

# Electronic Voting Machine with Solar Tracker

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## Abstract:

The main aim of this project is to design a machine which can be used to get results in elections as well as this machine can be used in the rural areas since the power available is less. We are using a solar tracker through which we can get solar power and we can transmit the solar power to the electronic voting machine. The solar tracker which we are going to use in this project is not a stationary tracker. It is a single axis movable solar tracker. The components been used for solar tracker are two LDR'S, a battery, dc motor,motor drive and ATMEGA8 AVR micro controller. While coming to EVM components we make use of LCD, three RFID cards and three buttons along with a buzzer. The power from solar panels is sent to the battery and the power from the battery is used for working of EVM. The solar panel has the capability to move from east to west as well as from west to east with help of dc motor. So, we can obtain maximum output. While coming to electronic voting machine, voters can vote by using RF(radio frequency)ID card. Then the information is sent to the micro controller.

## Keywords:

SOLAR PANEL, EVM, RFID, AVR.

## 1. Introduction

As we are suffering from energy crisis, solar energy can be used for the working of machines. This solar energy can be obtained from sun without any limit and free of cost. This decreases the consumption of electric power also. By making use of solar panels which are made up of photo voltaic silicon cells. We can generate power and send it to the battery. The EVM receives its power from the battery. Thus, the further procedure of the voting can be done with the help of RF card, radio frequency power transmitter and a display(LCD). This project can be used in the village areas. This can be replaced in the place of balloting papers. The balloting papers method of voting is not completely secured. They may lose the papers. But this EVM based on solar tracker is completely safe and secure.

In this unit-1, we are discussed about introduction of EVM with solar tracker.In unit-2, we discussed about existing

system of solar tracker and EVM.In unit-3, we discussed about proposed system of EVM solar tracker. In unit-4, we discussed about circuit description.In unit-5, we discussed about output diagram and result. In this unit-6, we are discussed about conclusion.In this unit-7, we are discussed about future scope.In this unit-8, we are discussed about references



Fig.1

Solar Tracker.

## 2. Problem Statement

There are many solar trackers existing in the market. We can easily abstract solar energy by making use of those solar trackers. But we cannot get complete 100% output from those solar trackers. It is because they are non-movable solar trackers. Due to which we cannot get 100% output. The position of the panel will be stable and sun direction keeps on changing. So, the power obtained will be very low. This problem can be rectified using a movable solar panel. This panel is a single axis panel which moves according to the direction of the sun. It can be obtained by using two sensors (LDR) placed at top and bottom of the solar panels. If the light rays falls on the LDR's they keep changing the direction where the intensity of light is more. This can be used especially in the areas where the source of power is low. The voting process can be easily done by using this system. It reduces the problems of low electricity or no electricity in critical conditions and provides better security to the data stored in it.

### 3. Existing System

The solar trackers we are using at present are stationary and fixed. Though they cost less, they have many disadvantages like low power output. So, the power that is to be transferred for EVM working will be reduced. So, it can gradually create disturbance during the EVM (electronic voting machine) working. These are applicable in the cases where the use of power is low. They can be constructed easily without using a dc motor also, as they are non-movable. The major disadvantage of these solar trackers are, they cannot obtain output whole day. When the direction of sun changes, the power obtaining also changes.



Fig.2

Electronic voting Machine.

### 4. Proposed System

To reduce the drawbacks we have seen in the existing system, we are using a movable single axis solar tracker. This obtains more solar power while comparing to the stationary solar tracker. It can be made

BLOCK DIAGRAM



Fig.3

Block Diagram Of EVM Solar Tracker.

Possible by using dc motor along with motor drive which helps the panel to move. We are going to use the power obtained from solar power for the working of EVM. Components we are using are microcontroller, two LDR sensors, L293D motor drive, dc motor, LCD, buzzer, 4 buttons [3 as voter names and one for checking result] solar panel, battery, and RFID card.

#### 4.1 Micro Controller

We are using AVR ATMEGA8 micro controller. This micro controller is a chip used in embedded system for performing specific tasks required for the user. AVR can perform operations like 8,16,32 bits. It consists of 28 pins with ports-A,B,C,D

#### 4.2 Sensors

In this project we are using two sensors. They are LDR's (Light dependent resistor) one is placed at the top of the solar panel and the other one at the bottom of the solar panel. When the sun rays falls on the panels, the light rays are absorbed by the LDR's. Based on the intensity of the light falling, the direction of the panel changes. If the intensity of the light is more on the top LDR the panel moves towards the direction and if the intensity of light is more on bottom LDR, then the panel moves towards the bottom direction.

