

# SOLAR PANAL CLEANING BY USING ARDUINO

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**Abstract** - Dust and dirt particles accumulating on Photovoltaic (PV) panels decrease the solar energy reaching the cells and thereby reducing their overall power output. Hence, cleaning the PV panels is a problem of great practical engineering interest in solar PV power generation. In this project, the problem is reviewed and methods for dust removal are discussed. In this project Arduino based electro mechanical system is proposed to use as a cleaning mechanism and it will try to clean the solar panel and increase the efficiency of solar panel.

**Key Words:** — Photovoltaic (PV), Return on investment (ROI), Arduino

## 1. INTRODUCTION

In day to day life use of renewable energy is increasing so that there are several types of electrical energy generation method are available. In that solar power generation is the way of energy generation which is widely used in renewable energy system. Solar panel is the combination of different auxiliary's in that solar PV cells, glass, output collectors are come. If we want the high generation then we want the 100% efficiency of the solar panel then the temperature control, dust control this methods are used for increasing the efficiency of solar panel. There are various methods are available for this methods in that for temperature control we can split the water on the surface of the solar panel and for the dust control method we can clean it by using gear mechanism, bearing mechanism, high pressure steam mechanism etc.

In this project we are trying to clean the solar panel and clean the dust of solar panel by using electromechanical shaft due to which the solar panel cleaning will be done and the efficiency of the solar panel will be increases due to which the output of the solar panel increases and it make the energy efficient solar panel. In the mechanism we are using some advance technology which is Arduino based and also the RTC is used for the timing control. There are some motors are used for controlling the movement of shaft and the pumping the water for cleaning of solar panel. It is totally timer based system in which the cleaning time and also the water splitting time is given by using keyboard and this time is display on the LCD screen. We are set this time as per our requirement when the solar panel is dirty at that period we set the set point then system will clean the solar panel

This is fully automatic system which is work as per the set

point. When the set point is come system automatically turn on the water splitting and then automatically the movement of the shaft is started. By this way our solar panel cleaning system by Arduino is done.

## 1.1 Problem Identification

In the previous system to clean the solar panel we are using the manual operated system. In that there are various errors are come sometimes due to manual error improper cleaning of solar panels is takes place also due to bird waste and dust and dirt is accumulated on the surface of the solar panel due to which the efficiency of the solar panel is reduces. Also the time to time cleaning of solar panel is not take place due to which it harms the solar panels.

Also if we want to clean the solar panel mechanically then there is wear and tear is created due to which losses of the system are increases. And the system efficiency is decreases so this system is also not energy efficient.

## 1.2 Scope

When any one can make the project there are some outcomes are required like that in our project there are various outcomes such as dirt and dust will be clean then the birds waste accumulated on the solar panel will be clean and the more amount of solar radiation will be consume by solar panel, due to which the electrical output of the solar panel will be increase and the efficiency of the solar panel is increases.

## 2. METHODOLOGY

Solar panel cleaning system is required for cleaning the solar panel and protection from birds waste, dust and dirt. By using human solar panel cleaning system was cleaned previously but it has some disadvantages like chances of accidents, it required large time for cleaning. Hence we are implementing this system automatic solar panel cleaning system.

In this system all the automation is taken place by using Arduino board and timer control. By which without human interference solar panel cleaning system will be automatically turn on and automatically turn off.

In this system we will set the timing on that particular timing water from nozzles will be automatically sprinkled on the solar panel and then after electromechanical shaft will be

turned on and start the solar panel cleaning by moving upward and downward direction. After cleaning electromechanical shaft will be turned off. And again water will be sprinkled on the panel. By this way automatic solar panel system may be work.

This system will be automatically turned on automatically by using real time clock it will count for the 24 hour timing it does not required any human interference. And also it will be automatically turned off by using RTC. By this way automatically solar panel cleaning system will be work.

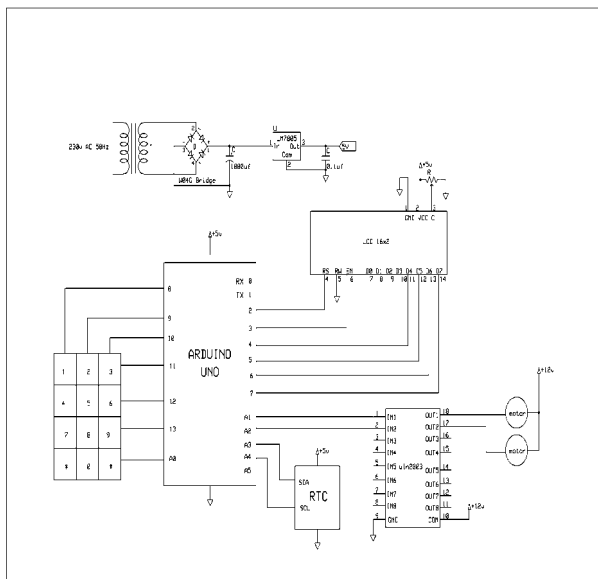


Fig -1: Circuit Diagram

This Fig no 1 shows the how we are creating the circuit of our project. Due to which overall project will be run. By using this way we are use the pins of components. There is separate power supply is connected of 5v.by using this circuit we run this project.



Fig -2: Hardware components of project

Then we are decided to use the Arduino based automatic system which is beneficial for our project then by using different components data sheets we are decided the project components.

Then by using the protius software we draw the circuit diagram and by using express PCB software we draw the schematic diagram

Then as per schedule we had done the soldering of different components by using data sheet. Here there is no need of PCB board because of inbuilt features of the Arduino.

Those are the hardware components used in this project in that following are the main components.

Arduino

- RTC
- Keypad
- LCD
- Connecting wires

We are done the programming of Arduino which will control the operation of the system .we are done the interfacing of all the components with the Arduino all component receive information from Arduino.

### 3. CONCLUSION

In our project we studied about solar panel cleaning by using Arduino .in this project we trying to clean the solar panel and clean the dust of solar panel by using electromechanical shaft due to which solar panel cleaning will be done .This is used for increase the efficiency of output & reduce the human effort.

### ACKNOWLEDGEMENT

I feel great pleasure to present this project dissertation but it would be unfair on our part if we do not acknowledge efforts of some of the people, without the support of whom this work would not have been a success.

I would like to express my sincere gratitude to respected **Prof. Shaikh N. B. , HOD of Electrical Engineering Department** and **Dr.KTV REDDY** of **SVIT, Chincholi** for finding out time and helping me in this project work.

I am also thankful to all **Teaching and Non-Teaching staff** member of Electrical Engineering department who has helped me directly or indirectly during this work.

Last but not least I wish to express my gratitude to **my loving parents & friends** and all well-wishers for their moral support during completion of this project work.

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