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GSM SMART IRRIGATION SYSYTEM SYSTEM

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ABSTRACT

The purpose of this project is to design a system which monitors and controls the water flow to an irrigation system using Mobile Phone through GSM and monitoring temperature and humidity. This project also consists of GSM module for remote monitoring and control of water supply to irrigation system. Whenever the SMS sent through GSM then this information is sent through command received by microcontroller GSM and switches ON or OFF the electrical water pump. This smart irrigation system automatically continuously monitors the live temperature and humidity and send to authorized person. The design of this system is very much sensitive and should be handled with utmost care because the microcontroller is a 5 volts device, and it is employed to monitor the operation of high voltage water motor. So, every small parameter should be given high importance while designing the interfacing circuit between the controller and the water motor.

Keywords: Smart irrigation, GSM, Control of water supply.

1. INTRODUCTION

Major source of income is from agriculture sector and 70% of people depend on the agriculture, most of the irrigation systems uses traditional methods which are operated manually. Two scarce and valuable resources of irrigation, that is water and energy are not efficiently utilized by the current irrigation system. Today's advanced society has turned into a digital world through the contribution of technology, now we are living in such an era where technology is studied to improve our lifestyle. Hence to make life simpler and convenient smart watering system had been introduced. Major source of income is from agriculture sector and 70% of people depend on the agriculture, most of the irrigation systems uses traditional methods which are operated manually.

Two scarce and valuable resources of irrigation, that is water and energy are not efficiently utilized by the current irrigation system. Today's advanced society has turned into a digital world through the contribution of technology, now we are living in such an era where technology is studied to improve our lifestyle. Hence to make life simpler and convenient smart watering system had been introduced. A model of controlling irrigation facilitates helping millions of people. India's Smart watering system can be defined as the science of artificial application of water to the soil depending on the soil moisture content. With the advent of open-source Arduino boards along with the moisture sensor, it is viable to create devices that can monitor the soil moisture content and accordingly irrigate the fields or the landscape when needed.

The proposed system makes use of microcontroller ATMEGA328P on Arduino Uno platform and GSM which enables farmers to remotely monitor the status of water level in the soil by knowing the sensor values thereby, making the farmers work much easier as they can concentrate on other farm activities. The agricultural sector has its largest contribution in the Indian economy. Agriculture uses 85% of available freshwater resources worldwide, and this percentage will continue to be dominant in water consumption because of population growth and increased food demand.

As our country is an agriculture- oriented country and the rate at which water resources are depleting is a dangerous threat to the mankind. Hence there is a need for an efficient way of irrigation. Major source of income is from agriculture sector and 70% of people depend on the agriculture, most of the irrigation systems uses traditional methods which are operated manually. Two scarce and valuable resources of irrigation, that is water and energy are not efficiently utilized by the current irrigation system.

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This project is designed to develop an automatic irrigation system which controls the watering in the fields depending on moisture content of the soil. The main advantage of this project is to reduce human intervention and still ensure proper irrigation. The aim of this project is to provide water to the plants or paddy fields automatically using microcontroller (Arduino Uno). There are many timer-based devices available in the market which water the soil at a set interval. But they do not sense the soil 4 moisture and the ambient temperature to know if the soil needs watering or not. The control unit of the system receives the signal of varying moisture condition of the soil through the sensing arrangement. The system has a network of soil-moisture sensors, an LDR sensor, humidity, and temperature sensor. These sensors outputs are fed to the microcontroller which will trigger the water pump whenever necessary. And we should develop some new methods that use the name of our project that is "GSM" which uses power for the functioning of the project and to save electricity. This

technique will be a very good option for the small and medium farmers who suffer just because of failure of crops that takes place every year.

The implementation of this technology has a wide scope soon. Moreover, implementing GSM in the system allows the user to control and monitor the scenario remotely. The freedom for real time application of data and data-driven insights has become easier than ever before. The status of the soil as well as the values of all the sensors will be transmitted over the internet and displayed on a web page which will help the user to globally access the values by any digital device like mobile phones. The smart sensors placed in the agriculture fields area is capable of real time notification about the moisture level in land sand can prevent wastage of water. This capability can be further used if the real time sensor data can trigger the water pump by switching it off or on depending on moisture content of the soil. The system is powered by photovoltaics and has a wireless communication link with the control unit.

