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Farmer Friendly Solar Electric Fence

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A B S T R A C T

All of the world's food demands are met by agriculture, which also produces a wide range of industrial raw resources. However, animal invasion of agricultural regions results in a huge loss of crops. Wild animals will wreak havoc on crops. Because of this, it's crucial to watch out for animals in the area. Then various devices should be activated to repel the dangerous animals. Operational amplifier circuits are put in place primarily for the purpose of detecting animal intrusion into the farm. The completed protection system is responsible for providing early warning of potential wild animal intrusion and harm. The Solar Electric Fence system is a more recent choice for crop and property protection than more traditional ones. The usage of an electrical fence helps reduce animal damage. The project illustrates a system that might be applied to stop animals from harming our farms, gardens, fields, and other infrastructure. These fencing devices are simpler to utilize than human labour. Cattle that breach the fence receive a safe, quick (1/5000th of a second) shock that educates them to avoid the fields. The shock is secure because the current in fencing is intermittent and there is a specific amount of time between two bursts. It reduces the current flow for a longer period of time by ldr sensor. The current flow is not sustained for extended lengths of time, and the animal is not shocked for lengthy durations of time since there is a pause between two pulses of current. This kind of fence strategy is more effective when looked at from a different perspective. Any animal that tries to cross the barrier receives a jolt, deterring them from entering the fields. Since the current travelling through the fencing is intermittent, no one is harmed by the stock. The creatures are later stunned since there is a significant period of time when it isn't connected to the current stream due to the pause between beats of the current. The paralyzed is secured since the electrical current in fencing is sporadic as there's certain timeframe between two pulses.

Keywords: Solar Energy, Pir sensor, LDR sensor, Relay drivers, Pico controller, Electric Shock, Electrical Energy, Dc Voltage, Rural Agriculture, Electrical Shocks

1. Literature survey

Electric fence breakage detection using sensors One of Sri Lanka's most serious environmental issues is the clash between humans and elephants. In recent years, approximately 200 elephant deaths each year have been documented, and nearly 70 human fatalities each year have been attributed to this. The government has started programmers to install electric fences around the national wildlife areas in order to control the issue. However, maintaining the electric fence is a challenge, because of its large perimeter and the lack of available manpower. IJARSCT ISSN (Online) 2581-9429 International Journal of Advanced Research in Science, Communication and Technology (IJARSCT) Volume 2, Issue 2, July 2022 Copyright to IJARSCT DOI: 10.48175/IJARSCT-5798 167 www.ijarsct.co.in Impact Factor: 6.252 High Power Electric Fence Energizer using Standalone PV Generators for Remote Areas Electric fence plays a vital role in the present-day security systems. They are frequently employed to secure locations including buildings, herds of animals, expansive farmlands, and international borders. This research suggests a stand-alone PV generator-based high-power electric fence energizer for remote locations. The proposed energizer is based on standalone PV system with battery backup and Marx generator circuit with high gain resonant converter. III. BLOCK DIAGRAM IV. WORKING The fence system is powered by a 12v rechargeable battery. The battery is attached to a solar panel for daytime charging. The battery can also be charged using a 230v, 50 Hz household ac source. The controller circuit prevents overcharging of the battery by regulating the voltages. Another circuit or component is controlled by the driver circuit. This circuit uses regulated 12v, 750ma power supply. The fence is energized by the output pins of driver circuit. Due to the flow of current through the fence any interruptions made by animals or human beings generates an alarm and a minor shock. This way any interruptions or irregular interference of animals or human beings can be prevented. V. COMPONENTS USED 1. Solar panel 2. Battery 3. Relay 4. Controller circuit a. Voltage regulator b. 14007 Diode c. Two pin PCB connector 5. Driver circuit a. IC ULN 2003 6. Resistor 7. Capacitors 8. LED 9. Buzzer VI.

1.1 Introduction

Solar-powered virtual fences work on the basis of shocking those who contact them with electricity by turning solar energy into electrical energy. In various locations, including farms and forest regions, electronic fence systems are used. Solar energy is transformed to electrical energy to generate the necessary voltage for electrical fences, protecting certain areas from theft and animals. As the solar energy's unregulated DC voltage is transformed into regulated DC voltage and then, with the help of an inverter, into AC voltage. And anyone who touches the fence or the animals receives a brief but powerful shock as a result of this electrical energy. However, electrical shocks pose a hazard to life because, despite being brief, as even a brief shock will be hazardous to life because it contains electrical energy and there is a probability of death, Therefore, we created a model of a virtual fencing technology that warns humans whenever an animal tries to enter a fence-protected area, protecting farms. The owner is about the intrusion and lets the owner choose the type of defense to use remotely monitoring through IOT BLYNK APP which is made possible in our model through a raspberry PICO w module.

