



# Intelligent Farmer Friendly System

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## ABSTRACT

The greenhouse based modern agriculture of industries are the recent requirement in every part agriculture in India. In this technology, the humidity and temperature of plants are precisely controlled. Due to the variable atmospheric circumstances these conditions sometimes may vary from place to place in large farmhouse, which makes very difficult to maintain the uniformity at all the places in the farmhouse manually. It is observed that for the first time an android phone-control the Irrigation system, which could give the facilities of maintaining uniform environmental conditions are proposed. The Android Software Development Kit provides the tools and Application Programmable Interface necessary to begin developing applications on the Android platform using the Java programming language. Mobile phones have almost become an integral part of human life serving multiple needs of humans. This application makes use of the GPRS [General Packet Radio Service] feature of mobile phone as a solution for irrigation control system. GSM (Global System for Mobile Communication) is used to inform the user about the exact field condition. The information is passed onto the user request in the form of SMS. The concept of anti theft security is used It hence deters thieves from committing the theft. It also effectively prevents stealing of motor wires and it has been a persisting problem around the fields and greater challenge to the farmer.

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## I. EXISTING SYSTEM

The project proposes a water level sensor at each place where the water has to be monitored. When the motor is switched on the sensors are activated and the fields are irrigated automatically. Once the water reaches a particular level which may even takes hours, the system takes appropriate steps to regulate or even stop the water flow.

The farmers' job gets over immediately after switching the power supply. The project houses a high speed microcontroller and water sensors at different fields. These sensors are attached to the microcontroller and are controlled accordingly using motor and water controller circuits. The microcontroller used is a high speed microcontroller for fault free operation. It has a variety of advantages over conventional old microcontrollers such as RISC architecture, larger memory word, fast operation and a host of inbuilt features such as ADC, communication protocols etc.

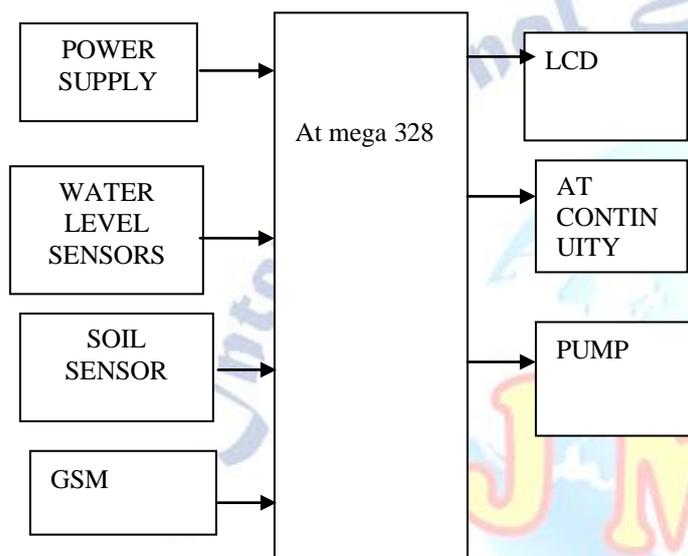
This helps in precious saving of water and electricity and eases the job of the person. The project can be used in large agriculture lands and many other plantations and even in home environment or industries and colleges where there are large gardens to monitor and irrigate them automatically. The continuous increasing demand of the food requires the rapid improvement in food production technology. In the modern drip irrigation systems, The most significant advantage is that water is supplied near the root zone of the plants drip by drip due to which a large quantity of water is saved. At the present era, the farmers have been using irrigation technique in India through the manual control in which farmers irrigate the land at the regular intervals. Automating farm irrigation allows farmers to apply the right amount of water, regardless of the availability of labor to turn valves on and off.

## II. PROPOSED SYSTEM

This project proposes the concept of anti theft security is used It hence deters thieves from committing the theft.

It also effectively prevents stealing of motor wires and it has been a persisting problem around the fields and greater challenge to the farmer. If the continuity breaks, the sytem aumotically sends the sms through gsm to the user. To overcome the disadvantages of the ARM7 we are using the arduino in the system.

