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GREEN FIELD MONITORING SYSTEM USING WSN

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ABSTRACT

In the present years, automated irrigation system was developed to optimize water use for agricultural crops. The system has a distributed wireless network of soil-moisture, PH sensor, temperature sensors, nitrate sensor, flood sensor and zinc sensor are placed in the root zone of the plants. Temperature and moisture of the soil is sensed with the help of appropriate sensors. This sensed information is sent to the microcontroller, if this value is below the threshold value the motor valve will be opened. After this process ph sensor, zinc sensor, nitrate sensor sense the minerals of the soil. If the sensed mineral value is below the threshold value the particular fertilizer is supplied to the plant along with the water. An algorithm was developed with threshold values of temperature and soil moisture based gateway to control water quantity. This project is aimed to help the people to conserve water. It makes farmer to monitor the land in home itself using WIFI module.

KEYWORD: Agriculture, soil-moisture sensor, PH sensor, temperature sensors, nitrate sensor, flood sensor and zinc sensor, Threshold value, WIFI module

I.INTRODUCTION

Irrigation is the method in which water is supplied to plants at regular intervals for agriculture. Now a days, water shortage is becoming one of the biggest problem in the world. Many different methods are developed for conservation of water. We need water in each and every field. In our day to day life also water is essential. Water is considered to be basic need of human. Water is needed for everyone human beings, animals, plants, etc. Agriculture is one of the fields where water is required in tremendous quantity. Wastage of water major problem in agriculture. Every time excess of water is given to the fields. There are many techniques to save or to control wastage of water from agriculture. Automatic irrigation systems are convenient, especially for those who travel. If installed and programmed properly, automatic irrigation systems can even save you money and help in water conservation. Dead lawn grass and plants need to be replaced, and that can be expensive. But the savings from automatic irrigation systems can go beyond that. Neither method targets plant roots with any significant degree of precision. Automatic irrigation systems can be programmed to discharge more precise amounts of water in a targeted area, which promotes water conservation.

A.IRRIGATION

The increasing demand of the food supplies requires a rapid improvement in food production technology. In many countries where agriculture plays an important part in shaping up the economy and the climatic conditions are isotropic, but still we are not able to make full use of agricultural resources. One of the main reasons is the lack of rains & scarcity of land reservoir water. Extraction of water at regular intervals from earth is reducing the water level as a result of which the zones of un-irrigated land are gradually increasing. Also, the unplanned use of water inadvertently results in wastage of water. The most significant advantage is that water is supplied only when the moisture in soil goes below a pre-set threshold value. This saves us a lot of water. In recent times, the farmers have been using irrigation technique through the manual control in which the farmers irrigate the land at regular intervals by turning the water-pump on/off when required. This process sometimes consumes more water and sometimes the water supply to the land is delayed due to which the crops dry out. Water deficiency deteriorates plants growth before visible wilting occurs. In addition to this slowed growth rate, lighter weight fruit follows water deficiency. This problem can be perfectly rectified if we use Automated Irrigation System in which the irrigation will take place only when there will be intense requirement of water, as suggested by the moisture in the soil.

B.WATER CONSERVATION AND NEW IRRIGATION TECHNOLOGY

Improving irrigation efficiency can contribute greatly to reducing production costs of vegetables, making the industry more competitive and sustainable. Through proper irrigation, average vegetable yields can be maintained (or increased) while minimizing environmental impacts caused by excess applied water and subsequent agrichemical leaching. Recent technological advances have made soil water sensors available for efficient and automatic operation of irrigation systems. Automatic soil water sensor-based irrigation seeks to maintain a desired soil water range in the root zone that is optimal for plant growth. The target soil water status is usually set in terms of soil tension or metrics potential or volumetric moisture. Another benefit of automatic irrigation techniques is convenience. In a previous experience working with a soil-moisture-based automatic irrigation system found that once such a system is set up and verified, only weekly observation was required. This type of system adapts the amount of water applied according to plant needs and actual weather conditions throughout the season. This translates not only into convenience for the manager but into substantial water savings compared to irrigation management based on average historical weather conditions.

