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FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL ENGINEERING

FINAL YEAR PROJECT REPORT

**COPPER EARTHING CONDUCTOR VANDALISM
DETECTOR AND MONITORING SYSTEM**

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BU/UP/2022/1916

*project report submitted in partial fulfillment of the requirement for the
diploma in electronics and electrical engineering*

ABSTRACT

Copper conductor vandalism detector and monitoring system is based on the microcontroller (Atmega328P) and a GSM network device. The system monitors and detects if the copper conductor has been vandalized, and using GSM network the information is transferred to the mobile devices. Measurements of these vital parameters is done in case the copper conductor is cut, the sensor will detect and conveys the information to the microcontroller and then the microcontroller initiates the alarm triggering system through the buzzer and also sends an SMS message through the mobile phones.

A prototype has been developed to give a reliable and efficient copper conductor vandalism monitoring system that can play a vital role in providing better security for copper conductor theft. The system architecture consists of the above sensors for monitoring vital parameters, LCD screen, GSM interface, buzzer for alarming controlled by a single microcontroller core (Atmega328P that is built on the Arduino Uno programmer.

DECLARATION

I OKOLONGO DAWSON of Reg. No. **BU/UP/2022/1916** am hereby declaring that no portion of this work in this document has been submitted in support of an application for any other diploma or qualification of this or any other university or institution of learning. All information contained in this report is certain and true of us.



Signature-----*Okolongo Dawson*
Date *1-7-2024*

APPROVAL

This is to certify that this project of **COPPER EARTHING CONDUCTOR VANDALISM DETECTOR AND MONITORING SYSTEM** has been carried out under supervision of our lecturers who were a located to us as a group of two and it's now ready for submission to the supervisor.

We do certify that the information in this report belongs us and we do understand it.

PROJECT SUPERVISOR

NAME: MADAM PATIENCE MUGUME	
SIGNATURE: 	DATE: 02/01/2024
NAME: MR BALIGONZAKI PATRICK	
SIGNATURE: 	DATE: 1 st -07-2024

DEDICATION

This project is dedicated to GOD Almighty for His infinite mercy and love, our dear supervisor.

Madam **PATIENCE MUGUME**, our parents, relatives and friends, mentor and colleagues who have been supportive in all conditions during the project construction journey.

ACKNOWLEDGMENT

We sincerely appreciate our distinguished parents for their love and parental care, our honorable Head of department, Eng. KIGOZI JOHN for his tremendous contributions to this work and advice he gave us during the course of this work, and not forgetting all our lecturer's madam Mugume Patience. We pray that God will keep you strong for your families.

Finally, we appreciate all our course mates, all our friends who have in one way or the other contributed immensely to the construction of this project. May God bless us all.

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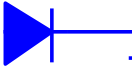
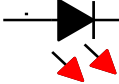



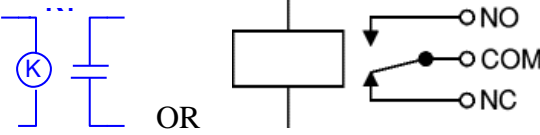
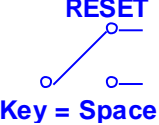


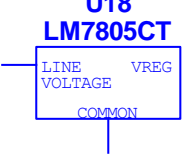
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LIST OF ACRONYMS

LCD	Liquid crystal display
ATMega	Microcontroller Cip created by Atmel in the megaAVR family
USB	Universal serial Bus
EEPROM	Electrically Erasable Programmable Read-Only Memory.
SRAM	Static Random Access Memory
BJT	Bipolar junction transistor
IC	integrated circuit
GSM	Global System for Mobile phones
C	Capacitors
D	diodes
DC	direct current
PLL	phase-locked loop

LIST OF SYMBOLS

	DIODE
	LIGHT EMITTING DIODE WITH RED OUTPUT
	CAPACITOR
	RESISTOR
	TRANSISTOR
	RELAYS
	SET-RESET KEY
	DC POWER SUPPLY
	Single pole switch
	IC Regulator

CHAPTER ONE: INTRODUCTION

1.1 Background

This project gives the insight on the design and construction of a copper conductor vandalism detector and monitoring system. Vandalism means destructive action. It is a hateful and deliberate defacement/destruction of somebody else's property or national assets like the high-voltage, transmission transformers and distribution transformers, etc. The high-voltage transformers strung from support towers form the backbone of the nation's electric power grid. Many of those 158,000 miles of lines, supported by nearly 800,000 towers, run through isolated areas as they deliver electricity from generating plants to cities. These high-voltage transmission power lines around the world are vulnerable to terrorism, vandalism, physical deterioration and extreme weather. Every year in Nigeria bad citizens vandalize the power line, towers, transformers, generators and other power transmission/distribution facilities. This causes frequent power failure and power surge that seriously affects over 50 million business firms and manufacturing industries in the country. These companies depend on electricity power supply from the power line for their productions. If the power line is vandalized, some of their machines cannot be powered on a generator then income, investments and commodities worth billions of Naira will be lost. If electricity is available during the power line vandalism incident, the lives and properties of the people within the area can be affected as a result of electric shocks, power surge and fire outbreak, etc. Vandalism is now largely driven by the soaring values of copper and aluminum in the international metals market due to increased world market demand fuelled by China and India's growth in industrialization. Consequently, the vandals now operate in well-organized syndicates complete with offices and hierarchy and accumulate large volumes of stolen materials which they eventually consign for export as scrap. Transformer oil, copper and aluminum are the main targets of these vandals. The uses of the stolen transformer oil are:

- Mixed with diesel and sold as fuel,
- Used as fuel for industrial furnaces and as cooling for welding sets,
- Mixed with vegetable oil and sold as cooking oil.
- Used as a cosmetic and treatment for wounds.

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