Solar Powered Auto Irrigation and Soil Health (SPAISH) System Based on GSM Technology

[1]Ramdayal kumawat,

[1] Department of Mechanical Engineering
[1]Geetanjali Institute of Technical Studies Dabok, Udaipur, India

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Abstract : The task is designed to broaden an automated irrigation system which switches the pump motor ON/OFF on sensing the moisture content of the soil. in the discipline of agriculture, use of right technique of irrigation is crucial. The gain of the usage of this method is to lessen human intervention and nevertheless make certain right irrigation. The challenge uses an 8051 collection microcontroller that is programmed to receive the input sign of various moisture condition of the soil via the sensing arrangement. that is performed by way of using an op-amp as comparator which acts as interface among the sensing association and the microcontroller. as soon as the controller receives this sign, it generates an output that drives a relay for working the water pump. An lcd show is also interfaced to the microcontroller to show fame of the soil and water pump. The sensing arrangement is made by using using two stiff metallic rods inserted into the sector at a distance. Connections from the steel rods are interfaced to the manipulate unit. another concept of GSM era additionally included in that on every occasion the water pump switches ON/OFF, an SMS is delivered to the involved man or woman regarding the reputation of the pump. We also can manipulate the pump thru SMS. In sure volume the involvement of pH/NPK sensor make the device for higher assessment of soil substances and hence fertilizer can be regulated.

Keywords: GMS Technology, Microcontroller Automatic Sprinkle Ph NPK .

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I. INTRODUCTION

Continuous increasing demand of food requires the control in highly specialized greenhouse vegetable rapid improvement in food production technology. In a production and it is a simple, precise method for country like India, where the economy is mainly based on irrigation. It also helps in time saving, removal of human agriculture and the climatic conditions are isotropic, still error in adjusting available soil moisture levels and to we are not able to make full use of agricultural resources. Maximize their net profits. The main reason is the lack of rains & scarcity of land Irrigation is the artificial application of water to the soil reservoir water. The continuous extraction of water from usually for assisting in growing crops. In crop production earth is reducing the water level due to which lot of land is it is mainly used in dry areas and in periods of rainfall coming slowly in the zones of un-irrigated land. Another shortfalls, but also to protect plants against frost. Very important reason of this is due to unplanned use of Types of Irrigation water due to which a significant amount of water goes to surface irrigation waste. Localized irrigation in modern drip irrigation systems, the most significant Drip Irrigation advantage is that water is supplied near the root zone of sprinkler irrigation. The plants drip by drip due to which a large quantity of water is saved. At the present era, the farmers have been the conventional irrigation methods like overhead using irrigation techniques in India through manual control sprinklers, flood type feeding systems. At introduced GSM SMS remote measurements and control greenhouse data based system with base station. Base station is developed by microcontroller, GSM module, sensor and actuator. Mainly focuses on field of remote monitoring on control potential advantages an automated irrigation unit is conjunction with a low-cost. The moisture sensor is proposed in this paper. A system level description is provided and detailing the hardware and software design. The subsequent section introduces the GSM technology.The two sections are provided detailing hardware and software used by some description of the experimentation.

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II. Solar Power Auto Irrigation System

   As we know that it is very difficult in agriculture field to control the water pump manually. One has to visit in fields to switch ON and OFF. In worldwide, where electricity is the main problem, villagers frequently don't have the electricity. In that situation, solar energy is used to give the power to water pumps. In this type of irrigation system, the solar charge controller is employed to store DC power of solar panels in batteries. This battery is used to give the power supply to water pumps automatically.Solar powered auto irrigation system work in the sunlight. When the sun shines the water, pumping process is a sensible way of solar energy use throughout the summer, as the water need is the highest. The water pump which is used will provide a reliable water source for plantation. For any solar based water pumping system, the ability to drive water is a function of three variables like pressure, power, and pressure. These three essential components are used in this solar powered auto irrigation system.

1 Block Diagram of Solar Power Auto Irrigation System

The main objective of this solar powered auto irrigation system is to develop an irrigation system in the agriculture field with the help of Solar Energy. The required electrical and electronic components of this proposed system are Solar Panel, 8051 series Microcontroller, water pump, an operational amplifier, LCD, Relay, MOSFET(Metal oxide Semiconductor FET), Motor, Diodes, Voltage Regulator, Resistors, Capacitors, LED, Crystal and also Transistors.
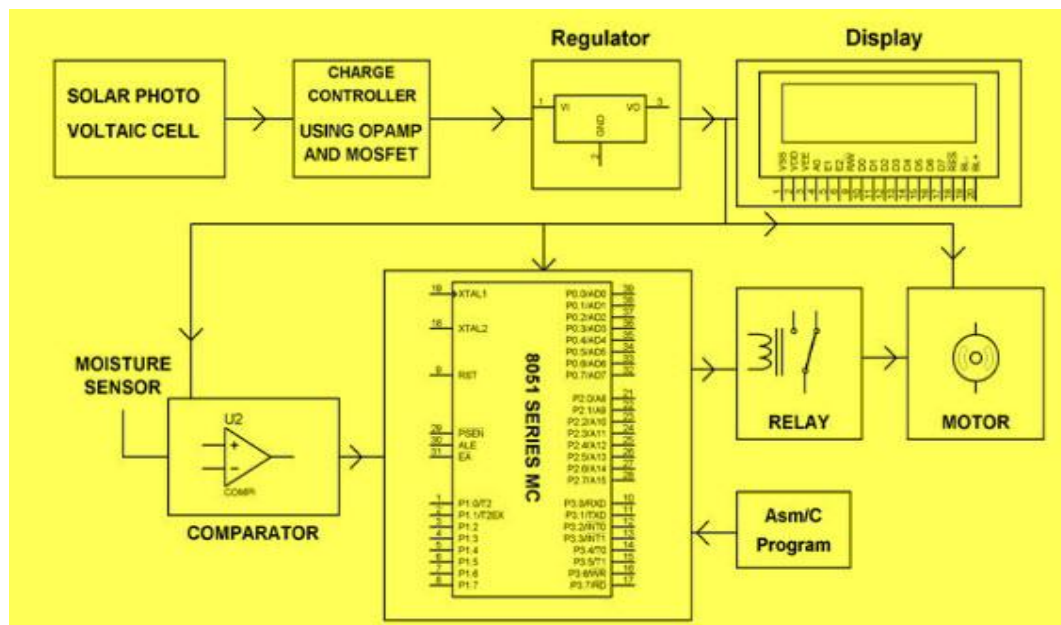
Solar Powered Auto Irrigation System Block Diagra