C.SOIL MOISTURE SENSORS FOR MANUAL IRRIGATION CONTROL

Soil water status can be determined by direct (soil sampling) and indirect (soil moisture sensing) methods, direct methods of monitoring soil moisture are not commonly used for irrigation scheduling because they are intrusive and labor intensive and cannot provide immediate feedback. Soil moisture probes can be permanently installed at representative points in an agricultural field to provide repeated moisture readings over time that can be used for irrigation management. Special care is needed when using soil moisture devices in coarse soils since most devices require close contact with the soil matrix that is sometimes difficult to achieve in these soils. In addition, the fast soil water changes typical of these soils are sometimes not properly captured by some types of sensors. Many indirect methods are available for monitoring soil water content. An in-depth review of available techniques is given in EDIS Extension.

These methods estimate soil moisture by a calibrated relationship with some other measurable variable. The suitability of each method depends on several issues such as cost, accuracy, response time, installation, management and durability. Depending on the quantity measured (i.e., volumetric water content or soil tension), indirect techniques are first classified into volumetric and tensiometric. Both quantities are related through the soil water characteristic curve that is specific to a given soil. Therefore, it is important to remember that they cannot be related to each other the same way for all soil types. In addition, this relationship might not be unique and may differ along drying and wetting cycles, especially in finer soils. To calculate irrigation requirements (the amount of water that needs to be applied with each irrigation based on crop needs), suction values from tensiometric methods need to be converted to soil moisture through the soil characteristic curve. Among the available tensiometric techniques, tensiometers and granular matrix sensors (GMS) are the most used for automatic irrigation.

Most of the currently available volumetric sensors suitable for irrigation are dielectric. This group of sensors estimate soil water content by measuring the soil bulk permittivity (or dielectric constant) that determines the velocity of an electromagnetic wave or pulse through the, the total permittivity of the soil or bulk permittivity is mainly governed by the presence of liquid soil. In a composite material like the soil (i.e., made up of different components like minerals, air and water), the value of the permittivity is made up by the relative contribution of each of the components. Since the dielectric constant of liquid water is much larger than that of the other soil constituents water.

The dielectric methods use empirical (calibrated) relationships between volumetric water content and the sensor output signal (time, frequency, impedance, wave phase). These techniques are becoming widely adopted because they have good response time (almost instantaneous measurements), do not require maintenance, and can provide continuous readings through automation.

D.FERTILIZER THROUGH WATER

The application of fertilizer through irrigation systems is referred to as fertigation. Using fertigation, fertilizer can be directed towards the plant root zone with irrigation water. A liquid fertilizer solution is injected into the irrigation water at the desired rate. When injecting fertilizer into a properly designed micro-irrigation system the fertilizer will be carried to the plant root zone by the irrigation water. Fertilizer is generally available in dry, suspension or solution forms. When using a dry material, only water soluble compounds should be used. Dry water-soluble fertilizer must be dissolved into water before it can be injected. Dry fertilizers may be coated or use clay as a carrier, if so they must be decanted before injection. Suspension fertilizers may contain some undissolved constituents. Any undissolved material may cause plugging problems if allowed to reach the emitters. Solution fertilizers are completely dissolved. Fertilizer solutions come in many different blends. The material may require dilution with water in order to provide an adequate volume for uniform distribution to the crop.

The paper is organized as follows. In Section 2 Deals with block diagram implementation. In Section 3, discuss the hardware ,4. Discuss the result and Section 5 concludes the project.

