

## GSM based fault alert system for BTS (Mobile tower)

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**Abstract-**Base transceiver system (BTS) is a site where wireless communication takes place between the network and gadgets. To avoid blockage of network smooth functioning of BTS is very necessary. BTS comprises of many kinds of devices. Thus our aim is to develop a system which detects the errors occurring in these devices and generates alert immediately. These faults are fed into a remote user device with the help of GSM modem creating a message instantly. This method will enhance the efficiency of the services provided by the BTS. It will take measures to rectify the delays. Our project improves the performance ability of BTS and provides immediate assistance in case of distant wireless service, practically eliminating manpower. This technique of remote controlling and monitoring can be implemented at each and every BTS tower to look after the safety and management of its network.

**Keywords-** Base transceiver system (BTS); Fault detection; GSM modem; Alert System; Fault Generation.

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### I. INTRODUCTION

Cellular towers form the backbone of our modern communications infrastructure. Each tower is incorporated with a power plant with batteries, diesel generator and devices for backup power. Some sites are not supported by utility power hence sometimes they rely on hybrid power sources like solar power plants. The sensors which we used to detect over temperature, diesel levels or diesel theft.

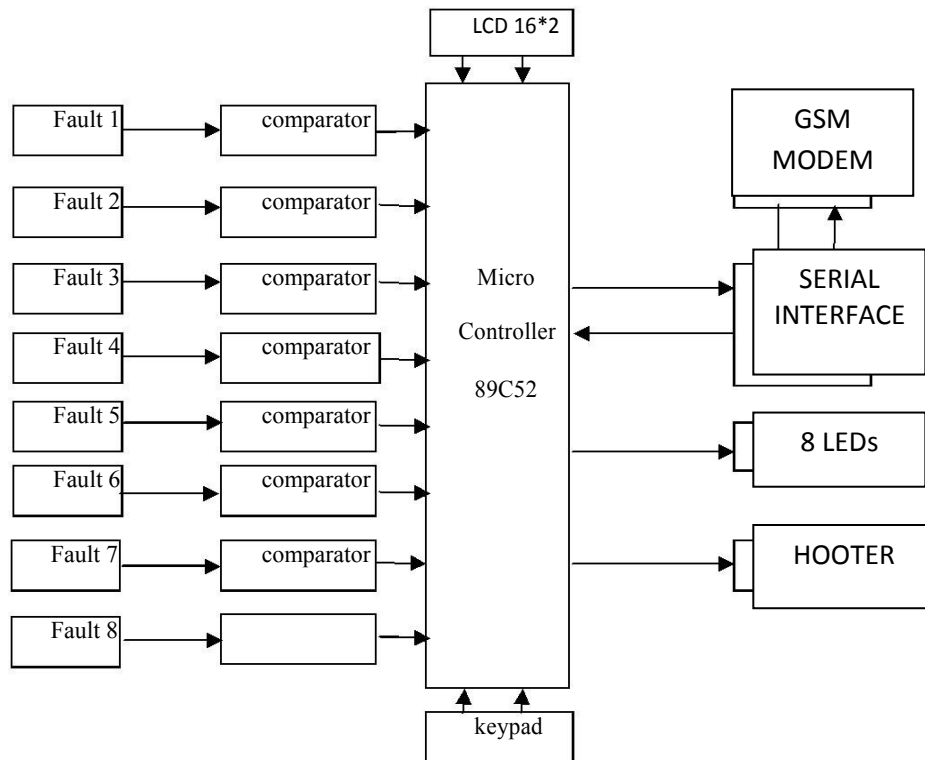
#### Aim of Project

This project aims a single comprehensive solution that 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. Time management of cell sites in case of any failure protects the mobile network, mobile tracks and measures cell site performance for peak operation. This project provides the Power management of which enables the wireless operators to monitor cell sites remotely for performance degradation before it affects network integrity. The aim of the project is to Control multiple individual subsystems per base station site and thousands or more base station sites across your network. Alerting users immediately when temperature rises to

prevent or reduce damage to cell sites. Reducing energy consumption through automatic maintenance and monitoring of temperature. The GSM based Fault Alert System for BTS(Mobile Tower) using GSM system will get the input from the devices and it will show the corresponding fault by lamp indication and by sending the message to the pre-assigned mobile number giving exact information about the fault occurred.

## II. BLOCK DIAGRAM

Block diagram consist of following components



*Figure 1. Block diagram*

## III. PROPOSED SYSTEM

The microcontroller 89c52 gets the input from the various devices which are present in the BTS (Mobile Tower) systems. The faults occurring in these devices are shown by glowing of their respective LEDs. GSM modem is serially interfaced with microcontroller. 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 .Simultaneously the Hooter will switch ON. It is also displayed on the 16x2 matrix LCD. This will alert the person who is present at the site regarding the fault occurred in the device.

The following different type of faults are indicated & given an alert by SMS:

**A. Inverter status sensing:** The fault occurring due to the failure of inverter is detected by using a limit switch.

**B. Over Current Fault:** The fluctuations produced due to the current supply will vary from the reference value. Comparison of values are carried out in the comparator. Hence fault is existed.

