

Farmer Friendly Solar Electric Fence

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Abstract: *Crops are vulnerable to animals because of this it is very essential to monitor the surrounding area of farm, where the threat of animal or human interruption is expected. In this paper we present a method to protect farm from animals by using microcontroller based electric fence circuit using other peripheral devices like solar panel, IC ULN 2003, controller circuit, driver circuit, and buzzer. The developed system is not harmful to animal and human being.*

Keywords: Solar Electric Fence

I. INTRODUCTION

Solar electric fencing is one of the efficient periphery systems to protect your property than conventional barbed wire fencing. When an animal or human being come in contact with the electric fence, they receive a sharp, short, painful but safe electric shock. The shock does not cause any physical damage. After a period of conditioning, the mere presence of the fence acts as an effective barrier even if it is not powered 'ON'. Electric fence can be made to detect a fault on the fence like shorting or cutting of the wire due to tampering on the fence with the Alarm system. Nano bright solar offers customized solutions for solar electric fencing according to your needs.

Electric fences can be used to protect farmhouses, farmlands, forest bungalows etc. from animals. Thus, electric fences are economical and practical solutions to maximize field production through controlled grazing. Electric fencing is safe, as its output is discrete (not continuous). This project works on stable multivibrator principle. A free running oscillator is designed to generate square wave and the output is given to push-pull amplifier. This square wave is stepped up to high voltage level and can be connected to the fence.

1.1 Problem Statement

- Improper fencing causes disturbance and irregular conditions in farms and agricultural fields.
- Animals invading the fields in search of food is a major problem as it destroys the crops.
- Dangerous accidents and deaths are the outcomes of careless fencing methods.
- Protection of property or land can be improvised as the older fencing methods haven't proven to be much effective.

1.2 Objectives

- Low maintenance cost.
- Highly reliable as it functions irrespective of grid failure.
- No physical harm caused to human beings or animals.
- Cost-effective.
- Makes use of renewable solar energy.
- Generally, comes with a centralized alarm system.

II. LITERATURE SURVEY

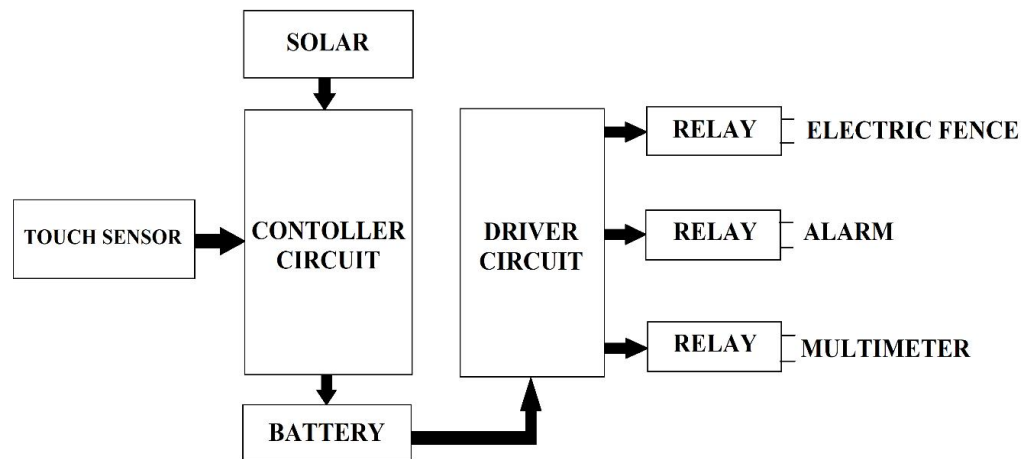
Sensor-Based Breakage Detection for Electric Fences

The human-elephant conflict is one of the most severe natural problems in Sri Lanka. This has been the main cause for nearly 70 human deaths and over 200 elephant deaths that have been recorded each year in the recent past. To manage the problem, the government has initiated projects that secure the national wildlife parks with electric fences. However, maintaining the electric fence is a challenge, because of its large perimeter and the lack of available manpower.

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 commonly used to protect premises such as buildings, cattle, large farm areas and international borders. This paper proposes a high-power electric fence energizer using standalone pv generators for remote areas. 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. A solar panel is connected to the battery to charge on day time. The battery also can be charged from house hold ac supply of 230v, 50 hz. The controller circuit prevents overcharging of the battery by regulating the voltages. The driver circuit is used to control another circuit or component. 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. CONCLUSION

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 is easily expandable and can be used by farmer to increase the security of the land from animals, and compatible with all types of additional security gadgets.

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