
Monitoring the Angle and Structure of the Building, Earthquake and Flashflood Alerting System

S.P.Manikandan

Assistant professor, Sree Sastha College Of Engineering

Abstract: The system focuses on monitoring the angle and structure of a building, water level & earth vibrations via sensors, & generates alert signal when water level or level of earth vibrations crosses a threshold. Alert message is the mail send to the concerned authorities and to the local people, who lives nearby. Large magnitude earthquakes may cause significant losses of life and property. Designing an earthquake alarm to detect the magnitude of the quake and give an alarm. A method is described in the present disclosure which includes detecting the axis and strength of a building by a MEMS accelerometer and strain sensor and transmitting an alarm notification indicating the axis and strain value of the building. The purpose of this project is to monitor the angle and structure of a building, water level & earth vibrations to detect the magnitude of the Disaster and give an alarm.

Keywords: Microcontroller, MEMS accelerometer and strain sensor, water level sensor, buzzer, GPRS and GSM module, LCD display.

1.Introduction

Flood and earthquake becomes one of major problem in most of the countries around the world.Floods are common in some countries in asia, especially in Indonesia. These disasters cannot be eliminated i.e it is not possible to control flood, however this condition can be prevented if the authorities always know the current status of the water level or earth vibration levels. The disaster Alert systems have been introduced to notify people in early stage about the possible threat so that safety precaution can be taken to avoid any mishap.

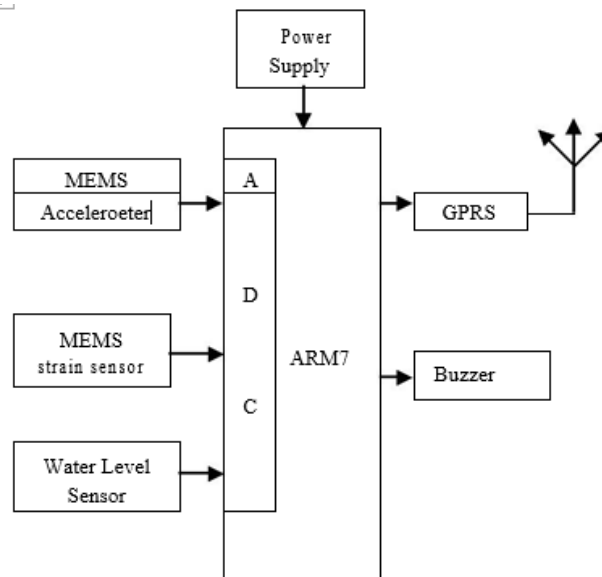
Natural Disaster Alert system using GPRS will give prior intimation through mail to the concerned persons, who will take precautionary measure against the disaster & thus life of people and animals can be saved by quick shifting them to safe places before situation becomes critical.The warning message can be delivered by media such as television and radio etc.The biggest advantage of the proposed system is that it gives alert message throught mail to the concerned authorities along with the buzzer.

2. System Design Model

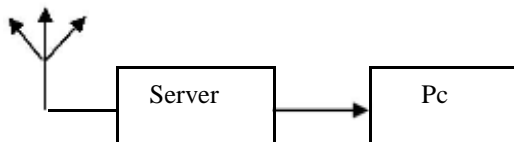
The system focuses on monitoring the angle and structure of a building, water level & earth vibrations via sensors, & generates alert signal when water level or level of earth vibrations crosses a threshold. Alert message is the mail send to the concerned authorities and to the local people, who lives nearby.Large magnitude earthquakes may cause significant losses of life and property. Designing an earthquake alarm to detect the magnitude of the quake and give an alarm.

A method is described in the present disclosure which includes detecting the axis and strength of a building by a MEMS accelerometer and strain sensor and transmitting an alarm notification indicating the axis and strain value of the building.The purpose of this project is to monitor the angle and structure of a building, water level & earth vibrations to detect the magnitude of the Disaster and give an alarm.

Block Diagram: TRANSMITTER SECTION



RECEIVER SECTION

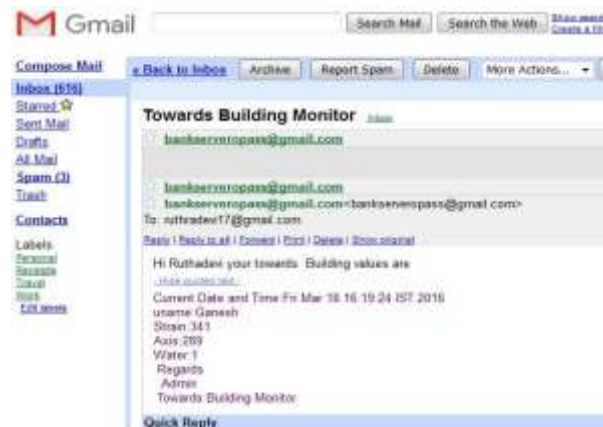


The MEMS accelerometer sensor is used to measure the axis of the building i.e x, y, and z axis of the building. The MEMS strain sensor is used to measure the stress or strength of the building. The water level sensor is used to check the water level periodically. Here the system uses carbon rod as water level sensor because of its corrosive property. One of the most useful device which is performing signal condition operation is A/D converter. The outputs of sensors are given to it, which converts an analog output of sensors to digital signals as required by the microcontroller for further processing.

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. GSM modem receives and sends messages from mobile device by using radio waves. Microcontroller and GSM modem interface are using AT commands for sending and receiving message. It is possible to create the source files in a text editor such as Notepad, run the Compiler on each C source file, specifying a list of controls, run the Assembler on each Assembler source file, specifying another list of controls, run either the Library Manager or Linker (again specifying a list of controls) and finally running the Object-HEX Converter to convert the Linker output file to an Intel Hex File. Once that has been completed the Hex File can be downloaded to the target hardware and debugged. Alternatively KEIL can be used to create source files; automatically compile, link and convert using options set with an easy to use user interface and finally simulate or perform debugging on the hardware with access to C variables and memory. Unless you have to use the tools on the command line, the choice is clear. KEIL Greatly simplifies the process of creating and testing an embedded

3. Experimental Result

In the experimental result, particularly a sensor device which may be positioned in the building may detect the axis, strength and water level. The sensor device may make a determination as to whether the received digital signal is greater than a predetermined threshold. If it is greater than the predetermined threshold, the microcontroller transmit a alert message using GPRS and GSM technology to concern authorities. This may provide an opportunity for the people to leave the building before it becomes critical. Here we used LCD to display the values i.e. axis, strain and water. The below figure shows the alert message sent to an email.



4. Conclusion:

The paper concludes the recent technological advances in communication made new trends in the disaster monitoring system. The system focuses on monitoring water level & earth vibrations via sensors, & generates alert signal when water level or level of earth vibrations crosses a threshold. Alert message is Voice Message Service to the concerned authorities through their mobile phones. It also includes Public address system to broadcast the messages to the local people, nearby the river side. The module can also send status of water elevation to anyone who knows the system's modem number.

Reference:

- [1] Zigbee Alliance: "ZigBee Technology", March 2011. [http://www .zigbee.org/about technology/zigbee technology](http://www.zigbee.org/about technology/zigbee technology)
- [2] Windarto, J." Flood Early Warning System develop at Garang River Semarang using Information Technology base on SMS and Web". International Journal of Geomatics and Geosciences Vol. 1 No. 1, 2010
- [3] A GPRS-Based Data Collection and Transmission for Flood Warning System: The Case of the Lower Mekong River Basin by SaysothKeouangsine and Robert Goodwin