Trapping Parallel Port to Operate 220V Appliances

Prateek Sharma, Kapil Kumar, Ajay Kumar Singh

Abstract— With advancement of technology things are becoming simpler and easier for us. Automation is the use of Technology to reduce Human work. Automatic systems are being preferred over manual system. Internet controlling offers a new approach to control electric appliances from a remote terminal, using the Internet, Bluetooth and Local Area Network connection. This system is accomplished by personal computers, parallel port, local area network connection, internet connection, mobile phone and Bluetooth device. The system is designed to control home appliances 'on/off', to regulate their output power. The prototype of this system was tested and it responded successfully, which verifies the feasibility of this system's theory and concept. In this paper we have tried to show automatic control of a home appliances as a result of which power can be saved to some extent.

Index Terms— Home Automation, Remote Access, Blue jacking Parallel Port.

I. INTRODUCTION

Home automation [1] is playing a vital role in the lives of people in developed countries like U.S.A, U.K *etc*. It offers a lot of benefits like it save energy thereby saving money too. Home automation when clubbed with remote access also allows us to switch "on/off" our appliances. It offers security. In developing countries like INDIA concept of home automation is still in the budding stage. People in developing countries still think that these things are for luxury ones. The need is there to make home Automation less costly. In this paper we are presenting one of the method through which we can do home automation on a small scale. Our method if applied to do home automation in a house can save a significant amount of money which will otherwise be wasted.

II. COMPONENT USED IN CIRCUIT CONSTRUCTION

We have designed the circuit from following components:

Relay: The main function of the Relay [2] is to switch between two terminals. The operating Voltage of the relay is 6 Volt DC. Maximum switching current that can be passed through the relay can be 220 Volts 5A AC. Magnetic field is produced when current is passed through the coil of relay.

MCT2E Optocoupler: They come in small 6 pin or 8 pin IC package, we are using 6 pin. The main purpose of an Opto-isolator is to prevent high voltages or rapidly changing voltages on one side of the circuit from damaging components or distorting transmissions on the other side.

Resistor: The main purpose of resistance is to drop flow of current up to extent of Resistance. Two types of resistance are used *i.e.* 4.7 k and 470Ω. 470 Ω is connected along printer port and a combination of 4.7 k and 470 Ω is connected across transistor.

Transistor-2222: A transistor is a semiconductor device used to amplify and switch electronic signals and power. It is composed of a semiconductor material with at least three terminals for connection to an external circuit. A voltage or current applied to one pair of the transistor's terminals changes the current flowing through another pair of terminals.

Parallel port: A parallel port is used to connect hardware with computer. Parallel Port consists of selection lines D0 –D7 which we are using to give 2 Volt supply to the optocoupler.

III. WORKING OF CIRCUIT

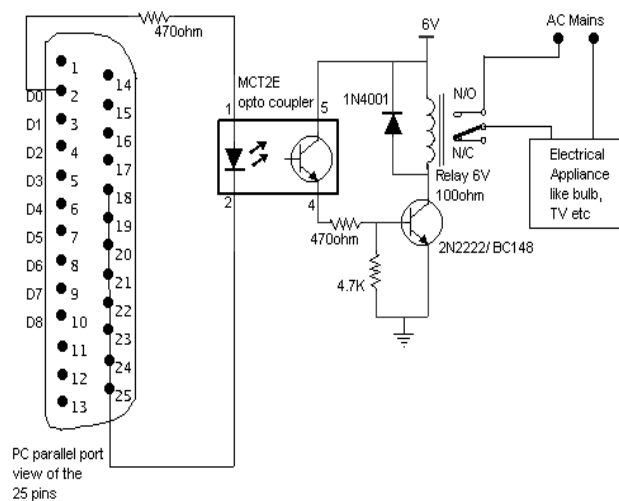The proposed circuit diagram [3] is given below in figure 1.

Fig. 1 Circuit for Connecting Devices to the Printer Port

First the circuit has been tested on bread board. Approximately 2 Volt supply is given through printer port and 6 Volt battery supply is used to drive the relay. Two resistances one of 470 ohm and another of 4.7 k are used. The main purpose of resistance is to drop flow of current up to extent of resistance. Relay [4] is used to switch between two terminals. Optocoupler MCT2E is used. The use of Optocoupler ensures complete isolation of the PC from the relay driver circuitry.

