SMART IRRIGATION SYSTEM USING GSM MODULE AND SOLAR PANEL

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ABSTRACT

In this project we have designed smart irrigation system. In this we used moisture sensor to check the moisture of the soil. Whenever this sensor detects the level low then it sends the message to the mobile of requirement of water. After receiving this message a person can send message and switch on the motor by sending*on#. Similarly when this moisture reaches at the particular level than message comes to the person of its normality. With the help of message *of# we can switch of the motor.All this process runs on solar panel which is also a renewable source of energy. The project is designed to develop an automatic irrigation system that switches a pump motor on/off upon sensing moisture content of the soil. In the field of agriculture, use of proper method of irrigation is important. The advantage of using this method is to reduce human intervention and still ensure proper irrigation

INTRODUCTION

1.1Overview

The fundamental thought of building up this undertaking is to get most extreme daylight from the sun for the duration of the day, by following the development of the sun. Here the Solar Cell Panel is moved by the situation of the sun. By following the development of the sun, most extreme daylight is acquired, further this vitality will be put away in a 12 V DC Battery. The sunlight based cell board will be mount on a turning structure. This structure will have DC engines that will assist the structure with rotating. Here we are going to actualize the LDR for location of the daylight. The LDR will recognize the daylight and send the information to the microcontroller. We are going to utilize two LDRs in the task. One at every heading East and West. For whatever length of time that the daylight is in the edge of the first LDR the sun based board will stay a similar way. When the daylight is out of the border of the 1 LDR, it will quit sending information to the microcontroller. And yet the daylight will be in the border of the 2 LDR, as we have introduced the LDRs in such an example. Presently the second LDR will begin sending the information to the microcontroller. After getting the information from the second LDR the microcontroller will send an order to the DC engine. Subsequent to accepting the order from the microcontroller now the DC engine will begin and the board will move to the comparing bearing. This is the means by which we are going to follow the daylight and alter the sun oriented board in a position where it will get greatest daylight.

1.2 Evolution Of Irrigation System

Our Objective is to character the main considerations that have affected water system improvement, to concentrate on the ebb and flow issues, and to propose what this infers for the future advancement Of water system and for the Steps expected to advance this advancement. The attention is on South and Southeast Asia. Three timespans are recognized: the Colonial Era (1850 to 1945), the Cold war Era (1946 to and the New Era 0t Globalization (1990) The targets of water system improvement set to fifth by pioneer systems. national governments, and multilateral advancement organizations in every one Of these timespans have been somewhat comparative. The attention has been on the other clashing objectives Of destitution mitigation and nourishment security from one viewpoint and productivity and income assortment on the other. All the more as of late, with the accomplishment of nourishment security at the national level, the

motivation has widened to incorporate improved jobs, destitution lightening, and natural assurance, Irrigated farming, in any case, has changed drastically and has thusly cultivated change and in country networks. With the outcome that the advantages of water system advancement have gone to a great extent to customers. Pm Farm family units have booked to Other wellsprings of pay, both ranch and non-ranch. Rustic economies are experiencing social just as financial change and the provincial urban outskirts is getting obscured. As we enter an Era of Globalization, ranchers and framework administrators have acclimated to the difficulties presented by the developing interest for water by misusing groundwater, reusing water from channels and trenches, changing trimming designs, and altering the planning of water discharges. Tubewells and siphons have become typical giving makers more noteworthy adaptability in acquiring water when required. Be that as it may, especially in the semiarid districts, over misuse of ground water has diminished both the amount and nature of water. Confronted With spending requirements, governments have Even hesitant to give the assets expected to keep up the colossal interest in surface water system frameworks. The various projects intended to urge nearby rancher associations to accept a more prominent monetary and the board job in Operation and support have met with limit

1.3 Benefits Of Using Wireless Media For This Purpose

Nowadays ,the use of mobile phones is very common. Everyone uses mobile phones. So, it is very beneficial to connect the irrigation system to the mobile number of farmer. So, it is a more beneficial option for the farmers to grow their crops by virtue of wireless media such as mobile phones.

