Electronic Farming Control System

Joshi Jalpa A., Patel Divya J., Thakkar Binita A., Patel Lalit A.
### ITM UNIVERSE, Jarod, Vadodara

ABSRACT: *Agriculture has been one of the less technically developed sectors. For obvious reasons, various problems has occurred, such as socio-economic limitations, division of the land into tiny farms, little capital investment and the low value of the end products, the seasonal cycle of the crops and cheap low-skilled manual labor. Furthermore, it is influenced by the huge variety of crops and installations, as well as by adverse and variable meteorological conditions. Nevertheless, the development of utensils, tools and sophisticated machines to help produce foods and raw materials has been a major preoccupation within the field of agricultural over the past few years. Our aim of this project is to implement the automatic farming system and monitoring with GSM module.*

Keywords: *GSM, Encoder, Soil moisture content, Seed dropping mechanism, Automatic Farming control System*

I. INTRODUCTION

Indian economy is 70% dependent on agriculture. By understanding the importance of farming in economy, we are trying to develop the system which will be helpful for the farmers to solve daily problems such as seed sowing, pesticide spraying etc. We are trying to overcome all these problems and make farming more productive and efficient.
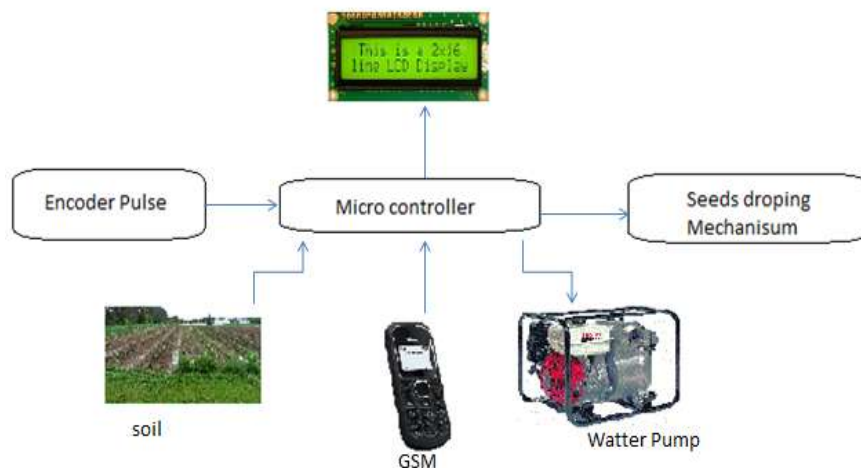
Using above concept we can make the farming easy and we can solve many of daily challenges faced by a farmer. The main purpose of this project is to help farmer in their daily jobs by improving the farming techniques such as seeds sowing, pesticide spraying, water supply and also trying to develop advance farming techniques which can be helpful to farmer.

II. RELATED WORKS

In 19th century, traditional farming was the most popular farming system where farmers were using bullocks to dig their farm followed by the labors who were sowing seeds manually. This traditional farming technique was time consuming and required huge amount of men efforts, resulted in less financially as well as productively efficient.

There have been improvements in the farming techniques in mid-20th century where farmers started using tractor to dig the farm. Even though using these techniques, it required men efforts to sow seeds, which leads to inaccurate distance of two adjacent seeds and results in wastage of resources. Moreover maintenance is also difficult because humans are employed to do necessary action which is time consuming. To overcome all these challenges, we have developed the system which will decrease the farmer's unnecessary hard work by making most of the farm work automatic manner such as sowing seeds, pesticide spraying, water supply etc.

International Journal of Engineering Research and Development (IJERD) ISSN: 2278-067X
Recent trends in Electrical and Electronics & Communication Engineering (Page 56-59)
(RTEECE 08th – 09th April 2016)

Basically it is smart farming system, which smartly controls many of the activities of the farm. System also includes the water flow control function in farm, so that it can remotely switch on-off the water pump through the GSM technique.

III. SCOPE OF PROJECT

Today's era, whenever we visit a farm, a farmer always with a bullock or tractor and some labors are working in farm. In this traditional way there are chances of misinterpretation of order given by farmer. This would be eliminate by using the New Edge Farming techniques which manages all order of work processes in farm. Through this system, the activities of the farm can be controlled remotely which reduces efforts & time. This approach of developing farming systems, built on the principles of productivity, profitability, stability and sustainability. All the components are complimentary and supplementary to each other.

3.1 System features:

- This will allow seed dropping mechanism to drop seeds at a specific distance.
- Problems of seed misalignment can be overcome.
- This will help the system to decide the distance between two adjacent seeds dropping.
- Different types of seeds can be sows by little modifications in the system.
- Intimation to the driver for available seeds in the storage.
- Time, money and efforts of the farmer can reduce to a great extent.
- Farmer gets updated with every farming activity through GSM.

