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Remote Management of Telecom Base Station

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ABSTRACT : In today's world mobile or cell phone plays very important role in communication. There is a station known as cell site or the Base Transceiver Station (BTS) site .Which monitors the various elements at cell site. It provides the safety of the cell site. Our paper makes an use of GSM modem which gives the instant message which detects the errors occurring in this devices. It is designed to monitor various threats like fire detection, smoke detection, to check the fuel level, to check door is left open. The door check is required since many times maintainer workers forgot to properly close the door of base station unit. It also includes power management unit. The major problems faced including the theft of wires, fuel amount being unnoticed, unauthenticated entry, the fluctuation of temperatures, the vendor and the technician's time management in of above defined problems. The method of GSM modem which gives the instant message about the each activity happening in the site. The temperature sensors will sense the temperature of the room and if it rises above the threshold value the GSM module will send the message to the master mobile which is already set in the system. The RFID authentication system use to access the door of BTS sits. In addition the site is under the CCTV camera which turns ON automatically. The cell site Base Transceiver Station (BTS) which are operated by Diesel generator can be controlled manually or can be put in automatic mode.

KEYWORD: Atmega2560, BTS Shelter, Mobile station, GSM, Arduino , RFID , Sensors.

I. INTRODUCTION

It Controls & Monitors each subsystem inside BTS. The sensors which we used to detect over temperature, diesel levels or diesel theft. The sensors that monitor temperature, diesel fuel levels, site door open/close status. The Power management of which enables the wireless operators to monitor cell sites remotely for degradation before it affects network integrity. The aim is to Control multiple individual subsystems at each base station site and across network [1]. Alerting users immediately when temperature rises to prevent or reduce damage to cell sites. The temperature sensors and relay will sense the temperature of the room and if the main fails the GSM module will send the message to the master mobile which is already set in the system [2]. The cell site base transceiver station (BTS) which are operated by Diesel generator, when the power is off we can switch on the Diesel generator by sending the SMS command like (DG ON) or we can switch of the generator with the command (DG OFF). Each tower is supported by a power plant with batteries.

II. LITERATURE SURVEY

A) Problems Occurred due to

- The site has to work in particular temperature if temperature increase above normal level then their occurs damages of the system, which is due to fluctuation of the temperature.
- The authorized site technician has to enter .Poor security occurs unauthorized entry.
- The Generator fuel being unnoticed by the site person which stops whole working procedure of the system.
- energy (light) saving is very important.
- In the absence of technician Due to some problem Smoke is generated. Which should be sent wirelessly sent information to authorized person.
- Due to improper time management by technician unauthorized entry in room

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III. SECURITY ATTACKS ON STATION

This project aim is to provide a single solution which remotely controls and monitors the subsystems inside each base station site and enables network operators to coordinate and manage the conditions at all base station sites across their network. Control multiple individual subsystems per base station site. The objectives of the BTS project are to facilitate the achievements of the AMPE (Accelerated Mobile Phone Expansion) Programmed which targets the achievements of full voice coverage [3]. Alerting users immediately when temperature rises to prevent or reduce damage to cell sites.

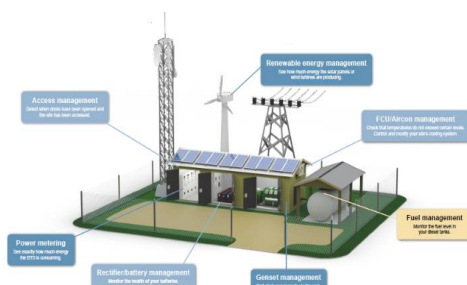


Fig 1. Mobile Communication Base Station

IV. PROPOSED METHOD

It consists of two parts 1) Software unit 2) Hardware unit Software unit includes the compiler to build the assembly program used in Atmega2560 microcontroller. Hardware includes Atmega2560 microcontroller, Sensors, Power supply, Buzzer, Display unit. The ATmega2560 gets the input from the various devices which are present in the BTS (Mobile Tower) systems. GSM modem is serially interfaced with ATmega2560 [4]. Thus we can send an SMS to the pre-assigned mobile number giving exact information about the fault occurred with the help of this modem.