2.PROBLEM FORMULATION

Water system is a fundamental part of manageable agrarian improvement however it's anything but a one of a kind segment, since it faces moves like those defying other open and private division financial exercises. The past areas of this report inspect how different interest side strategy measures can help shape choices that empower water-use proficiency. Nonetheless, while suitable arrangements and guidelines are vital for improved water efficiency, an assortment of extra water-sparing measures are required in the water system area. Some water-sparing measures include exploiting the logical, designing and innovative advances in soils, plants and water system. Different estimates center around authoritative and administrative changes to improve proficiency, including the decentralization of open water system offices and a more noteworthy dependence on rancher claimed and rancher worked water system. This last area features three key water system issues: declining development and speculation drifts in water system; the challenges forced by water system initiated ecological debasement; and endeavors to change administrative and regulatory frameworks. A considerable lot of the present water system related issues seem forcing and in any event, overpowering. The reason for this segment isn't to introduce a debilitating review of water system's future however to concentrate on significant issues that will shape its future. At the point when rare water is under human control in water system frameworks, there are numerous chances to utilize it ideally. Understanding the issues related with inappropriate water system just as the potential for effective water system is an initial phase in the quest for these chances.

3.OBJECTIVE

The fundamental thought of building up this venture is to acquire most extreme daylight from the sun for the duration of the day, by following the development of the sun. Here the Solar Cell Panel is moved by the situation of the sun. By following the development of the sun ,greatest daylight is gotten, further this vitality will be put away in a 12 V DC Battery. The sun based cell board will be mount on a pivoting structure. This structure will have DC engines that will assist the structure with rotating. Here we are going to actualize the LDR for location of the daylight. The LDR will recognize the daylight and send the information to the

microcontroller. We are going to utilize two LDRs in the venture. One at every heading East and West. For whatever length of time that the daylight is in the border of the first LDR the sun based board will stay a similar way. When the daylight is out of the edge of the 1 LDR, it will quit sending information to the microcontroller. And yet the daylight will be in the edge of the 2 LDR, as we have introduced the LDRs in such an example. Presently the second LDR will begin sending the information to the microcontroller. After getting the information from the second LDR the microcontroller will send a direction to the DC engine. In the wake of getting the order from the microcontroller now the DC engine will begin and the board will move to the relating course. This is the way we are going to follow the daylight and alter the sun powered board in a position where it will get most extreme daylight. Presently moving to the second piece of the undertaking, the vitality created through the sun based board will be sent to a DC battery. The battery will store the vitality for additional applications. Presently we are interfacing a water siphon to the battery with the goal that the engine should run on the force produced by the sun based board. We are making the water system framework a shrewd one. Right now water supply will be a robotized one that implies the siphon will supply the water just when the land needs it. Also, the water siphon will be constrained by a mobile phone from any remote area. So as to accomplish this errand we are utilizing a dampness sensor and a GSM Module or gadget. The dampness sensor will be set in the field, and it will be associated with the microcontroller. The dampness sensor will be consistently sending the measure of dampness to the microcontroller, where it will be contrasted and a predefined esteem. Presently at whatever point the dampness level turns out to be not exactly the predefined level, the microcontroller will initiate the GSM Module, which will make an impression on the client, expressing that the dampness level of the land has dropped. Presently after getting the message the client can initiate or switch on the water siphon by simply sending a SMS. Subsequent to getting the SMS the GSM module will send the information to the microcontroller and the microcontroller will send an order to initiate the water siphon. After the engine begins and starts providing water to the field, all the while the dampness sensor will send the dampness level to the microcontroller. Since the field is getting water supply now the dampness level of the field will Solar Panel Tracking System for GSM Based Agriculture System begin expanding, this expansion in the dampness will again be contrasted and a predefined dampness level by the microcontroller. Once in the event that it arrives at the greatest level again the microcontroller will enact the GSM module which will again make an impression on the client about the expansion in the dampness level. Presently if the client needs he/she can turn off the water siphon by sending a SMS. This is the means by which the framework will turn into a robotized framework additionally .we are drawing most extreme force through the daylight. The client is allowed to take a choice whether to supply the water or not from any remote area as long as there is mobile phone arrange.

