GSM Based Water Management in Irrigation system using Arm7

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Abstract— In our country, agriculture plays an important role for the development of food production. It mainly depends on the monsoons where there is no sufficient source of water. So the irrigation is used in agriculture field. In this irrigation system, depending upon the type of the soil, water is provided to plant as per the requirement. Here the GSM based water management system using ARM7 is a software and hardware combination which is used for the purpose of irrigation, which automates the irrigation of land to find exact field information and to provide instant information of the field to the users mobile. GSM module will contains a subscriber identity module (SIM) in which user can communicate with this SIM-number. When the particular command activated or given by the user, immediately the corresponding sensor will activates and reads the present reading and sends results to the same user mobile and displays in the LCD panel in the field. Immediately farmer will take the necessary action if required. Here we are using sensors to monitor the field condition. Those are temperature, humidity and soil moisture sensors. All these devices are connected to the ARM processor. GSM is used for communication purpose, with the help of AT (attention)-commands we can communicate with the components. For level sensing applications we are using motor.

Keywords—: ARM7LPC2148, GSM, LCD, Soil Moisture Sensor, Temperature Sensor

I. INTRODUCTION

Agriculture is a main source of live hood of majority Indians. Modern agriculture offers a range of benefits, including greater production and higher incomes for farmers. If irrigation becomes difficult, we will not have food to survive. Mostly, in dry areas or in case of

Inadequate rainfall, irrigation becomes very difficult. So, irrigation needs to be automated for proper production and handled remotely for farmer safety [1]. Increasing energy costs and decreasing water supplies is the main need for better water management irrigation water management. Irrigation management is a difficult task to determine when and how much water to be applied for a growing crop to meet specific management objectives [2]. If the farmer is far from the agricultural land he will not be aware of current conditions. To overcome all the above disadvantages we are developing our system which is based in ARM7LPC2148 and GSM.

II. RELATED LITERATURE

Now days, energy is a necessary want for human life and for the development in all sectors of economy. Mainly more man power is needed for irrigation system. To overcome this problem, we come up with an idea to provide automatic irrigation system using arm7.[5] In this project the farmer can able to notice the current condition of the field even he is far from the agricultural land. The main objective of the project is to provide water management in irrigation system which monitor and controls the parameters in agriculture sectors[2]. A design of arm7 processor-based embedded GSM interface is presented.
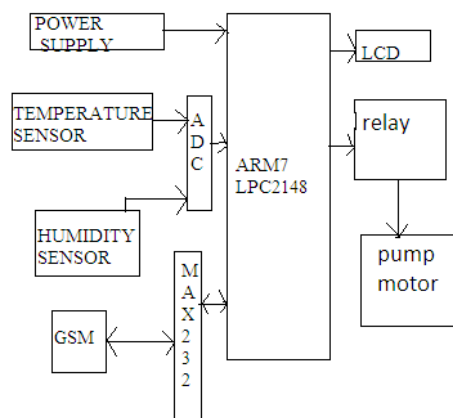
A. Block diagram

Fig. 1. Block Diagram Of GSM based water management in irrigation system Using arm7

The following block diagram shows the modern agricultural system. The parameters as discussed in the block diagram will monitor the field by using soil moisture sensor, temperature sensor and humidity sensor and gives the accurate results to the user. This system mainly using ARM7TDMI core and GSM.[3] GSM is an important part of this system. System communicates using GSM. GSM will operate through SMS and it is a link between ARM processor and centralized unit. This system monitors climate as well as field condition in real time and send the information to user in the form of SMS and GSM is controlled with the help of AT (attention) commands.[4] These AT commands are used to control majority of the functions of GSM model. Soil moisture sensor

is placed in the root of the field and sense water level of the field. If it is dry, then automatically water is supplied in to the soil and make it wet. Temperature and humidity sensors are useful in the case of monitoring the weather conditions.

B. Working Principle of the proposed system

We proposed system consists of following components:
a) ARM7 (LPC2148)
b) GSM
c) Soil moisture sensor
d) Temperature sensor
e) Humidity sensor
f) Pump motor

All this components are interfaced with arm7 i.e., LPC2148 microcontroller. It is a32 bit ARM7TDMI with real time emulation and embedded trace support that combine microcontroller with embedded high speed flash memory up to 512 KB.[6] GSM is interfaced with arm7 using RS-232 female to female cable. Once we 'on' this system by using adapter. Sensors sense water level continuously and give the information to farmer through cellular phone, farmer controls the motor using cellular phone without going in paddy field. If the field water level reaches the predefined value then automatically motor will be off without conformation of farmer. [8]The user can also know the temperature and humidity of the field by this, we can estimate the resources required and can predict the weather in the future days
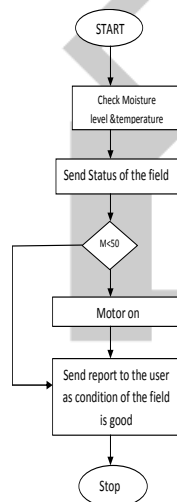
C. Flowchart of the proposed system

Fig. 2. flowchart of GSM based water management in irrigation system using arm7

If we on the system, automatically temperature and humidity of the field is measured and the moisture condition of the field is also monitored.[7] This information is send to the user mobile. By the condition of the field user will take necessary action, if required. If the soil moisture condition is dry, motor is 'on 'automatically and at the same time the user will get a SMS as motor is 'on'.

D. Applications

1. This system can be used for irrigation in gardens and parks.

2. This system can be used in Industrial Automation, Weather stations and Home Automation

E. Scope for future work

• 1. Implementing a sensor to find the disease of the plant at roots and give suggestions regarding the fertilizers to the farmer.
• 2. Implementing the system to communicate with nearer weather station through satellite communication to predict the exact weather.

III. CONCLUSION

The "GSM based water management in irrigation system using arm7" is implemented to involve the atomization in the field of agricultural .By this system, some operations become very easy, reduced the manpower, saving of water which ensured the saving of power. The main advantage of this system is, we can monitor the weather, through this we can expect the productivity as well as resources needed for future days.

ACKNOWLEDGMENT

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