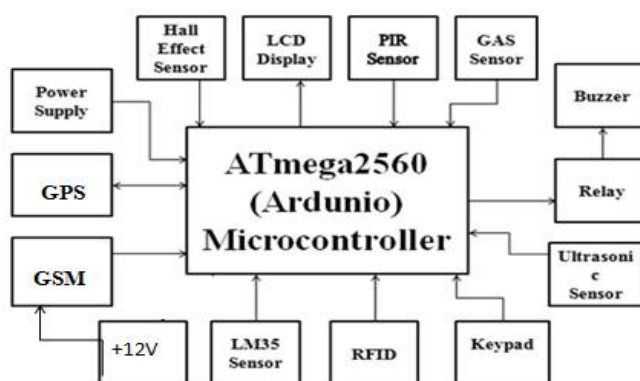


Fig 2. Block Diagram

B) Flow Chart

1. Start
2. Initialize the LCD
3. Print the project name on LCD
4. Initialize the GSM
5. Wait for fault
6. Check the fault
7. Check Di1=0 if yes then
8. Print on LCD name of fault
9. Hooter on, relay on and LED of respective fault glows
10. Send SMS to the registered mobile no.
11. If Di1=1 then check Di2=1 if yes go to 8
12. Check for MUTE button if it is pressed then hooter is off
13. Check for RESET button if it is pressed then LED is off
14. Go to 6
15. End

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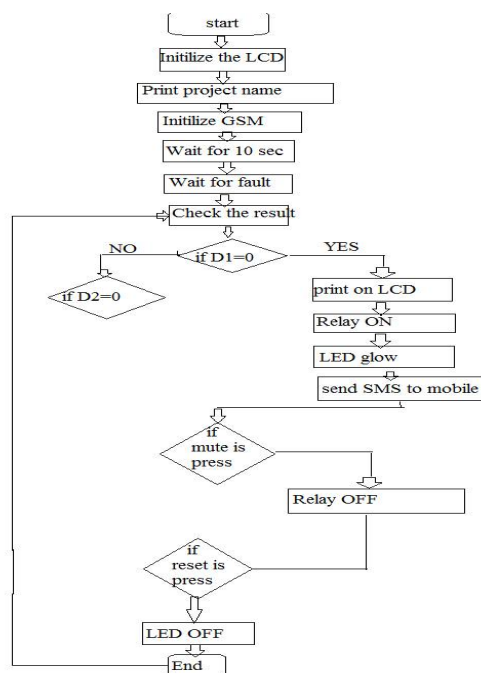


Fig 3.Flow Chart

V. RESULT

Working model of the system is shown in below figures..

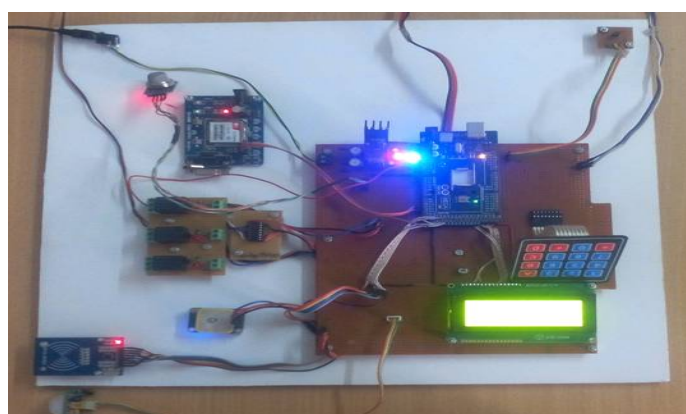


Fig 4. Working Model of BTS

Result Includes the output of the project where output as authentication success, if correct password is entered (123456).Authentication is fail if wrong password is press (852569).The room temperature is measured using LM35 sensor and also the fuel level in tank using ultrasonic sensor based on distance it will indicate fuel level. These all results are displayed on the LCD display and also display the result in the atmega2560 Aurdino Software. From the result observation it is cleared that all the modules are working as expected in objectives.

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```
TEMPRAITURE = 30°C          TEMPRAITURE = 29°C
level = 37.50                level = 37.50
TEMPRAITURE = 28°C          TEMPRAITURE = 29°C
level = 0.00                 level = 37.50
237 3 125 43 184            TEMPRAITURE = 29°C
Authentication              Gas13
Correct Password            13
Master                      141 252 124 43 38
65816                        Rejected
TEMPRAITURE = 29°C          Motion detected!
level = 31.25                TEMPRAITURE = 29°C
TEMPRAITURE = 28°C          level = 37.50
level = 31.25
Motion detected!