### Block diagram:



### Working:

The power supply, sensors and gsm are the inputs for the arduino. In this two sensors are used. One is soil sensor which is used to check the soil conditions either dry or wet. When the soil is dry the motor is automatically on. Another is water level sensor, which is used to identify the water level condition either low or high. When the water level is low it sends the message to the farmer. If the water level reaches to required water level the motor will be automatically turned off and it intimate the subscriber through gsm the motor is off .then system continually check its continuity test and if it breaks the intimation is forwarded to arduino and through gsm a message is send to farmer in mean while that arduino alerts the nearby people by sound of buzzer.

### Components List:

Our system components are:

- 1)GSM
- 2)ARDINO
- 3) SENSORS
- 4) TRIAC

5) PUMP

6) POWER SUPPLY

### Component description:

#### A. Power Supply:

The input to the circuit is applied from the regulated power supply. The A.C input i.e.230V from the mains supply is step down by the transformer to 12V and is fed to a rectifier. The output obtained from the rectifier is a pulsating D.C voltage. So in order to get a pure d.c voltage, the output voltage from the rectifier is fed to a filter to remove any a.c components present even after rectification. Now, this voltage is given to a voltage regulator Obtain a constant pure D.C voltage.

GSM:GSM(Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services.

GSM(Global System for Mobile communication) is a digital mobile telephone system that is widely used in Europe and other parts of the world. GSM uses a variation of Time Division Multiple Access (TDMA) and is the most widely used of the three digital wireless telephone technologies (TDMA, GSM, and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1,800 MHz frequency band. It supports voice calls and data transfer speeds of up to 9.6 Kbit/s, together with the transmission of SMS



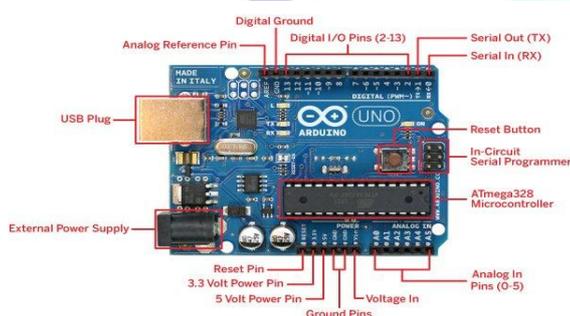
(ShortMessageService).

#### B. Arduino

The Arduino Uno is a microcontroller board based on the ATmega328 . It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB

connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.

"Uno" means one in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions.



Arduino is common term for a software company, project, and user community that designs and manufactures computer open-source hardware, open-source software, and microcontroller - based kits for building digital devices and interactive objects that can sense and control physical devices.

The Arduino project provides the Arduino integrated development environment (IDE), which is a cross-platform application written in the programming language Java. It originated from the IDE for the languages *Processing* and *Wiring*. It is designed to introduce programming to artists and other newcomers unfamiliar with software development. It includes a code editor with features such as syntax highlighting, brace matching, and automatic indentation, and provides simple one-click mechanism to compile and load programs to an Arduino board. A program written with the IDE for Arduino is called a "sketch".<sup>[21]</sup> The Arduino IDE supports the languages C and C++ using special rules to organize code. The Arduino IDE supplies a software library called Wiring from the Wiring project, which provides many common input and output procedures.

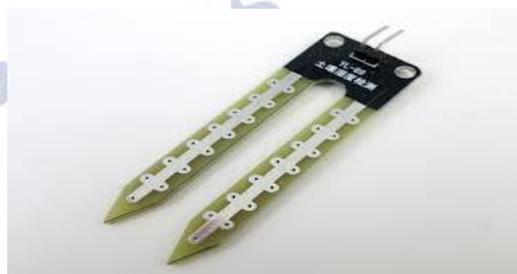
### C. Sensors:

A sensor (also called detectors) is a device that measures a measurable attribute and converts it into a signal which can be read by an observer or by an instrument. For example, a mercury-in-glass thermometer converts the measured temperature into expansion and contraction of a liquid which can be read on a calibrated glass tube. A thermocouple converts temperature to an output voltage which can be read by a voltmeter.

A water level sensor measures and regularly reports the level of water in the field. They may be used in homes for people to avoid the wastage of water and it helps the farmer by intimating the level of water in farmhouses. Water level sensors can also be used in public places like office and industries and in meteorology stations to report and predict water.



