

"EGBMAC" - EMBEDDED GSM BASED MONITOR AND CONTROL

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Introduction

This project is designed to monitor and control different devices attached to our project from a remote environment using extensive GSM technology for communication purposes and microcontroller for device control. The highlights of our system are the long range of communication and four bit password security. The device monitoring is done by placing a phone call, controlling and acknowledgement is done through sms codes between our access number and the authenticated user.

Objective

To design an electronic system that can either monitor or control a Device using GSM Technology. EGBMAC provides the user, the freedom roam about and still have the control over the device and can also get information about the device status by making a call to the GSM modem.

Methodology

1. Design of the electronic circuits and verification
2. Identification of suitable components (performance v/s price)
3. Circuit assembly and interconnections using 8051 Development board
4. Circuit testing
5. Programming and debugging
6. Final verification

Details of Hardware and Software

The Hardware set up of EGBMAC begins with the use of 8051 development board and interfacing other peripherals(ADC,LCD) and the heart of the EGBMAC i.e. the GSM Modem to the Brain of the EGBMAC i.e. the Microcontroller.

The Serial communication between the microcontroller and GSM modem is achieved by RS232 cable connection. Baud rate of 9600 bps is being used.

Motor driver circuitry is built around a pair of Darlington transistors. EGBMAC requires at least of +7.5V, 1A to drive GSM modem and +5V to drive peripherals. Hence power supply unit is designed to empower both development board and the GSM modem so that EGBMAC can function from its own dedicated power supply unit.

Software Logic

EGBMAC can perform Power Status Monitoring, Voltage Monitoring by means of ADC0804, Device Control and Device Monitor by means of the SMS service of GSM Technology, User Mobile number alteration by password Authentication. To achieve these entire functionality 8051 assembly language program is written in Atmel AT89C51 microcontroller.

Operation

The software accepts and stores the user number in GSM modem memory when entered after four password authentication. Now when the power is switched on the execution of software enters the SMS and Call reception Routine. If a call from the User number arrives then that call is hung up and a SMS containing the information about device status and Voltage being monitored is sent to the User Handset or else if the user sends an SMS to control the device then the action corresponding to the SMS is performed and an Acknowledgement SMS containing the device status is sent to the User Handset.

Result and Conclusion

- The EGBMAC makes use of the ubiquitous GSM technology by which it empowers the user to exhibit control over the device from the remote destinations. The user has the freedom to move about and still have the control over the device and can also get information about the device status by making a call to the GSM modem.
- The Desired Mobile number can be stored on to the GSM Modem and hence user has the liberty to change his/her mobile number.

Scope For Future Work

The EGBMAC can be further enhanced by

- Extending the number of users
- By incorporating the Microcontrollers which can support CAN, I2C, SPI, PWM outputs EGBMAC unit will be able to interact, communicate and control many devices at a single stretch