3.2 Hardware Interfaces-1:
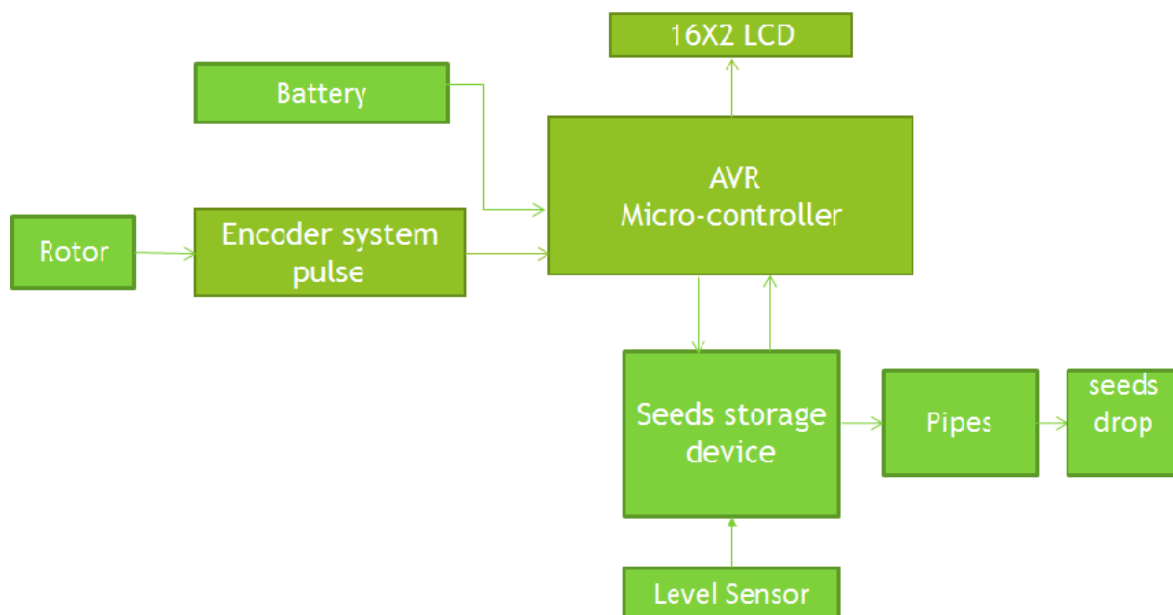
Figure 3.2.1 Block Diagram of Dynamic system

- Above figure shows basic block diagram of the dynamic system, in which AVR(ATmega16) is the heart of this system. AVR Micro-controller co-ordinates all the modules and makes the complete system. As shown in figure Micro-controller is connected with the encoder system pulse, seed storage device and LCD (Liquid crystal display).

Encoder:

A cyclic encoder is a device that converts motion into a sequence of digital pulses. By counting a single bit or by decoding a set of bits, the pulses can be converted to relative or absolute position measurements. Encoders have both linear and rotary configurations, but the most common type is rotary. Rotary encoders are manufactured in two basic forms:

1. The absolute encoder where a unique digital word corresponds to each rotational position of the shaft
2. The incremental encoder, which produces digital pulses as the shaft rotates allowing measurement of

International Journal of Engineering Research and Development (IJERD) ISSN: 2278-067X
Recent trends in Electrical and Electronics & Communication Engineering (Page 56-59)
(RTEECE 08th – 09th April 2016)

relative position of shaft. Most rotary encoders are composed of a glass or plastic slotted disk. As radial lines in each track interrupt the beam between a photos – emitter- detector pair, digital pulses are produced.

Electronics seed sowing system:

This part includes the seed sowing in the farming where seeds can be initially dropped automatically in to the certain depth of the soil. Encoder will connect on the wheel of the tractor, which gives signal pre revolution .this signal will sense by the CMOS sensor which is inside of the encoder, and the signal will send to the controller. This controller will sense the exact distance travelled by a tractor or it will count the meter travelled by a tractor par revolution. Suppose we set 20cm distance then after every 20cm distance travelled by tractor controller will count it and accordingly it will on the lid of the storage device for the time period around one or two seconds and then close suddenly, In between this time the seed will be drop in the soil through the pipes into the soil at certain depth.

