

SMART SEWAGE MONITORING SYSTEM AND SAFETY MEASURES FOR THE SEWAGE WORKERS.

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ABSTRACT:

In this project, it is a real time monitoring systems for sewage workers for safety measurement. Now a day's death rate of the sewage workers was increased. According to past 5 years' survey Tamilnadu is in 2nd place to face death rate of sewage workers. By our project we help to overcome the issues faced by the workers. Our device will monitor the workers Heartbeat, Temperature and also detect the toxic gas preset in the sewage tunnel. by this information will be updated in our website and notify by buzzer, LCD and LED.

Keywords:

Buzzer, LCD, LED, website, heartbeat, temperature.

INTRODUCTION:

In our America is growing faster each day in terms of generation however the situation of the sewage employees who are there for cleaning and sanitation of sewer strains isn't converting. Because of the absence of facilities provided and the discharge of dangerous gasses like methane, Carbon monoxide and hydrogen Sulphide, even as cleansing the sewer lines, many sewage employees had misplaced their lives and additionally going through many ailments like cardiovascular illnesses, bronchial asthma, and plenty of more. Actual time health tracking tool will show very useful for the health. To allow them to and concerned authorities understand about the dangerous hassle earlier than this hassle motive any damage to them. This actual time monitoring device goes to act as piece of safety machine for sewage people. This device will take

a look at the temperature of the manhole and also frame temperature of the employee, heartbeat price of the employee before entering into the manhole, hit upon the toxic gasses like methane, ammonia and so on.,

by means of using the RFID tag the records of the worker like name, gender, worker id, e mail, smartphone no., and so forth., the ones datum is reader inside the RFID reader module thru scanning the RFID tag. The above mentioned data are uploaded in our WAMP SERVER website.

Our net web page will help to monitoring the sewage worker who's operating inside the positive tunnel, and moreover discover the tunnel which is in below operating.

If something going to occur sewer line like respiration hassle suffocation, gasoline poisoning explosion and lots of extra everything is straight away and in a roundabout way related to gasses. With the aid of the use of this tool human beings and authorities have a replace of the explosion of harmful gasses and any breathing hassle skilled thru worker while sanitizing in real time, so that urgent safety step has to be taken for them without losing of time.



Image credit: WaterAid/CS Sharada Prasad

1.Manhole Kit

EXISTING SYSTEM:

In the existing system, a number of jobs related with gas detection and ensure security system. A signal is generated and message is sent to the licensed user as an alerting system to help in faster reduction of the critical situation. It automatically registers for cylinder requirement when it reaches the lowest weight 500g. This system highly focuses only on domestic gas detection.

PROPOSED SYSTEM:

This real time health monitoring device will work in a sewage as a safety equipment. In this project, the device presented will monitor the pulse rate of a person using a pulse sensor. The methane concentration and the atmospheric oxygen concentration and provide alert to worker and exterior unit. RFID system helps to know the worker's detection who in the sewage pipe line in real-time across their sites which increases safety and it provides RFID worker system Our project work is to design an effective accident avoid system by preventing drainage in major cities.

By using gas sensor, the toxic level of gas will be notified in the LCD display to indicate the workers. If the gas is above 120ppm the workers will not have allowed to enter into the tunnel. Heartbeat Sensor is used to check the worker pulse rate before entering the tunnel, if any abnormal in pulse rate the worker will not have allowed to continue his work, and also displayed in LCD display.

The water level of the sewage will be checked by using Water Level Sensor before entering into the tunnel, Temperature sensor used to check both tunnel and to workers.

In this project we separated as two parts, Manhole part and worker's details. The all collected information will be uploaded in our created website WAMP SERVER by using local host webpage.

BLOCK DIAGRAM:

