

# GSM BASED OVERHEATING DETECTION SYSTEM

***Abstract:*** Security and automation is a prime concern in our day-to-day life. The approach to home and industrial automation and security system design is almost standardized nowadays. In this report, we have tried to increase these standards by combining new design techniques and developed a low cost industrial automated security systems. Everyone wants to be as much as secure as possible. The design of simple hardware circuit enables every user to use this wireless industry security system with temperature sensor at Industries.

## I.INTRODUCTION

Industry security is the most significant one for every industry. This GSM Based industrial security system can be used to provide security system for industry, and for all commercial purposes using GSM technique. Security systems are certain electronic devices which are used to detect intrusions in home or industry. The basic component of an automation security system is temperature sensor. It is cheaper and can be maintained easily than any other security device.

When the user is away from industry, all the sensors are activated by switching on the Security system. Whenever systems experiences a abnormal condition in the industry like any overheating of equipments occurs in the industry and any intrusion into the industry the Security system alerts the security personnel as well as the supervisor of the industry by sending SMS alerts to the users of the industry. In the system along with security alert, security alarm will also buzz. The system operates with the help of sensors installed in this system.

Existing systems

1. Wired System,
2. RF Based Security System,
3. Web enabled Security System.

Disadvantage of Existing Systems

1. Difficult to maintain
2. Need internet access
3. Distance.

Proposed System

The proposed system uses GSM module which enables us to know the security status of industry when we are away from the industry.

## II. SYSTEM DESIGN

### A. Circuit Diagram

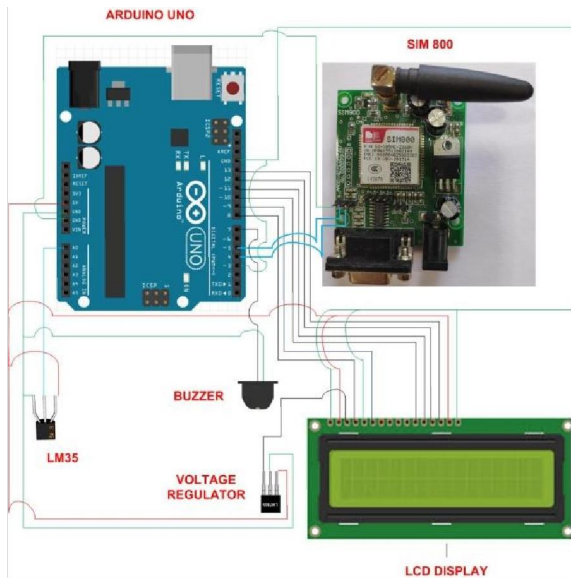


Fig.:1 Circuit Diagram

It can be implemented to any levels of the security system. The architecture of the system mainly consists of three components the GSM MODEM, ARDUINO UNO and the interface circuit that include the LM35 temperature sensor used. The function of the GSM MODEM is the remote communication between the user and the Device. The function of the Arduino Uno is to continuously check the inputs coming from the temperature sensor and send message through the GSM network in case of overheating.

The Arduino Uno is connected to Temperature Sensor, buzzer , LCD and GSM Module. The GSM connected to the user through the mobile cellular network. A circuit has been designed which includes sensor as input device. Then the programmed Arduino Uno has been connected to the LCD Display, Buzzer and GSM Module in the circuit .

The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius temperature. In the features of LM35 it is given to be **+10 mills volt per degree centigrade**. It means that with increase in output of 10 mills volt by the sensor V-out pin, the temperature value increases by one.

### B. Hardware and Sensor

#### 1) Arduino Uno:

**Arduino Uno** is a microcontroller board based on the ATmega328P ([datasheet](#)). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

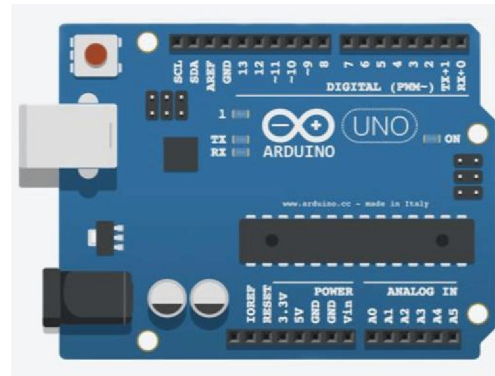


Fig.:2 Arduino Uno

#### 2) SIM800 GSM Module:

SIM800 is a quad-band GSM/GPRS module designed for the global market. It works on frequencies GSM 850MHz, EGSM 900MHz, DCS 1800MHz and PCS 1900MHz. SIM800 features GPRS multi-slot class 12/ class 10 (optional) and supports the GPRS coding schemes CS-1, CS-2, CS-3 and CS-4. SIM800 can meet almost all the space requirements in users' applications, such as M2M, smart phone, PDA and other mobile devices. SIM800 has 68 SMT pads, and provides all hardware interfaces between the module and customers' boards. SIM800 is designed with power saving technique so that the current consumption is as low as 1.2mA in sleep mode. SIM800 integrates TCP/IP protocol and extended TCP/IP AT commands which are very useful for data transfer applications.



