

Intelligent Management of Garden Irrigation System

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Abstract— The main aim of this paper is to provide garden irrigation system which helps in saving money, water and man power. It also helps in water conservation by automatically providing water to the plants or gardens depending on their water requirements. It can also prove to be efficient in Agricultural fields, Lawns & Parks. In order to resolve the problems which include loss of soil fertility and waste of water resource in agriculture production, we design an intelligent irrigation system based on wireless sensors and PIC controller. Embedded and PIC-controller systems provide solutions for many problems. This application precisely controls water system for gardens by using a sensor PIC-controller system. It is achieved by installing sensors in the field to monitor the soil temperature and soil moisture which transmits the data to the controller for estimation of water demands of plants.

Key words: Automated Irrigation Systems, Garden Irrigation System

I. INTRODUCTION

Water is basic need of human beings, animals, plants. We need water in each and every field. Agriculture is one of the fields where water is required in tremendous quantity. Wastage of water major problem in agriculture. There are many techniques to save or to control wastage of water from agriculture. In the field of agriculture use of proper method of irrigation and its control is important. Many different methods are developed for conservation of water.

Now days, water shortage is becoming one of the biggest problem in the world At the same time, irregular rainfall, coupled with the occurrence of high temperatures, are strong obstacles to the preservation and growth of plants, causing high rates of water efficiency. In this project monitoring the state of soil and irrigation control have been developed with the aim of improving water use efficiency. On the other hand, it is common to see the squandering of treated drinking water in the irrigation of gardens on rainy days or during hours of intense solar radiation with the inevitable and significant evaporative losses. Water requirements for irrigation depend on evaporation. Which in turn is a function of local weather conditions, the type and condition of germination, growth and maturation of plants. This system is specific for a crop and hence its usage is limited. Proper scheduling of irrigation is critical for efficient water management in crop production, particularly under conditions of water scarcity. The effects of the applied amount of irrigation water, irrigation frequency and water use are particularly important. To improve water efficiency there must be a proper irrigation scheduling strategy. So our project devices a simple system, using a PIC controller to automate the irrigation.

These systems suggest to provide automatic irrigation to the plants. The circuit is more effective indoors if one intends to use it for long periods. This is because the water from reservoir (bucket, etc) evaporates rapidly if it is kept in the open. For regulating the flow of water, either a

tap can be used or one end of a rubber pipe can be blocked using M-seal compound, with holes punctured along its length to water several plants.[1]

This system suggest to stable and reliable data transmission, which achieve real time monitoring of soil on crop growth, give a right amount of irrigation based on crops growth information.[2]

This technology is recommended for efficient automated irrigation systems and it may provide a valuable tool for conserving water planning and irrigation scheduling which is extendable to other similar agricultural crops. This project can be used in large agricultural As we know we are using the PIC f8xx family microcontroller this microcontroller has in built ADC that can convert inherently analog data into digital. Then Controller can read this information from ADC and Compare it with its Predefined threshold Level. If these values varies above or below the predefined value then controller can transmit the message for GSM as well as PC Monitor. If soil is enough moist then motor is automatically off through relay drive and controller send message on that GSM that motor is off. GSM can resent the acknowledgment to controller to drive the Relay .once Relay driver got the sufficient voltage it can start the motor and water is supplied by the Pumps or sprinklers to the Garden.

Sensor which we are using can continuously sense the environmental changes like temperature, humidity soil moisture etc. it can continuously sent to the Controller. so when Adequate water is supplied to the garden, sensor can again sense the actual situation of soil and sent to the Controller again it can convert physical quantity into electrical. Controller can compare these values with predefined values if it below the threshold level then itself can sent message to the GSM to alert that water supply is adequate you may stop the motor. GSM again can send acknowledgment to the Controller to stop the motor. It can sent command to the relay driver to stop the power supply which is given to the motor.

Pc monitor is used for observing the changes which is happening in garden .so 24 hour we can see the changes in environment. GSM is used for wireless communication between user and controller. As we know we are using the PIC f8xx family microcontroller this microcontroller has in built ADC that can convert inherently analog data into digital. Then Controller can read this information from ADC and Compare it with its Predefined threshold Level. If these values varies above or below the predefined value then controller can transmit the message for GSM as well as PC Monitor. If soil is enough moist then motor is automatically off through relay drive and controller send message on that GSM that motor is off. GSM can resent the acknowledgment to controller to drive the Relay .once Relay driver got the sufficient voltage it can start the motor and water is supplied by the Pumps or sprinklers to the Garden.

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II. MOTIVATION

Every day a thousands of litter water is wastage due to lack of water management if we use such system which can conserve water and also save man power and money.

Intelligence management for garden in urban area can worked on the principle which save and conserve the water regarding the need of soil. It can sense the temperature humidity and ph. of the soil and it provide the water supply by using control system.

The implementation of precise control irrigation for crop water demand information is one of the important ways to improve the utilization of water.

III. BLOCK DIAGRAM

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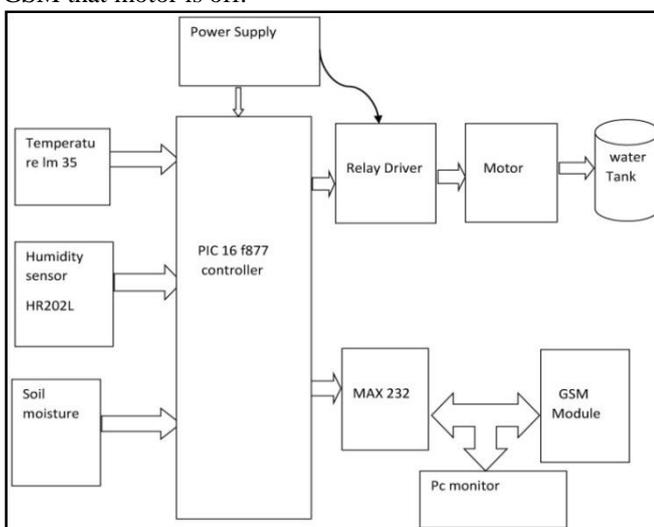


Fig. 1: Block diagram

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IV. CONCLUSION

The system provides with several benefits and can operate with less manpower. The system supplies water only when the humidity in the soil goes below the reference. Due to the direct transfer of water to the roots water conservation takes place and also helps to maintain the moisture to soil ratio at the root zone constant to some extend. Thus the system is efficient and compatible to changing environment.

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