

SOLAR OPERATED HYDROPONIC GRASS AUTOMATION

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ABSTRACT

Hydroponics is the technique of growing grass without soil. On the surface, the concept of putting 1 kilogram of grain into a hydroponic system and producing six to eight kilograms of green sprouts, independent of weather and at any time of year, is appealing. In this process like growing a lot of feed, the increase in fresh weight is due to water and most beneficial fact is there is a reduction in dry matter weight compared with the initial grain. In this project we have provide automation to control the hydroponic system like as temperature control and humidity monitoring and control the supply of water by using the float sensor we can also sense the water level.

KEYWORDS: Arduinio, Atmega 328p, Temperature-Sensor, Float Sensor, humidity sensor, Solar charge controller.

I. INTRODUCTION

In hydroponic fodder production present system there is lack of technological aspect. We are develop such a system in that we overcome the problem that problem today we are faces for food production are the following

1. No soil is required.
2. The quantity of water required is less than the normal fodder production.
3. No need of pesticides.
4. Fodder produced from this system is healthy and it does not produce any harmful effect on animals.

In such that system we will provide automation due to that we reduce the man power as well as increase the capacity of fodder generation. In this technology we use arduino controller that controller monitor all the parameter and

work according to the set values. So there is no requirement of any person to monitor the system. The automation system required dc +5volt Supply for that supply we use the solar plate the solar generation used for working of the system and for sprinkler we use motor of single phase supply. Only we required single phase external supply for motor. For brightness at the time of night the light sensor is provided. The lights will be automatically on at the night and off at the day. According to the coding the controller controls the motor on off time that we are set in the code. Relay circuit act as a driver circuit to drive the output devices connected to the supply and the controller.

II. BLOCK DIAGRAM

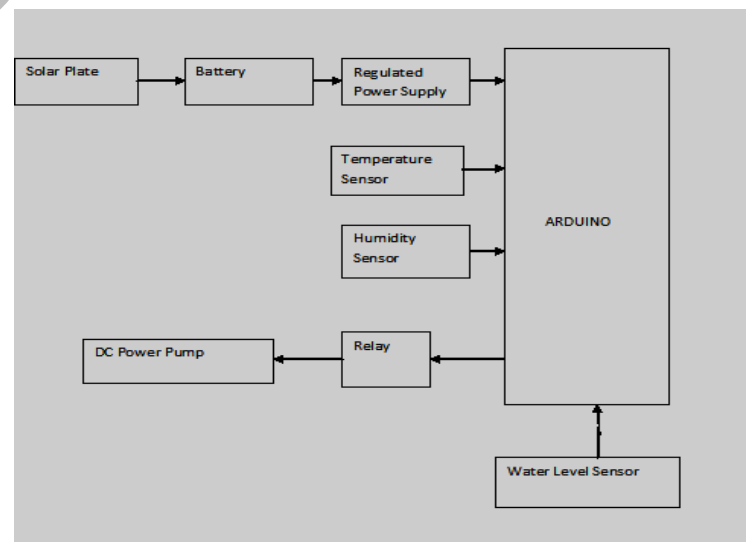
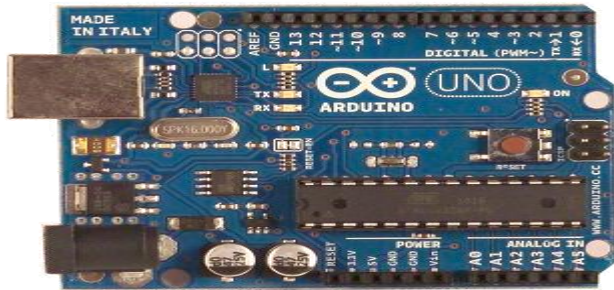


Fig: Block Diagram

A- ARDUINO

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins

(of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDIUSB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.



Photograph-Arduino

B-FLOAT SENSOR

A float switch is a device used to detect the level of liquid within a tank. The switch may be used in a pump, an indicator, an alarm, or other devices. Float switches range from small to large and may be as simple as a mercury switch inside a hinged float or as complex as a series of optical or conductance sensors producing discrete outputs as the liquid reaches many different levels within the tank.

C-TEMPERATURE SENSOR

National Semiconductor LM35I has been used for sensing the temperature. It is an integrated circuit sensor can be set to measure with an electrical output proportional to the temperature in degree Celsius.

D-HUMIDITY SENSOR

The humidity sensor HIH 4000 is used in this system. It delivers instrumentation quality RH (Relative Humidity) sensing performances. Relative humidity is measured in percentage of the vapor in the air compared to the total amount of vapor that could be held in the air at given temperature.

