International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.01, February 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

ADVANCED IRRIGATION SYSTEM WITH SMS ACKNOWLEDGEMENT ASSISTING

Rajkumar Gupta[1],Sanjeev Kumar Singh[2], Sunil Kumar[3]

[1,2,3]*Department Of Civil Engineering*

IIMT College Of Engineering, Greater Noida(India)

ABSTRACT

In any country irrigation is the main criteria especially in India irrigation plays major role that is way we developing project like "AUTOMATED IRRIGATION USING WIRELESS NETWORK". In the title named it was automatic irrigation i.e. the main requirement of irrigation is water, so we supply the water for irrigation automatically. An automated irrigation system was developed to optimize water use for agricultural crops. The system has a distributed wireless network of soil-moisture and temperature sensors placed in the root zone of the plants. In addition, a gateway unit handles sensor information, triggers actuators, and transmits data through mobile phone. An algorithm was developed with threshold values of temperature and soil moisture that was programmed into a microcontroller-based gateway to control water quantity. The automated system was tested in a sage crop field for 136 days and water savings of up to 90% compared with traditional irrigation practices of the agricultural zone were achieved. Three replicas of the automated system have been used successfully in other places for 18 months. Because of its energy autonomy and low cost, the system has the potential to be useful in water limited geographically isolated area.

Keywords: GSM Module, Mobile, SMS, Temperature Sensor, Humidity Sensor, Water level and Micro Controller.

I. INTRODUCTION

The worldwide Irrigation system state of affairs, be that because it could, is represented by poor execution, dilated interest for higher farming potency, diminished accessibility of water for business, increasing soil saltiness Associate in Nursing conceivable impacts of an Earth-wide temperature boost and environmental modification. This procedure in some cases devours a lot of water or sometimes the water involves late as a result of that the harvests get dried. Water inaccessibility will be preventative to plants before obvious withering happens. Obstructed development rate, lighter weight natural product takes once slight water inadequacy. This issue will be consummately amended on the off probability that we have a tendency to utilize programmed microcontroller based mostly irrigation system framework during which the irrigation system can happen simply once there'll be exceptional necessity of water.

As we have a tendency to notice that Republic of India could be a making nation and also the important piece of our value development rate fits in with business alone. Therefore we are able to say that husbandry is that the foundation of Republic of India and watering system is thought because of the facilitation. Thus, husbandry in Republic of India has been the foremost very important would like within the money improvement of nation since the liberty. Important piece of our consumption is spent on business alone and however that we have a tendency to not obtaining obligated yield. In India, there's uneven natural totally different qualities cause, some half encounter dry seasons whereas some sections surge, therefore there's faithfully inaccessibility of water accessible for the watering system. Farmers in rustic region severally are influenced by this condition. New innovations nearing but they're too pricey for the fundamental farmer.

The system offers a less costly and a lot of simple account this issue by making computerised microclimate irrigation system controllers with remote capability helped with smallest effort remote device hubs. Like temperature device, viciousness device, water level device that schools the temperature at that territory, damp of the Soil, and water level within the space. The realm or firm is isolated into microclimatic districts equipped keen indicated sensors and incorporated remotely into mechanized watering system controller with remote systems administration ability.

II. LITERATURE REVIEW

To implement the GSM for Irrigation system the study has done on completely different researches.

In the existing System the ability provides for the system is going to be traditional it should be some conditions the ability are going to be unobtainable and it's going as an obstacle. Antecedently the ability provide for the motor is additionally traditional however here we have a tendency to square measure providing the ability provide from the alternative energy. Whenever the user send a message the motor on/off operation are going to be performed.

The foremost necessary objective of the paper is to style and develop a foreign observance and closed-loop system for contemporary agricultural system. within the projected system we have a tendency to square measure implementing the arm7 primarily based irrigation system victimization GSM technology and climate observance like temperature, moisture, water level etc. Here we have a tendency to square measure interfacing the controller with the GSM electronic equipment, wetness sensing element, temperature sensing element and water level sensing element and motor. Whenever the user have to be compelled to recognize the climate of the land he can sent an SMS like standing then he can get a reply from the controller, depends on fait the standing the user once more sent SMS like motor on/off.