Our project is separated into two segments

2. Worker Kit

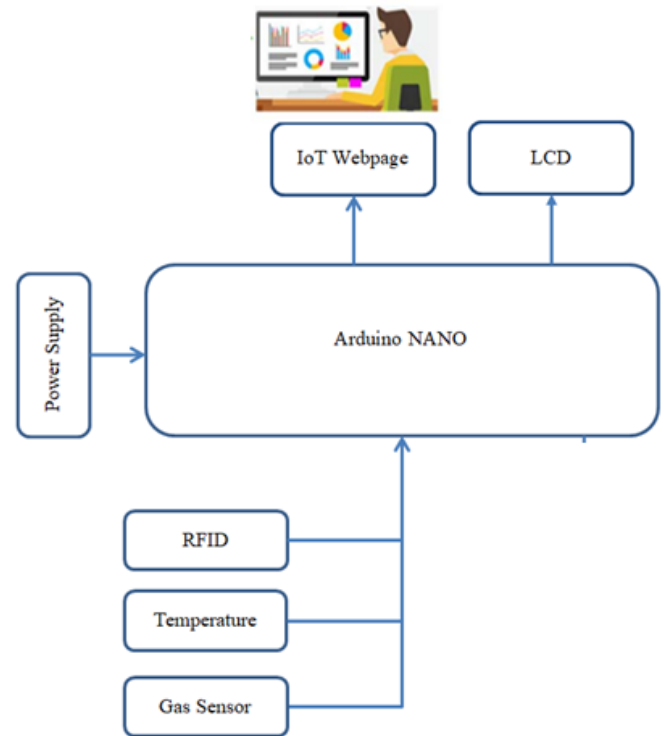


Fig 1: block diagram of Manhole Kit

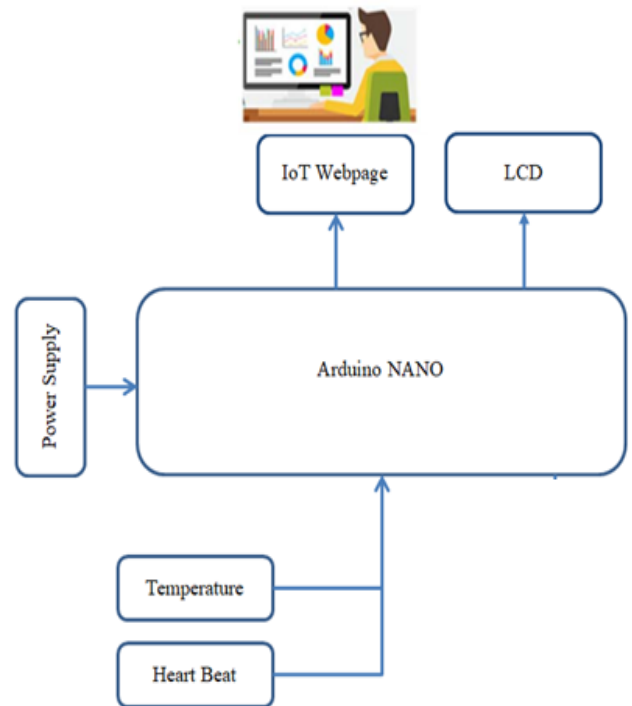


Fig 2: block diagram of Worker Kit

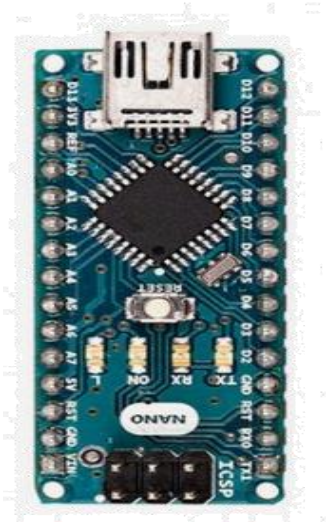
COMPONENTS USED:

Hardware Requirements:

- Arduino NANO
- RFID Read (EM18)
- LM35 – Temperature Sensor
- Heart Beat Sensor
- Gas Sensor
- LCD
- Wi-Fi IoT Module
- Power Supply

Software Requirements:

- Arduino IDE (Embedded C Program)
- PHP and MySQL



POWER SUPPLY:

The power supply module was required to supply regulated 5V dc to the circuit while plugged to the mains. The components include Step down transformer, Voltage regulator, Capacitors and Diodes.

RFID READER:

EM-18 RFID reader is one of the commonly used. RFID reader to read 125KHz tags. It features low cost, low power consumption, small form factor and easy to use. It provides both UART output formats. It can be directly interfaced with microcontrollers using UART and with PC using an RS232 converter.



ARDUINO NANO:

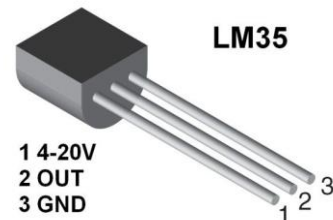
Arduino is an open source platform for prototyping based on user-friendly software. It provides a flexible base for engineers to experiment on designing interactive environments. Its main components are

- 14 digital input/output pins
- 6 analog inputs
- 16 MHz crystal oscillator
- USB connection
- reset button

TEMPERATURE SENSOR:

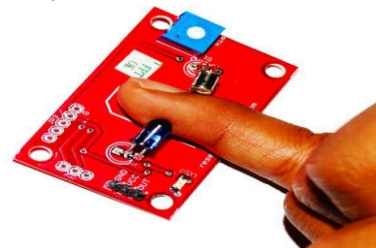
Temperature sensor basically measures the heat/cold generated by an object to which it is connected. It then provides a proportional resistance, current or voltage output which is then measured or processed as per our application.

- Features,
- Calibrated Directly in Celsius (Centigrade)
- Rated for Full -55°C to 150°C Range
- Suitable for Remote Applications
- Low-Cost Due to Wafer-Level Trimming
- Operates from 4 V to 30 V



HEART BEAT SENSOR:

Heartbeat sensor in sensor node 1 consists of both the infrared light emitter diode and the detector are arranged side by side in a leaded package. The output produced is a digital pulse which is synchronous with the heartbeat.



