

# MICROCONTROLLER BASED SOLAR GRASS CUTTER

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## Abstract

*Robotization is vital in Electrical Engineering. The reason for this paper is to plan a programmable programmed design configuration grass cutting motor with solar based cutter which no longer requires tedious manual grass cutting, and that can be worked remotely from a protected distance which is fit for cutting the grass in for sure required shapes and examples; the cutting sharp edge can likewise be acclimated to keep up the distinctive length of the grass.*

*This paper is fundamentally arrangements to plan a model that can work with a practically no Physical client cooperation. The proposed work is cultivated by utilizing a microcontroller, DC Motors, DC battery, sun powered board, and so on.*

**Keywords:** Automation, Solar Grass Cutter, Microcontroller, Motor, Solar Panel, Battery.

## 1. INTRODUCTION

The savvy grass cutter framework advances a totally robotized yard trimmer component. The mechanical vehicle is furnished with a grass cutter edge that takes into account grass cutting at high RPM. The framework has a brilliant usefulness that permits it to cover the total zone of a grass or nursery by distinguishing corners utilizing ultrasonic sensor and moving in a crisscross way to cover the whole region[1].

This effective framework utilizes a microcontroller based circuit to accomplish this usefulness. It is a battery worked framework that utilizes 2 batteries. One battery is utilized to run the vehicle development DC motors and the other one is utilized to control the grass cutter motor.

Additionally the framework utilizes a sun based board to show the charging of vehicle development battery. The microcontroller works the vehicle development dc motors just as the grass cutter simultaneously as observing the ultrasonic sensors. The microcontroller keenly works the dc motors utilizing the motor driver IC to accomplish wanted development dependent on ultrasonic sources of info [2].

The framework additionally utilizes a gyro sensor to accomplish wonderful 180 degree turns to accomplish total grass/garden inclusion. Hence this framework takes into account completely mechanized grass cutting framework without the requirement for any human intercession.

## 2. OBJECTIVES

There are a couple of benefits of using this structure, for instance, –

- a) To get familiar with the working of programmed sunlight based force grass cutter.
- b) To lessen the human endeavors, wounds and diminish utilization of electrical power.
- c) To advance horticulture computerization.
- d) To diminish grass reducing expense.
- e) To lessen human mistakes.

## 3. METHODOLOGY

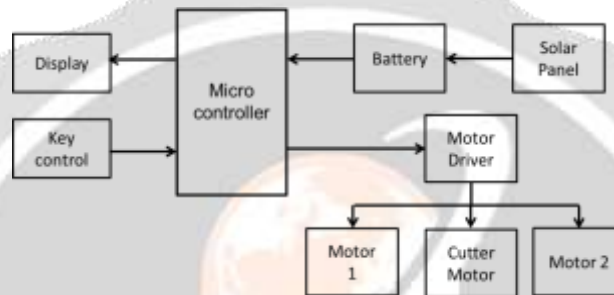


Fig.3.1. Block diagram

### 3.1 Microcontroller

The main controlling device used will be microcontroller board as shown in Fig.3.1. It requires +5V power supply and it can source 20mA current at its I/O pins.

### 3.2 LCD Display

LCD display module as shown in Fig.3.2 works on input voltage range of 4.5 to 5.5V. It consists of total 16 pins. We are using LCD display to take inputs from the user. It consists of two registers- command register and data register[7]. It requires 1 mA current for its operation.

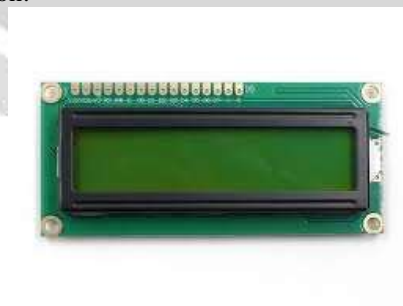


Fig.3.2. LCD Display

### 3.3 Motor Driver

Usually the current required by dc motor is more than what is available at the microcontroller pins. Therefore when we need to control dc motor through microcontroller, motor driver ICs are required to boost the current level.

This IC consists of 16-pins which can be used to control two DC motors simultaneously. The current capacity of this driver is 600 mA, thus using this we can drive small and medium sized motors

### 3.4 Rechargeable Battery

Solar panel produces electricity in the daylight only. So, it is required to store the electricity produced by solar panel [6].

### 3.5 Solar Panel

A solar panel is nothing but solar photovoltaic cells used to convert solar energy into electricity [5].



Fig.3.3 Solar Panel

The solar panel is connected to the battery through charge controller which controls the charging voltage and current for the batteries[4].

### 3.6 Key control

Keypad is used to to change the speed of the the motor as well as to switch ON & OFF purpose.

## 4. WORKING

Working of grass cutter Coming to the working of solar based grass cutter, it has board mounted on top of model in a specific course of action with the end goal that point of tendency is 45 degree consequently it tends to be get extreme focus sun oriented radiation without any problem.

Solar oriented board changes over sunlight based energy into electrical energy. This electrical energy is put away in the battery.

## 5. ADVANTAGES

Diverged from the standard development, this model has clear advantages, yet its headway constant to be limited by various components, which needs the assessment.

This system may have the Advantages as-

- Compact size and Portable.
- Easy to move starting with one spot then onto the next place.
- Operating guideline is straightforward.

- Non gifted individual can likewise work this.

## 6. DISADVANTAGE

- The eventually disposal of battery is problematic.
- The motor in cordless cutter lend to be less powerful than gasoline motor of same total weight.

## 7. CONCLUSION

This paper entitled solar based grass cutter will occupy less space and light in weight and as it uses nonconventional source of energy hence running cost is zero. It has facility of charging battery while grass cutter is in the working condition. The cost of solar based grass cutter will be less than the market grass cutter. Grass cutter is used to keep the lawn clean and uniform in schools, gardens and playgrounds.

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