2.Methodology

Everyone, including animals and inanimate objects, emits some IR radiation. The warmth and material composition of the body or object affect how much IR radiation they release. Although IR is invisible to humans, we have created electronic detecting tools that can pick up these signals. Thermal sensing applications, such security and motion detection, use PIR sensors. They are frequently employed in applications for automatic lighting, motion detection alarms, and security alarms.

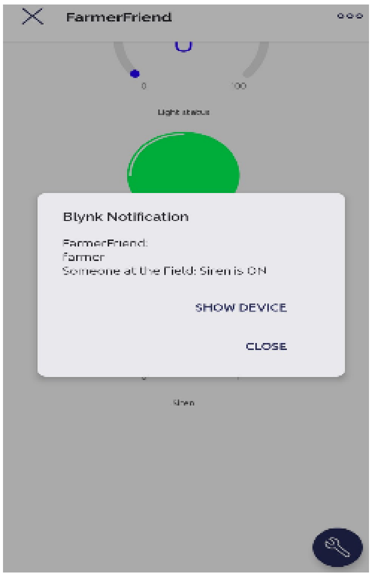
Using the Raspberry Pi Pico Board & LDR (Light Dependent Resistor), we will create a Dark Activated Fencing Circuit. You will learn more about automatic day/night activated fencing circuits after completing this project.

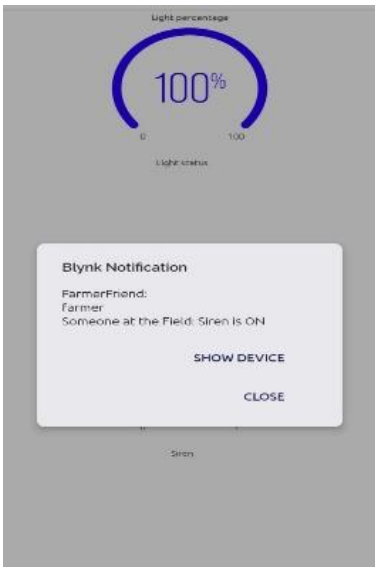
The solar fencing circuit outside our agriculture land had to be switched on every day night, and more often than not we ended up forgetting to switch them off in the morning. In addition to being a handy way to turn on the fencing circuit, a straightforward device with the Raspberry Pi Pico can stop energy waste even in appliances like torches left on throughout the day.

A Raspberry Pi Pico, LDR, and PIR are all that are needed to complete this project. The LDR-resistor network in this situation may be programmed to read the analogue voltage using a Raspberry Pi Pico. The value is then put up against a reference value in order to make a choice. The choice may be to automatically turn ON the electronic lights when darkness is detected or automatically turn OFF the electronic fencing when light is detected.

3.Result

The variable sensors(PIR&LDR) are connected as inputs to the raspberry pi, we will get the result in the form of sound like "fencing off"(day time) and "fencing on"(night time) and it gives a little shock to fencing. the buzzer is used for alerting. By using the blynk application we can manage the fencing.





4.Conclusion and Recommendations

The project "FARMER FRIENDLY SOLAR ELECTRIC FENCE" is designed such that it can be installed on any surface. It is much easy and cost effective than increasing the height of the wall. The project can be easily expanded, and farmers may use it to strengthen the protection of their land from animals. It is also compatible with a variety of other security technology. IJARSCT Volume 2, Issue 2, July 2022, ISSN (Online) 2581-9429 International Journal of Advanced Research in Science, Communication, and Technology Impact of IJARSCT's copyright DOI: 10.48175/IJARSCT-5798 168 www.ijarsct.co.in. Factor: 6.252 REFERENCES[1]. The Forestry Commission is located at Alice Holt Lodge in Wrecclesham, Farnham, Surrey, GU10 4LH [2] and Central Science Laboratory is located at Sand Hutton in York, YO41 1LZ2. Electric fence manual-Wildlife management series[3]. Sadek M.Z.E.L. The Egyptian electricity system's frequent outages should be avoided. Second Middle East Int. Conf. Assiut University, Egypt; MEPCON 92; 1992 January; 14–9p [4]. 2015 IEEE Conference on Technologies for Sustainability (SusTech): Solar Energy for Electric Vehicles[5]. Assiut University, Egypt; MEPCON 92; 1992 January; 14–9p [4]. 2015 IEEE Conference on Technologies for Sustainability (SusTech): Solar Energy for Electric Vehicles. [5]. Nomura Y.K. Solar fencing for smart agriculture. CIGRE SC-37. 1987 July 23rd Zeichen Journal Volume 6

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