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2222 P-N transistor is employed. P-N junction 2222 transistor is used to control biasing. This set up is working fine as shown in the figure 2.
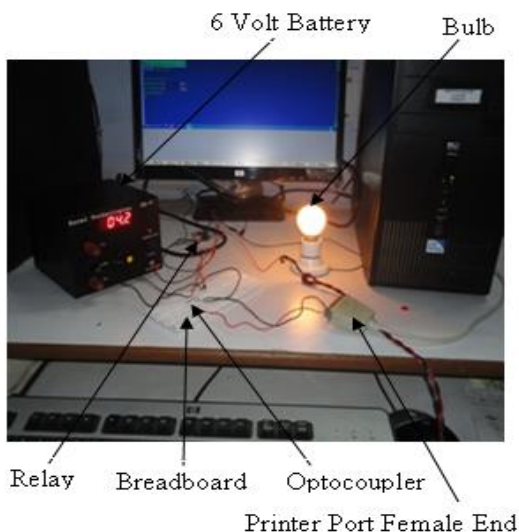

Fig. 2 Circuit in operation

Then we had made a Printed Circuit Board (PCB) [5] as shown in figure 3 and tested this connection on it.
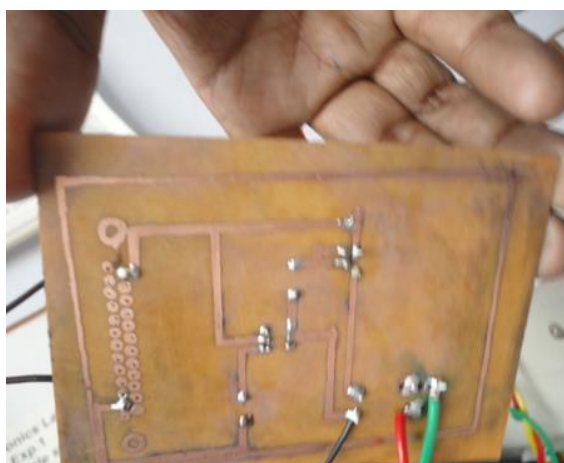

Fig. 3 Prepared PCB

Maximum of eight devices can be operated through eight Data buses (D0 to D7) available in female end of printer port. However we are operating three devices as shown in figure 4.

IV. REMOTE ACCESS FOR APPLIANCES

The circuit which is used here can be remotely accessed [6] via LogMeIn Software, provided both locations have internet connectivity. LogMeIn [7] is freely available on the website https://secure.logmein.com.
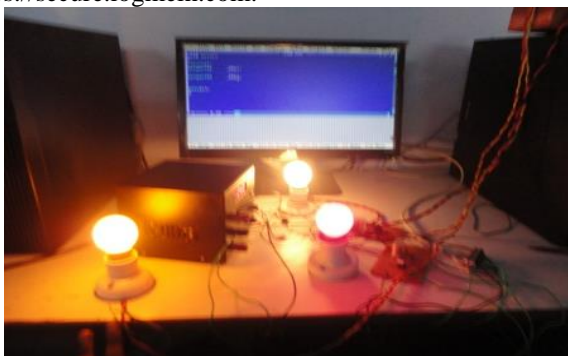

Fig. 4 Three Devices Operating Together

In this site first, user has to make his account and then choose his password and Login ID. By entering user ID and password, he get authentication [8] to go to his account as shown in figure 5. Initially, we have to download software setup and get it installed on the system where our printer port is attached.

Fig. 5 User Authorization

The user then enters the email address of the person whom he wishes to share his desktop and files as shown in figure 6. That person then accepts this invitation. Now the user friend who is sitting at a remote location can access user desktop. In a way he can do all the normal functions that a system provides. He can control appliances by running the C program on his system. File sharing [9] is also possible through the use of this software.

V. BLUEJACKING

Bluejacking [10] is the sending of either a picture or message from one user to another unsuspecting user through bluetooth wireless technology. First of all, the Bluetooth [11] software has to be installed on the PC to which the electrical appliances are connected. After the software has been installed we connect the Bluetooth device also known as dongle to the USB port of the PC. Then we switch on the Bluetooth of the PC and of the mobile device, so that the electrical appliances connected to it can be controlled, in other words, we can switch on/off any appliance connected to it. To send the information from mobile to PC pairing has to be done between them which are possible only if the dongle *i.e.* Bluetooth device has been attached to the Universal Serial Bus (USB) port of the PC. Once the pairing is done the mobile name will be shown on your computer screen. The window will appear as shown in figure 7.
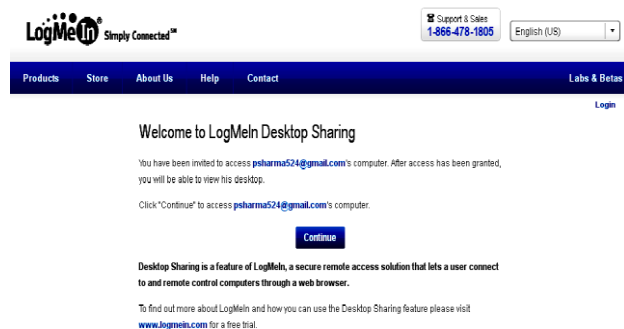