Level Sensor:

Sensors has been used to give information about the level of the seeds in the storage device. If seed is not available in the seed storage device then through the micro-controller system it will displayed on LCD.
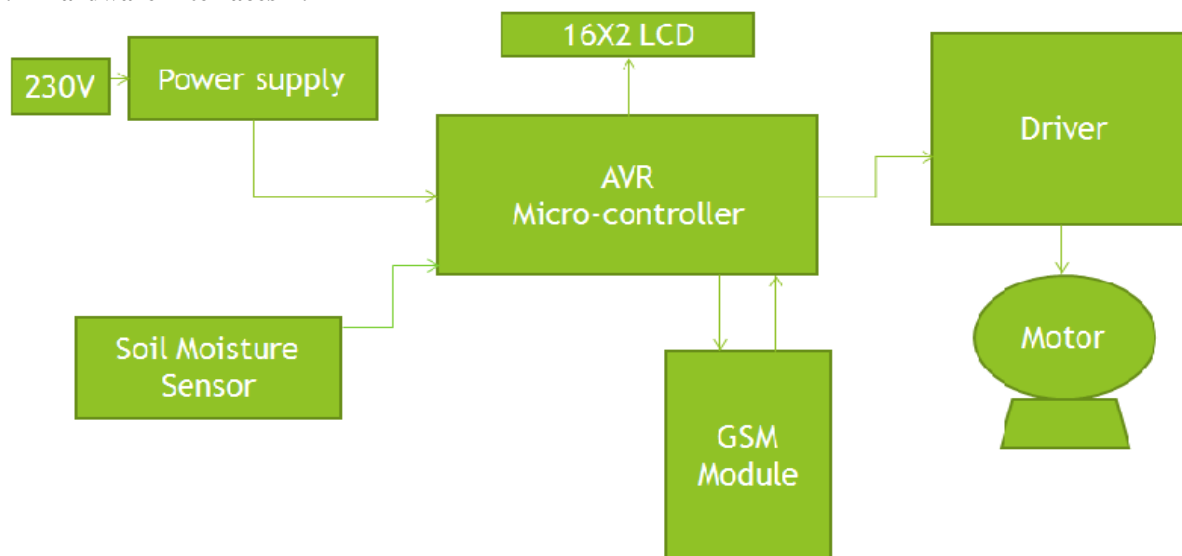
LCD:

LCD will be located in front of the driver of tractor indicating availability of seeds in the seed storage device.

Battery:

It is used while working with the tractor mounted moving system.

3.2 Hardware Interfaces-2:

Figure 3.2.2 Block Diagram of Stationary system

Soil moisture:

Soil moisture is the key variable in the controlling the exchange of the water and heat energy between land surface and atmosphere through the evaporation and plant transpiration. Soil moisture sensor can sense the water content of the soil and initialize water supply according to the requirement.

Automatic water supply through GSM:

This system includes the switch with ON/OFF operation for controlling the water pump.

LCD (Liquid crystal display):

It displays the messages like water content in soil and the working condition of pump.

International Journal of Engineering Research and Development (IJERD) ISSN: 2278-067X
Recent trends in Electrical and Electronics & Communication Engineering (Page 56-59)
(RTEECE 08th – 09th April 2016)

3.3 Software Interfaces:

The system is designed using AVR. We have used Proteus Simulation to design the user interface. The system Programming Software is BASCOM (Basic Compiler) for basic error finding. GSM (Global System for Mobile Communication) is used to send or receive information and to control farming activity as per the requirement.

3.4 Advantages of System:
- This system provides more convenient and accurate method for seed delivery up to certain level in soil. Other than that, it also can minimize the waiting time spent at the farm because of the greater speed of system.
- By using this system, the farming efficiency and productivity also can be increased.
- Increases productivity and reduces labor.
- Reduces turn around between digging process and seed planting.
- Eliminates water overflow by remote operation of water pump.
- Leads to better production of crops.
- Problems of misalignment of distance can be avoided.
- Energy and time can be saved.

3.5 Disadvantages:
- Modern farming requires field machinery, repeatable operations based on models of systems & processes. It is quite costly than the manual system.

3.6 Application:
- It is used to plant seeds in the certain qualified depth of the soil with an accurate distance and controlling farming activities through GSM.

IV. CONCLUSIONS

The system would reduce efforts of the farmers and atomized system will automatically control many of the farming activities and helps a farmer in an appropriate manner.

REFERENCES
[1]. www.docircuits.com/learn
[2]. www.circuitstoday.com/5v-power-supply-using-7805
[3]. Wikipedia – AVR controller
[4]. www.engineersgarage.com
[5]. www.datasheetcatalog.org
[6]. www.engineersgarge.com/electronic-components/16x2-lcd-module-datasheet
[7]. www.circuitstune.com/2011/11/5v-regulated-power-supply-circuit.html