4.SOLUTION METHODOLOGY

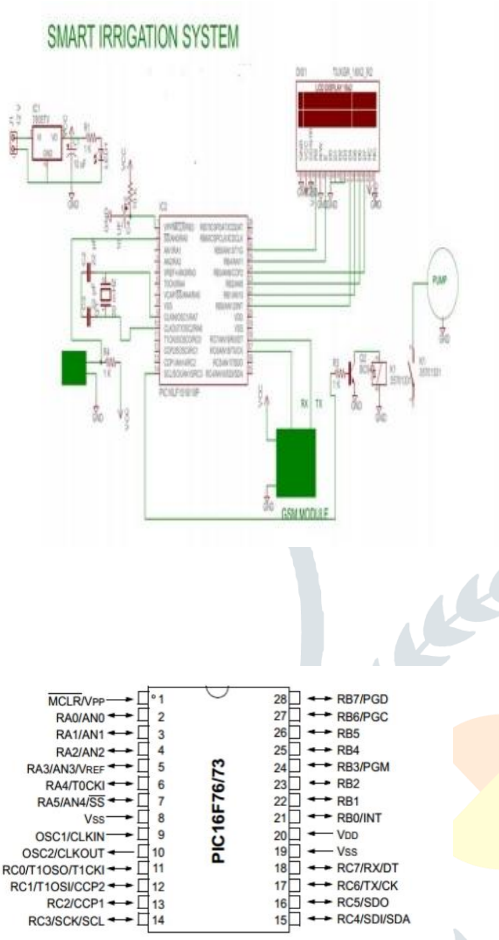

Fig 1.**CIRCUIT** DIAGRAM

4.2Components

- Capacitor 470 µf
- Capacitor 10 µf
- LM7805
- 2 pin connector
- LED red
- Resistor 1k
- PIC16F73 Microcontroller
- Soil moisture sensor
- 28 PIN BASE
- Crystal 20 MHz
- Transistor BC547
- Relay
- 12V DC pump
- Capacitor 22 Pf
- Resistor 10 k
- Capacitor 1µf
- Burg strip
- 12V BATTERY
- Solar panel
- GSM module(sim900a)

4.2.1 PIC Microcontroller

In our day to day life the role of micro-controllers has been immense. They are used in a variety of applications ranging from home appliances, FAX machines, Video games, Camera, Exercise equipment, Cellular phones musical Instruments to Computers, engine control, aeronautics, security systems and the list goes on.

Microcontroller versus Microprocessors

What is the contrast between a microchip and microcontroller? The microchips, (for example, 8086, 80286, 68000 and so forth.) contain no RAM, no ROM and no I/O ports on the chip itself. Hence they are alluded as universally useful microchips. A framework planner utilizing universally useful microchip must include outside RAM, ROM, I/O ports and clocks to make them utilitarian. In spite of the fact that the expansion of outer RAM, ROM, and I/O ports make the framework bulkier and considerably more costly, they have the upside of adaptability with the end goal that the fashioner can settle on the measure of RAM, ROM and I/O ports expected to fit the job needing to be done. This is the not the situation with microcontrollers. A microcontroller has a CPU (a microchip) notwithstanding the fixed measure of RAM, ROM, I/O ports, and clocks are totally implanted together on the chip: along these lines, the creator can't include any outside memory, I/O, or clock to it. The fixed measure of on chip RAM, ROM, and number of I/O ports in microcontrollers make them perfect for some applications in which cost and space are basic. In numerous applications, for instance a TV remote control, there is no requirement for the registering intensity of a 486 or even a 8086 chip. In numerous applications, the space it takes, the force it devours, and the cost per unit are considerably more basic contemplations than the registering power. These applications frequently require some I/O activities to understand signals and turn on and off specific bits. It is fascinating to realize that some microcontroller's fabricates have gone similar to incorporating an ADC and different peripherals into the microcontrollers.

Embedded (PIC 8-Bit Microcontroller)

PIC is a group of changed Harvard design microcontrollers made Microchip innovation, got from the PIC1650 initially created by General instruments Microelectronics Division. The name PIC at first alluded to "Fringe Interface Controller'" presently it is "PIC'" as it were. PICs are mainstream with both mechanical designers and specialists the same because of their ease, wide accessibility, enormous client base, broad collectiof application notes, accessibility of minimal effort or free improvement devices, and sequential programming (and re-programming with streak memory) ability.

