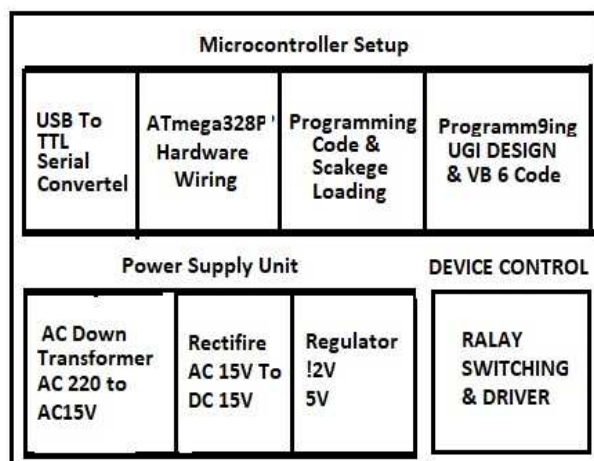# DEVICE CONTROL THROUGH PC'S USB PORT USING VISUAL BASIC

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Here is a Windows-based program developed in Microsoft visual Basic 6 programming language for creating an easy user graphic interface (UGI) suitable for Windows Operating System PC's USB port with hardware Interface Card. The hardware Interface card is also developed with micro processor based electronic Circuit to control eight devices through the personal Computer. The program generates specific instructions as input for micro processor based electronic interface card connected on PC's USB port and the output is pre programmed and loaded in micro processor memory and accordingly the requirement is actuated at a specific Relay Number connected to a specific IO pin of micro processor & driver circuit.

The heart of this project is a Single-Chip 8-bit Microcontroller type ATMEL328P 28 Pin DIL package manufactured by Microchip Technology US. , and the full details including data sheet is available online at https://www.microchip.com/en-us/product/atmega328p\

We have used this IC Chip 8-bit Microcontroller type ATMEL328P 28 Pin DIL package because it is affordable & easily available in Indian market & its IDE is also available on free platform as Arduino is using this Chip. You can also download free Arduino IDE Program online using the link https://www.arduino.cc/en/software for programming Chip 8-bit ATMEL328P used in our project.
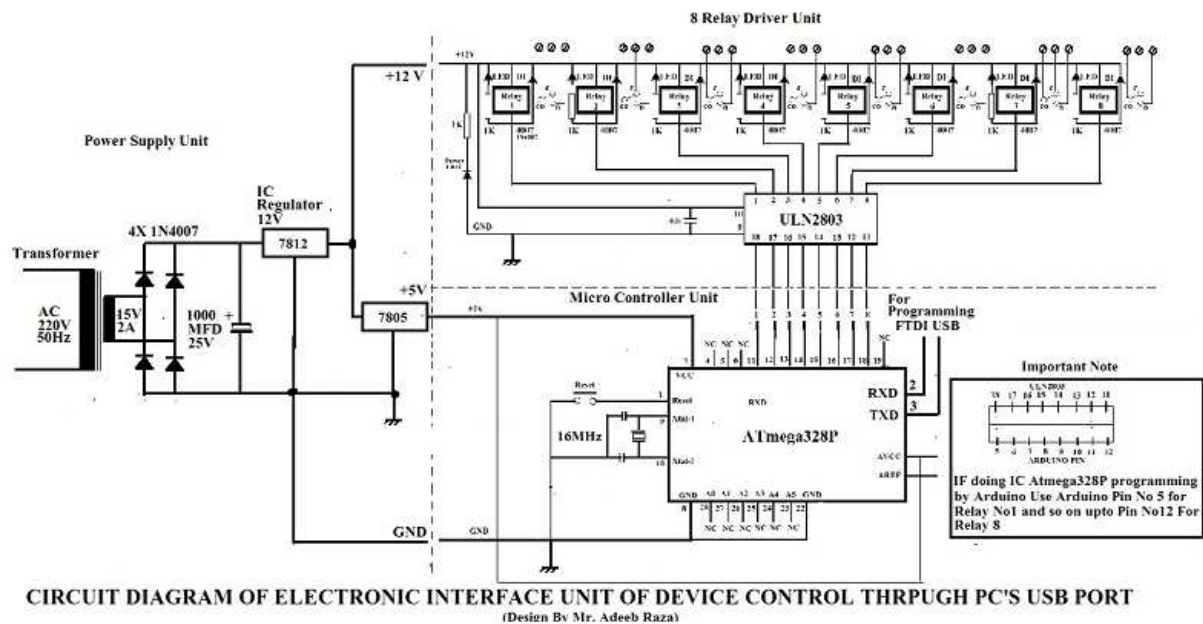
BLOCK DIAGRAM :-The block diagram shows the total function of the project & the circuit diagram showing the working operation of the the same.