II. HARDWARE DESIGN

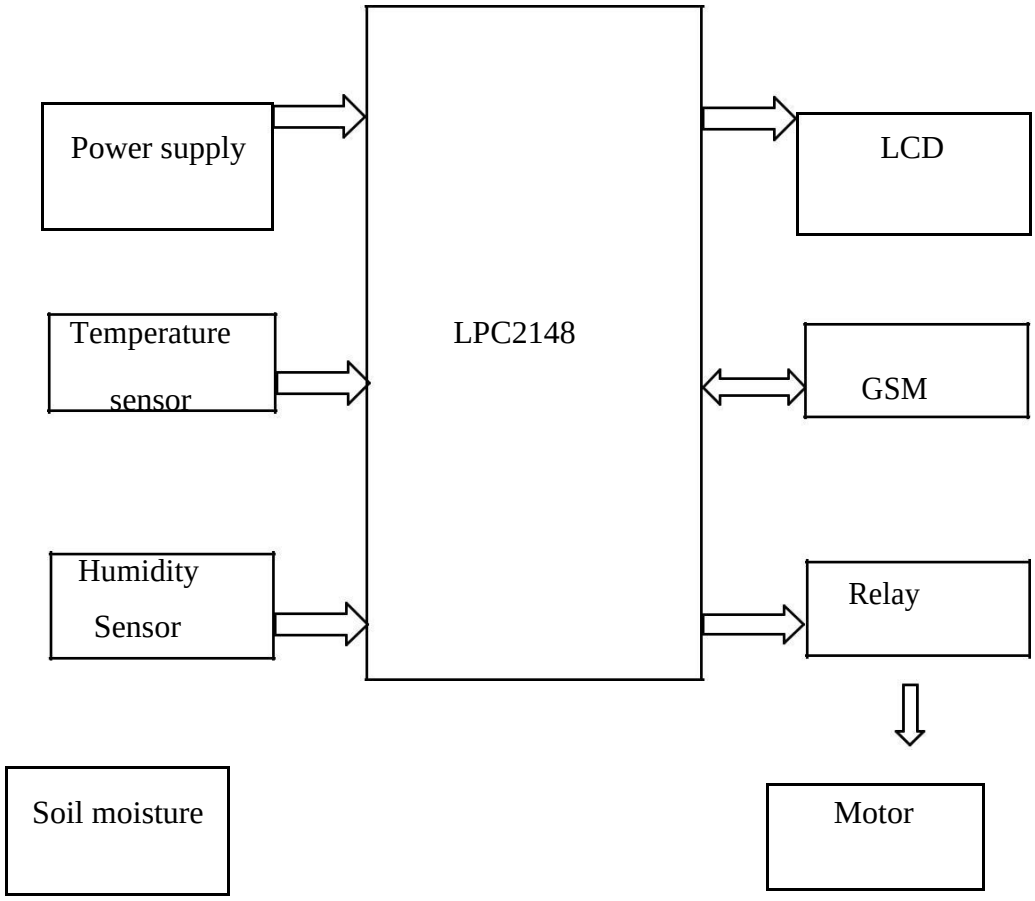


Fig 1: Block Diagram

The Irrigation Control system using GSM technology consists of different hardware and software modules. The following block diagram shows the overview of hardware components included in the system.

2.1 LPC2148Microcontroller

The LPC2148 microcontroller board supported a 16-bit/32-bit ARM7TDMI-S CPU with time period emulation, 16-bit/32-bit ARM7TDMI-S microcontroller during a small LQFP64 package, eight K to forty K of on-chip static RAM and thirty two K to 512 K of on-chip flash memory; 128-bit wide interface/accelerator permits high-speed sixty megacycle operation, In-System Programming/In-Application(ISP), Single 10-bit DAC provides variable analogue output, 2 32-bit timers/external event counters (with four capture and 4 compare channels each), PWM unit (six outputs) and watchdog, Low power time period Clock (RTC), Multiple serial interfaces as well as 2 UARTs (16C550), 2 quick I2C-bus (400 kbit/s), SPI and SSP with buffering and variable information length capabilities.

2.2 GSM Modem

GSM electronic equipment may be a device which may perform all the module operations like business, and GPRS network with it. However, the most distinction is that the GSM electronic equipment is that the crude kind of a cell phone that is planned to use in fashionable and take a look at applications. The GSM electronic equipment utilizes 900MHz information transfer capability as a district of Bharat in step with the medium body tenets. As we are saying previous it's a crude kind of a cell phone, the GSM electronic equipment contains a SIM card area, Antenna and max232 drivers in it.

2.3 Motor

The 12V DC intermeshed Motor is utilized as a vicinity of assortment of mechanical technology applications and is accessible with intensive kind of rev and torsion. During this paper we tend to square measure utilizing a 12v DC engine with the sixty rev speed/s

2.4 Temperature Sensor

The DS1621 measures temperature by tallying the quantity of clock cycles that an oscillator with a low temperature coefficient experiences among a door period controlled by a high temperature coefficient oscillator.