Fig 2. PIC MICROCONTR

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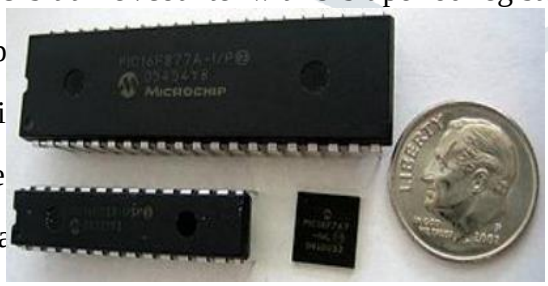
Special Microcontroller Features

- Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
- Programmable code protection
- Power saving SLEEP mode
- Selectable oscillator options
- In-Circuit Serial Programming (ICSP) via two pins

Peripheral Features

- Timer0: 8-bit timer/counter with 8-bit pre-scalar
- Timer1: 16-bit timer/counter with pre-scalar, can be incremented during SLEEP via external crystal/clock
- Timer2: 8-bit timer/counter with 8-bit period register, pre-scalar and post-scalar
- Two Cap



- Capture i
- Compare
- PWM ma
- 8-bit, up to 8-channel Analog to Digital converter
- Synchronous Serial Port (SSP) with SPI (Master mode) and I2C (Slave)
- Universal Synchronous Asynchronous Receiver Transmitter (USART/SCI)
- Parallel Slave Port (PSP), 8-bits wide with external RD, WR and CS controls (40/44pin only)
- Brown-out detection circuitry for Brown-out Reset (BOR)

CMOS Technology

• Low power, high speed CMOS FLASH technology

• Fully static design

• Wide operating voltage range: 2.0V to 5.5V

• High Sink/Source Current: 25 mA

• Industrial temperature range

• Low power consumption:

- < 2 mA typical @ 5V, 4 MHz

- 20 μA typical @ 3V, 32 KHz

- < 1 μA typical standby current

Device Overview

This document contains device specific information about the following devices:

• PIC16F73

• PIC16F74

• PIC16F76

• PIC16F77

PIC16F73/76 devices are available only in 28-pin packages, while PIC16F74/77 devices are available in 40-pin and 44-pin packages. All devices in the PIC16F7X family share common architecture, with the following differences:

• The PIC16F73 and PIC16F76 have one-half of the total on-chip memory of the PIC16F74 and PIC16F77

• The 28-pin devices have 3 I/O ports, while the 40/44-pin devices have 5

• The 28-pin devices have 11 interrupts, while the 40/44-pin devices have 12

• The 28-pin devices have 5 A/D input channels, while the 40/44-pin devices have 8

• The Parallel Slave Port is implemented only on the 40/44-pin devices

- **Specifications for voice**

This type of battery has been under development by SAFT and more recently by Marathon. Limited flight tests have been performed by the U.S. Navy on the H-1 helicopter. Application of this technology to commercial aircraft is also being pursued. Determining the most suitable battery type and size for a given aircraft type requires detailed knowledge of the application requirements (load profile, duty cycle, environmental factors, and physical constraints) and the characteristics of available batteries (performance capabilities, charging requirements, life expectancy, and cost of ownership). With the various battery types available today,

selector switch across a range of resistances or transformer windings to gradually step the output voltage up or down, or to rotate the position of a moving-coil AC regulator. Early automobile generators and alternators had a mechanical voltage regulator using one, two, or three relays and various resistors to stabilize the generator's output at slightly more than 6 or 12 V, independent of the engine's rpm or the varying load on the vehicle's electrical system. Essentially, the relay(s) employed pulse width modulation to regulate the output of the generator, controlling the field current reaching the generator (or alternator) and in this way controlling the output voltage producing back into the generator and attempting to run it as a motor. The rectifier diodes in an alternator automatically perform this function so that a specific relay is not required; this appreciably simplified the regulator design. More modern designs now use solid state technology (transistors) to perform the same function that the relays perform in electromechanical regulators. Electromechanical regulators are used for mains voltage stabilisation see AC voltage stabilizers below. To control the output of generators (as seen in ships and power stations, or on oil rigs, greenhouses and emergency power systems) automatic voltage regulators are used. This is an active system. While the basic principle is the same, the system itself is more complex. An automatic voltage regulator (or AVR for short) consists of several components such as diodes, capacitors, resistors and potentiometers or even microcontrollers, all placed on a circuit board. This is then mounted near the generator and connected with several wires to measure and adjust the generator. How an AVR works: In the first place the AVR monitors the output voltage and controls the input voltage for the exciter of the generator. By increasing or decreasing the generator control voltage, the output voltage of the generator increases or decreases accordingly. The AVR calculates how much voltage has to be sent to the exciter numerous times a second, therefore stabilizing the output voltage to a predetermined set point. When two or more generators are powering the same system (parallel operation) the AVR receives information from more generators to match all output.