(FIG.1) BLOCK DIAGRAM OF DEVICE CONTROLLER

USB TO TTL SERIAL CONVERTER CARD

CIRCUIT DIAGRAM OF ELECTRONIC INTERFACE UNIT OF DEVICE CONTROL THRPUGH PC'S USB PORT
(Design Bv Mr. Adeeb Raza)

Construction :-

We Required the following Parts for the construction of Project " **DEVICE CONTROL THROUGH PC'S USB PORT USING VISUAL BASIC"**

1.Transformer 220v Primary Secondary Isolated 15V 3 Amp
2 Rectifire Diode 1N4007
3Filter Capacitor 1000 MFD 25V
4 Regulator 12V IC 7812
5 Regulator 5V IC 7805
5 Relay 12V one Change Over
6. Relay Driver IC ULN2803
7.LED DIODE
8. Resistance 1K
9. Microcontroller ATmega328P with boot loader
10 IC Base DIL 28 Pin
11. Cristal 16 MHz
12 Capacitor
13 Headers
14 USB to TtL Serial Converter
15. Download Online Arduino IDE Software for Programming
16 Download Online USB to TtL Serial Converter Driver for PC Connection with ATmega328P Programming

Procedure Step By Step :-

(a) Wire the total above circuit diagram on a Zero PCB & test that is OK
(b) If you are doing programming through ARDUINO UNO then No need of USB to TtL Serial Converter.
(c) Remove Original Arduino IC from Board & Insert New ATmega328P on the Arduino Board

(d) Run Arduino IDE Program on your PC

(e)If your not using Arduino Board then Use USB to TTL Serial converter Card to programe your Microcontroller Atmega328p Connect PIN No.2 that is RXT (Reveiver) & Pin no.3 that is TXT (Transmitter). Connect Atmega328p (Reveiver) to USB to TTL (Transmitter). Like this Connect Atmega328p (Transmitter) to USB to TTL (). Reveiver). Rest are same

(f) Know your Arduino Port throughPC's Divice Manager then Go to IDE Tool and Select your Board & PORT

(g) On IDE software open new Sketch

(h) Copy Code given here & paste on new Sketch

(i) Verify the Sketch & load the Sketch on new Microcontroller that is ATmega328P with boot loader

(j) Run VB6 on your Pc & Copy Vb6 Program given here & paste on the new project & correct the form Design Make EXE File then Run the progrme step by step .

Microsoft visual Basic 6 is old but very strong & easy programming language in respect to other Programming software therefore I am using here this for our user graphic interface (UGI) development. The program is in two parts. Part One - Arduino UNO Code Programming and Part two - VB6 Programming For Creating UGI as explained below. The project code is as follows:-

Part One Arduino UNO Code Programming
****
// This programme developed by Mr. Adeeb Raza
// This programme is controling Eight Relays With VB6

