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AUTOMATION IN FARMING USING ANDROID APPLICATION

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ABSTRACT

Farming can be done using various new technologies to yield higher growth of the crops and their more production. The main objective of our project is to work for the same mentioned above. This paper proposes a new architecture for remote control of agriculture devices. The paper here is all about automated control features with latest electronic technology using microcontroller and Bluetooth Devices. The project works automatically and hence reduces the man power.

Keywords: Microcontroller, Bluetooth Device.

I. INTRODUCTION

We live in a world where everything can be controlled and operated automatically, but there are still a few important sectors in our country where automation has not been adopted or not been put to a full-fledged use, perhaps because of several reasons one such reason is cost. One such field is that of agriculture. Agriculture has been one of the primary occupations of man since early civilizations and even today manual interventions in farming are inevitable.

Due to the explosive spread of the smart phone and the rapid development of information technology, the applications of the smart phone were widely developed in a variety of fields, such as: internet news, games, industry applications, and general living information. Information technology was also used to develop applications for the agriculture cultivating system, seeding system and Irrigation System. The Bluetooth communication is easy to use to connect the phone and environment devices

The main idea behind the proposed architecture is to design system, which would be used as a platform which provides the services needed to perform remote control of agricultural devices. The farmer should be able to on/off the Irrigation Device,Cultivation Device, Seeding Device, and decide the pesticides proportion and monitor the farming activities remotely. Many times user misses their farming tasks because he/she is not able to remember all the activities and their correct timing on which it is necessary to perform that activity. This system should provide reminder to the user so that their farming activity will take place on time and also provide all online information about any particular crop.

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II. PROPOSED MODEL FOR AUTOMATION IN FARMING

In proposed system, commands are sent to the receiver to control the movement of the seeding device either to move forward, backward etc. using android application device,and also controls the irrigation pump either to on or off.The android application device transmitter acts as a remote control that has the advantage of adequate range, while the receiver end Bluetooth device is fed to the microcontroller to drive DC motors via motor driver IC for necessary work. Remote operation is achieved by any smart-phone with Android OS; upon a GUI (Graphical User Interface) based touch screen operation. In our application we will provide static information about all crops and their fertilizer mechanism and requirement of other maintenance, the entire set-up becomes user friendly.

