Power Conservation Using Home Automatic Messaging System

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Introduction

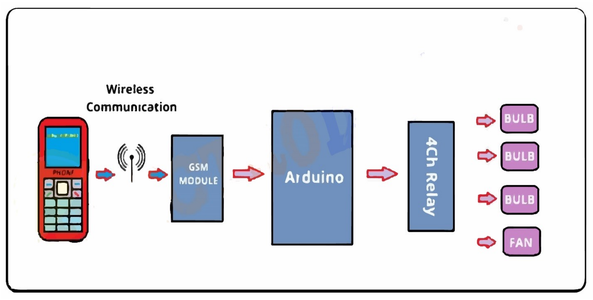
This research was about how we can minimize the power loss normally due to lights, fans, A/Cs and other electrical appliances by using a wireless connection system working under messaging system to achieve an optimum and sustainable use of electrical power. The use of second generation cellular connection (2G) proved worthy as it can be accessed all over Tanzania so we found it suitable and the use of Arduino programming using ATMEGA microcontrollers. The system uses simple technology using the Global System for Mobile Communication GSM module which acts as a receiver for the signals sent by mobile phones from normal ISPs such as Vodacom and Tigo. Once the signals are received they are sent to the motherboard which consists of Microcontroller programmed with Arduino coding and sent to the Relay switches to take action whether to switch on or off the appliances.

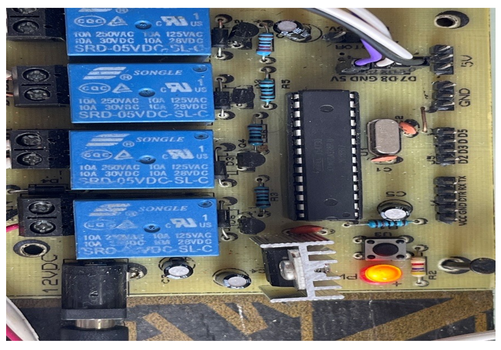
Most of the households and institutions present in developing Tanzania suffer from frequent buying of electricity resulting into very high electrical bills due to the power loss caused by electrical appliances such as leaving the lights on in their houses or offices resulting from sudden trips and forgetting to switch off the appliances leading to unnecessary power consumption, and once someone has travelled far from home and forgot to switch on the lights or the electrical fence for house security hence leaving the house vulnerable for threats such as theft and robbery lastly but not least there are smart systems that work under internet connections which use 3rd,4th and 5th generation cellular connections(3G,4G and 5G) which they are not present in the whole country and present only in urban areas hence people living in rural areas cannot use the smart systems .

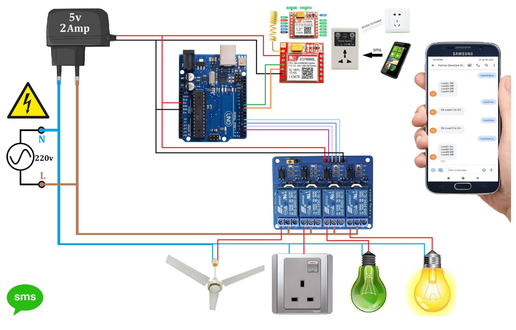
Statement of research problem.

High electric bills caused by unnecessary power consumption leaving the electrical appliances and such as lights, Fans A/Cs in the households is a major hindrance of peoples development and engagement in economic activities and use a lot of money to pay for electricity bills and also people leave their houses without security once they have lights off and they have travelled far away from home are major problems in Many households in Tanzania.

"Can we control our electrical appliances when we are far away by using simple 2G technology text messages which are accessible all over Tanzania?"







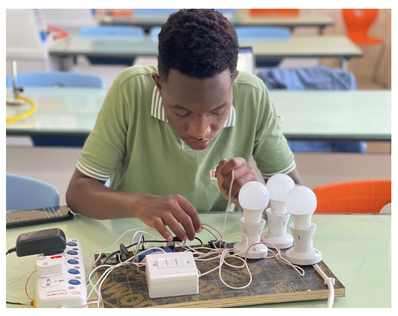
Method

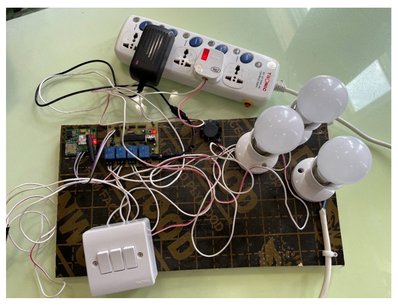
Materials:

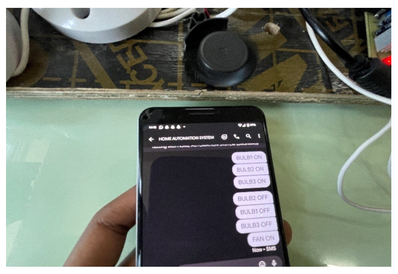
The materials used in this research project are Mobile phone with a registered sim card, Global system for mobile communication (GSM) module with a registered sim card,5M long Connecting wires, ATMEGA microcontroller programmed with Arduino programming , Step down transformer , a wooden board, Three switches ,Relay switches, bulbs, bulb holders and a Fan and a 220-240v power source.

PROCEDURES:

The entire project was carried out according to the procedures below from 15th January 2022 until present







Conclusion

The use of second generation cellular network (2G) has proven worthy as it can be used all over the country and its signal is always strong hence it is the best choice if you want to make a program which can reach and help all people in Tanzania regardless their location and their economic level hence it is the most effective way and covers a longer distance compared to other cheap connections such as Bluetooth. The effectiveness of this network enables us to control our electrical appliances even when we are far away from home such as switching on the lights, fans and A/Cs, electrical fences and electrical gates to mention a few.

Recommendation: Further and wider research on the use of 2G connection should base more on controlling things like light intensity of the bulbs, the speed of the fan, and the temperature of the A/Cs in order to make it even more useful and productive to minimize the use of electricity and also they should make a system that even when someone is travelling abroad how can he use 2G connection to control his/her electrical appliances even several countries away or even overseas.

References

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