#### 4.3 DC Motor

We are using L2893D dc motor. This is basically used for the moment of panel from one

direction to another direction. It converts dc electrical energy into mechanical energy.

#### 4.4 LCD

LCD (liquid crystal display) is a device used to display the names of voters. The operation which is taking place in micro controller can be observed from the screen of LCD. When the RF card is scanned, then the LCD displays whether the card is an authorized card or an unauthorized card.

#### 4.5 Buzzer

Buzzer is used in emergency actions. For example, a person is voting for the second time then the buzzer will be on. Even if a person is from non-local area and tries to give this vote then the buzzer will be makes Sounds.

#### 4.6 RFID

RFID stands for radio frequency identity detection. We are using a microchip inserted in the RFID tag. This RFID tag consists of 12 digit data through which the identification of the voter can be done. We are also using RFID reader; it is a radio frequency power transmitter. The Range of RFID tag from RFID card ranges from 10-30 Cm.

#### CIRCUIT DESCRIPTION:

When the light rays falls on the solar panels, the LDRs placed at the top and bottom of the panel sense them. The information will be sent to the microcontroller. This microcontroller converts the light from analog to digital form i.e, the ADC value is to be calculated and the value is sent to the dc motor. Thus the DC motor rotates. In this way the changes in the solar rays is sent from LDR to micro controller, Micro controller to panel is done. Finally, the power obtained is sent to battery. The battery sends the power to EVM. In an EVM, when a person wants to vote he should the RF tag. The information about

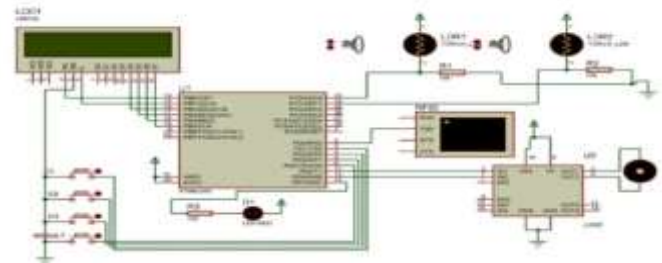


Fig.4

Circuit Diagram

the person is stored in the microchip of RF tag. The person keeps the RF tag near RF reader, then it shows the card is authorized or unauthorized. If the card is authorized there will be three buttons one button for each nominee voter. So there are three nominee voters. Person should press on the button on the nominee voter, he wishes to vote. The data is stored in micro controller. The result can be seen in the by clicking on the fourth button. If the card is unauthorized it will be displayed on LCD as “UNAUTHORISED”. The buzzer will also be on. While coding for micro controller and EVM we are using Proteus design suite software for simulation and AVR GCC for compiling. This process is done on “AVR STUDIO 4”.

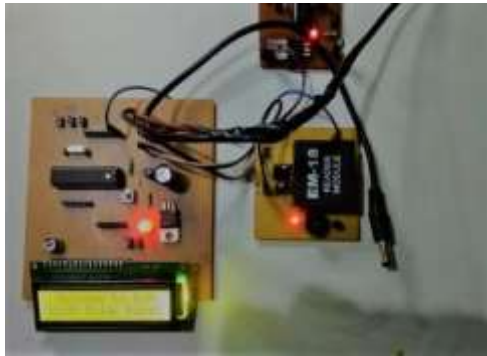
### 5. OUTPUT RESULT



Fig.5

Output Of EVM Solar Tracker

We have worked on the drawbacks of the stationary solar tracker. This solar tracker is capable of obtaining 100% output from solar energy. The EVM constructed at the end can be used at any critical conditions and rural areas where electricity is low.



## 6. CONCLUSION

This paper has presented a new method of solar tracking which gains maximum power from the sun with the help of AVR micro controller and dc motor. The attractive feature of EVM with solar tracker is its easy to construct and the data stored is secured.

## 7. FUTURE SCOPE

1. Solar trackers generate more electricity comparing to stationary due to increase in the direct exposure to sun rays in any direction either from west to east or east to west.
2. In many advanced versions of EVM there is no external communication networks involved by which it makes hackers to hack it difficultly.

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