

Solar Operated Automatic Pesticide Sprayer

Saurabh S. Mane^{1*}, Abhishek J. Hasabe², Sandip S. Bandagar³, Vaibhav R. Kapase⁴,

Dhanappa H. Dhagare⁵, R. S. Gaikwad⁶

^{1,2,3,4,5}B.Tech. Student, Department of Electrical Engineering, Sanjay Bhokare Group of Institute, Miraj, India

⁶Assistant Professor, Department of Electrical Engineering, Sanjay Bhokare Group of Institute, Miraj, India

Abstract: In our everyday lives, agriculture plays a significant role. In Indian agriculture, traditional pesticide sprayers are used to carry backpack or fit in tractor types that demand human labor. In this study, a control system to alleviate the human effort and issues connected with backpack or tractor mounted sprayer is presented. The system will operate on a renewable energy source, solar energy. The solar panel supplies the equipment meant to spray pesticides with electricity and reduces pesticide waste with a minimum of energy and time required by man.

Keywords: Solar power, solar energy, pesticide sprayer, PLC.

1. Introduction

Agriculture was the backbone of the economy and culture in India and Nepal, which will continue for a long time as such. Pesticides sprays are necessary to protect crops from pests in agriculture. Almost 70% of the population in Nepal and India relies on agriculture [4]. agriculture is an occupation with numerous laborious procedures and practices, one of which is pesticide spraying in plants. Solar pesticide sprayer is a beneficial ergonomic, more efficient and moving machine and a source of energy utilized in a non-conventional environment. Therefore, in future it is important. Insects are responsible for the damage of crops. A present reality relating to spray is that farmers are employing hand-operated sprayer or motorized sprayers on the agricultural land of Nepal and India [5]. Carbon dioxide is a pollutant that has an adverse impact on our environment and human health. Fuel operated spray pumps These traditional sprayers are therefore not particularly effective. Insecticides are used to kill or control the reproduction of insects. Through a specific instrument called as a sprayer, these herbicides, insecticides and fertilizers will be sprayed on agricultural plants [6]. With minimal effort, sprayer delivers optimal performance. A revolution in agriculture or gardening, notably in the development of sprayers, is the creation of pesticides and fertilizers that enables farmers to get maximum farm production [8,9]. They are used to spray garden, to prevent weed and pests, to fertilize fluids and to polish flower leaves. It allows for a uniform disperse of the chemicals to throw the chemical at the desired level, precise paddy tip for adjustable streams, and to throw foggy, light, or heavy, according to requirements [7]. There are many advantageous applications of sprayers, such as ease-in-operation and maintenance, handling, etc. Capacity difficulties, decreasing

incomes, and labor scarcity, and rising consumption demands face the agricultural industry [10]. In general, renewable energies are challenged as long-term resources. Sun is the greatest and most plentiful energy source. Solar power is one of the main non-conventional energy sources. It is environmentally beneficial, largely pollutant-free energy. On the solar panel, solar power from the sun is collected. The panel consists of photovoltaic panels that generate energy between the photon and electricity. The silicon semiconductor consists of these cells.

2. Block Diagram and Proposed System

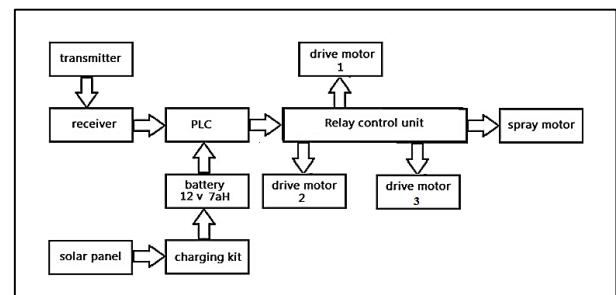


Fig. 1. System block diagram

The system runs on an internal battery 12V power supply. These batteries are recharged and are powered by various power sources. These sources were solar cells or electricity connected directly. In the wet season, however, solar cells do not operate, which means that 230V AC power is also needed.

This provides power for all electrical devices such as PLC, and also isolates the relay coil activation motor for many devices. These above are some specifics of all the equipment that operate.

If the transmitter is linked to their appropriate recipient, this signal gets to the recipient when the transmitter has pressed a button. After the recipient configured with PLC, the recipient got the data, then PLC received signal, and then its programming was based upon the respected output open/close. The power supply to the relevant motors is therefore relayed by PLC signal.

The PLC output is programmable dependent. Signal reversed/forwarded by motor comes from the PLC recipient. This project works configuration.

*Corresponding author: gajkumar.kavathekar@ritindia.edu

3. Flow Chart and Working

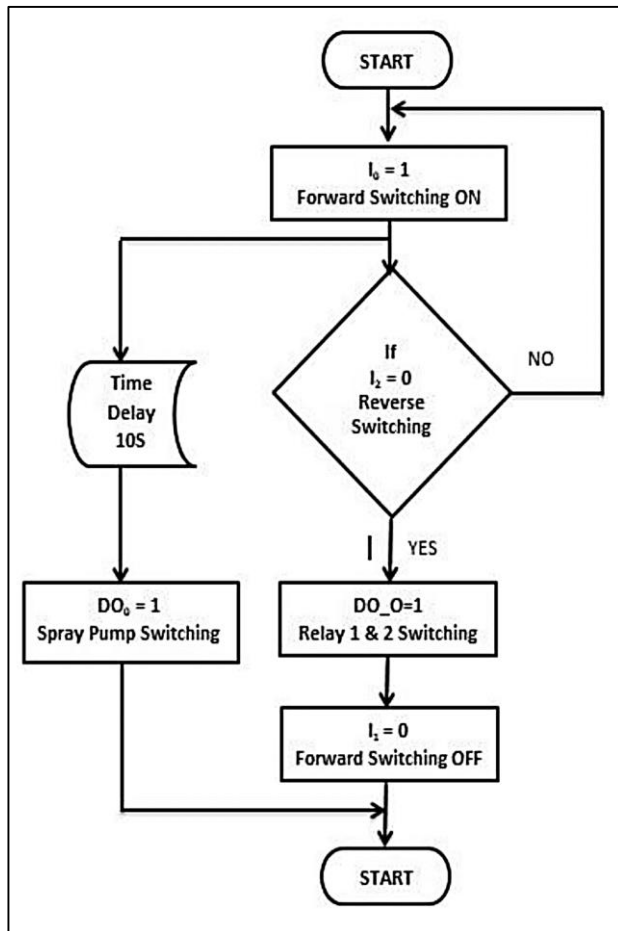


Fig. 2. Flow chart

The system, i.e. battery, is powered by 12 V. The system functions. The batteries and other sources of electricity are refreshed. It was connected to a solar cell or a direct power supply. However, due to the 230 V AC power source, solar cells do not work in the wet season.

The provision of energy for all electrical systems, such as PLC, including separated engines in many systems for relay spiral activation. Depending on this equipment, the details of every piece of equipment. If the transmitter is connected to its specific receiver, and the transmitter is pressed on any button,

the signal is transmitted to the receiver. After PLC has been installed, the beneficiary has obtained the data, and then a signal is given to the PLC. This transmits the PLC signal to the relay that supplies power to the motors. The PLC output is depending on programming. The PLC receiver provides the signal forward/reverse motor.

4. Conclusion

By using the PLC, the suggested system will be automated. The system will use renewable energy as a source of solar energy. The solar panel will give energy to the pesticide sprinkler system and minimize pesticide waste and time consumption. The sprayer timing and robot movement is controlled by the PLC. In order to reduce farmers' labour costs, the technique is helpful for small and large-sized farmlands.

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