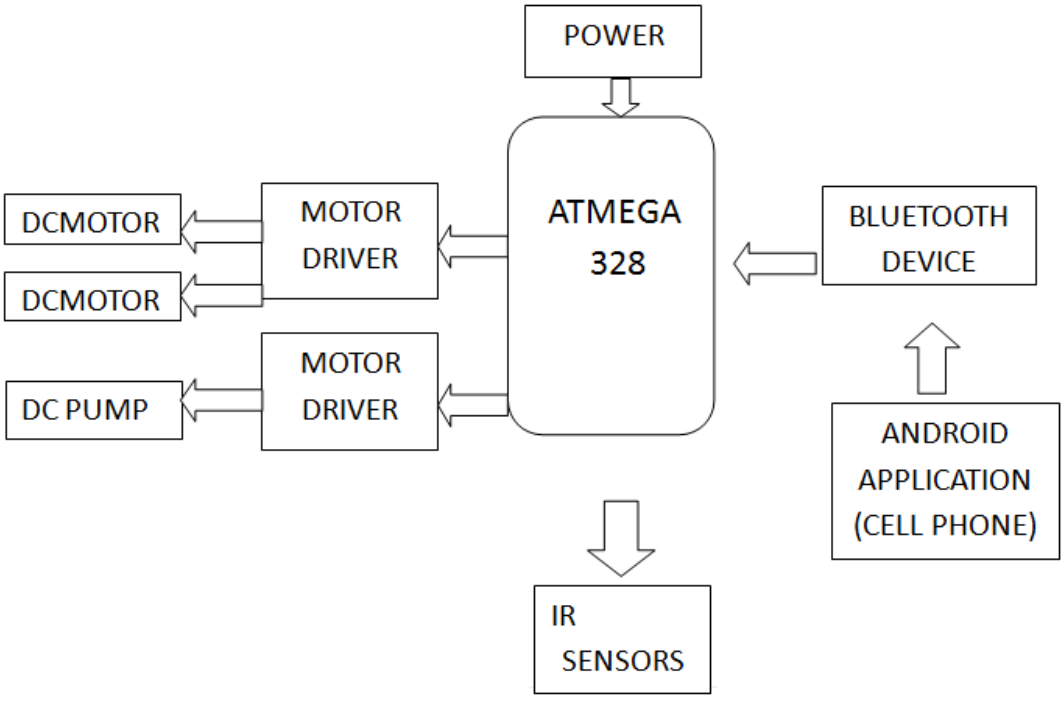

Fig: Block Diagram Of Proposed System

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III. PARTS OF THE SYSTEM

3.1 Microcontroller

*ATmega328P:*The ATmega328P is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega328P achieves throughputs approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed.

3.2 Bluetooth Device

BLUETOOTH MODULE HC05:HC-05 module is an easy to use Bluetooth SPP (Serial Port Protocol) module,designed for transparent wireless serial connection setup.Serial port Bluetooth module is fully qualified Bluetooth V2.0+EDR (EnhancedData Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Bluecore 04-External single chip Bluetooth system with
CMOS technology and with AFH (Adaptive Frequency Hopping Feature). It has the
footprint as small as 12.7mmx27mm.It is used to send and receive the signals to and from the smartphone device.

3.3 Sensor

IR SENSOR SINGLE: The IR Sensor-Single is a general purpose proximity sensor. Here we use it for seed quantity calculation and error detection. The module consist of a IR emitter and IR receiver pair. The high precision IR receiver always detects a IR signal. The module consists of 358 comparator IC. The output of sensor is high whenever it IR frequency and low otherwise. The on-board LED indicator helps user to check status of the sensor without using any additional hardware. The power consumption of this module is low. It gives a digital output.It is used to count the seed quantity has been used for seeding purpose and also sends message to the smartphone device if error occurred during the seeding process.

3.4 Drivers

PUSH-PULL FOUR CHANNEL DRIVER WITH DIODES:The Device is a monolithic integrated high voltage, high current four channel driver designed to accept standard DTL or TTL logic levels and drive inductive loads (such as relays solenoides, DC and stepping motors) and switching power transistors.It is used to drive the seeding machine's motor, cultivation machin's motor and irrigation pump.

3.5 Controlled Devices

1. CULTIVATION MACHINE: It is used to cultivate the farm automatically using smartphone.
2. SEEDING MACHINE: It is useful for automatic seeding process in farm.
3. IRRIGATION PUMP: Irrigation pump runs automatically for supplying water to the farm.

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IV. STEPS FOLLOWED IN DESIGNING THE SYSTEM

Step 1:Identify the software and the hardware to be used.

It is very important that control system functions are specified before deciding what software and hardware system to purchase. The model chosen must have the ability to:

1. Expand the number of measured variables (input subsystem) and controlled devices (output subsystem) so that growth and changing needs of the production operation can be satisfied in the future.
2. Provide a flexible and easy to use interface.
3. It must ensure high precision measurement and must have the ability resist noise.

Hardware must always follow the selection of software, with the hardware required being supported by the software selected. In addition to functional capabilities, the selection of the control hardware should include factors such as reliability, security, previous experiences with the equipment and cost.

Step 2: Identify measurable variables important to production

It is very important to correctly identify the parameters that are going to be measured by the controller's data acquisition interface, and how they are to be measured.An electronic sensor for measuring a variable must readily available, accurate, reliable and low in cost. If a sensor is not available, the variable cannot be incorporated into the control system, even if it is very important. Many times variables that cannot be directly or continuously measured can be controlled in a limited way by the system.For example seeds like rice difficult to measure continuously.

V.PROJECT SCOPE

It is useful for farmer owner to perform their task. This is fully automated system which works with less man power And user can perform the following things:

Remotely on/off water pump using bluetooth.
Remotely on/off cultivation process.
Remotely on/off seeding process.
Reminders to farmer about their scheduled activity.
Automatic generation of report of all work performed by machines.

VI. CONCLUSION

From the convenience of android application, a farmer will be able to control the motor and irrigation process.The project will allow for improving the efficiency of the irrigation process.Using this android application user can also get all information about particular crop(Fertilization process, online information about pesticides, online farming videos etc.).

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