

**POLITEKNIK KESEHATAN TANJUNGPINRANG
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PROTOTYPE SISTEM MONITORING KEKERUHAN DAN TOTAL DISSOLVED SOLID BERBASIS INTERNET OF THINGS (IoT)

xvii+ 61 halaman, 11 tabel, 46 gambar, 2 grafik, 9 lampiran

ABSTRAK

Perusahaan Daerah Air Minum (PDAM) Way Rilau mengolah air Sungai Way Kuripan sebagai air baku. Pemantauan kualitas fisik air baku dilakukan secara manual, setiap dua jam (kekeruhan) dan 12 jam (*Total Dissolved Solid/TDS*), dengan rata-rata waktu setiap pemeriksaan sekitar satu jam. Hasil pengukuran sebagai penentu dosis bahan kimia pada pengolahan air. Sementara, kualitas fisik air baku dapat mengalami perubahan secara cepat, terutama dipengaruhi curah hujan. Penelitian bertujuan membuat alat deteksi kekeruhan dan TDS berbasis *Internet of Things*, sehingga informasi kualitas air baku diperoleh secara cepat dan akurat.

Aplikasi dirancang menggunakan sensor kekeruhan Arduino, sensor TDS Arduino ESP8266, mikrokontroler *ATMega 328P*, *USB 2.0 type A to type B*, modul *SIM800L V.2*, dan kabel jumper sebagai penghubung. Data kekeruhan dan TDS yang ditangkap oleh sensor dan diteruskan ke *platform thinger.io* melalui Modul *SIM800L V.2*, selanjutnya disajikan pada *smartphone* secara *real-time*. Validasi dilakukan dengan membandingkan hasil pengukuran dengan *Turbidity-meter* dan *TDS-meter* sebagai *gold standard*, selanjutnya dianalisis dengan uji-T menggunakan SPSS.

Hasil perancangan mampu memberikan informasi kekeruhan dan TDS secara *real-time* pada *smartphone*, dengan jeda waktu sekitar 30 detik. Tingkat akurasi pengukuran sebesar 99,85% (kekeruhan) dan 97,51% (TDS). Hasil analisis statistik tidak menunjukkan perbedaan hasil pengukuran kekeruhan ($p\text{-value}=0,867$) dan TDS ($p\text{-value}=0,605$) dibandingkan *gold standard*. Perlu pengembangan lebih lanjut untuk pengukuran parameter kualitas air lainnya, serta menghubungkan sistem pengolahan air.

Kata Kunci : *Internet of things*, Arduino, kekeruhan, TDS.

Daftar baca : 22 (2015-2020).

**TANJUNGKARANG HEALTH POLYTECHNIC
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**PROTOTYPE OF TURBIDITY MONITORING SYSTEM AND TOTAL
DISSOLVED SOLID BASED INTERNET OF THINGS (IoT)**

xvii+ 61 pages, 11 tables, 46 pictures, 2 charts, 9 attachments

ABSTRACT

Regional Drinking Water Company (PDAM) Way Rilau treats Way Kuripan River water as raw water. Monitoring the physical quality of raw water is done manually, every two hours (turbidity) and 12 hours (Total Dissolved Solid/TDS), with an average time of about one hour for each examination. Measurement results as a determinant of the dose of chemicals in water treatment. Meanwhile, the physical quality of raw water can change rapidly, mainly affected by rainfall. The aim of the research is to make a cloud detection tool and TDS based on the Internet of Things, so that raw water quality information is obtained quickly and accurately.

The application is designed using an Arduino turbidity sensor, an Arduino ESP8266 TDS sensor, an ATmega 328P microcontroller, USB 2.0 type A to type B, a SIM800L V.2 module, and a jumper cable as a connector. Turbidity and TDS data captured by the sensor and transmitted to the thinger.io platform via the SIM800L V.2 . Module, then presented on the smartphone in real-time. Validation is done by comparing the measurement results with the Turbidity-meter and TDS-meter as the gold standard, then analyzed by T-test using SPSS.

The design results are able to provide real-time turbidity and TDS information on a smartphone, with a lag time of about 30 seconds. Measurement accuracy rate of 99.85% (turbidity) and 97.51% (TDS). The results of statistical analysis did not show differences in the results of the measurement of turbidity (p-value = 0.867) and TDS (p-value = 0.605) compared to the gold standard. Further development is needed for measuring other water quality parameters, as well as connecting water treatment systems.

Keywords : Internet of things, Arduino, turbidity, TDS.

Reading list : 22 (2015-2020).