Embedded System Designs

Project

Ankur Omar (2012A8PS296G)

Gauri Shelat (2012A3PS206G)

Hithesh Reddy (2012A8PS282G)

Shashank Verma (2012A3PS133G)

**Home Automation system**

Motivation

As technology evolves with time, we come across challenges like that of home automation. Hence, things like home control and home monitoring/security systems come under research and mainstream development work. We aim to develop an extensible home system, that includes ambient temperature and lighting control, locking of doors/gates, fire and gas leakage safety alarms, and a basic anti-theft alarm system based on user input from a mobile device, with an option of automatic control without user interference. We also aim to overcome the challenges and conflicts that arise when switching from automatic to manual-override mode. This is keeping in mind the user inexperience with programming such systems, and easy configuration of automatic default values.

Objectives

Our system will focus on two key sub-aspects of home automation i.e. Control and monitoring. 1. The control aspect will be related to lighting, temperature and locking of the main doorways, and IR-based/manual user controlled locking of the Garage.

1. The monitoring aspect will take care of the fire and gas leakage safety along with an anti-theft security system, which invokes an alarm and relays a message using a GSM module to the user and the concerned authorities to indicate the situation.
2. The default values for control can be input by the user in programming mode of operation, after which, these values are set for automatic control mode.
3. A manual-override mode exists through which the user can manually control the lighting, temperature and doors when not intending to operate in automatic mode.
4. We can program the system for a time-based locking scheme where the doorways will secure lock themselves at a user-programmed time in case the user forgets to do the same. This however, can be manually over-ridden whenever required.

Deliverables:

1. A microcontroller based control and monitoring system with multiple functionalities in automatic and manual-override modes.
2. Demonstrating the use of temperature, IR, gas, lux sensors, DC motors, and GSM module for control and safety monitoring, and a Matrix Keyboard for easy user-programming of the system.

Block Diagram

