

# Advance River Bridge Monitoring System & Alert Using GSM

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**ABSTRACT-**This project ADVANCE RIVER BRIDGE MONITORING SYSTEM & ALERT USING GSM demonstrates the design process, implementation and experimental verification of a Flood Level Monitoring system. The main objective of the proposed system is to be able to read the water level at every second, display it to the supervisor and alert the affected populace and relevant authorities by means of an short message system (SMS) when the level of water surpasses a user defined threshold. Global System for Mobile Communications (GSM) network has been used for sending the mobile messages. Driver circuit is used to read in the input from the sensor and send the signal through GSM. The measuring system is based upon the theory of pressure being applied to liquids. This warning system is deemed to be a faster method of alerting the relevant authorities and the vulnerable residence. This is ADVANCE RIVER BRIDGE MONITORING SYSTEM & ALERT USING GSM is best electronics system which can help the thousands of people in flood situation at a time. Also this system is best way to communicate between government and people at the time of flood.

**KEY WORDS:** Arduino, GSM Module, LCD display, Float Sensors.

## INTRODUCTION

Day by day, the electronics industry develops the different systems as per requirement of people. So as an engineer, we always think about the need of people and try to complete that requirement. As per requirement of society we design this system, which is a combination of different subsystems and using this subsystem we can produce this important device. Due to faster rate of ice & snow melting, heavy rain possibly caused by global warming, the sea level is increasing rapidly & resulting in a sudden discharge of large volume of water and this causes the flooding of the low laying areas. With this ever-increasing regularity of flood damage, a definite need has emerged for an early warning for regions deemed to be 'at high risk' from flooding. Flooding is the most common natural disaster worldwide happens without prior warning. Floods have been known to do some significant damage. They destroy homes, crops, cars, buildings and anything in their path. Animals and people get caught in the current of the flowing water and can't get out before rescue attempts are made. Although flooding was an abnormal phenomena ages ago, but now it is considered a life treating natural disaster for the mankind. Floods commonly occur when water from heavy rainfall, from melting ice and snow, or from a combination of these exceeds the carrying capacity of the river system, lake, or ocean into which it runs. Combination flow of several water-swollen tributaries causes flooding along a river bank or shoreline. The geographical location also one of the factors that caused flood occur, where the cyclical monsoons during the local tropical wet season. Due to the floods, many lives and the property are found destroyed. The flood make a traffic jam, an accident and any dangerous to road user. For this reason, the project has been proposed; to help the road user from this problems happened. It was invented based on the problem faced by road user when flood is occurred. This project will avoid the traffic jam because the users have a time to find an alternative road before they are going to be stuck at the flood area. This system is function when the water along the road is passing over the water level sensor. This water level sensor then will sent a signal to the control center via the GSM Mobile. The GSM Mobile will be put in the two different places, one at the place that sensor has been located and the other one at the control Centre. When the flood occurs, this sensor will sent a signal to the microcontroller circuit and activate the Visual basic interface at control Centre and project's Liquid Crystal Display (LCD) display.

Because of that we give the name of that project "ADVANCE RIVER BRIDGE MONITORING SYSTEM & ALERT USING GSM" to alert the more than thousands of people at a time and it can help to alert them in particular critical condition and save the life as well as properties. So our this system can help to those people for alerting as well as helping purpose in minimum time. For alerting the system we used GSM (Global System for Mobile Communication), mobile phones have become one of the most popular communication devices amongst the people all over the world. The SMS has become popular as it provides cheap, convenient and a faster method of communication.

## OBJECTIVE OF THE PROJECT:-

1. Study of GSM Technology and GSM Module
2. To learn about basic of Keil Computer
3. Implementation of Hardware module

## SCOPE OF THE PROJECTS:

By doing this project we alert to government department and people about level of water. We advanced this project by implementing flow graph of flood which indicates incrimination of water level. This all system is being installed on bridge of river. We also the measure the pressure of water will help us to prevent bridges.

## METHODOLOGY:-

The project design includes the hardware and software system. The detail of the workflow of the project will be discussed which include the device design and program development.

### Level 1- Selection of topic:

In this primary stage we have gone through many topics on that we can work. Finally we have selected this topic for our project as this project has many advantages such as when level of water is increase then we alert the people so there will be not risk& save the life of that people.

### Level 2- Block diagram selection:

After finalising of our project topic we started working on block diagram. After working on this we have made the selection of block diagram.

### Level 3-Selection of field:

After selection of block diagram we will select the field and assemble the component required.

### Level 4- Software selection:

It is a combination of hardware and software. We using for the programming Embedded c.