Fig. 6 Desktop Sharing Invitation

It means that this phone is in range of the PC and its Bluetooth is in "on" state at that time. Now the data can be sent from this mobile device to the PC and vice-versa as well and this information can be used as an input to the program to control the devices. When we send information from the mobile phone to the PC it is saved in a particular folder which is made at the time of the installation of the Bluetooth software.
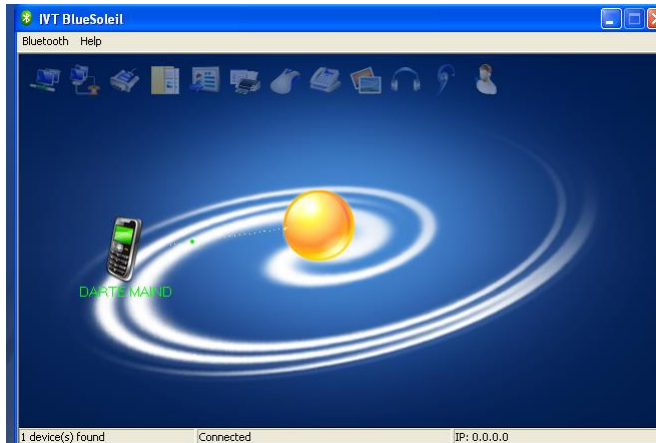

Fig. 7 Pairing of Mobile

For example, in this case this default folder named Inbox is made in the following folder – "C:\Documents and Settings\Administrator\MyDocuments\Bluetooth\inbox" naming Bluetooth as shown in figure 8.
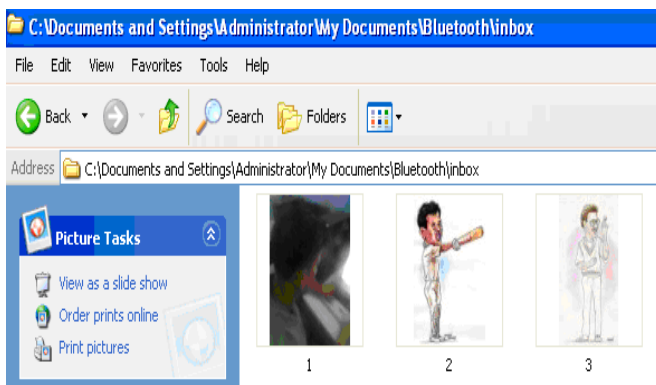

Fig. 8 Transferring Image from Mobile to Personal Computer

Now we have sent some photographs from our mobile to the PC, so they will be saved in a subfolder 'inbox' in the Bluetooth folder. We can use these photographs as an input for our C program which is used to control the appliances connected to the PC's parallel port. There is an inbuilt function known as "outportb ( )" [12] that is defined in dos.h header file which is used to control the parallel port. Now we can decide ourselves from which photo we want to control the first device, which one for the second device and similarly for all the three devices. The program searches for the photo and when it finds any of the photos in the specified folder it will send high voltage to the respective pin number of the parallel port and the 220 volt electrical appliance will turn "on". To control the second appliance the program searches for a photo named "2", now when we send the photo from our mobile then only it will find it in the specified folder and it will turn "on", so it completely depends on us that when do we want to turn on any of the appliances connected to the parallel port of the PC. We can also turn "on" multiple devices at the same time. At the maximum eight devices can be controlled.

VI. CONCLUSION

In our daily life, people often forget to turn off electric appliances and equipment, resulting in the slow but sure waste of electric power and hence energy. To resolve this problem, this paper provides a feasible solution for remotely controlling our home appliances. In this work, we have briefly discussed the importance of home automation. We have given a prototype model of home automation circuit which has been tested practically. Internet is used for remote access of the appliances. Our implemented system saves energy at the same time it can be built at a very low cost.

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