**C. Over Voltage Fault:** The comparator compares reference value and voltage supply's value. It checks whether the supply value is equal to the reference value. If both don't match then fault is detected. **D. Generator Status Indication:** Problem is Generator fuel amount being unnoticed. Hence the whole system stop working when the power loss and no fuel is present in generator is occurred.

**E. MSEB Supply Status indication:** A limit switch is detected this fault When the MSEB power supply get cut off, the fault occurs.

**F. Diesel theft sensing:** Only site technicians and admin are authorized to enter in the site but with poor security any one can easily enter. This person can lid of fuel tank for theft. Thus we can use sensor for opening and closing of tank.

**G. Fuse Blown Fault:** The comparator has two inputs out of which one is reference value. The other one it gets from the fuse. If the fuse gets burnt, the value passed to the comparator will differ from its reference value giving rise to the fault in the device.

**H. Over Temperature Fault:** The comparator compares the temperature of control room with the assigned temperature range ( $-55$  to  $+150^{\circ}\text{C}$ ). If there is sudden rise in the temperature the fault is occurred.

#### IV. ALGORITHM

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

**FLOWCHART:-**

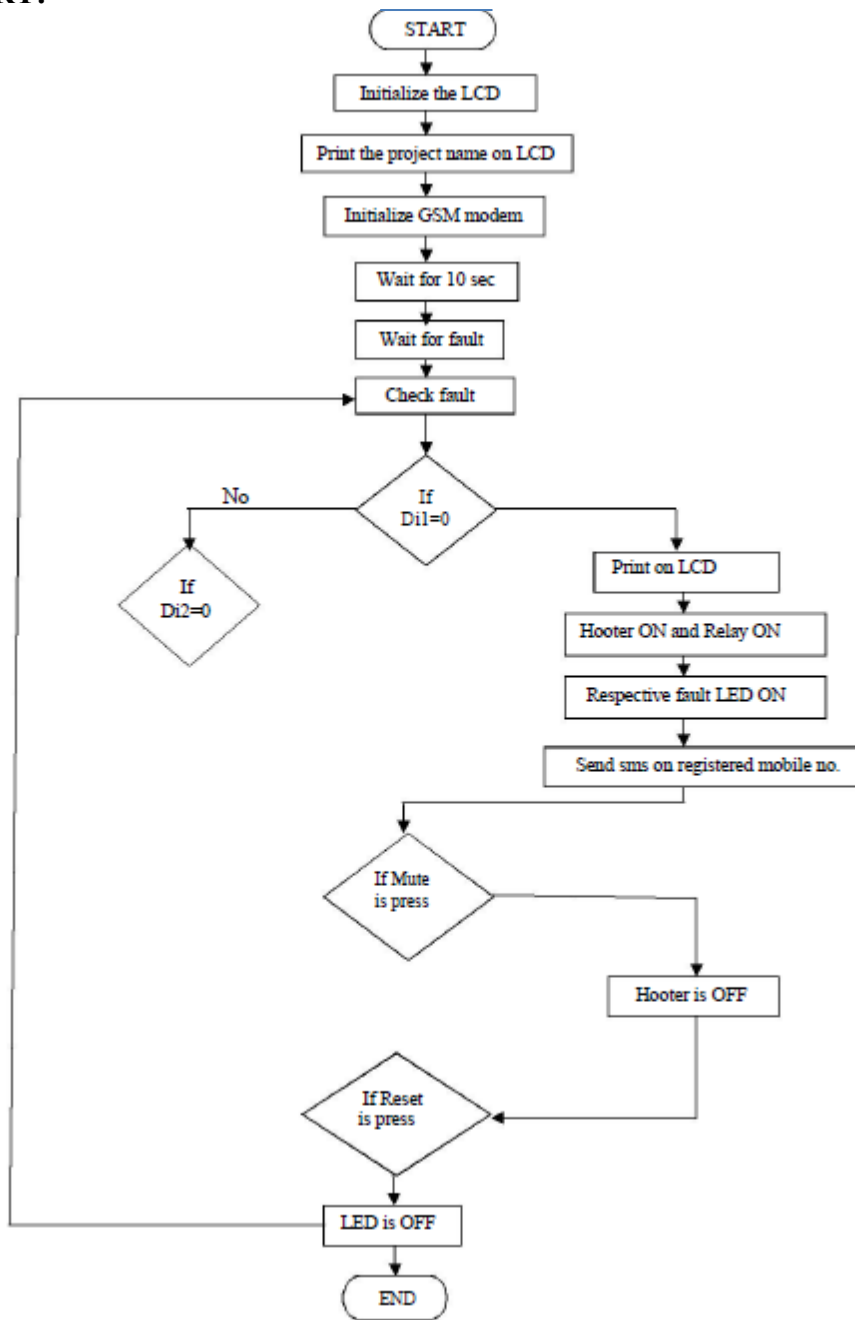


Figure 2. Flowchart

## **V. CONCLUSION**

By using microcontroller & latest technology like GSM communication, maintenance of remote places like BTS (mobile tower) can be very well attended in proper way in shortest possible time so the complexity and time consumption in finding the faults is reduced.

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