4.2.7 RELAY

Relay is an electromagnetic device which is used to isolate two circuits electrically and connect them magnetically. They are very useful devices and allow one circuit to switch another one while they are completely separate. They are often used to interface an electronic circuit (working at a low voltage) to an electrical circuit which works at very high voltage. For example, a relay can make a 5V DC battery circuit to switch a 230V AC mains circuit. Thus a small sensor circuit can drive, say, a fan or an electric bulb. A relay switch can be divided into two parts: input and output. The input section has a coil which generates magnetic field when a small voltage from an electronic circuit is applied to it. This voltage is called the operating voltage. Commonly used relays are available in different configuration of operating voltages like 6V, 9V, 12V, 24V etc. The output section consists of contactors which connect or disconnect mechanically. In a basic relay there are three contactors: normally open (NO), normally closed (NC) and common (COM). At no input state, the COM is connected to NC. When the operating voltage is applied the relay coil gets energized and the COM changes contact to NO. Different relay configurations are available like SPST, SPDT, DPDT etc, which have different number of changeover contacts. By using proper combination of contactors, the electrical circuit can be switched on and off. Get inner details about structure of a Relay Switch.

Fig 11.RELAY

4.2.8LCD

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on. A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD. Click to learn more about internal structure of a LCD.

Pin Description

Pin No	Function	Name
1	Ground (0V)	Ground
2	Supply voltage; 5V (4.7V – 5.3V)	Vcc
3	Contrast adjustment; through a variable resistor	V_{EE}
4	Selects command register when low; and data register when high	Register Select
5	Low to write to the register; High to read from the register	Read/write
6	Sends data to data pins when a high to low pulse is given	Enable
7	8-bit data pins	DB0
8		DB1
9		DB2
10		DB3
11		DB4
12		DB5
13		DB6
14		DB7
15	Backlight V_{CC} (5V)	Led+
16	Backlight Ground (0V)	Led-

Table 1

contrast (or "darkness") of the characters on the LCD screen.

RS (register select)

There are two important registers inside the LCD. The RS pin is used for their selection as follows. If RS=0, the instruction command code register is selected, then allowing to user to send a command such as clear display, cursor at home etc.. If RS=1, the data register is selected, allowing the user to send data to be displayed on the LCD.

R/W (read/write)

The R/W (read/write) input allowing the user to write information from it. R/W=1, when it read and R/W=0, when it writing.

EN (enable)

The enable pin is used by the LCD to latch information presented to its data pins. When data is supplied to data pins, a high power, a high-to-low pulse must be applied to this pin in order to for the LCD to latch in the data presented at the data pins.

D0-D7 (data lines)

The 8-bit data pins, D0-D7, are used to send information to the LCD or read the contents of the LCD's internal registers. To displays the letters and numbers, we send ASCII codes for the letters A-Z, a-z, and numbers 0-9 to these pins while making RS =1. There are also command codes that can be sent to clear the display or force the cursor to the home position or blink the cursor.

We also use RS =0 to check the busy flag bit to see if the LCD is ready to receive the information. The busy flag is D7 and can be read when R/W =1 and RS =0, as follows: if R/W =1 and RS =0, when D7 =1(busy flag =1), the LCD is busy taking care of internal operations and will not accept any information. When D7 =0, the LCD is ready to receive new information.

(photo meaning "light" and voltaic meaning "electricity"), convert sunlight directly into electricity. A module is a group of cells connected electrically and packaged into a frame (more commonly known as a solar panel), which can then be grouped into larger solar arrays. Photovoltaic cells are made of special materials called semiconductors such as silicon, which is currently used most commonly. Basically, when light strikes the cell, a certain portion of it is absorbed within the semiconductor material. This means that the energy of the absorbed light is transferred to the semiconductor. The energy knocks electrons loose, allowing them to flow freely. PV cells also all have one or more electric field that acts to force electrons freed by light absorption to flow in a certain direction. This flow of electrons is a current, and by placing metal contacts on the top and bottom of the PV cell, we can draw that current off for external use, say, to power a calculator. This current, together with the cell's voltage (which is a result of its built-in electric field or fields), defines the power (or wattage) that the solar cell can produce. That's the basic process, but there's really much more to it. Silicon has some special chemical properties, especially in its crystalline form. An atom of silicon has 14 electrons, arranged in three different shells. The first two shells which hold two and eight electrons respectively are completely full. The outer shell, however, is only half full with just four electrons. A silicon atom will always look for ways to fill up its last shell, and to do this, it