II.BLOCK DIAGRAM

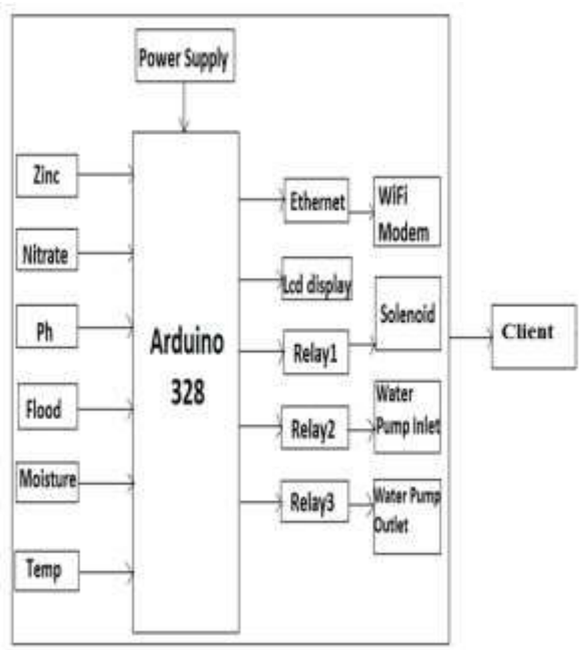

Fig :1Block Diagram of Green Field Monitoring System

A. BLOCK DIAGRAM EXPLANATION

Microcontroller is the heart of the project. The work of the microcontroller in the project is to monitor the WIRELESS SENSOR NETWORK (WSN) as shown in fig:1, like temperature ,humidity, PH, flood, zinc , nitrate. The temperature and soil moisture attain at threshold level it indicates to the farmer then it automatically run the process already we set to the contoller. These sensors first send the data to Microcontroller. The every data are shown in LCD display of the process going on at current time and also to the farmer using IP server technology send to the farmer. The fertilizer can be automatically monitored at an ten days once or time allocated for to mix with water. The required amount of fertilizer can be goes with water. So no crop can be waste of high amount of fertilizer stored in particular area.

The implementation of automatic irrigation system using wireless sensor network and automatic fertilizer system for the crops such as rice, sugarcane etc. They are six sensors are used for irrigation such as PH sensor, temperature sensor, humidity sensor, flood sensor, nitrate sensor, zinc sensor. The temperature sensor is used if at least one soil temperature sensor value of the WSN exceeds the programmed threshold level it starts motor ON to run the water. Humidity sensor is used if at least one soil moisture sensor value of the WSN drops below the programmed threshold level it starts motor ON to run the water

This is the one part of irrigation system in agriculture, also we are implementing an automatic Nowadays irrigation comes automatically, that is helpful for farmers but still automatic fertilizer for a crop by identifying image cannot be implemented so we are implementing this system helpful for future generation farmers. For example; if rice can be planted, the fertilizers like potassium, sodium, phosphorous etc are filled in the tank and valve can be set at the end of the tank. After ten days the crop will looks dull it requires a potassium fertilizer immediately. Already the data can be processed for how many percentage of potassium it requires and how many drops can be sent at an appropriate time interval once all are stored in database by following that, the fertilizer can be mixed through water and a fraction of seconds the fertilizer valve will be open and closed. All the process is displayed in LCD display.

Then the WIU is sent to the client by using RS 232 by a IP. Normally it is a long range covering device when comparing Bluetooth, wi-fi devices. The above process taken place in the transmitter side. While at the receiver receives every data sent by the transmitter.

The client can be viewed through mobile or pc connecting by a IP. It mainly used for future generation farmers monitoring even when they are in homes etc. It requires a low power consumption and at low cost.

III.HARDWARE

A.ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, 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 Atmega16U2 (Atmega8U2 up to version R2) 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, see the index of Arduino boards

Microcontroller	ATmega328
Operating Voltage	5V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6
Analog Input Pins	6
DC Current per I/O Pin	40 Ma
DC Current for 3.3V Pin	50 Ma
Flash Memory	32 KB (ATmega328) of which 0.5 KB used by boot loader
SRAM	2 KB (ATmega328)
EEPROM	1 KB (ATmega328)
Clock Speed	16 MHz

Length	68.6 mm
Width	53.4 mm
Weight	25 g

POWER

The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically.

External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector.

The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

The power pins are as follows:

- VIN. The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or, if supplying voltage via the power jack, access it through this pin.
- 5V.This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board. We don't advise it.
- 3V3. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 50 mA.
- GND. Ground pins.
- IOREF. This pin on the Arduino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source or enable voltage translators on the outputs for working with the 5V or 3.3V.

.MEMORY

The ATmega328 has 32 KB (with 0.5 KB used for the bootloader). It also has 2 KB of SRAM and 1 KB of EEPROM (which can be read and written with the EEPROM library).