2. PROPOSED SYSTEM

The soil wetness device and water level sensors area unit are helpful for indicating thresholds, like below dry conditions, Optimum condition, and Overload water condition of water within the land these desires offer the analogue. signals, wherever the microcontroller (AT89S52) can perceive solely the digital signals. In the physical world parameters like temperature, pressure, humidity, and rate area unit analog signals.

We want to associate analog to digital device (ADC) that converts continuous signals into separate kinds in order that the microcontroller will scan the information. Then the Georgia home boy 232 associate interface that is employed to attach the GSM electronic equipment and provides message to the farmer. Then the farmer has got to dial through the telephone and with the connection to DTMF decoder passes the data to the microcontroller. Then the microcontroller switches on the motor by the motor driver. For power offer there'll be a Main power offer and power accessibility checking unit that is connected to the microcontroller with the battery backup.
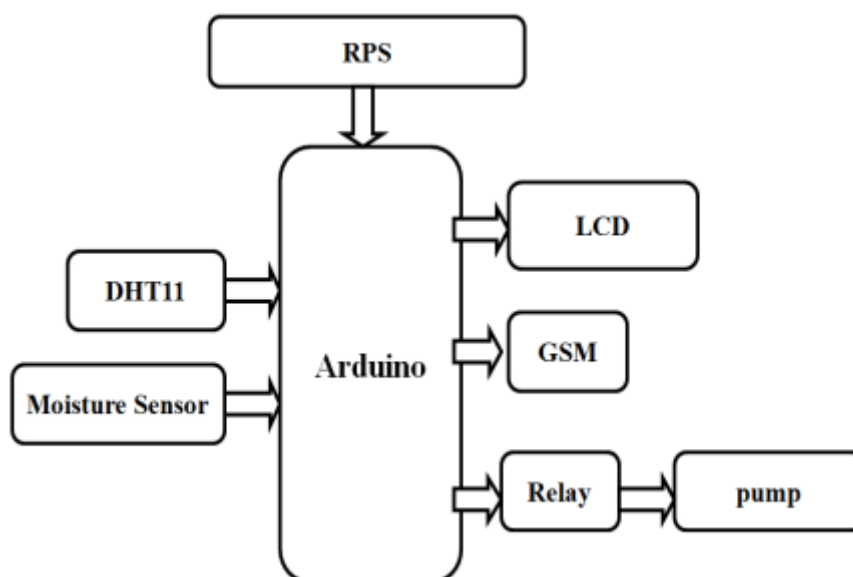

Fig. 1: Block diagram of proposed system.

Description Of Each Block:

RPS

A regulated power supply is an embedded circuit, it converts unregulated AC (Alternating Current) into a constant DC. With the help of a rectifier, it converts AC supply into DC. A regulated power supply is used to ensure that the output remains constant even if the input changes.

LCD Display

An LCD panel is made of many layers. These consist of a polariser, polarised glass, LCD fluid, conductive connections etc. Polarisation is a process in which the vibration of light waves is restricted to a single plane, resulting in the formation of light waves known as polarised light. Since liquid crystals do not produce light of their own, they need an external light source to work. An LCD panel has sets of polarised glass consisting of liquid crystal materials in between them. When the external light passes through one of the polarised glasses and electric current is applied on the liquid crystal molecules, they align themselves in such a way that polarised light travels from the first layer to the second polarised glass, causing an image to appear on the screen.

GSM

GSM, which stands for Global System for Mobile communications, reigns (important) as the world's most widely used cell phone technology. Cell phones use a cell phone service carrier's GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz It is estimated that many countries outside of Europe will join the GSM partnership.

Relay

Relays are electrically operated switches that open and close the circuits by receiving electrical signals from outside sources. Some people may associate "relay" with a racing competition where members of the team take turns passing batons to complete the race. The "relays" embedded in electrical products work in a similar way; they receive an electrical signal and send the signal to other equipment by turning the switch on and off.