will share electrons with four nearby atoms. It's like each atom holds hands with its neighbours, except that in this case, each atom has four hands joined to four neighbours. That's what forms the crystalline structure, and that structure turns out to be important to this type of PV cell. The only problem is that pure crystalline silicon is a poor conductor of electricity because one of its electrons are free to move about, unlike the electrons in more optimum conductors like copper. To address this issue, the silicon in a solar cell has impurities other atoms purposefully mixed in with the silicon atoms which changes the way things work a bit. We usually think of impurities as something undesirable, but in this case, our cell wouldn't work without them. Consider silicon with an atom of phosphorous here and there, maybe one for every million silicon atoms. Phosphorous has five electrons in its outer shell, not four. It still bonds with its silicon neighbour atoms, but in a sense, the phosphorous has one electron that doesn't have anyone to hold hands with. It doesn't form part of a bond, but there is a positive proton in the phosphorous nucleus holding it in place. When energy is added to pure silicon, in the form of heat for example, it can cause a few electrons to break free of their bonds and leave their atoms. A hole is left behind in each case. These electrons, called free carriers, then wander randomly around the crystalline lattice looking for another hole to fall into and carrying an electrical current. However, there are so few of them in pure silicon, that they aren't very useful. But our impure silicon with phosphorous atoms mixed in

GSM (Global system for Mobile Communications) is a standard which is developed by the European Telecommunication Standard Institute (ETSI) to describe all the different protocols of second generation (2G) cellular networks which is used by cell phones. Figure 5.1 describes the architecture of GSM.

5.1 Architecture of GSM

Global Identity (CGI), a number that uniquely identifies the cell.

 Location Area: A group of cells form a Location Area (LA). This is the area that is paged when a subscriber gets an incoming call. Each LA is assigned a Location Area Identity (LAI). Each LA is served by one or more BSCs.

 MSC/VLR Service Area: The area covered by one MSC is called the MSC/VLR service area.

 PLMN: The area covered by one network operator is called the Public Land Mobile Network (PLMN). A PLMN can contain one or more MSCs.

5.5 SWITCHING SYSTEM FUNCTIONAL ELEMENT

Home Location Register (HLR)

The HLR is a database used for storage and management of subscriptions. The HLR is considered the most important database, as it stores permanent data about subscribers, including a subscriber's service profile, location information, and activity status. When an individual buys a subscription in the form of SIM, then all the information about this subscription is registered in the HLR of that operator.

Mobile Services Switching Centre (MSC)

The central component of the Network Subsystem is the MSC. The MSC performs the switching of calls between the mobile and other fixed or mobile network users, as well as the management of mobile services such as registration, authentication, location updating, handovers, and call routing to a roaming subscriber. It also performs such functions as toll ticketing, network interfacing, common channel signalling, and others. Every MSC is identified by a unique ID.

Visitor Location Register (VLR)

The VLR is a database that contains temporary information about subscribers that is needed by the MSC in order to service visiting subscribers. The VLR is always integrated with the MSC. When a mobile station roams into a new MSC area, the VLR connected to that MSC will request data about the mobile station from the HLR. Later, if the mobile station makes a call, the VLR will have the information needed for call setup without having to interrogate the HLR each time.

Authentication Centre (AUC)

The Authentication Centre is a protected database that stores a copy of the secret key stored in each subscriber's SIM card, which is used for authentication and ciphering of the radio channel. The AUC protects network operators from different types of fraud found in today's cellular world.