INPUT AND OUTPUT

Each of the 14 digital pins on the Uno can be used as an input or output, using pinMode(), digitalWrite(), anddigitalRead() functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40 mA and has an internal pull-up resistor (disconnected by default) of 20-50 kOhms. In addition, some pins have specialized functions:

- Serial: 0 (RX) and 1 (TX). Used to receive (RX) and transmit (TX) TTL serial data. These pins are connected to the corresponding pins of the ATmega8U2 USB-to-TTL Serial chip.

- External Interrupts: 2 and 3. These pins can be configured to trigger an interrupt on a low value, a rising or falling edge, or a change in value. See the attachInterrupt() function for details.
- PWM: 3, 5, 6, 9, 10, and 11. Provide 8-bit PWM output with the analogWrite() function.
- SPI: 10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK). These pins support SPI communication using the SPI library.
- LED: 13. There is a built-in LED connected to digital pin 13. When the pin is HIGH value, the LED is on, when the pin is LOW, it's off.

The Uno has 6 analog inputs, labeled A0 through A5, each of which provide 10 bits of resolution (i.e. 1024 different values). By default they measure from ground to 5 volts, though is it possible to change the upper end of their range using the AREF pin and the analogReference() function. Additionally, some pins have specialized functionality:

- TWI: A4 or SDA pin and A5 or SCL pin. Support TWI communication using the Wire library.

There are a couple of other pins on the board:

- AREF. Reference voltage for the analog inputs. Used with analogReference().
- Reset. Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board.

COMMUNICATION

The Arduino Uno has a number of facilities for communicating with a computer, another Arduino, or other microcontrollers. The ATmega328 provides UART TTL (5V) serial communication, which is available on digital pins 0 (RX) and 1 (TX). An ATmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The '16U2 firmware uses the standard USB COM drivers, and no external driver is needed. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. The RX and TX LEDs on the board will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (but not for serial communication on pins 0 and 1). A Software Serial library allows for serial communication on any of the Uno's digital pins. The ATmega328 also supports I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus; see the documentation for details. For SPI communication, use the SPI library.

PROGRAMMING

The Arduino Uno can be programmed with the Arduino software (download). Select "Arduino Uno from the Tools > Board menu (according to the microcontroller on your board). For details, see the reference and tutorials. The ATmega328 on the Arduino Uno comes preburned with a bootloader that allows you to upload new code to it without the use of an external hardware programmer. It communicates using the original STK500 protocol (reference, C header files). You can also bypass the bootloader and program the microcontroller through the ICSP (In-Circuit Serial Programming) header using Arduino ISP or similar; see these instructions for details.

The ATmega16U2 (or 8U2 in the rev1 and rev2 boards) firmware source code is available . The ATmega16U2/8U2 is loaded with a DFU bootloader, which can be activated by:

- On Rev1 boards: connecting the solder jumper on the back of the board (near the map of Italy) and then resetting the 8U2.
- On Rev2 or later boards: there is a resistor that pulling the 8U2/16U2 HWB line to ground, making it easier to put into DFU mode.

You can then use Atmel's FLIP software (Windows) or the DFU programmer (Mac OS X and Linux) to load a new firmware. Or you can use the ISP header with an external programmer (overwriting the DFU bootloader). See this user-contributed tutorial for more information. Automatic (Software) Reset.

Rather than requiring a physical press of the reset button before an upload, the Arduino Uno is designed in a way that allows it to be reset by software running on a connected computer. One of the hardware flow control lines (DTR) of theATmega8U2/16U2 is connected to the reset line of the ATmega328 via a 100 nanofarad capacitor. When this line is asserted (taken low), the reset line drops long enough to reset the chip. The Arduino software uses this capability to allow you to upload code by simply pressing the upload button in the Arduino environment. This means that the bootloader can have a shorter timeout, as the lowering of DTR can be well-coordinated with the start of the upload.

This setup has other implications. When the Uno is connected to either a computer running Mac OS X or Linux, it resets each time a connection is made to it from software (via USB). For the following half-second or so, the bootloader is running on the Uno. While it is programmed to ignore malformed data (i.e. anything besides an upload of new code), it will intercept the first few bytes of data sent to the board after a connection is opened. If a sketch running on the board receives one-time configuration or other data when it first starts, make sure that the software with which it communicates waits a second after opening the connection and before sending this data.