char incomingOption;

```
void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600);
  pinMode(5, OUTPUT);  // Relay1
  pinMode(6, OUTPUT);  // Relay2
  pinMode(7, OUTPUT);  // Relay3
  pinMode(8, OUTPUT);  // Relay4
  pinMode(9, OUTPUT);  // Relay5
  pinMode(10, OUTPUT);  // Relay6
  pinMode(11, OUTPUT);  // Relay7
  pinMode(12, OUTPUT);  // Relay8
//****************************
  pinMode(13, OUTPUT);  // LED
//****************************
  digitalWrite(5,LOW);
  digitalWrite(6,LOW);
  digitalWrite(7,LOW);
  digitalWrite(8,LOW);
  digitalWrite(9,LOW);
  digitalWrite(10,LOW);
  digitalWrite(11,LOW);
  digitalWrite(12,LOW);
```

```arduino
  //*************************
}
void loop() {
 // put your main code here, to run repeatedly:
 incomingOption =Serial.read();

//*********RELAY NUMBER-1*****
{
  if (incomingOption =='0') // VB Output Receive By Arduino ON
   digitalWrite(5, LOW);
{
  if (incomingOption =='1') // VB Output Receive By Arduino OFF
   digitalWrite(5, HIGH);
}
//*********RELAY NUMBER-2*****
}
  if (incomingOption =='2')
  digitalWrite(6, LOW);
{
  if (incomingOption =='3')
  digitalWrite(6, HIGH);
}
//*********RELAY NUMBER-3*****
{
   if (incomingOption =='4')
   digitalWrite(7, LOW);
{
   if (incomingOption =='5')
   digitalWrite(7, HIGH);
}
//*********RELAY NUMBER-4*****
}
if (incomingOption =='6')
  digitalWrite(8, LOW);
{
  if (incomingOption =='7')
  digitalWrite(8, HIGH);
{
//*********RELAY NUMBER-5*****
}
   if (incomingOption =='8')
   digitalWrite(9, LOW);
{
   if (incomingOption =='9')
   digitalWrite(9, HIGH);
}
//*********RELAY NUMBER-6*****
}
   if (incomingOption =='A')
   digitalWrite(10, LOW);
{
```

```
    if (incomingOption =='B')
    digitalWrite(10, HIGH);
}
//*********RELAY NUMBER-7*****
{
    if (incomingOption =='C')
    digitalWrite(11, LOW);
{
    if (incomingOption =='D')
    digitalWrite(11, HIGH);
}
//*********RELAY NUMBER-8*****
{
    if (incomingOption =='E')
     digitalWrite(12, LOW);
}
    if (incomingOption =='F')
    digitalWrite(12, HIGH);
}
//*********RELAY NUMBER-9 *****
{
if (incomingOption == 'a')
  digitalWrite(13,HIGH);
}
 if (incomingOption =='b')
  digitalWrite(13,LOW);
 }

//************ The End ************
```

