BRIDGE MONITERING SYSTEM USING GSM MODULE

Prof S.D.Indalkar

1) Yewale Kajal Dashrath

2) Late Rohini Vitthal

3) Pawar Sanjay Janardhan

S .B. Patil College, of engineering indapur E& TC

ABSTRACT-This paper propose a wireless solution, based on global system for mobile communication (GSM) network for the monitoring and controlling of the river water level parameter. One of the advantages of the system is that it can be used for monitoring decrement of water in the rivers and water level rising in case of flooding. The system at certain interval continuously sends river water level measurement to the concerned authority with water environmental flow management. But once the water reaches the critical level either by decreasing or flooding, an alarm will be send via GSM network to the personal in charge, furthermore, the proposed system allows on-line configuration of the system equipment at the field. This system uses ultrasonic sensing equipment and web infrastructure that allows remote access of information from any place of the country.

1. INTRODUCTION

Monitoring the water level in the river is often an important requirement. Moreover, water level detection through wire communication is not a flexible and cumbersome method and requires a robust, real time, portable and operating system for this purpose. Many C technologies are use today to fulfil basic tasks like water level measurement, bridge health etc. A water level monitoring system is a type of structure that measures the depth of water through an ultrasonic sensor technique. Modern microcontroller and wireless sensors can provide many solutions for automatic water level monitoring in many applications. In most cases the expensive radio modem used in the fastest access to remote data as it provides a long distance and reliable radio link to the sensor network. Simultaneously the processed digital data is transmitted to the correct location and device a wireless network. In other words, the transmission step is performed on the wireless network control channel using GSM.Deterioration of bridges reduces the load carrying capacity of bridges.

The condition of heavily used urban bridges is even worse as they are classified as unable to accommodate the weight and volume of modern vehicles.

2. EXISTING SYSTEM- Generally many disasters occurred during floods. The bridge will get damaged. If the higher authorities didn't recognize it then people who are going in that way may lose their lives. Many people lost their lives. As authorities are staying far away from the bridges it is difficult for them to notice the problem. Rescue operation are going slowly as they didn't know when the incident occurs. Different disasters and damaged sites require different professional disaster rescue knowledge and equipment in order to achieve optimal rescue results. However, lack of information about the damage site can impede information management at the rescue centre and rescue operation, resulting in poor rescue efficiency or even preventable causalities. However there are many drawback like power consumption of equipment is high and cost of the equipment is high.

3. PROPOSED SYSTEM- These sensors will be responsible for pressure of the water, level of the water rising in the river. The data sensed by sensor will get converted into an electrical signal. The device which generate output are generally called as an actuators (sound buzzer). Both sensor and actuator are collectively called as a transducer. The electrical signal will get transmitted to the arduino Microcontroller. The server will receive data from a microcontroller using Wi-Fi module, then it will transfer the data further to the web application using a servlet. Servlet receive and response to request from Web clients, usually across HTTP, the hypertext transfer protocol. In this way, the admin will get the data and alert will be generated through buzzer and auto barrier on the bridge. If it is necessary then the admin assign the task to the employee for maintenance.
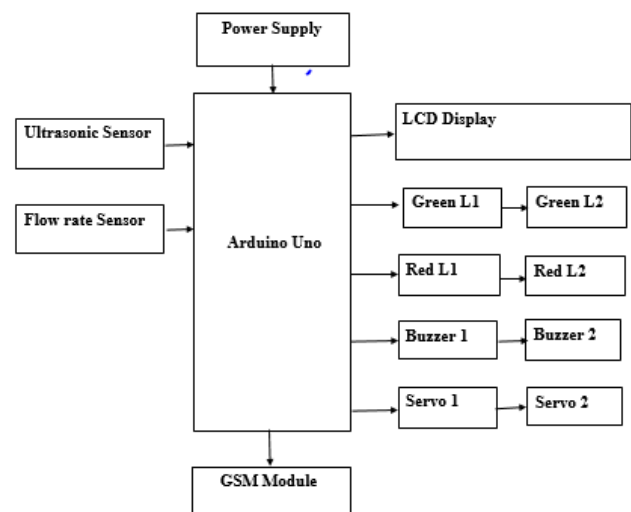
4. BLOCK DIAGRAM-

Fig:- Block Diagram

5. HARDWARE-

A) GSM Module

B) Arduino Uno

C) LCD Display

D) DC Motor

A) GSM Module-GSM modules are one of the commonly used communication modules in embedded system.

