

# Design & Application of Computer Controlled Switch

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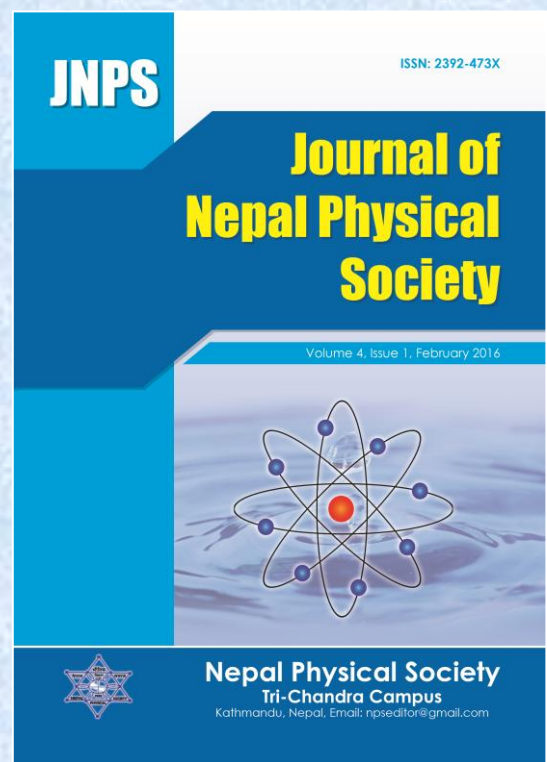
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## Design & Application of Computer Controlled Switch

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### ABSTRACT

A parallel port is an inexpensive and powerful tool for controlling the real world peripherals. It provides eight Transistor Transistor Logic (TTL) outputs, five inputs and four bidirectional input and output for Personal Computer (PC) interruption. By using the structure oriented programming language they are fused in circuit boards, microcontrollers etc. to carry out specified functions. The reason is the elegance and simplicity of the code used in visual basic.

**Keywords:** Transistor Transistor Logic, Parallel Port, Optocoupler, Controlled Switch.

### INTRODUCTION

Basically, in personal computer (PC), the parallel port, 25 pin female connector, specially designed for printer is used. It is also called printer port.

A PC printer port is an in expensive and yet powerful platform for implementing projects dealing with the control of real world peripherals. The printer port provides eight TTL outputs, five inputs and four bidirectional leads and it provides a very simple means to use the pc interrupts structure. Data port starts from pin 2 to pin 9.

By using the command from the computer, the data of the output port of the parallel port D0, D1 ...D7 will be high or low. If D0 = 1, then it enables optocoupler and relay driver so that the relay is energize i.e. 'ON' state.

The main aim of our programming is to produce high or low value for optocoupler.

Here male 25 parallel pin ports are used as main output data port for the system. There are eight optocoupler whose output is used as input from pin 1 to 8 of ULN2803. In figure only one optocoupler is shown but all other is also connected in the same way. The IC ULN2803 is used as a relay driver and the eight relay are connected from pin no 11 to 18 respectively.

When the output of parallel port is low then the output of optocoupler is also low so that the output of relay driver is high, which is in off state i.e. disable.

When the output of parallel port is high then the output of optocoupler is also high so that the output of relay driver is low, which is the relay is in "ON" state i.e. enable.

### METHODOLOGY

To design it following components is used:

#### List of components:

1. Parallel Port (Male)
2. Optocoupler –MCT2E
3. Relay driver – ULN2803
4. Relay – 12V/200ohm
5. PCB – 12V/200ohm
6. Power supply – 12V, 2A
7. 7812 IC – 12V
8. Diode
9. Capacitor

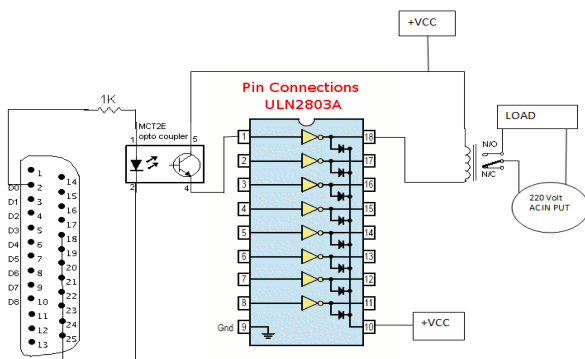


Fig.1. Circuit Diagram for Computer Controlled Switch

**OPTOCOPLER (MCT2E):**

**Description**

It is Standard Single Channel Phototransistor Couplers. The MCT2/ MCTE family is an Industry Standard Single Channel Phototransistor. Each optocoupler consists of gallium arsenide infrared LED and a silicon NPN phototransistor.