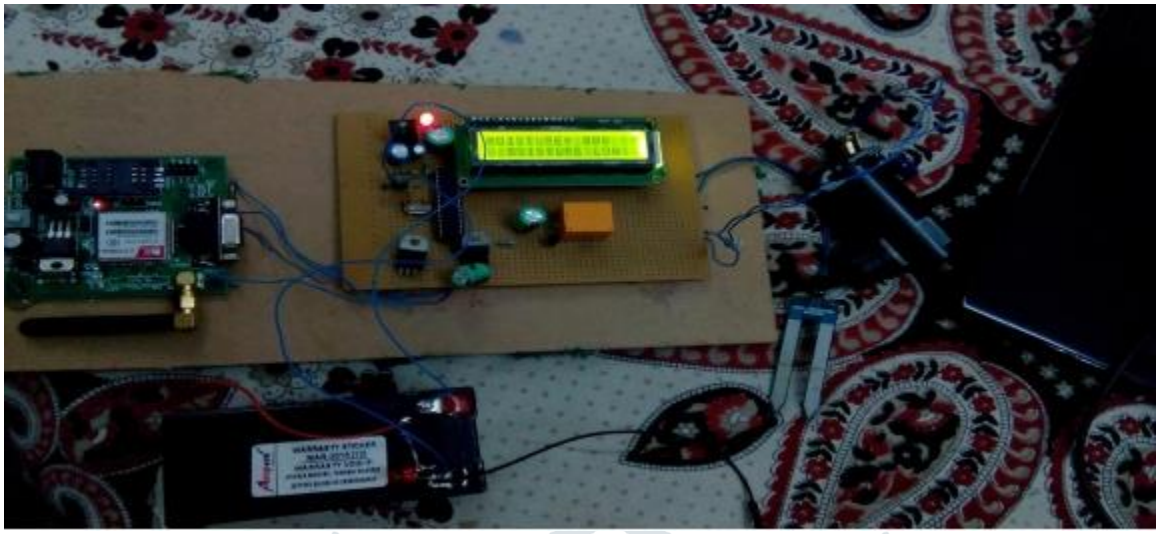
Equipment Identity Register (EIR)

The Equipment Identity Register (EIR) is a database that contains a list of all valid mobile equipment on the network, where its International Mobile Equipment Identity (IMEI) identifies each MS. An IMEI is marked as invalid if it has been reported stolen or is not type approved.

1. Connect the adapter to module and turn it ON.

RESULT AND DISCUSSIONS

Step 1: Make the connection as shown in the circuit diagram



Step 2: Switch on the power supply

Fig 16.WORKING PROJECT II

Step 3: GSM module will take some time to synchronize

Step 4: Soil moisture sensor will sense the level of moisture of soil. If moisture is below than 100 then display on LCD is ”MOISTURE LOW”

Fig 17.WORKING PROJECT III

If more than 100 then display on LCD is ”MOISTURE NORMAL”

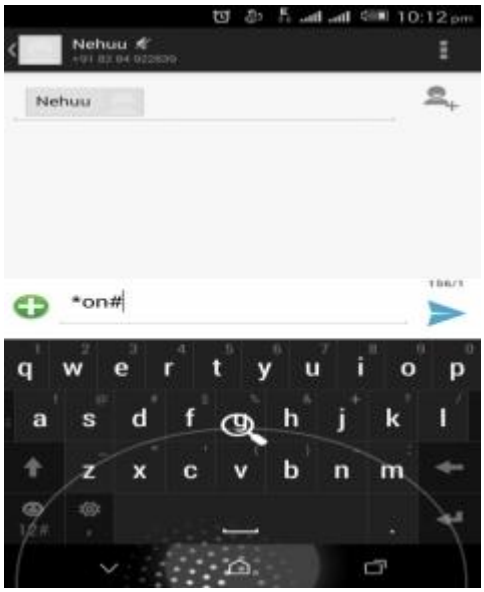


Fig 19.WORKING PROJECT V

Step 6 : And when the moisture will be normal after supplying the water message would arrive "moisture normal" and we would off the pump using command *of#