Acquired Data
-----
Lat/Long(10^-5 deg): 18457184, 73846954 Fix age: 617ms.
Lat/Long(float): 18.45718, 73.84696 Fix age: 639ms.
-----
121 207 32 43 189
Rejected
Rejected
TEMPRAITURE = 29°C
level = 37.50
121 207 32 43 189
Rejected
Rejected
Unauthenticated Person Attempting to Enter the Base Station Message sent
```

Fig 5. Software output Authentication(Success & fail)

If Temperature is very high in BTM Room which is sensed by the LM35 sensor send an alert SMS to mobile using Gsm i.e Check temperature level and turn on the air conditioner cooler. If there Gas leakage in the station the gas sensor will sense and send an alert message to the technician through GSM module. If there is an Unauthorized entry in the room the PIR sensor will sense the motion & it will send an alert message to the technician..



Fig 6.GSM Module

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 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.This GSM modem is a highly flexible plug and play quad band **SIM900A** GSM modem for direct and easy integration to RS232 applications.

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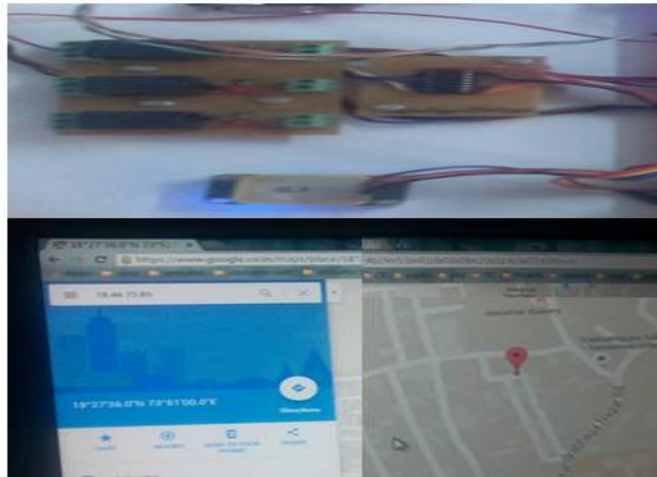


Fig 7.GPS Module(Location of BTS)

GPS (Global Positioning System) is used for the finding the area of the base station, which is very easier to find out the location. It will send the latitude and longitude message to the mobile so that location can be found. 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..

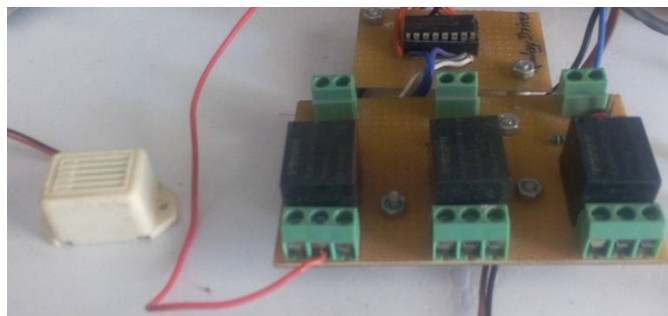


Fig 8.Relay connected to Buzzer(Alarm)

Whenever GAS Leakage or Fire is found in the BTS, Relay will trigger the Buzzer as well it will send message to the mobile using GSM. Relays are connected to the GAS sensor, PIR Sensor, and Hall effect sensor. Whenever if any theft is detected or motion or gas is found the Buzzer is triggered by the three relays.

V. CONCLUSION &LIMITATION

- Fault Management (FM) such as alarms and notifications at critical events.
- Configuration Management (CM) — for example setting the cooling temperature on your air-conditioning equipment.
- Performance Management (PM) — Generate reports and statistics.

All this adds up to better control of BTS — from any location. This project introduced beneficial techniques to protect the mobile BS site and its proper uninterrupted operation like, BS Security Monitoring enables users to monitor remotely

the conditions of base stations (BS). System Temperature, Distance, Unauthorized entry in room, theft of wires are all problems are solved. The core of the solution is the GSM SMS controller which always performance monitoring features. Great time management and hence required less number of technicians. With the help of this system the technician is alerted of any unexpected situation and can attend to it immediately and hence the loss is minimized. The



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user has to use the RFID card to enter the base station. The only limitation of this paper is that the user cannot enter the premises if he/she forgot his RFID also the RFID data is time critical i.e. the user with proposed time slot can only enter the premises at the given time. The user cannot enter the premises at any time as they may please. The user has to carry the RFID tag at all times. The users that might have lost their cards will have to contact the administrator.

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