

# Analysis of Water Observation Using Arduino Based on GSM and Wireless Detector Technology

Ramesh S<sup>1</sup>

<sup>1</sup>Department of Electronics and Communication Engineering, Sankar Polytechnic College, Tirunelveli,

## Abstract:

The idea of 'Wireless Detector Network' (WDN) is the basic building block of a water monitoring and observation using wireless detector network (WDN) technology. To monitor water quality over different sites as a real-time application, an excellent system. The water observation and system is an open source software and hardware based on arduino technology. The Flow Of Water In The Pipes Is Been Sensed By Using Flow Sensor And Controlled By Arduino. In This Arduino Controller we Can Sense the Water Flowing And Also we can Get An Aware About Water Management based on technology. GSM which we can able to know the water supply to your area/home is initiated. The advantages such as, low power consumption, more flexible to deploy at remote sites and so on. This project is implemented using Arduino micro controller.

**Keywords:- Wireless detector network, water observation, GSM module, Arduino controller.**

## 1. INTRODUCTION

Water is an essential building block of life .It is more than just essential to protect health. GSM performance is influenced by existing system for water observation and monitoring. In proposed system major new system and sub system designs and implementation are available. Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online system. The Arduino software is easy-to-use for beginners, yet flexible enough for advanced users. We used A flow sensor is a device for sensing the rate of fluid flow. The activation of the sensor is done by the microcontroller. The microcontroller will check the flow by using sensor. It will switch relay to turn ON buzzer alarm and also turn ON GSM to send SMS about the water initiated to the people. In this project Water observation and monitoring with help of controller. To notify the user via sms if the water supply to your area/home is initiated. It can show the time when the water is begin to supply.

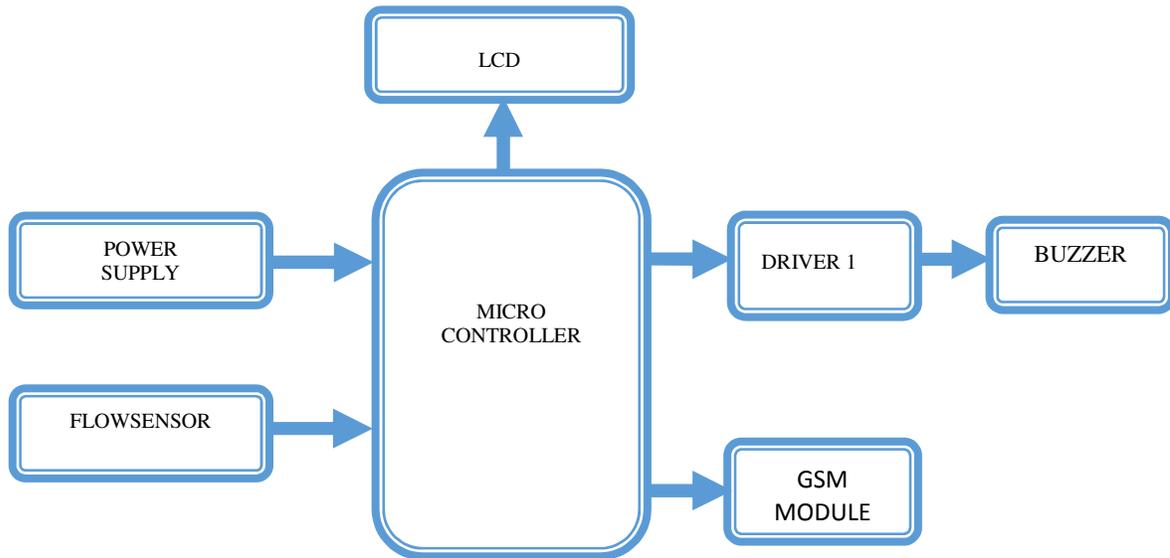


Fig 1: Basic diagram of Proposed System

## 2. THE DESIGNED ARDUINO SYSTEM

Arduino is an open source computer hardware and software company, project, and user community that designs and manufactures single board microcontroller and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or as do-it-yourself (DIY) kits. Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analog input/output (I/O) pins that may be interfaced to various expansion boards (*shields*) and other circuits. The boards feature serial communications interfaces, including Universal Serial Bus(USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler tool chains, the Arduino project provides an integrated development environment (IDE) based on the Processing language project.



