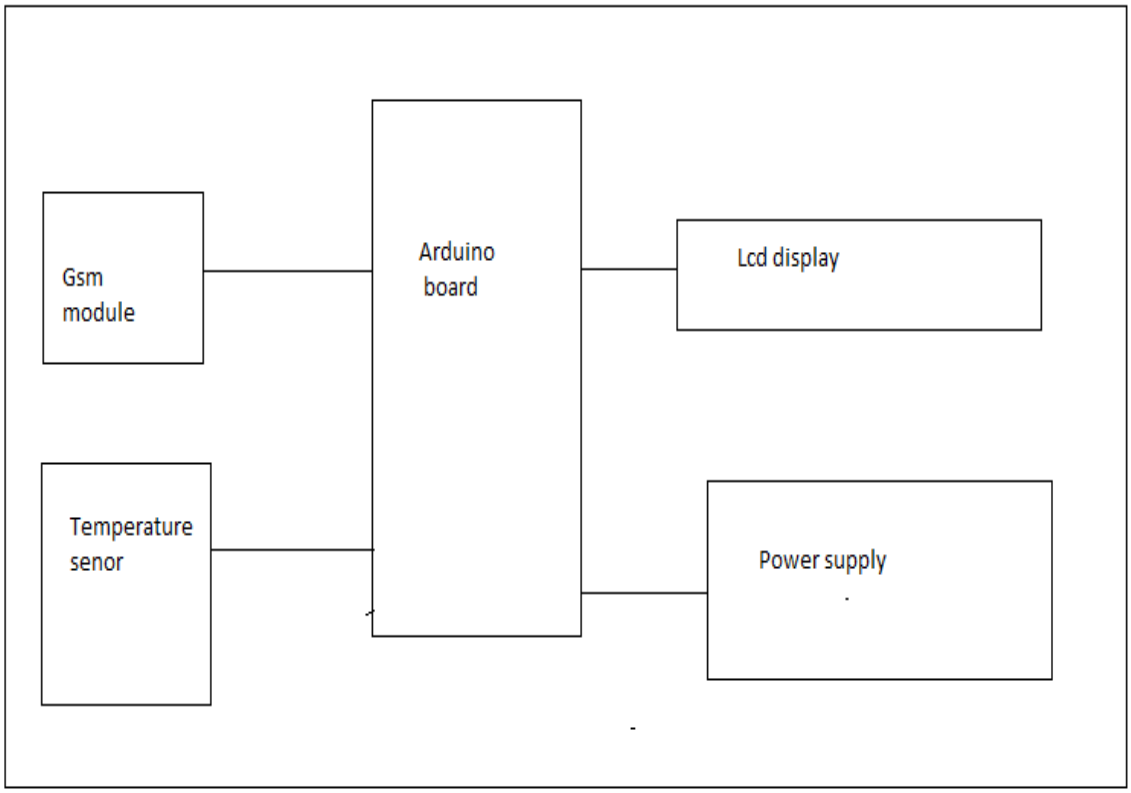
GSM based SMS Alert Fire Alarm System using Arduino

***Introduction**: Arduino Fire Alarm System which will send SMS to a set of Mobile Numbers when fire occurs in a particular location. For example in office, bank ,hospital, warehouse it will helpful when there is absence of a person to know about fire accident it sends message to certain people.

