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PC Controlled Home Appliances

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ABSTRACT
With advancement of technology things are becoming simpler and easier for us. Automated systems are being preferred over manual system. PC based control systems are highly reliable, accurate and time saving systems. They provide number of features like quick data storage, transfer data and data securities which helps in industries to work in sufficient manner. A microcontroller based controller is designed to control a number of electrical equipment. To control and monitor connected equipment through the PC.
Keywords – Microcontroller 8051, Computer, RS-232 cable, MAX-232, Relay and home equipment.

I. INTRODUCTION

In today's world .there is high a demand for PC based control system because of its various advantages s over manual control system, PC based control systems are highly reliable , accurate and time saving systems, they provide number of features like quick data storage , data transfer and data security which help industries to work in efficient manner

In this paper, a PC based system which will control various devices like Motor, Light, and Fan etc. Designed a GUI (Graphical User Interface) on the PC and which helps to give command to the system. Microcontroller is used in order to receive commands from PC and accordingly control the devices connected to it. In this way this system is completely controlled by PC.

II. SYSTEM DESCRIPTION

For controlling, a number of electrical equipment using a PC from a centralized location involved development of hardware and software for controlling it. The block diagram of PC controlled home appliances system as shown in fig.1.

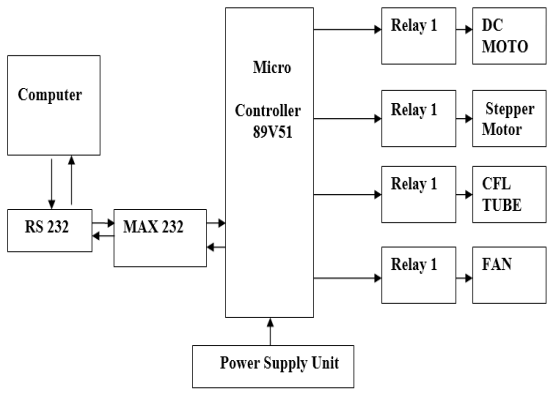

Fig.1. Block diagram of the system

The system consists of five sections are as follows

1. Power supply
2. Computer
3. RS 232 protocol
4. Microcontroller
5. Relay circuitry

1. POWER SUPPLY

There are many types of power supply. Most are designed to convert high voltage AC mains electricity to a suitable DC voltage supply for electronic circuits and other devices. 5 Volt DC power supply require for operation of microcontroller.

2. COMPUTER

Computer is used in order to give commands to the system with the help of RS 232 protocol commands through Graphical User Interface.

3. RS 232 PROTOCOL

It has been used in order to do serial communication with the help of MAX 232 as level converter.

4. MICRO-CONTROLLER (8051)

This is the most important segment of the project. The controller is responsible for detection and polling of the peripherals status. It is responsible for making and prioritizing all the devices attached to it.

In this project, P89V51RD2 microcontroller is used. The P89V51RD2 is a low-power, high-performance CMOS 4-bit microcontroller with 64K bytes of in-system programmable Flash memory. It has got 32 I/O lines two data pointers, two 16-bit timer/counters, six-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and a clock circuitry [1].

5. RELAY

A relay is an electrically operated switch. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal.

WORKING OF THE SYSTEM

When the power is ON initially, all IC's & relays get resets. Once any Button is pressed by user through computer control device window (GUI), computer will send command to Microcontroller with the help of standard serial communication protocol (RS 232). And through microcontroller relay operation take place & according that home appliance works [2].

The developed model is connected to four appliances fan, motor, lamp and CFL. By giving appropriate command individual appliances are turned on and off simultaneously. All the devices can work at a time. Any device can turn off as on as per requirement by giving appropriate command as shown in table 1.

Table 1Turning ON and OFF devices through command

SR. NO.	APPLIANCES	ON	OFF
1.	LAMP	B	A
2.	CFL	D	C
3.	FAN	F	E
4.	MOTOR	H	G

Command can be programmed as per choice of user during programming. It is observed that developed model is working successfully.

III. SOFTWARE REQUIREMENT

In this paper, docklight software is used. Docklight is a testing, analysis and simulation tool for serial communication protocols (RS232, RS485/422 and others). It allows to monitor communications between two serial devices or to test the serial communication of a single device. Docklight is easy to use and works on almost any standard PC running Windows 8, Windows 7, Windows Vista and Windows XP. Docklight will work with the COM communication ports provided by operating system. Physically, these ports will be RS232 SUB D9 interfaces in many cases [3].

IV. ADVANTAGES

1. This paper can be effectively and conveniently utilized for the control of different appliances.
2. As this paper could be extended to control number of devices, this could be used for computerization of an office, home, or a firm. The circuit is simple and the working mechanism could be easily understood.
3. It is able to know the status of the device to be controlled.
4. The program to control the appliances is written in C language which is more user friendly and easy to understand than other programming languages
5. In today's world there is high a demand for PC based control system because of its various advantages over manual control system.
6. PC based control systems are highly reliable, accurate and time saving systems. they provide number of features like quick data storage, data transfer and data security which help industries to work in efficient manner.

V. DISADVANTAGES

It is inconvenience to carry personal computer. There may be problem occurred during serial communication.

VI. CONCLUSION

Necessity of automation is a part of our day to day life. The automated household thing which is controlled by remotely when plugged into a mains supply are in demand. The controlled system is made available with proper security barriers and low cost installation provides good choice to others. Security is the main issue present with controlled system it may be wired or wireless system.

The scope of home automation can range from structured wiring for telephone, video-intercom, internet, LAN and video, through home theatre and multi-room audio, automated lightning control, security, surveillance and keyless entry, to automated control of electric motorised blinds, roller shutters, windows, watering, air- conditioning, exhaust fans, ceiling fans and other appliances.

Smart Grid: Home automation technologies are viewed as integral additions to the Smart grid. The ability to control lighting, appliances, HVAC as well as Smart applications (load shedding, demand response, real-time power usage and price reporting) will become vital as Smart Grid initiatives are rolled out.

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