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Research Paper

DESIGN AND HARDWARE IMPLEMENTATION OF PRECISION AGRICULTURE SYSTEM

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The greenhouse based modern agriculture industries are the recent requirement in every part of agriculture in India. In this technology, the humidity and temperature of plants are precisely controlled. Due to the variable atmospheric circumstances these conditions sometimes may vary from place to place in large farmhouse, which makes very difficult to maintain the uniformity at all the places in the farmhouse manually. It is observed that for the first time an android phone-control the Irrigation system, which could give the facilities of maintaining uniform environmental conditions are proposed. The Android Software Development Kit provides the tools and Application Programmable Interface necessary to begin developing applications on the Android platform using the Java programming language. Mobile phones have almost become an integral part of human life serving multiple needs of humans. This application makes use of the GPRS [General Packet Radio Service] feature of mobile phone as a solution for irrigation control system. GSM (Global System for Mobile Communication) is used to inform the user about the exact field condition.

Keywords: Implementation, Precision, Agriculture system

INTRODUCTION

In a Farming Field area, there is a need of proper water supply to prevent it from drying and avoiding the over flow condition. If the water level in a Borewell connected near to the field drops below the threshold level for irrigation and Field starts drying and also its pump motor may get air-locked or even burn out due to dry running. It is inconvenient for farmers to walk all the way to their fields at night just to switch the pump motor 'off.' Besides, he may never get to know the problem. This problem can be solved by using this GSM-based system that will automatically give the user a call on his mobile phone when the water level in the Borewell drops below or rises to the threshold level for pumping. The user can also remotely 'switch on' or 'switch

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off' the pump motor by sending a message from mobile phone.

OBJECTIVE

The aim of our project is to design and implementation of precision agricultural system based on IOT. This can help the end users such as farmers in the better understanding of agriculture practices to be adopted for crop management. The system consists of nodes, which are equipped with small size application specific sensors.

EXISTING SYSTEM

Climatological condition monitoring is one of the most important aspects in agricultural production that has its direct impact on the productivity and maintenance of field crop. A huge loss is incurred every year due to damages of crop by various diseases caused by improper maintenance of some climatological conditions. In real time is important for better management and maintenance of agricultural production. If these factors can be maintained properly, that, in turn, may prevent the severe attacks of diseases on the crops. This will also help the farmers to take proper and timely actions regarding irrigation and fertigation etc. to prevent any kind of damages in the crop, based on the circumstances in each individual field.

Dew condensation on the leaf surface of greenhouse crops can promote diseases caused by fungus and bacteria, affecting the growth of the crops. In this paper, we present a IOT based automatic monitoring system to prevent dew condensation in a greenhouse environment. The system is composed of sensor nodes for collecting data, base nodes for processing collected data, relay nodes for driving devices for

Figure 1: Block Diagram of The System

Figure 2: Block Diagram Description
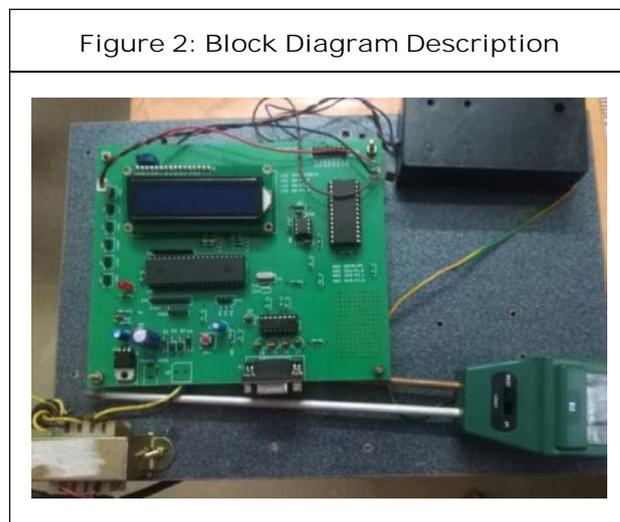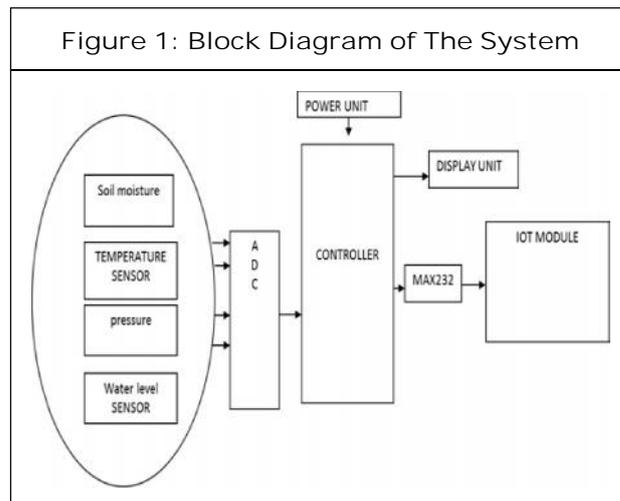
adjusting the environment inside greenhouse and an environment server for data storage and processing.

The block diagram consists of a power supply of 220 V ac that is stepped down using a step down transformer. There are two sensors A and B that are inserted into the Borewell for monitoring the levels of the Bore well. Transistor T1 is used as a sensor driver, and T2 is used as a relay driver. Relay driver drives the relay, that turns the motor 'on' or 'off'. Pic16f877a microcontroller is used in which hex code of the software program written in 'c' language and compiled by using Keil software is burnt.

GSM modem(SIM300 v7.03) is global system for mobile communication that works on the RS-232 standard and MAX-232 is used for generating the signals. The corresponding output is obtained by MAX232 that generates signals for the GSM modem that in turn sends signals to the mobile phone of the farmer, also it receives the signals to turn 'off' or 'on' the motor.

CONCLUSION AND FUTURE WORK

Irrigation has been the backbone of human civilization since man has started agriculture. As the generation evolved, man developed many methods of irrigation to supply water to the land. In the present scenario on conservation of water is of high importance. Present work is attempts to save the natural resources available for human kind. By continuously monitoring the status of the soil, we can control the flow of water and thereby reduce the wastage. By knowing the status of moisture and temperature through GSM with the use of moisture and temperature sensors, water flow can be controlled by just sending a message from our mobile. Conservation of water and labor: Since the systems are automatic, they do not require continuous monitoring by labor. System and operational flexibility: As desired, any valve can be controlled along with the pump and increases the efficiency of water use. If water is stored in tanks at irrigation lands, one can get the status of the status of the water level, temperature sensor and moisture content in soil through SMS generator by microcontroller present at the irrigation land. The system has an incorporated Bluetooth for remote monitoring which reduces the problem of range with GSM network and saves SMS cost for the farmer. The smoke sensors used to send emergency information to user incase of fire in field or burning of motor. The design is low power, low cost, small size, robust and highly versatile.

Thus, this system avoids over irrigation, under irrigation, top soil erosion and reduce the wastage of water. The main advantage is that the system's action can be changed according to the situation (crops, weather conditions, soil, etc.). By implementing this system, agricultural, horticultural lands, parks, gardens, golf courses can be irrigated. Thus, this system is cheaper and efficient when compared to other type of automation system. In large scale applications, high sensitivity sensors can be implemented for large areas of agricultural lands. A stand by battery or solar cells can be implemented which comes into use in case of power cuts. A secondary pump can be used in case of failure of the pump.

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