Fig.:3 SIM800 GSM Module

### 3) LM35 Temperature sensor :

LM35 is a temperature sensor that outputs an analog signal which is proportional to the instantaneous temperature. The output voltage can easily be interpreted to obtain a temperature reading in Celsius. The advantage of lm35 over thermistor is it does not require any external calibration. The coating also protects it from self-heating. LM35 can measure from -55 degrees centigrade to 150-degree centigrade. The accuracy level is very high if operated at optimal temperature and humidity levels. The conversion of the output voltage to centigrade is also easy and straight forward.

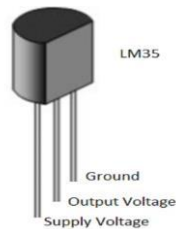


Fig.:4 LM35 Temperature Sensor

### 4) LCD (RG1602A) :

LCD is an electronic display module which uses liquid crystal to produce a visible image. The 16×2 LCD display is a very basic module commonly used in circuits. The 16×2 translates o a display 16 characters per line in 2 such lines. In this LCD each character is displayed in a 5×7 pixel matrix.

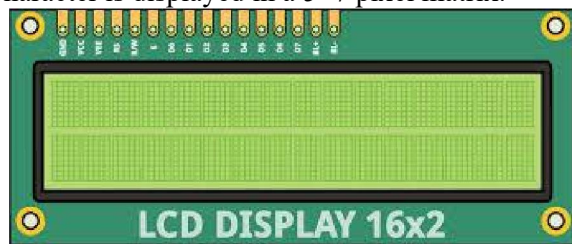


Fig.:5 LCD

## III. EXPERMENTAL PROTOTYPE

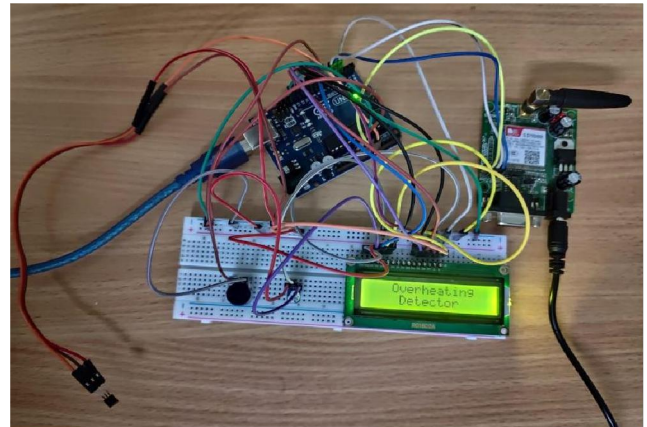


fig.:6 Overheating Detector Initiates



Fig.:7 LCD displaying current temperature

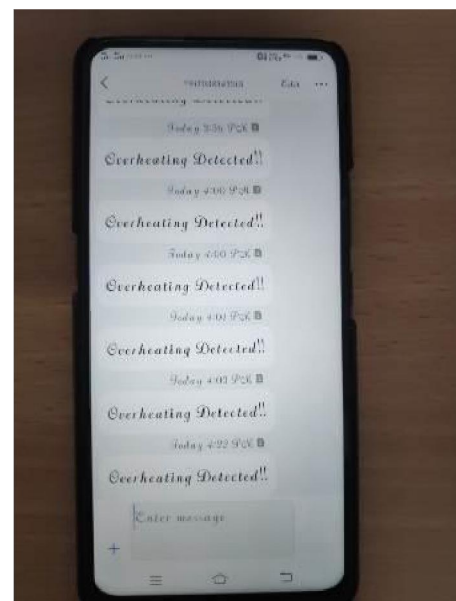


Fig.:8 Overheating alert message

The Overheating Detectors initiates. The LCD displays the temperature detected by LM35 continuously. When the temperature exceeds 100 °C then buzzer buzz and GSM Module sends the Overheating Alert to desired mobile number. This helps to detect the overheating very quickly and alerts the user even if the user is at very far distance from the device and also does not require internet connectivity.

The connectivity of cellular network is the main limitation of the prototype proposed. With strong Cellular Network connectivity this limitation can be overcome.

#### **IV. RESULT**

Buzzer buzzed when temperature exceeded 100 °C and message alert for overheating was successfully received.

#### **V. CONCLUSION**

This report presents user friendly and low cost industrial automation and security systems. A simple system to improve the standards is developed. It is a real- time monitorable system developed with simple hardware which simplifies the possibility of error free security system. This system can be easily implemented with maximum reliability and the high security with low cost is a special enhancement from the existing systems for industrial security.

#### **ACKNOWLEDGEMENT**

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