

Disaster Flood Alert System Using Ultrasonic Sensor

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Abstract

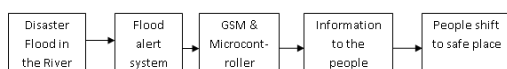
In India disaster flood is one of the huge disaster which affects the human, animals & soil. It is not possible to control the flood but by using the technology we can reduce the strength of flood & its effects on human & animal life.

Hence this disaster flood alert system using GSM & ultrasonic sensors come in picture. This project will help us in the season of monsoon, this system is implemented in the river in such a way that ultrasonic sensor will be able to detect the water level at any time. Then it will send the message to control room about the water level, and control room consist of mobile numbers of river sided people. Means when there is flood in the river above the safe level then river sided people becomes alert and quickly they will shift away from the basin of the river. Means people who were in the flood zone get shifted away from the danger of flood. And ultimately the life of human being as well as animal will be saved from the danger of the flood.

1. Introduction

Disaster flood alert system using GSM & ultrasonic frequency sensors is one of the important technology which is useful to make the people alert from disaster flood, in this project ultrasonic transducers are used to find out the water level of the flood. And then information given to the controller and GSM, this system continuously send the messages towards control room about the level of the flood when water level will change.

Every year disaster flood has its adverse affects. Due to this government have to face more critical problems. Many people with animals have to strive for their life. Overall it affects the ecological balance crops die due to excess water and is carried away with it. Soil erosion takes place to large extent. We are helpless in front of flood. As it is a natural calamity.

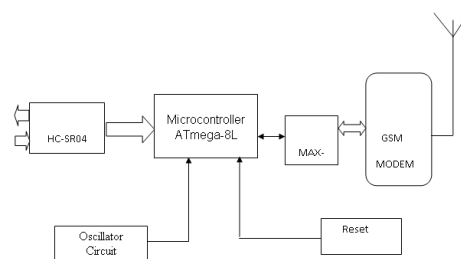


Block Diagram for Theme of the Project

Flood Forecasting Using Ultrasonic Sensors

Flooding is caused by the inadequate capacity within the banks of the rivers to contain the high flow brought down from the upper catchments due to heavy rainfall. It is also caused by accumulation of water resulting from heavy spells of rainfall over areas, which have got poor drainage characteristics.

Flooding is accentuated by erosion and silting leading to meandering of the rivers in plains and reduction in carrying capacity of the river channel. It is also aggravated by earthquakes and landslides, leading to changes in river course and obstructions to flow. Synchronization of floods in the main rivers and tributaries and retardation of flow due to tidal effects lead to major floods



3. Main Theme

In this way by using this circuitry we are going to give the information to the river sided people or the leader of village people, not only single but we can send messages either written or spoken to the number of persons who live at the river side.

That means after getting the message they will leave the river side quickly join the safe place or away from the danger zone.

This flood alert system is basically useful to get idea about flood in forecast, to do the sensing of the incoming water level for detection of flood is done by implementing ultrasonic sensors which are the low level medium level and high level sensors.

When the input is high that is if the water is present, output across the transmitter which is in sensing circuitry will have a output zero this zero is an input signal will be given to NOT gate, which will have output 1 however if no water level is present the output across the emitter is 1 which will be bypassed to a register through ground.

So the main function of the sensor is to provide the information about the appearance of the water.

Then information is given to the signal conditioner whose main function is to make incoming signal from sensor suitable for connecting with the another IC.

In this system the signal conditioner that is inverting amplifier converts the small signal into high level signal

Comparisons of the Ultrasonic Sensor & FPGA Based Flood Prediction System

The flood prediction system described in this paper is capable of predicting floods before they occur. Alerts are generated as necessary, and sent to appropriate emergency management authorities along with data on water level and flow rate. The self-checking circuits employed in the design provide assurance of battery life and correct positioning and operation of the sensors at each node. A false trigger correction block has been included to validate the system operation and avoid false triggering from any of the nodes. A large number of pressure sensors are required for implementation of the system. However, the overall cost of these sensors is less than a single UV sensor used in existing flood detection systems.

The project is installed in the river with creating a supportive basement in the river and to decide the water levels in the river ultrasonic sensor will sense the continuously the water level of the selected river.

In the table given below we will be able to understand the working of the ultrasonic sensor with respect to the distance from the water level.

For the operation of the ultrasonic water level sensor four conditions are given:-

Condition one: - If the water in the river is below one meter from the sensor then level considered by the sensor is high level & such a message will send towards the controller.

Condition two: - If the water in the river is about one meter then level considered by the sensor is medium low & such a message will send towards the controller.

Condition three: - If the water in the river is about two meter then level considered by the sensor is medium level & such a message will send towards the controller.

Condition four: - If the water in the river is about three meter then level considered by the sensor is low level & such a message will send towards the controller.

In this way water level will be sensed by the sensor and concerned messages will be given to the controller then it will take the further action on that command.

Table: Comparative Study of HC-SR04 and FPGA System

Sr. No.	Parameters	Ultrasonic Sensor HC-SR04 System	FPGA Based System
1	Accuracy	It is More Accurate	It is Less Accurate
2	Sensing distance	It cover more Distance	It Cover Less Distance
3	Operating Temperature	Operates on More Temperature Range	Operates on Less Temperature Range
4	Weight	Weight is More	Weight is Less
5	Effect of Water on Working	Less	More
6	Life	More	Less
7	Efficiency	Less	More
8	Sensitivity	Less	More

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