The Uno contains a trace that can be cut to disable the auto-reset. The pads on either side of the trace can be soldered together to re-enable it. It's labeled "RESET-EN". You may also be able to disable the auto-reset by connecting a 110 ohm resistor from 5V to the reset line; see this forum thread for details.USB Over current Protection.

The Arduino Uno has a resettable polyfuse that protects your computer's USB ports from shorts and over current. Although most computers provide their own internal protection, the fuse provides an extra layer of protection. If more than 500 mA is applied to the USB port, the fuse will automatically break the connection until the short or overload is removed.

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PHYSICAL CHARACTERISTICS

The maximum length and width of the Uno PCB are 2.7 and 2.1 inches respectively, with the USB connector and power jack extending beyond the former dimension. Four screw holes allow the board to be attached to a surface or case. Note that the distance between digital pins 7 and 8 is 160 mil (0.16"), not an even multiple of the 100 mil spacing of the other pins.

POWER SUPPLY

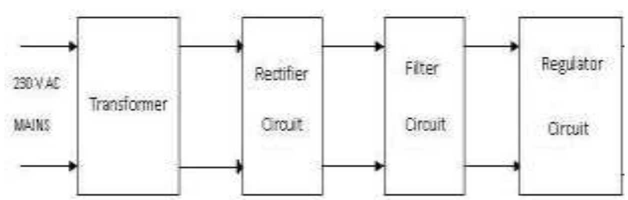

Fig 2 Block diagram of power supply

The given block diagram includes following:

Transformer: A transformer is an electromagnetic static device, which transfers electrical energy from one circuit to another, either at the same voltage or at different voltage but at the same frequency.

Rectifier: The function of the rectifier is to convert AC to DC current or voltage. Usually in the rectifier circuit full wave bridge rectifier is used.

Filter:

The Filter is used to remove the pulsated AC. A filter circuit uses capacitor and inductor. The function of the capacitor is to block the DC voltage and bypass the AC voltage. The function of the inductor is to block the AC voltage and bypass the DC voltage.

Voltage Regulator

Voltage regulator constitutes an indispensable part of the power supply section of any electronic systems. The main advantage of the regulator ICs is that it regulates or maintains the output constant, in spite of the variation in the input supply.

B.Temperature Sensor

Thermistor are thermally sensitive resistors whose prime function is to exhibit a large, predictable and precise change in electrical resistance when subjected to a corresponding change in body temperature is shown in fig3. Negative Temperature Coefficient (NTC) thermistors exhibit a decrease in electrical resistance when subjected to an increase in body temperature and Positive Temperature Coefficient (PTC) thermistors exhibit an increase in electrical resistance when subjected to an increase in body temperature.

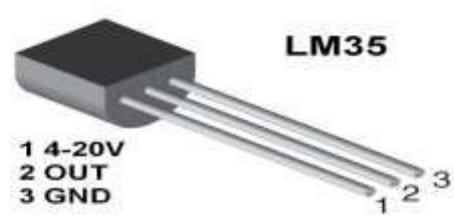

FIG 3 Temperature Sensor

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C. Humidity Sensor

From the fig 4shows that Humidity is the presence of water in air is. The amount of water vapor in air can affect human comfort as well as many manufacturing processes in industries. The presence of water vapour also influences various physical, chemical, and biological processes. Humidity measurement in industries is critical because it may affect the business cost of the product and the health and safety of the personnel.

FIG 4 Humidity Sensor

D.Zinc sensor

The "sensor probe" would consist of two dissimilar metals such as Zinc and Copper, However, the actual current flow due to Galvanic redox reactions is what would create the energy to deflect the needle of the sensor, rather than conductivity of the moist soil alone (as shown in fig:5). The moisture here works merely as an electrolytic medium for the electrochemical reaction. This sensor would fail if used in distilled or otherwise very pure water, or moisture containing no dissolved salts / electrolytes.

FIG 5 Zinc Sensor

E.Nitrate Sensor

From the fig:6 shows that Nitrates are mainly produced for use as fertilizers in agriculture because of their high solubility and biodegradability. The main nitrate fertilizers are ammonium, sodium, potassium, and calcium salts. Several million kilograms are produced annually for this purpose.