2.5 Humidity Sensor

Moistureis that the locality of water in air. The measure of water vapour in air can influence human solace and additionally various assembling procedures in industrial enterprises. The locality of water vapour likewise impacts totally different physical, concoction, and natural procedures.

2.6 Soil Moisture Sensor

To put it plainly, level sensors are one in all the vital sensors and assume crucial part in assortment of purchaser/ modern applications. Equally as with alternative form of sensors, level sensors are accessible or may be composed utilizing mixture of detective work standards.Soil Moisture Sensor is a basic breakout for measuring the dampness in soil and comparative materials. The dirt dampness sensor is really straight forward to utilize. The two vast uncovered cushions capacity as tests for the sensor, together going about as a variable resistor. The more water that is in the dirt means the better the conductivity between the cushions will be and will bring about a lower resistance, and a higher SIG out. Soil Moisture Sensor working all you will need is to associate the VCC and GND pins to your gadget (or good advancement board) and you will get a SIG out which will rely on upon the measure of water in the dirt. One normally known issue with soil dampness senors is their short lifespan when presented to a sodden situation. To battle this, we've had the PCB covered in Gold Finishing (ENIG or Electro less Nickel Immersion Gold). We prescribe either a basic 3-pin screw pin terminal or a 3-pin jumper wire gathering (both can be found in the Recommended Products area beneath) to be bound onto the sensor for simple wiring.

2.7 Relay

The main purpose of a relay is switching. Relay is a device which provides connection between two or more points or device in response to the input given to the relay.The other way of using of relay provides isolation between the controller and the device as we know devices may work on AC as well as on DC.

2.8 Submersible Motor

A submersible motor 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 of pump is that it prevents pump cavitation, 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.

III. SOFTWARE DESIGN

In this proposed system, as we used LPC2148 we need to use following software tools to program it.

1. KeiluVision
2. Flash Magic

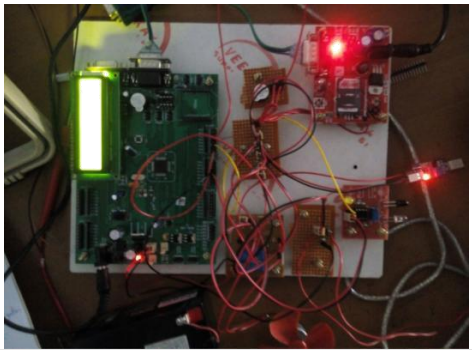
The KeiluVision is an IDE for Embedded C language. In this IDE, we need to import the utilities and libraries according to the controller we are using. This IDE is very simpler and in user friendly manner to use. It includes all the C/C++ compilers, assemblers, and debuggers in it. It simplifies the process of embedded simulation and testing along with Hex file generation.

The flash magic is a programming utility. The C/C++ program written in IDE will be processed into Hex file i.e. in .hex format. It is necessary to dump the hex file on to the microcontroller.

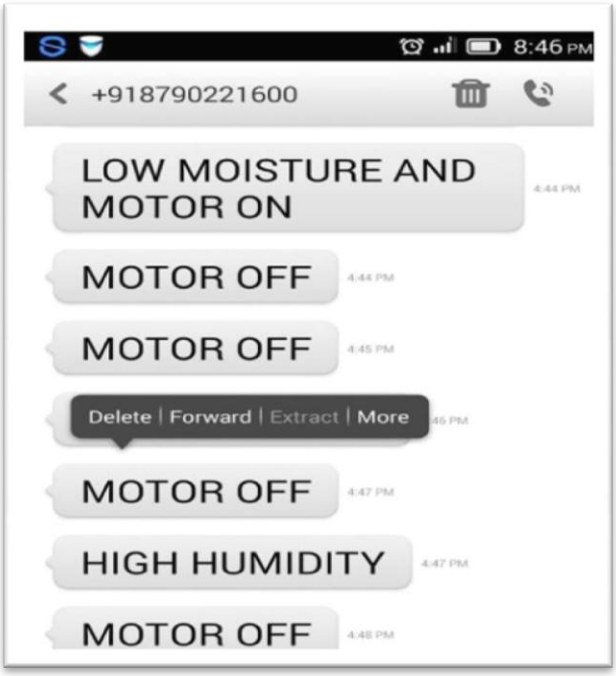
IV. WORKING DESCRIPTION

The Irrigation Control system working starts from user messaging depends up on the SMS content the operation will be performed by the Microcontroller, if the message is status then the controller will capture the all the sensors and it will send details to the user and motor on/off then the motor will be on/off. The main advantage of the system is solar power supply and knowing the weather conditions in the area. When the system gets powered up then the system will be wait for the user SMS, and captures the all the sensors details and compares with the normal weather conditions if the any one of the sensor will exceeds its limit then automatically the message sent to the authorized person and the operation of the motor will be depends up on the user command