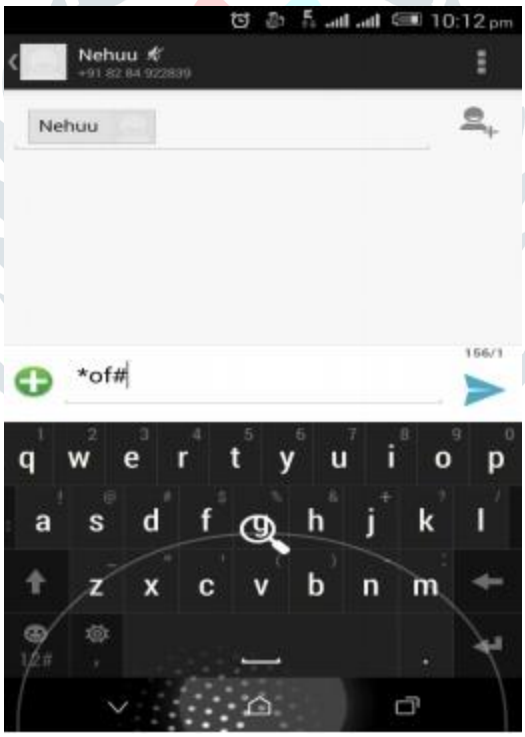


Fig 20.WORKING PROJECT VI

CONCLUSIONS AND FUTURE SCOPE

Smart irrigation system saves the water and avoids the wastage of water .As India is facing water crisis and this problem will increase in coming days so smart irrigation system has a great scope in agricultural and irrigation applications. In India, rural areas are facing shortage of electricity and Smart irrigation system uses solar energy as its power source which is renewable source of energy . This project uses solar panel which converts solar energy into proportional electrical energy. The entire system will act as a crop insurance system, as it will protect the crops by shielding it from untimely rain, hail stones, and temperature, thereby helping the farmers to get optimum cultivation. Also, it will help to make proper use of water, as the soil moisture level differs from crops to crops and this will be taken care of by the soil moisture sensor. As the entire system will be powered by solar energy which will be stored in the rechargeable batteries, one need not think of the electricity consumption, as life of solar panel which is available these days is 25 years. Moreover, the entire system is been monitored by GSM model, farmer will always be alerted what actions is been taken by the microcontroller.

By this project we can control the moisture content of the soil in the cultivating field. Based on soil moisture, pumping motor will be automatically switch on or off through relay. This saves the water at the same time and on the other hand the plant can get optimum level of water, so increasing productivity of crop.

The result is a scalable, implementable technology that we have tested and validated numerically and in the field**.** By using this sensor, we can find whether the soil is wet or dry. If it is dry, pumping motor will pump the water automatically.

The Soil moisture content based irrigation system was developed and successfully implemented along with flow sensor. Salient features of the system are: Closed loop automatic irrigation system, temperature and water usage monitoring. User can easily preset the levels of the Moisture and is regularly updated about current value of all Parameters on LCD display. In future, other important soil parameters namely soil pH, soil electrical conductivity will also be incorporated in the system.

REFRENCES

[1] Shen Jin, Song Jingling, Han Qiuyan, Wang Shengde, YangYan, School of Electric and Electronic Engineering, "A Remote Measurement and Control System for Greenhouse Based on GSM-SMS" IEEE 8th International Conference on Electronic Measurement and Instrument, 2007

[2]"Irrigation System Controllers", SSAGE22, Agricultural and Biological Engineering Department, Flo rida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Available: http://edis.ifas.ufl.edu

[3] Jeng-Nan Juang, R. Radharamanan; "Low Cost Soil Moisture System Brad Rodriguez."Moving Forth Part 7: Camel Forth for the 8051".

[4] "Measurement Scheduling for Soil Moisture Sensing: From Physical Models to Optimal Control," Proceedings of the IEEE, vol.98, no.11, pp.1918, 1933, Nov. 2010

[5] Shock, C.C., J.M. Barnum, and M. Seddigh (1998). "Calibration of Watermark Soil Moisture Sensors for irrigation management", pp.139-146 in Proceedings of the International Irrigation Show, Irrigation Association, San Diego, CA.

[6] Watermark 200SS soil moisture sensor specification manual. Available: http://www.irrometer.com/sensors.html

[7] Gsmworld.com. GSM Association. 2001. Archived from the original on 5 May 2011. Retrieved 5 May 2011. "1982 Groupe Speciale Mobile (GSM) is formed by the Confederation of European Posts and Telecommunications (CEPT) to design a pan-European mobile technology."

[8]"GSM World statistics". gsmworld.com. GSM Association. 2010. Retrieved 8 June 2010.

[9] G.K. Banerjee and Rahul Singhal (2010). "Micro controller based Polyhouse Automation Controller", 2010 International Symposium on Electronic System Design, IEEE 2010.