Fig GSM Module

A GSM Module is use to enable communication between a microcontroller (and a microprocessor) and the GSM/GPSR Network. A GSM GPRS MOSEM comprises of a GSM GPRS module along with some other components like communication interface (like serial communication –RS-232), power supply and some indicators. With the help of communication interface, we can connect the GSM GPRS Module on the GSM GPRS MODEM with an external computer (or a microcontroller).
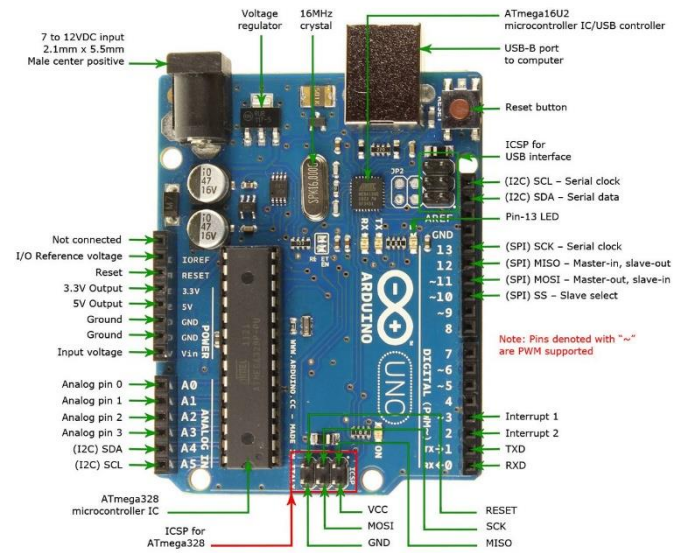
B) ARDUINO UNO-

Fig:-Arduino Uno

The Arduino Uno board are mostly used by the beginners that can use in electronics project and do programming in this board. The board has regular innovation and a bug fix in the design of the board to make the board suitable for the project use. The Arduino UNO board is considered as the most used board and a standard used by the rookie in their project. The Arduino UNO board is primarily used over other Arduino product because of the following reasons. As the board can be easily connected to the other computer system via USB port. The USB port fixed in the board serves two purposes. It can be used to supply the power supply to the board and can act as a serial device to connect the board to a computer system.

C) LCD DISPLAY-

Fig:-LCD Display

LCD (Liquid Crystal Display) is type of flat panel display which uses liquid crystals in its primary from of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitor and instrument panels. LCDs were a big leap in terms of the technology they replaced, which include light-emitting diode (LED) and gas plasma displays. LCDs allowed displays to the much thinner than cathode ray tube (CRT) technology. LCDs consume much less power than LED and gas-display displays because they work on the principle of blocking light rather than emitting it. Where an LED emits light, the liquid crystal in an LCD produces an images using a backlight.

As LCD have replaced older display technologies, LCDs have begun being replaced by new display technologies such as OLEDs.

D) DC MOTOR- A DC Motor is any of a class of rotary electrical motors that converts direct current (DC) electrical energy into mechanical energy. The most common types rely on the forces produced by induced magnetic field due to flowing current in the coil. Nearly all types of the DC Motors have some internal mechanisms, either electromechanical or electronic to periodically change the direction of current in the part of the motor.
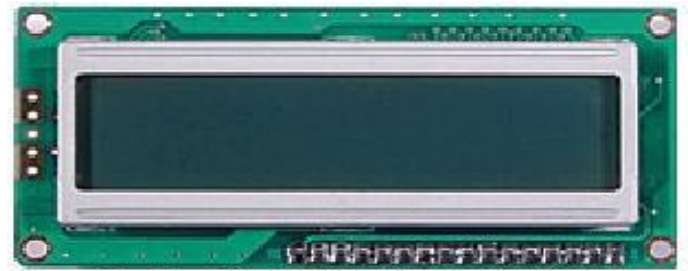
Module Size WxHxD (mm):80x36x9
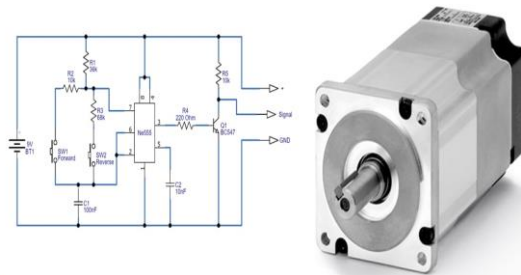Viewing Area WxH (mm): 65x16

Fig:-DC Motor

DC Motors were the first from of motors widely used as they could be powered from existing direct current lighting power description system. A Dc Motor speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field's windings. Small DC Motor are used in tools, toys, and appliances.