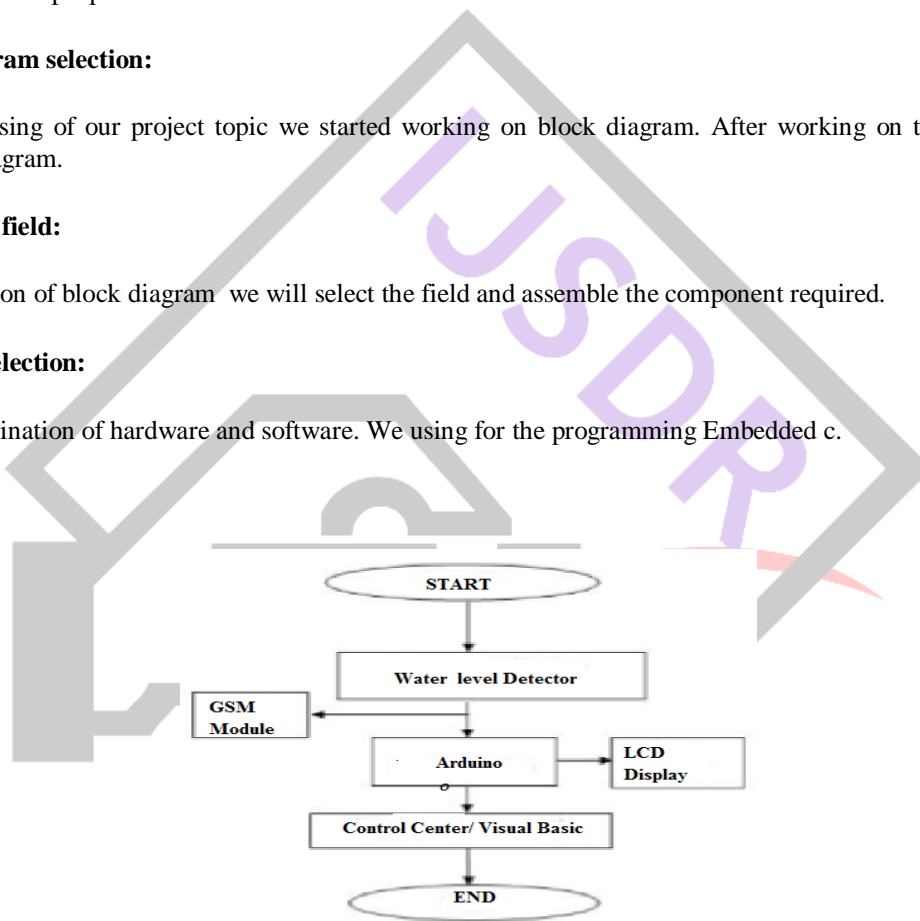


Fig.1 The flowchart River Bridge Monitoring System

### Level 5-System implementation:

After completion of programming and simulation we will start system implementation. We will divide the work of implementation in stages. The system implementation follows the block diagram.

### Level 6-Testing of System:

After that we are check the system.

## RELATED WORK

This ADVANCE RIVER BRIDGE MONITORING SYSTEM & ALERT USING GSM is basically depends on three main section and every section is consist of an electronics concepts with his related technological tools. As per project requirement, three sections are:

- 1) Input section
- 2) Control and observation section
- 3) Output section

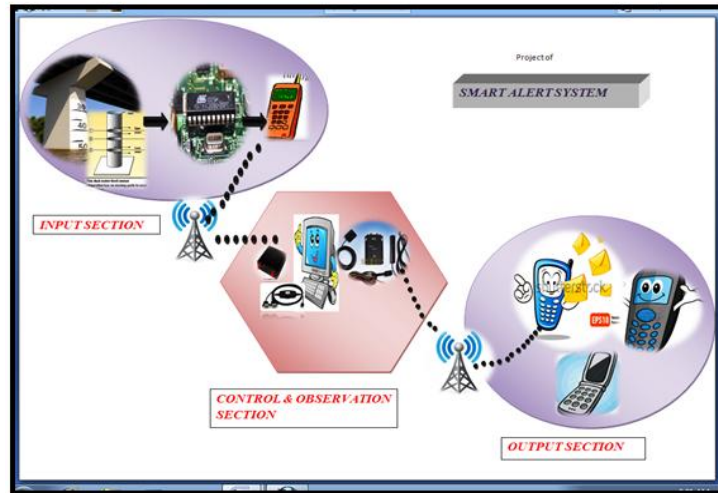


Fig.2:- Section wise Block Diagram

### 1:- Input section



Fig.3:-Bridge

In that system, when water level of river is increases then the float type sensor which is fitted on bridge can activated. The water level sensor set on bridge at every feet. All sensor are connect with arduino based driver circuit. There are total 6 sensor are provided in that system but we can increase the no. of sensor as per requirement. Every sensor activation is depends on operator means I have required only 5 sensor to active one by one sensor1-sensor2-sensor3..... sensor5 etc. so we provide that facility to that particular 5 sensor are activate in system and other 1 sensor are in deactivate mode. In between 6 sensor, operator activates or deactivate any sensor as per requirement. Arduino based driver circuit can control those signal and send data/information in binary form towards observation and monitoring section by using GSM modem. If in system 5 sensors are activate from sensor1 to sensor 5 , and 1th sensor are activate because of water level so information /data send from controller by using GSM in form of 100000000. Here 1 is show ,sensor activate and 0 is deactivate .