The second major application of nitrates is as oxidizing agents, most notably in explosives where the rapid oxidation of carbon compounds liberates large volumes of gases (see Gunpowder for an example). Sodium nitrate is used to remove air bubbles from molten glass and some ceramics. Mixtures of the molten salt are used to harden some metals. Explosives and table tennis balls are made

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from celluloid. The use of nitrates in food preservation is controversial. The production of carcinogenic nitrosamines can be potently inhibited by the use of the antioxidants Vitamin C and the alpha-tocopherol form of Vitamin E during curing. Under simulated gastric conditions, nitrosothiols rather than nitrosamines are the main nitroso species being formed.

FIG :6 Nitrate Sensor

F.Flood Sensor

Water and flood sensor(as shown in fig:7) measure the presence and the level of water where they are placed (for example, as necessary, along a river or behind the washing machines). They don't need cables so the installation is easy. They can be integrated in a monitoring system which is able to collect data in a database accessible by pc, tablet or smartphone.

When the pre-set threshold is exceeded, a sms alert is sent or a siren is triggered in order to warn about a flood danger. The wireless flood sensor makes possible to intervene immediately, limiting damage and inconvenience.

FIG :7 Flood Sensor

G. LCD

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.

H. Relay

From the fig 8 Relays can be of different types like electromechanical, solid state. Electromechanical relays are frequently used. Although many different types of relay were Electromagnet is constructed by wounding a copper coil on a metal core. The two ends of the coil are connected to two pins of the relay as shown. These two are used as DC supply pins. Generally two more contacts will be present, called as switching points to connect high ampere load. Another contact called

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common contact is present in order to connect the switching points. These contacts are named as normally open(NO),normally closed(NC) and common(COM)contacts. Relay can be operated using either AC or DC. In case of AC relays, for every current zero position, the relay coil gets demagnetized and hence there would be a chance of continues breaking of the circuit. So, AC relays are constructed with special mechanism such that continues magnetism is provided in order to avoid above problem.

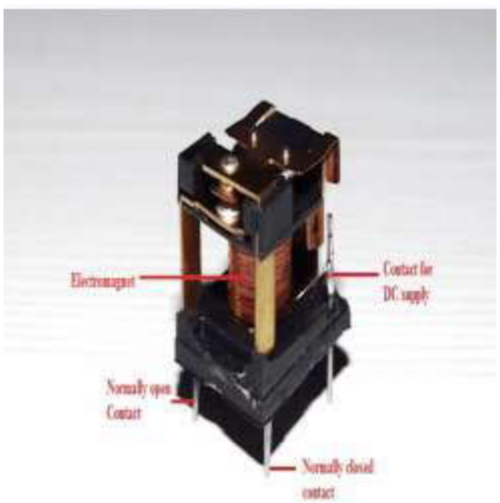

FIG :8 Relay

I.RS 232

RS-232 is a standard for serial communication transmission of data. It formally defines the signals connecting between a DTE (data terminal equipment) such as a computer terminal, and a DCE (data circuit-terminating equipment or data communication equipment), such as a modem.

J. Ethernet Shield

From the fig 9 The Arduino Ethernet Shield 2 connects the Arduino to the internet in mere minutes. Just plug this module onto your Arduino Board, connect it to your network with an RJ45 cable (not included) and follow a few simple steps to start controlling your world canadian pharmacy through the internet. As always with Arduino, every element of the platform – hardware, software and documentation – is freely available and open-source. This means you can learn exactly how it's made and use its design as the starting point for your own circuits. Hundreds of thousands of Arduino Boards are already fueling people's creativity all over the world, everyday. Operating voltage 5V (supplied from the Arduino Board) Ethernet Controller W5500 with internal 32K buffer. Connection speed is 10/100Mb, Connection with Arduino on SPI port

It is based on the (Wiznet W5500 Ethernet chip). The Wiznet W5500 provides a network (IP) stack capable of both TCP and UDP. It supports up to eight simultaneous socket connections. Use the Ethernet library to write sketches that connect to the Internet using the Shield. The Ethernet Shield 2 connects to an Arduino Board using long wire-wrap headers extending through the Shield. This keeps the pin layout intact and allows another Shield to be stacked on top of it.The most recent revision of the board exposes the 1.0 pinout on rev 3 of the Arduino UNO Board. The Ethernet Shield 2 has a standard RJ-45 connection, with an integrated line transformer and Power over Ethernet enabled.