Moisture Sensor

Soil moisture sensors measure or estimate the amount of water in the soil. These sensors can be stationary or portables such as handheld probes. Stationary sensors are placed at the predetermined locations and depths in the field, whereas portable soil moisture probes can measure soil moisture at several locations.

DTH 11 Sensor

The DHT11 is a basic, ultra-low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air and spits out a digital signal on the data pin (no analog input pins needed). It's simple to use but requires careful timing to grab data.

Arduino

Arduino is an open-source hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices

Pump (Ac Motor)

An AC motor is any of a class of rotary electrical motors that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of AC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current in part of the motor. AC motors were the first form of motor widely used, as they could be powered from existing direct-current lighting power distribution systems. An AC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small AC motors are used in tools, toys, and appliances. The universal motor can operate on direct current but is a lightweight brushed motor used for portable power tools and appliances. Larger AC motors are currently used in propulsion of electric vehicles, elevator, and hoists, and in drives for steel rolling mills.
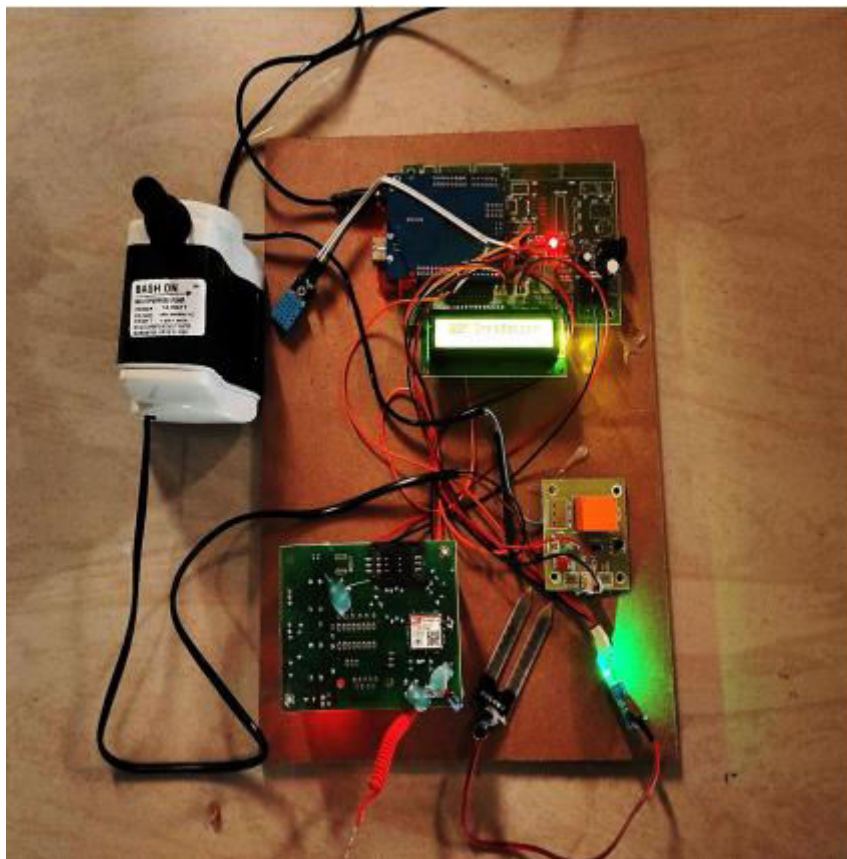
3. RESULT

Fig. 2: Result analysis.

4. CONCLUSION AND FUTURE SCOPE

We designed and integrated GSM controlled smart irrigation system. This proposed system consists of GSM module, temperature and humidity and LCD module. This project also consists of GSM module for remote monitoring and control of water supply to irrigation system. Whenever the SMS sent

through GSM then this information is sent through command received by microcontroller GSM and switches ON or OFF the electrical water pump.

Future Scope

This project can be extended by adding IOT module and we can also control irrigation pump using mobile anywhere. It can also be extended as an Agricultural Robot which helps in harvesting, picking, weed control, autonomous mowing, pruning, seeding, spraying, and shinning.

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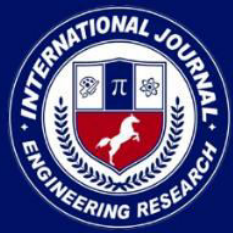
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