

IOT/GSM MONITORING AND POLLUTANT DETECTION OF HEAVY
EQUIPMENT FUEL SYSTEM

By

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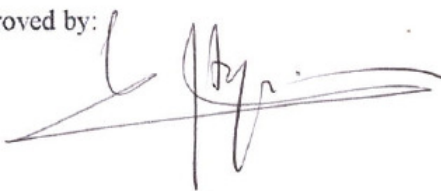


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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

IoT/GSM Monitoring and Pollutant Detection of Heavy Equipment Fuel System

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This thesis presents an automation system that can be used in the monitoring process of diesel fuel, especially fuel from the beginning to heavy equipment with a tiered transportation process. This can cause pollutants found in fuels, especially biodiesel / biofuel because of its solvency and hydroscopic properties that make it easy to absorb water to form mud and gel. Fuel available in heavy equipment sometimes has many impurities due to complex distribution. The study began by scanning the properties of fuel ranging from B0 to B30 compared to Water with a Moisture sensor scanner and measuring pollutants using TDS sensors on clean B0, clean B30 and B100 compared to dirty fuel taken from a real job site. By using Arduino Mega, SIM 800, Nextion LCD, Relay, power supply, Buzzer it can be used to create an automatic system that can activate pumps and valves so that automatically if there are pollutants and water can be monitored, with the blynk IoT application fuel conditions can be monitored online. Furthermore, if water or pollutants are contained in the fuel, then the developed tool can suck up using a valve and proceed to the filtering process with a filter to hold the pollutant and return the fuel again to the tank, if there is water on detection from the sensor, then the pump sucks water then continues to be accommodated to the reservoir. With IoT, every sensing activity in the fuel tank whether there is water or there is pollutant can be monitored in real time using the blink application. For commercial implementation, a robust design with powerful sensors and actuator is needed and in accordance with the operational conditions of the fuel tank.

keywords: Biofuel, heavy equipment, pollutant, hydroscopic gel, mud, water in fuel, Capacitive moisture sensor, TDS Sensor, Fuel Filter Clogging, Arduino Mega.

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DEDICATION

This study is wholeheartedly dedicated to my beloved wife Dwi Astuti, M.T. and children Hafiza Khairunisa F & Hasyifa Khairunisa F, who have been our source of inspiration and gave me strength when I thought of giving up.

To UT School and PT United Tractors Tbk. who has provided funding and support during the study.

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I have found my coursework throughout the Curriculum and Instruction program to be stimulating and thoughtful, providing me with the tools with which to explore both past and present ideas and issues.

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