Zig-bee Based Alert System for Coal Miners

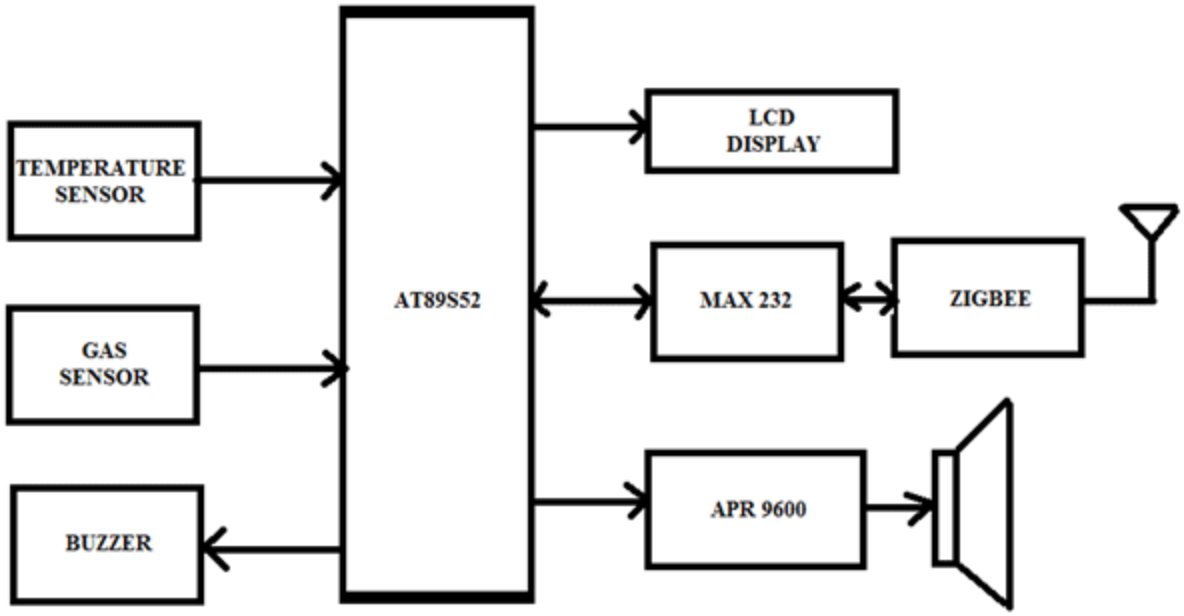
Safety is one of the main aspects of industry specially mining. To avoid loss of material and damage of human health, the underground mines need faithful communication as well as protection system. In order to increase both safety and productivity, a reliable communication must be established between mine workers and a fixed base station. Inside mines, the wired communication system is not so effective, because wires can be damaged. In this project we are going to monitor some parameters like abnormal gas, temperature and fire sensors to ensure the safety of workers. It makes use of text to voice converter that gives continuous information about the workers along with cameras that are meant for video monitoring.

ABSTRACT

In this system, the basic parameters like temperature, humidity and hazardous methane gas are going to be monitored and if any abnormality happens it will be intimated through voice alert within the mine and transmitted to the monitoring section via Zigbee communication module. For that we are using a microcontroller interfaced with sensors. Here a voice IC named APR9600 is used for intimating the abnormal status in voice format.

This system is well applicable in coal mines and gold mines .The system can also be easily extended with ZigBee wireless image transmission facility. In future it will improve scalability of underground environment and extend accurate position of miners. Inside mines, different parameters are intimated to the workers through voice.

A module of MEMS based sensors are used for underground environment monitoring and automating progression of measurement data through digital wireless communication. This technique is proposed with high accuracy, smooth control and reliability. A microcontroller is used for collecting data and making decision, based on which the mine worker is informed through alarm as well as voice system. The voice system carrying both microphone and speaker transform it into digital signal and effectively communicate wirelessly with the ground control centre computer.



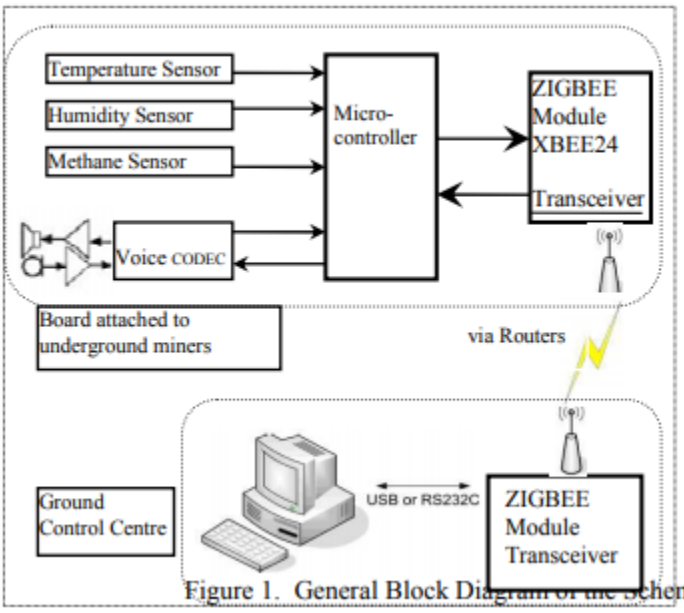


Figure 1. General Block Diagram of the scheme