Pengiriman data ke internet dengan kecepatan kurang dari 1 detik.

Kata kunci : ESP32, filter air, kualitas air, TDS sensor, *turbidity* sensor, *flow* meter sensor, *backwash*, *internet of things*

ABSTRACT

Clean water is the main need of living things. More and more humans in one area cause environmental pollution from households and industry. This causes the quality of ground water to decrease and become polluted. So the water needs to be treated before it is used for daily activities. The use of water filters is common, the problem is that the pollutants in the water make the filter dirty and clogged.

In the market, conventional types of water filters are available, cannot measure water quality, detect filter conditions, perform automatic backwashing when the filter is dirty and cannot be monitored anywhere. With the help of fuzzy logic, filter conditions can be determined and backwash if necessary.

From our research, the Turbidity sensor has a response time of 120.67 ms with an accuracy of 2 digits behind the comma and TDS has a response time of 154.33 ms with an accuracy of 3 digits behind the comma. Automatic backwash in less than 1 second. The distance between the device and the access point must be less than 6 meters. Sending data to the internet with a speed of less than 1 second.

Keywords: ESP32, water filter, water quality, TDS sensor, turbidity sensor, flow meter sensor, backwash, internet of things