Fig 2: Basic diagram of Arduino controller

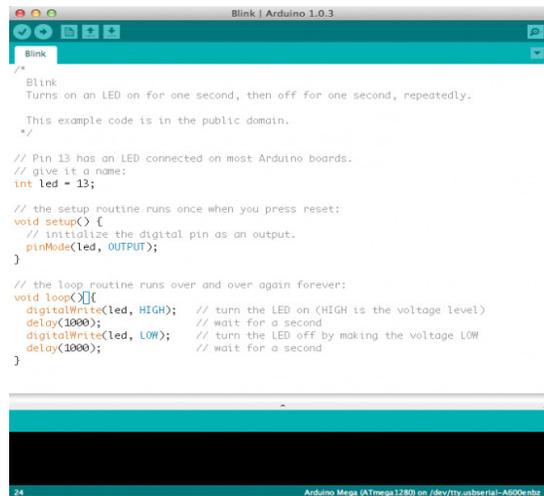
### 3. GSM

**GSM (Global System for Mobile)** Communications, originally (*Group Special Mobile*) is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation digital cellular networks used by mobile devices such as tablets, first deployed in Finland in December 1991. As of 2014, it has become the global standard for mobile communications – with over 90% market share, operating in over 193 countries and territories. 2G networks developed as a replacement for first generation (1G) analog cellular networks, and the GSM standard originally described as a digital, circuit-switched network optimized for full duplex voice telephony. This expanded over time to include data communications, first by circuit-switched transport, then by packet data transport via GPRS (General Packet Radio Services) and EDGE (Enhanced Data rates for GSM Evolution, or EGPRS).



Fig 3: GSM module

## 4. CODING OF ARDUINO

A screenshot of the Arduino IDE interface. The window title is "Blink | Arduino 1.0.3". The main text area contains the following code:

```
/*  
 * Blink  
 * Turns on an LED on for one second, then off for one second, repeatedly.  
 *  
 * This example code is in the public domain.  
 */  
  
// Pin 13 has an LED connected on most Arduino boards.  
// give it a name:  
int led = 13;  
  
// the setup routine runs once when you press reset:  
void setup() {  
  // initialize the digital pin as an output.  
  pinMode(led, OUTPUT);  
}  
  
// the loop routine runs over and over again forever:  
void loop() {  
  digitalWrite(led, HIGH); // turn the LED on (HIGH is the voltage level)  
  delay(1000);             // wait for a second  
  digitalWrite(led, LOW);  // turn the LED off by making the voltage LOW  
  delay(1000);             // wait for a second  
}
```

The status bar at the bottom indicates "Arduino Mega (ATmega328P) on /dev/tty.usbserial-A600e0bz".

Fig 4: ARDUINO (coding for arduino controller)

## 5. RELAY

A **relay** is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations. A type of relay that can handle the high power required to directly control an electric motor or other loads is called a contactor. Solid-state relays control power circuits with no moving parts, instead using a semiconductor device to perform switching. Relays with calibrated operating characteristics and sometimes multiple operating coils are used to protect electrical circuits from overload or faults; in modern electric power systems these functions are performed by digital instruments still called "protective relays".

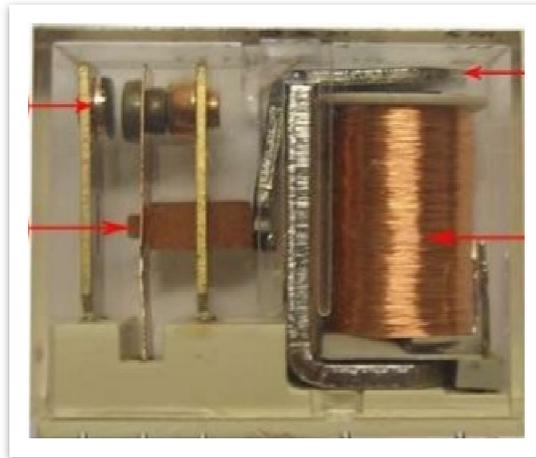


Fig 5: Diagram of relay

## 6. CIRCUIT DIAGRAM

The circuit diagram shows the operation of this project. The power supply for this circuit is taken from the dc supply is fed to the Arduino controller and also the GSM module. This Arduino controller has a master role in this circuit. It is the controller which will control the whole circuit. It is necessary to burn the microcontroller with proper program as per we need. The flow sensor is used to controller connections. The activation of the sensor is done by the microcontroller. The microcontroller will check the flow level by using sensor. When it driver circuit level, it will switch relay to turn ON buzzer alarm and also turn ON GSM to send SMS about the water initiated to the people. Then it will cut off the supply from the application devices.

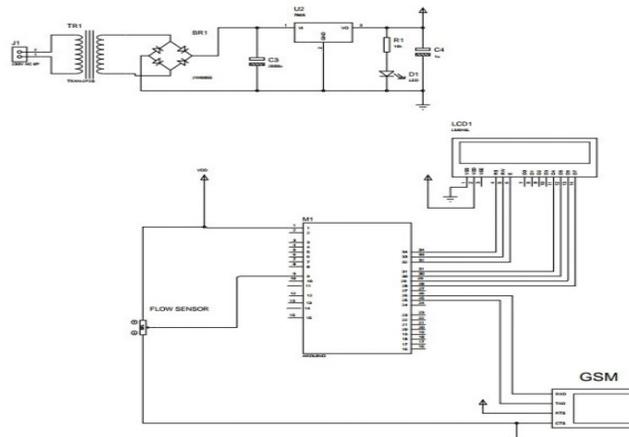


Fig 6: Circuit diagram

## 7. FLOW SENSOR

A flow sensor is a device for sensing the rate of fluid flow. Typically a flow sensor is the sensing element used in a flowmeter, or flow logger, to record the flow of fluids. As is true for all sensors, absolute accuracy of a measurement requires a functionality for calibration. The magnetic flow meter shall operate according to Faraday's law whereby a voltage is induced by a conductive liquid passing through a magnetic field. The magnetic field is generated by a switched alternating current with a magnitude of 2-10amps depending on the diameter of the flow sensor. And its specifications are,