E-GSM MODULE

A GSM module is a specified type of module which accept the SIM card ,operates over a subscription to a mobile operator ,just like a mobile phone .when a GSM module connected to a computer, to used the GSM module communicate over the mobile network. This GSM module used frequently used to provide mobile internet connectivity.



Photograph- GSM

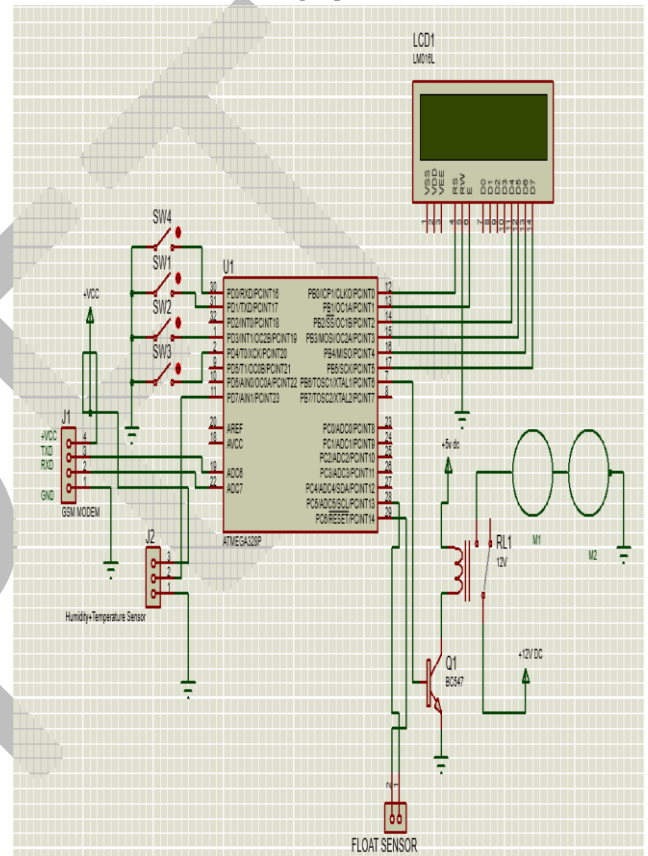


Figure- Circuit Diagram

F-CIRCUIT DIAGRAM OF POWER SUPPLY

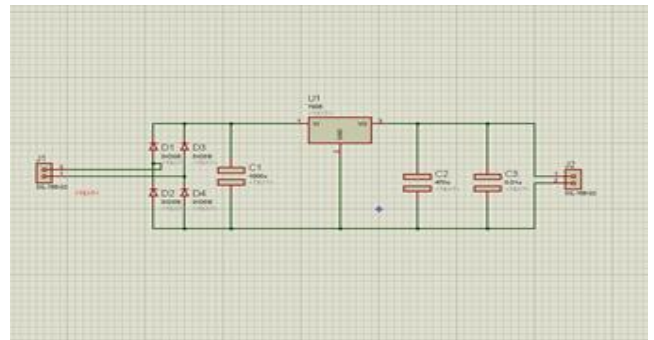


Figure: Circuit Diagram of Power Supply

The above figure show circuit diagram of power supply. In this the DC input is given to the bridge rectifier which converts the voltage to desired voltage level. Then output

of rectifier is given to the filter which gives filtered output means filter converted the pulsating DC to pure DC. The output of filter is given to the voltage regulator for the regulate the voltage means constant output voltage which is required for the system. In this power supply we have used the voltage regulator IC7805 because we required 5V DC supply for whole system. And hence we get constant 5V DC output to the output pins of the power supply.

RESULT

From observation of this project we know that the seeds of maize take 24 hours for the germination. The mass of the crops increased to 6 kg from 1kg in around 10 days. As the normal system take nearly equal to 1 month for the same amount of fodder production. The seeds grew to about 8 inch height in 10 days. In this system no special efforts are required to check the indoor air quality and humidity due to automation system. Humidity as well as temperature will be automatically maintained by spraying the water on the hydroponic fodder.

It will be directly control the battery charging supply whenever the battery will be full as well as down below the charge level.



Photograph-Fodder under growth



Photograph-Fodder for harvesting



Hardware of Automatic control



Photograph-Seed under germination

CONCLUSION

The main aim behind this project is to create an automated hydroponic system for farmer which is controlled by some conditions like as temperature and humidity also we use the renewable energy for power supply.

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