**Applications**

- AC mains detection
- Reed relay driving
- Switch mode power supply feedback
- Telephone ring detection
- Logic coupling with high frequency noise rejection

**ULN2803 (relay driver):**

The eight NPN Darlington connected transistors in this family of arrays are ideally suited for interfacing between low logic level digital circuitry and the higher current/voltage requirements of lamps, relays, printer hammers or other similar loads for a broad range of computer, industrial, and consumer applications. All devices feature open-collector outputs and freewheeling clamp diodes for transient Suppression. The ULN2803 is designed to be compatible with standard TTL families while the ULN2804 is optimized for 6 to 15 volt high level CMOS or PMOS.

We used visual basic language to design the Computer Controlled Switch, which can be applied many household and industrial applications. The full code written to design the computer controlled switch is given in appendix. Output of this software will be of the form given in figure 2.

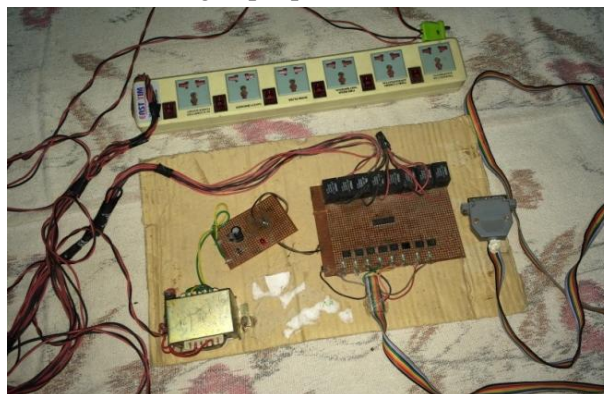


*Fig. 2: Output of program through the code can be used in multipurpose applications.*

**RESULTS & DISCUSSION**

**Application to Home Automation:**

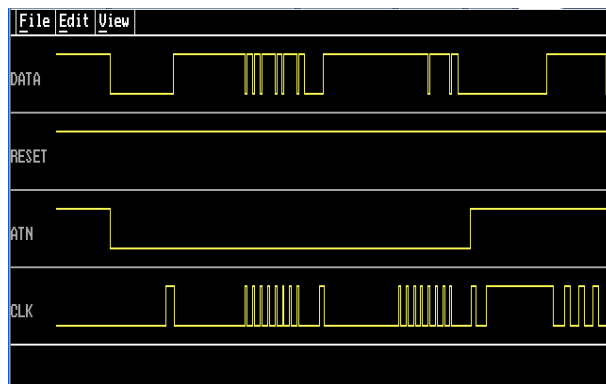
It can be used in home for automation. From this device, we can control the electrical appliance like rice cooker, fan, light, TV etc. as in figure 3 with single click. It is very beneficial for the people who are disable and aged people also.



*Fig. 3. Output of the program for home automation.*

**Application to Laboratory System:**

It is also used in laboratory automation system. We can simulate the laboratory system without any doubt.



(a)



(b)

*Fig. 4. Output of the program for Laboratory System.*

### Application to Automatic Robotic Controller

It is also can be used in automatic robotic controller system.

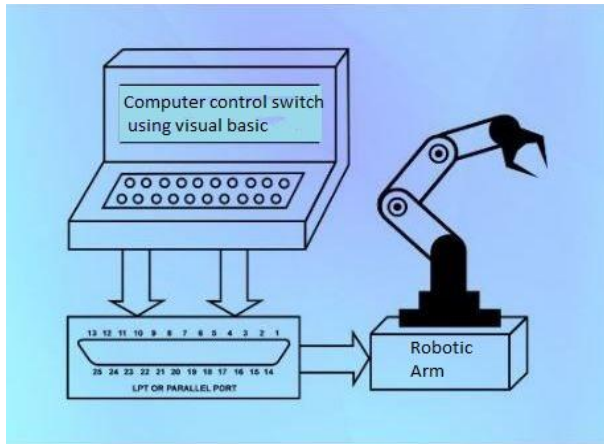


Fig. 5. Output of the program for Automatic Robotic Controller.