6. SOFTWARE-

A) Programming Tools:

The software for the robot is written in Arduino programming language. Arduino UNO is programmed using Arduino IDE software. ATmega328 on Arduino UNO comes with a boot loader that allows you to upload new code to it without using any external hardware programmer. It uses STK500 protocol to communicate. You can bypass the boot loader and program the MUC through in-circuit serial programming (ICSP)

header, but using boot loader programming is quick and easy. Select the correct board from Tools Board menu in Arduino IDE and burn the program (sketch) Through a standard USB port in the computer.

7. RESUILT-

Working: The aim of this project is to provide a long term monitoring system to achieve continuous and correct information about water level. To fulfil this objective, the following test was conducted to evaluate the success of the developed monitoring system. The system connected with sensor proposed has a particular design to be simple, trustworthy, and low cost which is fit to be used in embankment dams, river coastal tanks and reservoirs. Also the system is efficient to provide the information about the bridge as well as about the accident if any on that bridge. The system is very efficient and fast and sends SMS to the control centre for help and improvement.
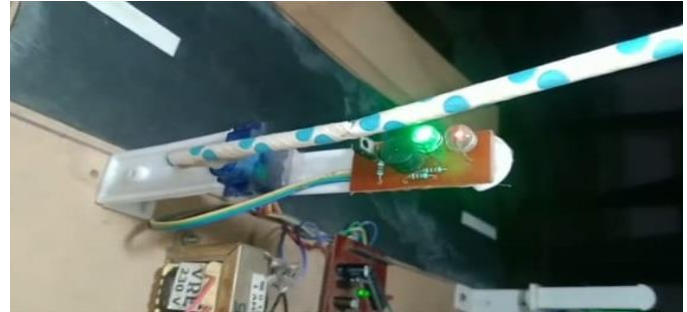

Fig 1: Buzzer Alert

Fig 2: Message Pass

The Water Level Of The River Is Flowing Above The Danger Level, All The Villages Of The River Banks Should Be Alert And Stay In Safe Places

Fig 3: Display Message

Fig 4: Final Result

8. CONCLUTION-In this paper a study of wireless communication using sensor and GSM technology is presented. The research work explain the design and performance of real time monitoring system for water level measurement. The developed system mainly highlights functional features including wireless network capability, sensor hardware compatibility (Ultrasonic Sensor), low cost production and efficient capture. Tested systems report good results that are energy efficient. Has strong communication capability and present real time measurement accuracy. Also the possibility of accident will be avoided. The system has the capability to alert vehicles passing over the bridge.

9. FUTURE SCOPE-

- Innovation in the structural styles of bridges.
- Innovation and application of new material.
- Loads determination and effect evaluation.
- Static and dynamic behaviour for complex bridge.
- Resistance of wind, seismic or other disaster.
- Dynamic effect and running safety of the traffic in bridges.
- Health monitoring and damage identification.
- State assessment reinforcement, and maintenance.
- Artificial intelligence and bid data.
- Construction technology innovation.
- Bridge for new types of transportation.
- Interdisciplinary innovation and application.

10.REFERENCES-

1. *Arshad MR.Recent advancement in sensor technology for underwater applications. Indian J. Marine Sci.2009; 38(3):67-273.*

2. *Fang L, Liu Q, Xiao Q, Liu Q, Liu Z. Design and implementation of airborne wide angle infrared dual-mode line/area array scanner in Heihe experiment. Advances in Earth Science.2009; 24:696-705.*

3. *Glatz PM, Homman LB, Steger C, Weiss R. Designing perpetual energy harvesting systems explained with rivermote: A wireless sensor network platform for river monitoring. Electron J Struct Eng. 2010; Special issue: Wireless Sensor Networks and Practical Applications: 55-65.*

4. *AshishKushwaha, UauravKatiyar, & HarshitaKatiyar, HemantYadav, Sexena 'GPS and GSM based Accident Alarm System; National Student Conference On "Advances in Electrical & Information Communication Technology" AEICT-2014.*

5. *C.Prabha, R.Sunitha, R.Anitha; Automatic Vehicle Accident Detection and Messaging System Using GSM and GPS Modem; International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering.*