

Indigeneous Farming and Revenue Collection System in India

Anupam Sharma¹, Ankit Mishra², Amit Verma³, Bipul Kumar⁴, Mr. Rajkumar⁵

Students of 4th Year, Department of Electrical and Electronics Engg, IMS Engineering College, Ghaziabad, India^{1,2,3,4}

Assistant Professor, Department of Electrical and Electronics Engg, IMS Engineering College, Ghaziabad, India⁵

Abstract: In most of agrarian countries people are not having proficient knowledge about the latest technology used in agriculture sector. Agriculture plays a major role in Gross Domestic Product (GDP). Farmers are needed to be more innovative with the techniques used for desired profits out of their work. The project 'Indigenous farming and revenue generation system' is an innovative idea towards a great future with a mutual interest in farming and great earnings. This project involves automatic drip irrigation system with GSM Module providing instant notification on farmers mobile phones, Solar panel for providing solar energy with energy meter and Fire alarm system for the safety of the crops. The revenue collection system is also introduced in this project to provide extra income to the farmers.

Keywords: GSM Module, Revenue Collection System, Indigeneous Farming.

I. INTRODUCTION

One of the major source of income in India is from agriculture sector and about 70% of India's population and farmers depends on on agriculture but in most of the agrarian countries people are not having proficient knowledge about the latest technology used in agriculture sector. One study from 2008 claimed that the population of India is growing at a rate higher than its ability produce food[1]. The national Crime records bureau of India in 2012 reported 13754 farmers suicide[2]. Out of all suicides in India 11.2% accounts for farmer[3]. In India manual operation of irrigation is still practiced. These outdated techniques need to be replaced with automatic techniques. Two of the most important issues agriculture are the fertility of land and second the moisture content of soil. The various problems of farmers can easily be rectified if automated multi cop irrigation system is used. This project is based on microcontroller for designing the model of automatic irrigation system, solar power is used as a source of power supply in addition with the storage battery, which stores the energy supplied by solar power. A sensor detecting soil's moisture content is placed into the soil. It senses the moisture level and automatically on the the pump for the supply of water to meet the requirement of moisture of the soil for a particular crop and sends the information to the farmer through cell phones in the form of sms through GSM module standard set of attention commands are used to control major function of GSM module[4]. After the required level of moisture is reached the pump automatically will be off with the conformation of farmer[5]. Also in this project drip irrigation is used. It saves water and fertilizers by allowing the water and to directly drip slowly to the roots of plant through a network of pumps, value and pipes[6]. Fire hazards are well documented risk with every phase of agriculture. Such hazard results in loss of life and property on farms.

To cope with such disaster we have used a fire sensor which will detect any fire near the store house or cattle may run away from the fire, thus saving their lives[7]. This project also introduces a revenue collection system to provide extra income to the farmers. The additional energy stored in the battery supplied by the solar power can be sent to the grid and thus the farmer can collect revenue from the government.

II. ITS NEED

- It is very easy to install and easy to configure.
- Results in saving resources and energy.
- Farmers will be able to decide the right amount of water needed for a particular crop.
- Avoids runoff of water or over watering of crops.
- Time saving method, eliminates human error in adjusting moisture levels of soil.

III. SYSTEM DESCRIPTION

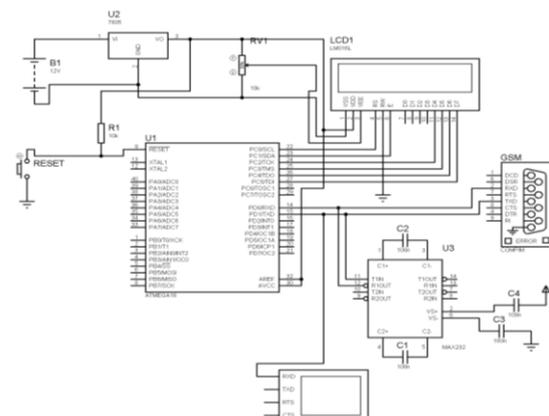


Figure 1: Main circuit diagram.

A. MAX232

It is a dual receiver/driver that contains a capacitive voltage generator to supply TIA/EIA 232 voltage levels from a single 5 volt supply.



Figure2: Max 232.

B. ATMEGA16:

It is a 8 bit AVR microcontroller with 16 bytes in system programmable flash. It has high performance , low power, high endurance, non volatile memory segment.

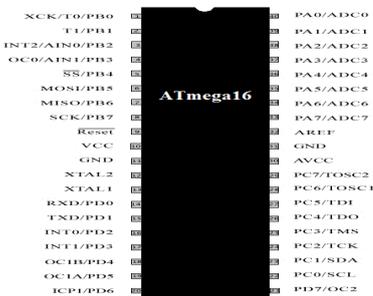


Figure3:Atmega 16

C.ULN2003:

These are high current ,high voltage, darlington arrays containing common emitter with seven open collector □ darlington pair.