2 Structure of GSM Module

At present the GSM module is used for Remote Control performance such as Gate Control and Temperature Control. GSM/GPRS component consists of a GSM/GPRS modem assembled equally with power supply circuit and communication interfaces for computer. The MODEM is the spirit of such modules. They generate, transmit or decode data from a cellular network, for establishing e-mail linking the cellular network and the computer. These are pretend for specific cellular network (GSM/UMTS/CDMA) or specific cellular data standard technology(GPS/SIM). They use serial email to interface with the user and need Hayes well-suited AT commands for e-mail with the computer (any microprocessor or microcontroller system).

III. IRRIGATION

Little water is lost to deep percolation if the proper amount is applied. Drip irrigation is popular because it can Irrigation system uses valves to turn irrigation ON and increase yields and decrease both water requirements and OFF. These valves may be easily automated by using labour. Controllers and solenoids. Automating farm or nursery Drip irrigation requires about half of the water needed by irrigation allows farmers to apply the right amount of sprinkler or surface irrigation. Lower operating pressures water at the right time, regardless of the availability of and flow rates result in reduced energy costs. Automation equipment are able to reduce runoff from over Plants can be supplied with more precise amounts of watering saturated soils, avoid irrigating at the wrong time water. Disease and insect damage is reduced because plant of day, which will improve crop performance by ensuring foliage stays dry. Operating cost is usually reduced. Adequate water and nutrients when needed. Automatic Federations may continue during the irrigation process Drip Irrigation is a valuable tool for accurate soil moisture because rows between plants remain dry. The capacity of soil to retain water is a function of soil texture and structure. When removing a soil sample, the soil being evaluated is disturbed, so its water-holding capacity is altered. Indirect methods of measuring soil water are helpful as they allow information to be collected at the same location for many observations without disturbing the soil water system. Content without any need for soil density determination. The new soil moisture sensor uses Immersion Gold which protects he nickel from oxidation. Electrodes nickel immersion Fig. 1 Overview of Automated Irrigation System gold (ENIG) has several advantages over more conventional (and cheaper) surface plating such as The above fig 1 explains about important parameters to be HASL (solder), including excellent surface planarity measured for automation of irrigation system are soil (particularly helpful for PCB's with large BGA packages), moisture. The entire field is first divided into small good oxidation resistance and usability for untreated sections such that each section should contain one contact surfaces such as membrane switches and contact moisture sensor. These sensors are buried in the ground at points required depth. Once the soil has reached desired moisture a soil moisture sensor can read the amount of level the sensors send a signal to the micro controller to moisture present in the soil surrounding it. It's a low tech turn on the relays, which control the motor. Sensor but ideal for monitoring an urban garden, or your .In proposed system, automated irrigation pet plant's water level. This is a must have tool for a mechanism which turns the pumping motor ON and OFF connected garden. On detecting the dampness content of the earth. In this sensor uses the two probes to pass current through domain of farming, utilization of appropriate means of the soil, and then it reads that resistance to get the irrigation is significant.

IV. MOISTURE SENSORS

The sensor is work on the change of moisture content presented in soil. When being dried and when called into action, if there is moisture into a process. These are the types of sensors mainly used for
Interfacing with Microcontroller to detect the liquid levels. Moisture detection for automatic watering of plants. Liquid level detected by putting multiple probes at each liquid level. The present proposal is a on the characteristics of the local soil, such as soil density model to modernize the agriculture industries on a small and soil texture. Scale with optimum expenditure. Using this system, one the basic technique for measuring soil water content is the can save manpower, water to improve production and gravimetric method. Because this method is based on ultimately profit. Direct measurements, it is the standard with which all other methods are compared.

V. CONCLUSION

Irrigation in farming becomes simple, accurate and viable with the same soil sample impossible. Because of the idea above shared and can be implemented in agricultural difficulties of accurately measuring dry soil and water fields in future to promote agriculture to next level. The Volumes, volumetric water contents are not usually output from moisture sensor and level system plays major determined directly.

VI. FUTURE WORK

Many features can further be added to this system which includes web-based communication, mobile alerts and weather adaptive systems. This type of system is a good solution for condition monitoring of agricultural setups as it is low in cost. This idea should be implemented to large scale farms in the form of sensor grids in which each sensor will be treated as a GSM. Each node is then connected to GSM master receiver, which then feeds data into hub for further processing. They provide water supply to specific part of the farm house using GSM through sms.

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