It can be used for our safety for the high voltage system like plasma applications and also for the schedule power on and off system used in hotel for power management system.

### CONCLUSIONS

From the present experiment, it can be concluded that we can control anything from computer code.

We also predict that application of present code is one of the most important achievements of the present study and can be applied in above mentioned applications without any risk.

### ACKNOWLEDGEMENTS

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### APPENDIX

#### Programming Language:

We used visual basic language to design the Computer Controlled Switch, which is written as follows:

#### Visual Basic Code

```
Option Explicit
Dim Value as Integer
Dim Port Address as Integer
Private Sub Check1_Click ()
If Check1.Value = 1 Then
    Value = Inp (Port Address)
    Value = Value Or & H1
```

```
Out Port Address, Value
Else
    Value = Inp (Port Address)
    Value = Value and & HFE
    Out Port Address, Value
End If
End Sub
```

```
Private Sub Check2_Click()
If Check2.Value = 1 Then
    Value = Inp(PortAddress)
    Value = Value Or &H2
    Out PortAddress, Value
Else
    Value = Inp(PortAddress)
    Value = Value And &HFD
    Out PortAddress, Value
End If
End Sub
```

```
Private Sub Check3_Click ()
If Check3.Value = 1 Then
    Value = Inp (PortAddress)
    Value = Value Or & H4
    Out Port Address, Value
Else
    Value = Inp (Port Address)
    Value = Value and & HFB
    Out Port Address, Value
End If
End Sub
```

```
Private Sub Check4_Click ()
If Check4.Value = 1 Then
    Value = Inp (Port Address)
    Value = Value or & H8
    Out Port Address, Value
Else
    Value = Inp (Port Address)
    Value = Value and & HF7
    Out Port Address, Value
End If
End Sub
```

```
Private Sub Check6_Click ()
If Check6.Value = 1 Then
    Value = Inp (Port Address)
    Value = Value or & H40
    Out Port Address, Value
Else
    Value = Inp (Port Address)
    Value = Value and & HBF
    Out Port Address, Value
End If
End Sub
```

```
Private Sub Check7_Click ()
If Check7.Value = 1 Then
    Value = Inp (Port Address)
    Value = Value or & H20
    Out Port Address, Value
Else
    Value = Inp (Port Address)
    Value = Value and & HDF
    Out Port Address, Value
End If
End Sub
```

```
Private Sub Check8_Click ()
If Check8.Value = 1 Then
    Value = Inp (Port Address)
    Value = Value or & H10
    Out Port Address, Value
Else
    Value = Inp (Port Address)
    Value = Value and & HEF
    Out Port Address, Value
End If
End Sub
```

```
Private Sub Command1_Click ()
Value = & HFF
Port Address = &H378
Out Port Address, Value
Check1.Value = 1
Check2.Value = 1
Check3.Value = 1
Check4.Value = 1
Check6.Value = 1
Check7.Value = 1
Check8.Value = 1
End Sub
```

```
Private Sub Command2_Click ()
Value = 0
Port Address = &H378
Out Port Address, Value
Check1.Value = 0
Check2.Value = 0
Check3.Value = 0
Check4.Value = 0
Check6.Value = 0
Check7.Value = 0
Check8.Value = 0
End Sub
```

```
Private Sub Command3_Click ()
Dim a As String
a = MsgBox ("Do you want to Exit", vb OK
Cancel, "ELECTRICAL DEVICES
CONTROLLING THROUGH PC")
```

```
If a = 1 Then
    Value = 0
    Port Address = &H378
    Out Port Address, Value
End
End If
End Sub
```

```
Private Sub Command4_Click ()
frm About. Visible = True
End Sub
```

```
Private Sub Command5_Click ()
Form1.Visible = True
End Sub
```

```
Private Sub Form_Load ()
Value = 0
Port Address = &H378
Out Port Address, Value
End Sub
```

```
Private Sub Form_Unload (Cancel as Integer)
Value = 0
Port Address = &H378
Out Port Address, Value
End Sub
```

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