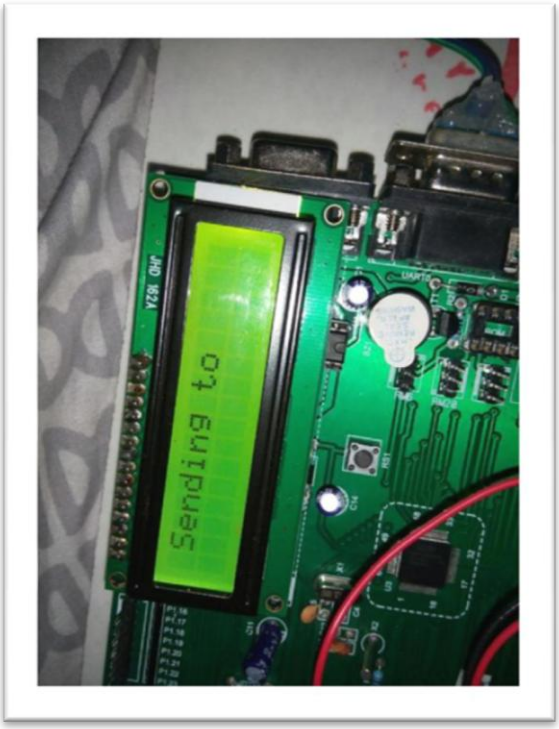
V. RESULTS



International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.01, February 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354



Received messages



Message sending the sensor triggered

The moisture of the soil is monitored in the interval timings and when the land is dry the status of the message is send directly to the registered user and motor is directly switched on. The motor on and off status are properly receive by the user and switch off the unnecessary usage of motor and there by spoiling the crops.

VI. CONCLUSION

Irrigation system has been the foundation of human progress since man has begun Agriculture. As the era developed, man created numerous strategies for irrigation system to control the supply of water in to the area.In the present situation on preservation of water is of high significance.By knowing the status of water level and temperature and moisture level in the land sent through the authorized person and also if the limit of the any one sensor exceeds then the motor will be automatically switched off. The Irrigation control system is low cost, easy in operation and uninterrupted power supply.After the code is programmed in to the controller and powered up then the GSM waits for the message and execute the code by operating Motor and capturing the status of the sensors details and here we are developing a conventional system for the efficient usage of the agricultural and for the emergency conditions.

REFERENCES

[1]. Kay, M., "Small holder irrigation technology: Prospects for sub-Saharan Africa" International Program for

[2]. N. Shah and I. Das, "Precision Irrigation Sensor Network Based Irrigation", a book on Problems, Perspectives and Challenges of Agricultural Water Management, IIT Bombay, India,April 2008 .

[3]. Fangmeier, D. D., Garrot, D. J.,Mancino, C.F and Husman, S. H., "Automated irrigation systems using plant and soil sensors", American Society of Agricultural Engineers, ASAE Publication, 1990.

[4]. Benzekri, A., Meghriche, K., and Refoufi, L., PC-based automation of a multi-mode control for an irrigation system Proceedings of International symposium on industrial embedded systems, Lisbon, July 2007.

[5]. Shinghal, K., Noor, A., Srivastava, N., and Singh, R., Wireless sensor networks in agriculture for potato farming International Journal of Engineering, Science and Technology, Vol. 2, No. 8, 2010.

[6]. Gautam, I., and Reddy, S. R. N.,Innovative GSM-Bluetooth based remote controlled embedded system for irrigation, International Journal of Computer Applications, Vol. 47, No. 8, 2012.

[7]. Zhang, F., Yang, M., and Ying, H., The application of GSM communication in agricultural automation, Journal of Technology for Agriculture, Vol. 1, No. 1, 2004, pp.Control System (HACS) for Automating Appliances and Security", *Issues in Informing Science and InformationTechnology*,2009.

[8]. Webin Huang, Guanglong Wang, Research of Wireless Sensor Networks for an Intelligent Measurement System Based on ARM, 2011.

[9]. Sezen SM, Yazar A, Irrigation Management on Yield And Quality Of Tomatoes Grown in different Soilless Media in Glasshouse,2010.

[10]. Daniel K.Fisher and HirutKebede, a Low Cost Microcontroller-Based System to Monitor Crop Temperature and Water Status,2010.