International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 03 Issue: 04 | Apr-2016 www.irjet.net p-ISSN: 2395-0072

Smart Irrigation System Using Mobile Phone

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Abstract – *In India Agriculture plays an important role for development in food production in our country Agriculture is depend on monsoons which is not sufficient so the irrigation is used in agriculture field. This system consist automatic water flow control using soil moisture sensor and GSM module. The main function of GSM is to send and receive sms to user. This system conserves water by reducing water losses.*
For the security purpose of Agriculture field Laser fencing technology is used. When there is an interrupt to beam of laser system produces huge noise so that wild animal runs far away from the place. Aim of paper is to modernizing agriculture technology by programming Electronic components.

Key Words: Smart irrigation, Soil moisture, GSM, Laser fencing, Zigbee.

1. INTRODUCTION

The purpose of this project is to monitor and control the water flow to an irrigation system using Mobile phone. This can be achieved by use of soil moisture sensor, which senses the water content in the soil. this sensor output is given to ARM based control system for further data processing. Main objective of Project is to send a short message service (SMS) to farmer regarding irrigation of different plots and ON and OFF condition. This system also supports water management decision which determines the controlling time for the process.

In this system we make use of one ARM controller (LPC2138) which is dedicated at the water pump. The ARM forms the heart of system and there are also soil moisture sensors which are meant for detecting the moisture in the soil. Also GSM modem which will operate the soil moisture sensor.

1.1 Laser fencing

Laser fence is mechanism to detect objects passing the line of sight between the laser source and the detectors stronger lasers can potentially be used to injure someone or something passing the laser beam.

2. SYSTEM DESIGN

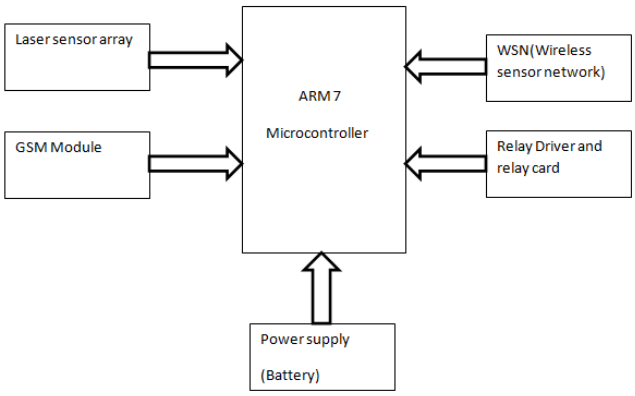

Fig -1: Master block diagram.

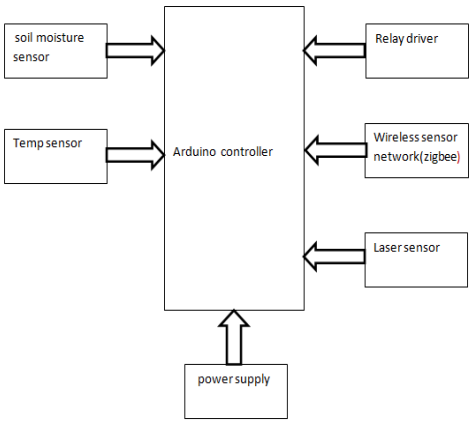

Fig -2: Slave Block diagram

1) ARM7 microcontroller :-

ARM7 is one of the widely used microcontroller family in embedded system application.LPC2138 is selected for the system. A simple design facilitates more efficient multi core CPU's and higher core counts at lower cost, providing higher processing power.

2) GSM module:

It is a specialized type of modem which accept a SIM card and operates over a subscription to a mobile operator, just like a mobile phone.

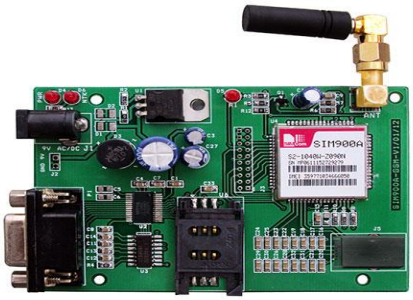

Fig-GSM module

3) Temperature sensor (LM35):

The LM35 series are precision integrated circuit temperature sensors, whose output voltage is linearly proportional to Celsius temperature.

4) Soil moisture sensor:

The soil moisture sensor is used to measure the volumetric water content of soil. It is used to monitor soil moisture content to control irrigation in greenhouse. A moisture sensor is used to sense the level of moisture content present in irrigation field. it has a level detection module in which we can set a reference value.

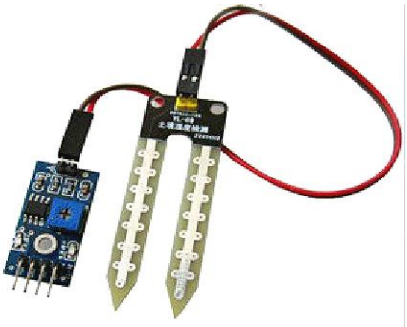

Fig-Soil moisture sensor

5) Zigbee:

Zigbee comes under 802.11 standards. It can operate in 2.4GHz frequency band. Incorporates power saving mechanism for all device classes. It has multiple star topology and inter personal area network communication. I t contains various transmission options including broadcast.

Fig-Zigbee module

6) Buzzer:

The buzzer produces sound based on reverse of piezoelectric effect. The generation of pressure variation or strain by application of electric potential across a piezoelectric material is the underlying principle.

Fig-buzzer

4. CONCLUSIONS

By implementing the proposed system there are various benefits for the government and farmers. for the government a solution for energy crisis is proposed. By using the automatic irrigation system It optimizes the usage of water by reducing wastage and reduce the human intervention for farmers. Here the automation process is done through microcontroller based technology. This Technology in future will enable the farmer to control and view farming direction from home through various methods like internet, mobile.

ACKNOWLEDGEMENT

We kindly thanks to Prof. Rizwana Qureshi, HOD of E&TC Engineering, Dhole Patil College of engineering, Pune for their esteemed guidance.

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