

Date: 27/01/2020

# **SEWAGE WORKERS SAFETY MONITORING SYSTEM BASED ON IoT**

## **ABSTRACT**

As one of the urban public facilities, sewer is related to the quality and safety of life of urban sewer. With the rapid development of urbanization, urban hardening area is also increasing. At the same time, global warming, water cycle changes, atmospheric circulation anomalies and other factors caused by complex situation which the abnormal weather and climate events continue to occur. Heavy precipitation and other disastrous weather frequency, intensity has increased, the trend of strengthening, the management of sewers is more and more demanding. In this project we are mainly focusing on the safety of urban sewer. Here we are using a helmet which consist of various sensors to detect the hazardous gas and other contents in the sewage. It also has a sensor to identifies the health condition of sewer. If any abnormalities or problems found, a buzzer will rang and the people outside the sewage will be alert and can get him out from the sewage.

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**Project Platform:** IoT

**Front End:** EmbeddedC

**Back End:** MySql

## **INTRODUCTION**

With the rapid development of urbanization, urban hardening area is also increasing. At the same time, global warming, water cycle changes, atmospheric circulation anomalies and other factors caused by complex situation which the abnormal weather and climate events continue to occur. Heavy precipitation and other disastrous weather frequency, intensity has increased, the trend of strengthening, the management of sewers is more and more demanding. However, the current sewer monitoring system is only for a certain aspect of the sewer to detect, the most common is to monitor the sewer toxic gas situation. There is no comprehensive sewer monitoring program, which gives the sewer management a great deal of inconvenience, which makes it impossible for departments involved in the operation of the sewer system to be able to grasp and monitor in real time, while the data systems in the management department are inconsistent, the data can not be organic integration, in the event of danger can not be timely warning and targeted, effective exclusion. So it is particularly important to place sensors in areas where people are not easy to reach. Therefore, the establishment of an efficient sewer monitoring system is not only an important part of urban environmental monitoring, but also an important component of safety early warning of facilities.

In the future development of technology IoT has a profound influence. In addition, with the development low power embedded technology, sensor technology is widely used. Constructing the wireless sensor network of sewer can increase the monitoring area, reduce the artificial blind spot of the sewer and improve the accuracy of monitoring.

In this project we are constructing an advanced sewer monitoring system. For this we are using various sensors. These sensors will be embedded on a helmet and the sewers can wear this helmet. This helmet has a carbon monoxide sensor, hydrogen sulphide sensor, methane sensor, temperature sensor, and also an ultrasound sensor to detect the obstacles. Also it has a body sensor to detect the health condition of the sewer. A threshold limit is programmed into it and a buzzer and LCD monitor is connected to it via a wireless network. If the sensor found any

of the substance above the threshold limit a buzzer will rang and we can get the sewer out of the sewage.

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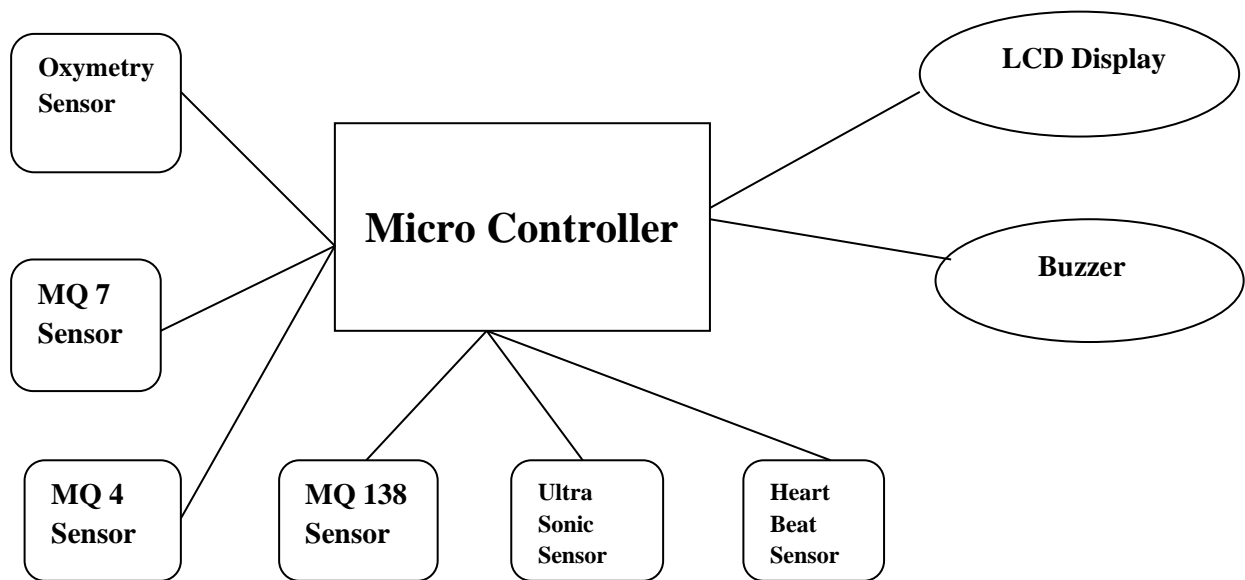
## **EXISTING SYSTEM**

A large number of sanitation workers die every year due to erratic and lack of facilities available, and harmful toxic gases released while cleaning the sewage. Real time health and safety monitoring system for such workers will prove helpful. In the existing system there are no efficient real time health and safety monitoring system. So many researchers proposed so many ideas, but they are not reliable. In the existing system they use very limited facilities like a gas sensor and a heart beat sensor. Under the drainage the possibilities of current monitoring system implementation are quite difficult. There is no unified equipment that can provide all the services in one place.

## **PROPOSED SYSTEM**

In our proposed system we are introducing a new system which can solve all the problems in the existing system. Here we are using a helmet which can wear by the sewage workers. This helmet consist of various sensors, which will measure the various gas levels, oxygen level, and health condition of the worker. Here we are also including an ultra sonic sensor to detect the obstacle in the drainage. Also we are providing a facility for communication between the workers and management team. Here we are unifying all the services and facilities that we can provide in one equipment, that is, through a helmet, which will work efficiently to save the life of sewage workers.

## **BLOCK DIAGRAM**



# **SYSTEM REQUIREMENTS**

## **Hardware Requirements**

Intel Core Processor

Hard Disk 50 GB

Memory 1 GB RAM

Gas Sensors

Oxymetry Sensor

Ultra Sonic Sensor

LCD Display and Buzzer

## **Software Requirements**

Windows 7 or Higher

Embedded C

MySql 5.6