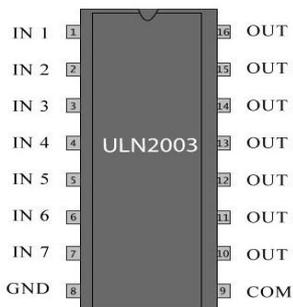


Figure4:ULN2003

D. □SIM900A GSM MODEM:

It is a simple arduino GPRS and GSM module and is of very low cost. Its features are :

- 1-On board power ON
- 2-on board provision to select the power using jumper
- 3-on board audio interference pins
- 4-on board PWM AND ADC channels

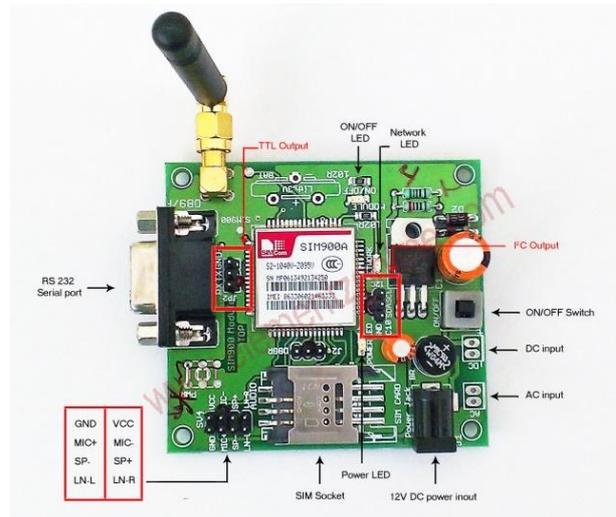


Figure5:Sim900A GSM modem

IV. APPLICATION

A. Agriculture: This application is very important in the sense of best water management to crop. The rubber pipe which carrying the water from tank is fed to the tip of fan which is attach to the DC motor. As the motor revolves the sprinkling of water is takes place in front of crop only. According to delay time we can decide the actual level of water which is required for crop. It provides the water to the crop in sufficient and accurate manner so the wastage of water will be minimize. It also overcome the requirement of sprinkle and drip irrigation system, and become less costly and easy construction.

B. Green house: Greenhouses form an important part of the agriculture and horticulture sectors in our country as they can be used to grow plants under controlled climatic conditions for optimum production. Automating a greenhouse envisages monitoring and controlling of the climatic parameters which directly or indirectly govern the plant growth and hence their produce.

Greenhouses in India are being deployed in the high-altitude and low-altitude regions where the temperature up and down makes any kind of plantation almost impossible and in arid regions where conditions for plant growth are hostile.This set-up involves visual inspection of the plant growth, manual irrigation of plants, turning ON and OFF the water controllers. vulnerable to human error and hence less accurate and unreliable.

C. Fire and smoke detection:It has a single independent input to detect any fire or smoke indication from the sensor unit, and sets an alarm or an indication to alert people. The sensor will detect presence of smoke and generate an interrupt to the microcontroller. This will switch on the exhaust fan and a sound alarm with flashing light. A GSM module is interfaced, so that the owner can be easily intimated about the fire in his mobile phone via an SMS. The alarm can be reset with the keypad interface.

V. CONCLUSION

This project is proposed to support the needs of farmer. The use of microcontroller in the project promises to increase the system life as it reduces power consumption. Automated irrigation system using various sensor will have huge demand and future scope too. It has various advantages which results into minimising human error save time and thus maximizes the net product and profit of the farmer.

REFERENCES

- [1] Sengupta, Somini (22 June 2008). "The Food Chain in Fertile India, Growth Outstrips Agriculture". *New York Times*. Retrieved 23 April 2010.
- [2] National Crime Reports Bureau, ADSI Report Annual – 2012 Government of India, Page 242, Table 2.11.
- [3] Nagraj, K. (2008). "Farmers suicide in India: magnitudes, trends and spatial patterns".
- [4] Jia Uddin, S.M. Taslim Reza, Qader Newaz, Jamal Uddin, Touhidul Islam, and Jong-Myon Kim, "Automated Irrigation System Using Solar Power" ©2012 IEEE.
- [5] Joaquín Gutiérrez, Juan Francisco Villa-Medina, Alejandra Nieto-Garibay, and Miguel Ángel Porta-Gándara "Automated Irrigation System Using a Wireless Sensor Network and GPRS Module" IEEE 2013.
- [6] Shaohua Wan, "Research on the Model for Crop Water Requirements in Wireless Sensor Networks", 2012 International Conference on Management of e-Commerce and e-Government.
- [7] .Bellinger P. L. (1994). *Farm and Ranch Safety Management*, 346 pp. Moline, IL.
- [8] N. Patel, D. Chittamuru, A. Jain, P. Dave, and T. S. Parikh, "Avaaj-otalo: a field study of an interactive voice forum for small farmers in rural India," In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, pp. 733-742. ACM, 2010.
- [9] PUNCHIHEWA, Devaka J., and Prasad Wimalaratne. "Towards an ICT Enabled Farming Community." *E-Governance in Practice, India (2010)*: 201-207.
- [10] Parikh, T. S., Patel, N., & Schwartzman, Y. (2007, December). A survey of information systems reaching small producers in global agricultural value chains. In *Information and Communication Technologies and Development, 2007. ICTD 2007. International Conference on (pp. 1-11)*. IEEE.
- [11] 'Il-krishi homepage;' August 2007, <http://www.e-krishi.org>
- [12] Ravindran Singh et al "Selecting Barley Variety through Expert System" at *International Journal of Engineering and Innovative Technology (IJEIT)* Volume 3, Issue 4, October 2013.
- [13] "Expert System on Wheat Crop Management" developed by Division of Computer Applications, IASRI, New Delhi.