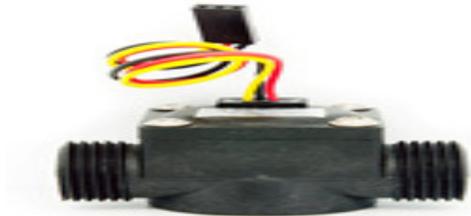


Fig 7: Diagram of flow sensor

Mini. Working Voltage	DC 4.5V
Max. Working Current	15mA(DC 5V)
Working Voltage	5V~24V
Flow Rate Range	1~30L/min
Load Capacity	≤10mA(DC 5V)
Operating Temperature	≤80°C
Liquid Temperature	≤120°C
Operating Humidity	35%~90%RH
Water Pressure	≤2.0MPa
Storage Temperature	-25°C~+80°C
Storage Humidity	25%~95%RH

## 8. LCD

The LCD (Liquid Crystal Display) screen is an electronic display module and finds a wide range of applications. A 16x2 LCD display is a very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven-segment and other multi-segment LEDs. It's easily programmable. Have no limitation of displaying special characters.

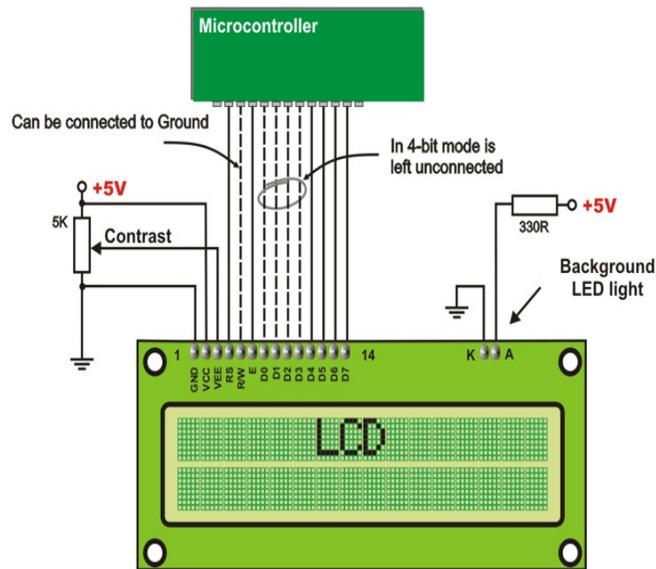


Fig 8: Diagram of Lcd

## 9. RESULTS

The Prevention is better than cure. The water monitoring and controlling by using technology. And also water as an integral part of ecosystem. To notify the user via sms if the water supply to your area/home is initiated. It can show the time when the water is BEGIN TO SUPPLY.

## 10. CONCLUSION

Nowadays, in village's, water management has some disadvantages. The flow of the water will not indicate only at the time we start. Otherwise it won't indicate. It can be overcome by this project. We have implemented "Water Observation and management" in village's for using Arduino based on GSM which we can able to know the water supply to your area/home is initiated, also life span and its efficiency.

To Monitor Water on Flow Over Different Sites As a Real Time Application. And Also we can Get An Aware About Water Management. The Water is important since it helps determine future irrigation expectations. And Water, once an abundant natural resource, is becoming a more valuable commodity due to droughts and overuse.

## 10. REFERENCES

[1] Web Based Water Quality Monitoring with Sensor Network: Employing ZigBee and WiMax Technologies by Steven Silva, Hoang N Ghia Nguyen , Valentina Tiporlini and Kamal Alameh, 978-1-4577-1169-5/11/\$26.00 ©2011 IEEE.

[2] Tuan Le Dinh; Wen Hu; Sikka, P.; Corke, P.; Overs, L.; Brosnan, S, "Design and Deployment of a Remote Robust Sensor Network: Experiences from an Outdoor Water Quality Monitoring Network," Local Computer Networks, 32nd IEEE Conference on, pp 799-806, 2007.

[3] J. Bartram and R. Balance, "Water Quality Monitoring - A Practical Guide to the Design and Implementation of Freshwater Quality Studies and Monitoring Programs", Edited by Published on behalf of the United Nations Environment Program and the World Health Organization, ISBN 0 419 22320 7 (Hbk) 0 419 21730 4 (Pbk), 1996.

[4] Peng Jiang, Zheming Wang, "Design of a water environment monitoring system based on wireless sensor network"IEEE 2nd International Conference on Industrial and Information Systems, pp., 2010.

[5] Jin, Liu, Y-W An overview of the water Environment water resource. 2009, 27, 33-36.



**RAMESH S** received the B.E. Degree – First Class - in Electronics and Communication Engineering from National Engineering College, K.R.Nagar, Nalattinpathur, Madurai Kamaraj University, Madurai, India in 1993 M.E degree – First Class with Distinction - in Computer Science Engineering from ManonmaniamSundaranar University, Tirunelveli, India in 2004 Now he is working as a Sr. Lecturer in Sankar Polytechnic College Tirunelveli.