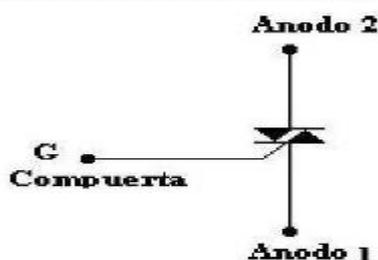
Soil moisture sensors measure the water content in soil. A soil moisture probe is made up of multiple soil moisture sensors. One common type of soil moisture sensors in commercial use is a Frequency domain sensor such as a capacitance sensor. Another sensor, the neutron moisture gauge, utilize the moderator properties of water for neutrons. Cheaper sensors -often for home use- are based on two electrodes measuring the resistance of the soil. Sometimes this simply consists of two bare (galvanized) wires, but there are also probes with wires embedded in gypsum.



### D. Triac

The triac is another three-terminal ac switch that is triggered into conduction when a low-energy signal is applied to its gate terminal. Unlike the

SCR, the triac conducts in either direction when turned on. The triac also differs from the SCR in that either a positive or negative gate signal triggers it into conduction. Thus the triac is a three terminal, four layer bidirectional semiconductor device that controls ac power whereas an SCR controls dc power or forward biased half cycles of ac in a load. Because of its bidirectional conduction property, the triac is widely used in the field of power electronics for control purposes. Triacs of 16 kW rating are readily available in the market.



“Triac” is an abbreviation for three terminal ac switch. ‘Tri’ indicates that the device has three terminals and ‘ac’ indicates that the device controls alternating current or can conduct in either direction

#### E. Pump

A submersible motor (or) electric submersible pump is a device which has a hermetically sealed motor close-coupled to the pump body. The whole assembly is submerged in the fluid to be pumped. The main advantage of this type is that it prevents pump cavitations, a problem associated with a high elevation difference between pump and the fluid surface. Submersible pumps push fluid to the surface as opposed to jet pumps having to pull fluids. Submersibles are more efficient than jet pumps.



#### F. Interfacing

LCD modules form a very important part in many Arduino based embedded system designs. So the knowledge on interfacing LCD to Arduino is very

essential in designing embedded systems. RS pin of the LCD module is connected to digital pin 12 of the Arduino. R/W pin of the LCD is grounded. Enable pin of the LCD module is connected to digital pin 11 of the Arduino. The sensor modules are interfaced with the digital pins in arduino. Here water level sensors are given to the digital pins 2, 3, 4 and similarly the soil moisture sensor is connected to digital pin 5. Digital pin 6 of the arduino controls the motor, digital pin 7 controls the circuit breaker which is connect with the parallel communication inputs and digital pin 9 of arduino controls the buzzer.

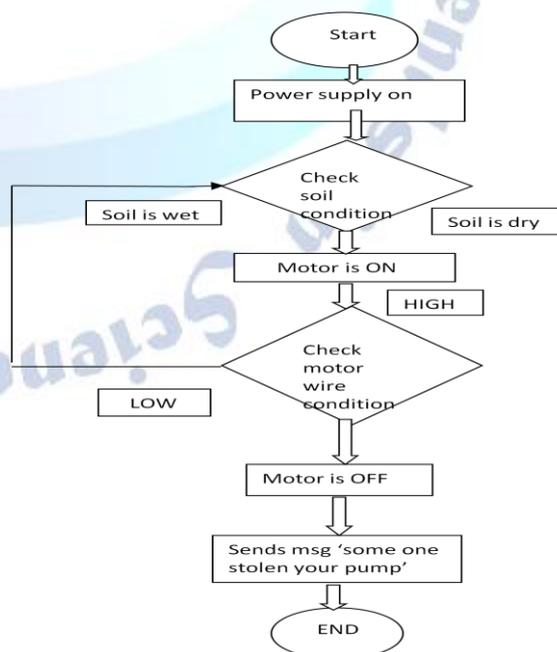
### III. CONCLUSION

GSM is the best technology that can be used for transmitting and receiving of data as compared to that of other technologies, but as per present scenario and requirement it should upgrade to 4G (Forth Generation) for higher speed and higher capacity. GSM systems is the collaboration of software & hardware through which most of the complicity reduces, even systems size & coast also reduced.

The GSM based irrigation system that we have created and will practical use in

Various types' farmhouses. This system can avoid human effort usage, and reduces the wastage of water, power & it intimates in the stealing of motor wires

#### FLOW CHART



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