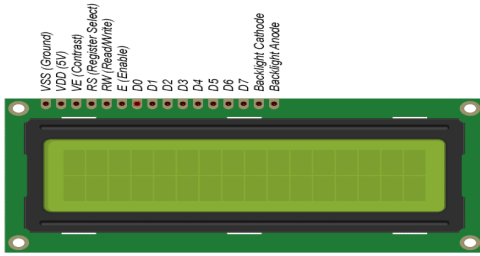
AIR QUALITY SENSOR:

Air quality sensor for detecting a wide range of gases, including NH3, NOx, alcohol, benzene, smoke and CO2. Ideal for use in office, hospital, home and factory. MQ135 gas sensor has high sensitivity to Ammonia, Sulfide and Benze steam, also sensitive to smoke and other harmful gases. It is with low cost and particularly suitable for Air quality monitoring application.



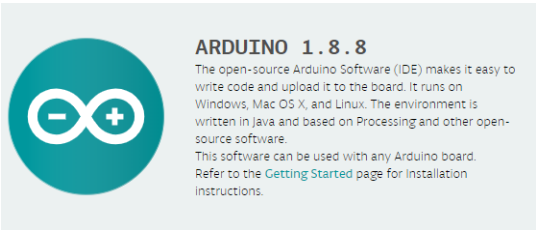
LCD DISPLAY:

This is a white on green display having 16 characters and 2 rows with high brightness backlight. 16 x 2 LCD is ready to use with micro-controllers as a digital input. LCD used to display the prototype sensors data display, and any data that requires a simple display.

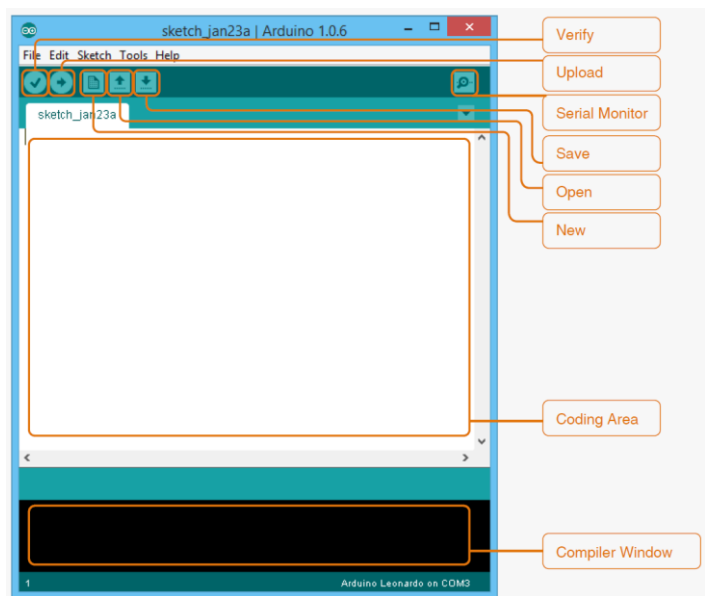


ARDUINO IDE:

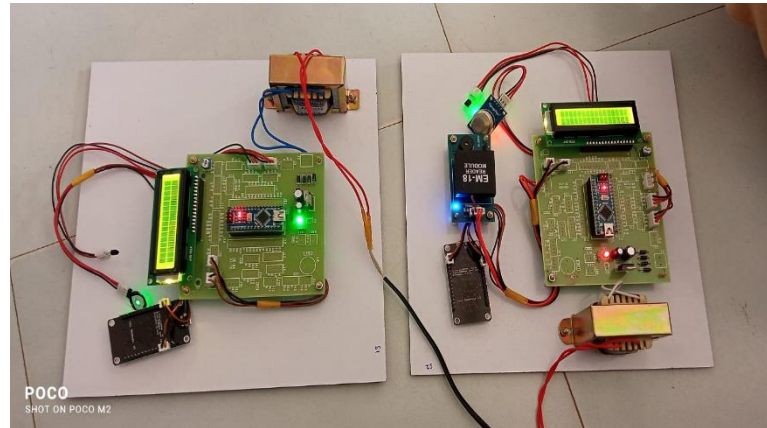
The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Geniuno hardware to upload programs and communicate with them.



ARDUINO IDE:



HARDWARE KIT:



ADVANTAGES:

- The workers clean, safety and healthy.
- To help contractors and workers to prevent gas poisoning during drainage work.
- The proposed methodology helps in preventing the sudden accident of workers that occurs while cleaning and also helps to keep the society clean.

FUTURE SCOPE:

In future microcontroller look through the values and it sends to the cloud through Wi-Fi module. ESP32 CAM documents the live images of the workers in manhole. If any parameter run over above the normal value it gives alert message to the mobile application. The emergency button is also used when it is needed.

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