

# HOME AUTOMATION AND SECURITY USING TCP/IP

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## ABSTRACT

*An automated home is about the convenience of saving your time and effort by having your home automatically do routine functions such as watering your grass (but only if it has not rained recently), or turning off all lights, setting the thermostat to economy mode and arming the security system when you retire for the night. When on holiday or working late, have the lights come on automatically and draw the curtains.*

*Set room moods, i.e. one button push to switch off the main light, dim the perimeter lights and switch the surround sound system on ready to play a movie. At dusk, check that the garage door is closed. Switch on the electric blanket whilst you're sitting on your sofa.*

**Keywords:** *Communication, TCP/IP, Embedded system, Microcontroller, Visual Basic, Socket programming, UART.*

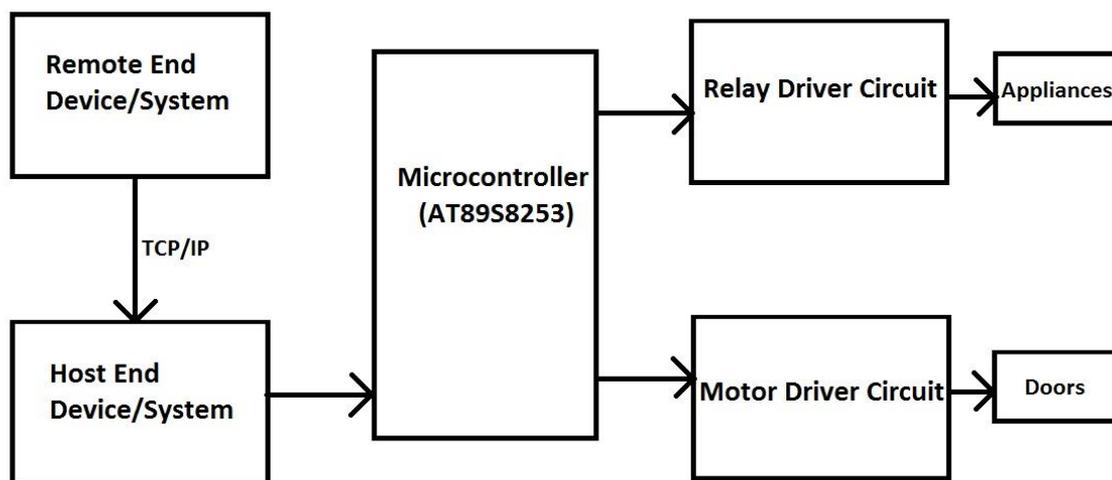
## I. INTRODUCTION

Imagine if there is a system through which you can alter the working of an appliance at your home with just a click sitting in any part of this planet, then feel how easy the life would be. So we decided to implement a circuitry through which we can make this easy life concept real. The concept used is that a person being at the remote end will send a signal to the host end by using TCP/IP. We developed a Graphical User Interface (GUI) using Visual Basic (a software used for developing GUI's in an Integrated Development Environment) at both the ends and used socket programming to communicate between them. At the host end the system will send a signal to the microcontroller through UART (Universal Asynchronous Receiver Transmitter) which will eventually control the home appliances/mechanical objects through electromagnetic relays/motor drivers.

## II. RELATED WORK

The developed system makes use of the TCP/IP protocol which is used to connect two devices on different networks and an embedded system including a microcontroller (AT89S8253) to send signals to a relay driver circuit and a motor driver circuit. The microcontroller sends signals to these two driver circuits based on the signal it receives from the connected device be it a computer (Host End) or any other capable machine. The host end machine is connected to a remote system through TCP/IP. This remote end system sends the command

signals to the host end or the connected system with the embedded circuitry through TCP/IP which is then processed and sent to the microcontroller accordingly. The relay driver circuit is used to control a number of relays which operate different appliances we wish to control and the motor driver circuit controls a DC motor which is used for door locking/unlocking. So in nutshell using embedded system and TCP/IP protocol we can operate any appliance or mechanical objects like doors etc. we wish to from anywhere we want.



**Figure 1: Block diagram of the Home Automation and Security using TCP/IP**

### III. PROPOSED METHODOLOGY

After analysing the need of automation and security in today's world, this paper proposes a systematic framework that is based on the TCP/IP and Embedded System for improving security management. This framework takes account of several key aspects such as home automation and security even when you are not at home. The proposed framework has the following advantages: low cost, high performance, easy to implement, and strong security control pattern. In addition, this paper proposes a dynamic security strategy that is about authorizing user ID and conforming the rightful owner of the property.

It is based on Microcontroller and TCP/IP to detect any unauthorised entry in the secured area. When a person wants to enter in the house he/she has to enter the premises with the method which is normal in nature ie: by using keys or security cards then the person is allowed to enter in the cabin or particular area. If the user tampers with the entrance or door of house or any other subject where the system is installed then the rightful owner of the property gets to know about it. Further if we install a camera in the system then we can also identify the person responsible.

### IV. APPLICATIONS

- House hold use
- Irrigation and farming purposes
- Vault purposes
- Container/ Yard Management

- Theft tracking
- Access management
- Security of commercial bodies
- Robotics systems

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## V. POSSIBLE FUTURE MODIFICATIONS

- Home will inform you if it finds anything suspicious
- Turn on a lighting path for your escape in case of an emergency
- Automatically phone the fire/police department in case of fire/intrusion.
- Cameras can be added to identify person responsible.
- CCTV Cameras can be installed to keep the house under surveillance.
- Alarms and buzzers can be attached with the circuitry for more caution.

## VI. MOTIVATION

Our final year project is Home automation and security using TCP/IP. This idea came to our mind when we thought of controlling our homes sitting anywhere and the other reason was home intrusion rate in our country is much greater than other developing and developed countries. So we thought that we can implement a security system which would help us in keeping our homes safe and secure and this is what our final year project is all about.

## VII. CONCLUSION

Home automation and security using TCP/IP: This is a very useful application of Embedded systems and TCP/IP. This can be commonly used in homes, offices, vehicles, communication and so on. This project can be utilized as a major tool against increasing number of thefts in our country.

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