### 2:- Control and observation section

The transmitted data from bridge is receiving at receiver side (in control room) by using another GSM modem. Those GSM can connected to computer by using RS232 serial cable and that particular binary data readout from using software visual basic. By using visual basic we not only read the data but also displaying the water level as well as displaying the just affected

and after some time affected area .we also provide the facility , the contact no. of all departments under disaster management is also displaying in just one click on pc screen in just in second.



Fig 4:- The water level system

### 3:- Output section

The last stage of project, supervisor or observer can decide the area to sending message. By using bulk message system we can send the thousand of messages in just few second at a time. We can feed the mobile no's of people as per area before flood and whenever need we send the messages on that numbers suddenly. This messages is in form of diff notice or which type of help provide by government is directly inform to affected people.

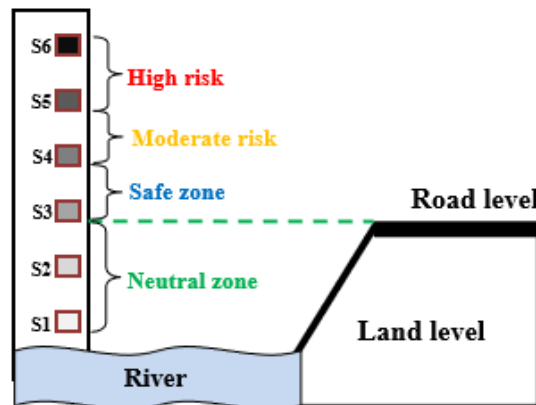


Fig 5:-Sensor position of the River Bridge Monitoring System with the various level of risk zone

### ADVANTAGES:-

1. This project can play an important role in river flood, earth quake, other natural or manmade critical condition to alert the people as early as possible and save the life and properties.
2. Provides information to support decision making for the rapid response of emergency Management services. (Government).
3. It has low maintenance so its maintenance cost is low.
4. Portable circuit easy to handle and because that we can use this system as per season.
5. It is a good communication channel between the Management service (government) and people.

### CONCLUSION:-

Advance River Bridge Monitoring system & alert using GSM is used to collect information about level of water. This information is as usually about the water level or any type of help which provided from disaster management of government to people.

### FUTURE WORKS:-

Sensors are important elements in the Flood Observatory System. Further studies on wireless sensor technology will be best to replace the current sensors. Precise and accurate detection of water level will improve the data collection system for the monitoring station. The flood alert information's can be displayed on LED display boards for road users and for safety reasons could be placed at strategic locations. Such information's should be in real time and transmitted wirelessly from the measured

location. A possible means of power supply for the sensors and centralized control unit is via solar cells. The Flood Observatory System will be easy to install and maintained if it is powered by solar cells. The use of solar energy will also provide cheaper source of power to the entire system to operate especially if the system is placed in a remote location. For sustainability the circuits and control unit should be designed to consume minimum power during operation.

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#### REFERENCES:-

- [1] Real-time flood monitoring and warning system Songklanakarin J. Sci. Technol. 33 (2), 227-235, Mar. - Apr. 2011
- [2] Flood level indicator and risk warning system for remote location monitoring using Flood Observatory System ISSN: 1991-8763 Issue 3, Volume 5, and March 2010
- [3] Bridge Condition Monitoring System Using Wireless Network ISSN(Online): 2349-9338, ISSN(Print): 2349-932X Volume - 2, Issue -3, 2015
- [4] Microcontroller chip Technology, 2001, at89s52Datasheet [www.microchip.com](http://www.microchip.com)
- [5] The Arduino Uno is a microcontroller board based –Digital–csicDigital CSIC,2014,digital.csic.es>bitstream>D-c-Arduino.
- [6] Bridge Condition Monitoring System Using Wireless Network ISSN(Online): 2349-9338, ISSN(Print): 2349-932X Volume - 2, Issue -3, 2015
- [7] Flash Flood Prediction Model based on Multiple Regression Analysis for Decision Support System ISBN: 978-988-19253-1-2 ISSN: 2078-0958 (Print); ISSN: 2078-0966 (Online)

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