There is an onboard micro-SD card slot, which can be used to store files for serving over the network. It is compatible with the Arduino Uno and Mega (using the Ethernet library). The onboard micro-SD card reader is accessible through the SD Library. When working with this library, SS is on Pin 4. The original revision of the Shield contained a full-size SD card slot; this is not supported. The Shield also includes a reset controller, to ensure that the W5500 Ethernet module is properly reset on power-up. Previous revisions of the Shield were not compatible with the Mega and needed to be manually reset after power-up.

FIG :9 Ethernet Shield

K. Ip Address

IP address for Arduino (as all devices connecting to a network have an IP address), find out what the networks IP address range. This is a standard output of the command “ipconfig” in Windows. IPv4 Address for the Arduino is 192.168.1.122.

IV.RESULT AND DISCUSSION

Irrigation becomes easy, accurate and practical with the idea above shared and can be implemented in agricultural fields in future to promote agriculture to next level. The output from humidity sensor and level system plays major role in producing the output. The primary applications for this project are for farmers and gardeners who do not have enough time to water their crops/plants. It also covers those farmers who are wasteful of water during irrigation.

From the FIG 10 shows the step down transformer is used to down the Ac voltage from 230v to 12v.The rectifier is used to convert Ac voltage to Dc voltage and the capacitor is used to the eliminate the noise. The regulator is used to supply 5v to the ATMEGA 328 controller. Already the program is compiled in ARDUINO IDE 1.0.5 software and dumped. The moisture sensor is placed in the field. Threshold value is fixed for the moisture sensor, if the moisture level of the soil is below the threshold value the motor is automatically ON using relay switch, water is irrigated to the field and if the moisture value is above the threshold condition motor is to be OFF this indicate the soil having the enough level of moisture level. Temperature sensor is also interface with the controller which monitor the temperature level of the field along with this flood sensor is included, that monitor whether water over flow or under flow in the field. It is placed in the required field there should be some distance from the field to the sensor, if the water is reached to the sensor, flood occurrence to be detected, the detected

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Vol.3, Special Issue.24, March 2017

information can be viewed using LCD display device, along with that PH sensor, zinc sensor, nitrate sensor is added. PH sensor measures the soil is acidic or basic based on the value of the sensor what the plant is planted in the agriculture field. Soil mineral is measured with the help of Zinc and nitrate sensor, these minerals are filled in tank if the mineral level low automatically required mineral is added with water through the solenoid valve. All the information is send to microcontroller and the client can view the details through the internet server.

FIG 10: Output of the Green Field Monitoring using WSN

V.CONCLUSION

This system supports remote management for the agricultural land. This architecture is based on the capabilities of current and next-generation controllers and their application requirements. Arduinos and internet used for the system is promising that it can increase system life by reducing the power consumption resulting from lower power consumption.

REFERENCES

[1] (2009) The Zigbee Alliance website. [Online]. Available: http:// www.zigbee.org/

[2] Chae, M.J., Yoo, H.S., Kim, J.R., and Cho, M.Y., “Bridge Condition Monitoring System Using Wireless Network (CDMA and Zigbee),” 23rd International Symposium on Automation and Robotics in Construction ISARC 2006, Tokyo, Japan, 3 – 5 Oct 2006.

[3] Sangmi Shim, Seungwoo Park and Seunghong Hong, “Parking Management System Using Zigbee,” IJCSNS International Journal of Computer Science and Network Security, Vol. 6 No. 9B, September 2006.

[4] F. Vergari, V. Auteri, C. Corsi and C. Lamberti, (2009, October 31), “ AZigbee-based ECG Transmission For Low Cost Solution In Home Care Services Delivery,” Mediterranean Journal of Pacing and Electrophysiology – Special Issue Article Preview, [Online], Available : http:// www.mespe.net/en/newselem/

[5] Cirronet, ZMN2405/HP ZigbeeTM Module Developer’s Kit User Manual, Rev A 2007.

[6] IEEE Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low Rate Wireless Personal Area Network (LR-WPANs), IEEE Standard 802.15.4TM , 2003.