# ABSTRAK

# RANCANG BANGUN SISTEM *MONITORING* KUALITAS AIR BERDASARKAN POLUTAN DAN SUHU MENGGUNAKAN SENSOR TDS DAN DS18B20 BERBASIS *INTERNET OF THINGS* (IOT) PADA AKUARIUM


**(M.Zacky Arrasyid Alatas 2026 : 101 Halaman)**

Penelitian ini bertujuan merancang dan membangun sistem monitoring dan pengendalian kualitas air pada akuarium ikan hias berbasis mikrokontroler NodeMCU ESP8266 menggunakan sensor TDS dan DS18B20 untuk mengatasi permasalahan keterbatasan pemantauan konvensional. Sistem bekerja secara otomatis dengan membaca nilai polutan terlarut dan suhu air secara real-time, kemudian NodeMCU ESP8266 mengaktifkan motor servo untuk menaburkan bubuk clay penjernih saat nilai TDS melebihi 400 ppm, serta menyalakan heater jika suhu turun di bawah 24°C atau menghidupkan fan pendingin saat suhu melebihi 28°C. Seluruh data hasil pengukuran beserta peringatan suara (buzzer) diinformasikan langsung pada layar LCD 1602 I2C dan OLED, serta terintegrasi dalam konsep Internet of Things (IoT) melalui aplikasi Blynk untuk pemantauan jarak jauh dan kontrol aktuator manual. Hasil pengujian terhadap berbagai sampel air menggunakan alat ukur pembanding menunjukkan sensor suhu DS18B20 memiliki rata-rata persentase error sebesar 0,54%, sementara sensor TDS memiliki rata-rata error sebesar 27,96%. Pengujian kinerja keseluruhan sistem menunjukkan persentase keberhasilan 100% dalam merespons parameter, dan serbuk clay mampu menurunkan kadar TDS pada air hingga 78,72%, yang mengindikasikan bahwa sistem ini berfungsi dengan efektif dan layak digunakan untuk menjaga stabilitas ekosistem akuarium ikan hias.



**Kata kunci** : IoT, *Monitoring* Kualitas Air, Sensor TDS, DS18B20, Blynk

# *ABSTRACT*

## *DESIGN AND DEVELOPMENT OF A POLLUTANT- AND TEMPERATURE-BASED WATER QUALITY MONITORING SYSTEM USING TDS AND DS18B20 SENSORS BASED ON THE INTERNET OF THINGS (IOT) FOR AQUARIUMS*

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*This research aims to design and build a water quality monitoring and control system in ornamental fish aquariums based on the NodeMCU ESP8266 microcontroller using TDS and DS18B20 sensors to overcome the limitations of conventional monitoring. The system works automatically by reading the values of dissolved pollutants and water temperature in real-time, then the NodeMCU ESP8266 activates a servo motor to dispense clarifying clay powder when the TDS value exceeds 400 ppm, turns on the heater if the temperature drops below 24°C, or turns on the cooling fan when the temperature exceeds 28°C. All measurement data along with sound warnings (buzzer) are displayed directly on the LCD 1602 I2C and OLED screens, and are integrated into the Internet of Things (IoT) concept via the Blynk application for remote monitoring and manual actuator control. The testing results on various water samples using comparative measuring instruments showed that the DS18B20 temperature sensor has an average percentage error of 0.54%, while the TDS sensor has an average error of 27.96%. The overall system performance test showed a 100% success rate in responding to the parameters, and the clay powder was able to reduce the TDS level in the water by up to 78.72%, indicating that this system functions effectively and is feasible to use for maintaining the stability of the ornamental fish aquarium ecosystem.*



***Keyword*** *: IoT, Water Quality Monitoring, TDS Sensor, DS18B20, Blynk.*