The file is also attached here with

Part two VB6 Programming For Creating UGI

```
'//****************************************************
'// Eight Numbers Relay Controlling through USB Port
'// Microsoft Visual Basic Ver.6 with Windows as OS
'// Project for Indicating & Controlling 8 Relays with
'// Atmel328P Interfacing circuit through PC's USB Port
'// Project By Mr Adeeb Raza
'// Allahabad (U.P) INDIA
'// Dated 11 th Aug 2024
'// Email: adeebraza@hotmail.com
'//****************************************************

Dim n
Option Explicit
Private Declare Sub Sleep Lib "kernel32" (ByVal dwMilliseconds As Long)
```

```vb
Private Sub Form_Load()
Text1.Text = ""
Label10.Caption = "DEVICE IS CONNECTED ON PORT NO. :"
n = Val(InputBox("Check Device Manager Then Type Com Port No. here"))
Text1.Text = n
MSComm1.RThreshold = 3
MSComm1.Settings = "9600,n,8,1"
MSComm1.CommPort = n
MSComm1.PortOpen = True
MSComm1.DTREnable = False
Label10.Caption = "DEVICE IS CONNECTED ON PORT NO. :"
End Sub

'//'****Arduino Pin No.5--Relay No.1 ON & OFF *******************

Private Sub Command1_Click()
Label2.Caption = "ON"
MSComm1.Output = "1"
End Sub

Private Sub Command2_Click()
Label2.Caption = "OFF"
MSComm1.Output = "0"
End Sub

'//'****Arduino Pin No.6--Relay No.2 ON & OFF ******************
Private Sub Command3_Click()
Label3.Caption = "ON"
MSComm1.Output = "3"
End Sub

Private Sub Command4_Click()
Label3.Caption = "OFF"
MSComm1.Output = "2"
End Sub
'//'****Arduino Pin No.7--Relay No.3 ON & OFF  *******************
Private Sub Command5_Click()
Label4.Caption = "ON"
MSComm1.Output = "5"
End Sub

Private Sub Command6_Click()
Label4.Caption = "OFF"
MSComm1.Output = "4"
End Sub
'//'****Arduino Pin No.8--Relay No.4 ON & OFF *******************
```

```vb
Private Sub Command7_Click()
Label5.Caption = "ON"
MSComm1.Output = "7"
End Sub

Private Sub Command8_Click()
Label5.Caption = "OFF"
MSComm1.Output = "6"
End Sub
'//'****Arduino Pin No.9--Relay No.5 ON & OFF *****************
Private Sub Command9_Click()
Label6.Caption = "ON"
MSComm1.Output = "9"
End Sub

Private Sub Command10_Click()
Label6.Caption = "OFF"
MSComm1.Output = "8"
End Sub
'//'****Arduino Pin No.10--Relay No.6 ON & OFF ******************
Private Sub Command11_Click()
Label7.Caption = "ON"
MSComm1.Output = "B"
End Sub

Private Sub Command12_Click()
Label7.Caption = "OFF"
MSComm1.Output = "A"
End Sub
'//'****Arduino Pin No.11--Relay No.7 ON & OFF
Private Sub Command13_Click()
Label8.Caption = "ON"
MSComm1.Output = "D"
End Sub

Private Sub Command14_Click()
Label8.Caption = "OFF"
MSComm1.Output = "C "
End Sub

'//'****Arduino Pin No.12--Relay No.8 ON & OFF  *******************
Private Sub Command15_Click()
Label9.Caption = "ON"
MSComm1.Output = "F"
End Sub

Private Sub Command16_Click()
Label9.Caption = "OFF"
```

```
MSComm1.Output = "E"
End Sub
'//'*********** ALL Relay ON *******************
Private Sub Command17_Click()
Call Command2_Click
Call Command4_Click
Call Command6_Click
Call Command8_Click
Call Command10_Click
Call Command12_Click
Call Command14_Click
Call Command16_Click
End Sub
'//'*********** ALL Relay OFF ******************
Private Sub Command18_Click()
Call Command1_Click
Call Command3_Click
Call Command5_Click
Call Command7_Click
Call Command9_Click
Call Command11_Click
Call Command13_Click
Call Command15_Click
End Sub
'//'****** ALL Relay ON & OFF ONE BY ONE ********
Private Sub Command19_Click()
Call Command1_Click
Sleep 1000
Call Command2_Click
Sleep 1000
Call Command3_Click
Sleep 1000
Call Command4_Click
Sleep 1000
Call Command5_Click
Sleep 1000
Call Command6_Click
Sleep 1000
Call Command7_Click
Sleep 1000
Call Command8_Click
Sleep 1000
Call Command9_Click
Sleep 1000
Call Command10_Click
Sleep 1000
Call Command11_Click
Sleep 1000
```
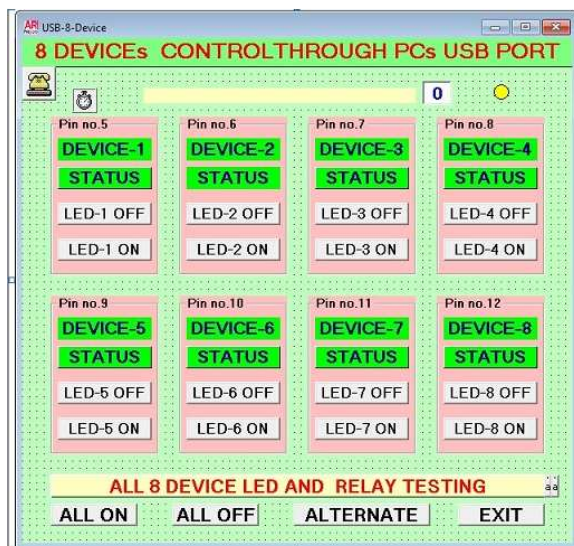
```
Call Command12_Click
Sleep 1000
Call Command13_Click
Sleep 1000
Call Command14_Click
Sleep 1000
Call Command15_Click
Sleep 1000
Call Command16_Click
Sleep 1000
End Sub
Private Sub Command21_Click()
MSComm1.Output = "a"
Shape1.FillColor = vbRed
End Sub
Private Sub Command22_Click()
MSComm1.Output = "b"
Shape1.FillColor = vbRed
End Sub
Private Sub Command20_Click()
End
End Sub
Private Sub Label19_Click()
Load Form2
Form2.Show
End Sub
```
***************** THE END ********************

User graphic interface (UGI)

*********************** The Project END **************************