***Abstract:** Fire alarm system plays an important role in maintaining and monitoring the safe of all kind environments and situations. However the usability of many existing fire alarm system is well known but could be produce with high cost. Subsequently, it is not affordable for the low income users. The main objective of this project is to produce a prototype of multilevel operating Fire Alarm system with low cost. The system has two main systems, the detection system and the monitoring system. The detection system operates as the fire detector. This detection system has temperature sensor. The monitoring system has two parts Arduino and Gsm module his fire alarm project make use of modern communication technologies to deal with emergencies. ires continue to occur in modern architecture, the people's lives and property has brought huge losses. In order to reduce the fire in the building automatic fire alarm equipment placed into a necessity. Fire alarm systems have become increasingly sophisticated and functionally more capable and reliable in recent years. They are designed to fulfil two general requirements: protection of property and assets and protection of life. As a result of state and local codes, the life-safety aspect of fire protection has become a major factor in the last two decades. A key aspect of fire protection is to identify a developing fire emergency in a timely manner, and to alert the building's occupants and fire emergency organizations. This is the role of fire detection and alarm systems. Depending on the anticipated fire scenario, building and use type, number and type of occupants and criticality of contents and mission, these systems can provide several main functions. First they provide a means to identify a developing fire through either manual or automatic methods and second, they alert building occupants to a fire condition and the need to evacuate. Another common function is the transmission of an alarm notification signal to the fire department or other emergency response organization. They may also shut down electrical, air handling equipment or special process operations, and they may be used to initiate automatic suppression systems. Fire alarm systems are important in providing occupants of buildings prompt warning if a fire occurs. Contrary to popular belief, a fire alarm system such as one of the many fire-lite alarm systems can provide a way to make either a large building like an apartment complex or even a large home more fire secure while also reducing the number of alarms and physical pieces of hardware required, or the required maintenance.

***Block diagram**



Components: *Gsm module

*Temperature sensor LM35

*Arduino board

*Lcd display

*Power supply

*Basic components

***Working :** when fire occurs ,temperature rise above reference level is sensed by LM35 temperature sensor and signal is sent Arduino which alerts Gsm module to send text message to predefined number and it will be displayed on the Lcd display .we Have written program to Arduino in INO format.
Fire can occur 24/7 we should look in program to run in loop to watch the temperature.

Arduino is an open-source computer hardware and software company, project and user community that designs and manufactures microcontroller-based kits for building digital devices and interactive objects that can sense and control the physical world.
The project is based on a family of microcontroller board designs manufactured primarily by Smart Projects in Italy, and also by several other vendors, using various 8-bit Atmel AVR microcontrollers or 32-bit Atmel ARM processors. These systems provide sets of digital and analog I/O pins that can be interfaced to various expansion boards ("shields") and other circuits. The boards feature serial communications interfaces, including USB on some models, for loading programs from personal computers. For programming the microcontrollers, the Arduino platform provides an integrated development environment (IDE) based on the Processing project, which includes support for C, C++ and Java programming languages.
The first Arduino was introduced in 2005, aiming to provide an inexpensive and easy way for novices and professionals to create devices that interact with their environment using sensors and actuators. Common examples of such devices intended for beginner hobbyists include simple robots, thermostats, and motion detectors

LM35 is three terminal linear temperature sensor from National semiconductors. It can measure temperature from-55c to +150C. The voltage output of the LM35 increases 10mV per degree Celsius rise in temperature. LM35 can be operated from a 5V supply and the stand by current is less than 60uA.

Gsm module: Global System for Mobile communication. This GSM Modem can accept any GSM network operator SIM card and act just like a mobile phone with its own unique phone number. Advantage of using this modem will be that you can use its RS232 port to communicate and develop embedded applications. Applications like SMS Control, data transfer, remote control and logging can be developed easily.

The modem can either be connected to PC serial port directly or to any microcontroller through MAX232. It can be used to send and receive SMS or make/receive voice calls. It can also be used in GPRS mode to connect to internet and do many applications for data logging and control. In GPRS mode you can also connect to any remote FTP server and upload files for data logging.

This GSM modem is a highly flexible plug and play quad band SIM900A GSM modem for direct and easy integration to RS232 applications. Supports features like Voice, SMS, Data/Fax, GPRS and integrated TCP/IP stack

*APPLICATIONS

1. SMS based Fire Alarm system are very useful in remote locations where human interaction is limited. Such systems are useful in mines, industrial areas, factories etc.

2. Night Owl – We all know owls don't sleep during night. SMS based Fire Alarm system helps to monitor locations and alert during fire that occurs in night time.

3. Quick Actions to shut down Fire – 90% of fire damages occur due to lack of early fire detection. A fire attack is usually silent and people will know about fire only when it has spread across a large area. SMS based Fire Alert system gives warning immediately to multiple mobile numbers and hence remedy actions can be taken quickly. This helps to prevent major damages and losses created by a fire accident.