

# Writing Visual Basic 2008 programs to communicate through USB

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This is a simple tutorial to interface microcontrollers, preferably the Propeller Chip, to a computer by building your own PC apps. I have found many different resources throughout the internet for this, but most of them were for VB 2005, which is a completely different language. When I finally had that “Ah ha!” moment on how to get this working, I thought that others would like it if I put together a simple resource for your own study. This is assuming that you know how to work the VB 2008 editor/IDE, even if you barely or do not know the language.

First things first, lets get a simple “Hello World” program working in VB 2008 and the Propeller. In VB, you will start a new windows application and get the code window up (by double clicking the application form, labeled “form 1”). When in the code window, enter the following:

**Note: The bold “break” flag indicates that the line is continuous and does not end at the end of the page.**

```
Imports System.IO

Public Class frmMain

    Dim WithEvents SerialPort As New IO.Ports.SerialPort

    Dim port as string

    Private Sub Form1_Load(ByVal sender As System.Object, ByVal e As break
System.EventArgs) Handles MyBase.Load

        port = InputBox("Select the COM port you wish to open", "COM break
port", "COM9")

        SerialPort.ReadTimeout = 100

        SerialPort.PortName = port

        SerialPort.BaudRate = "9600"

        SerialPort.Parity = IO.Ports.Parity.None ' no parity

        SerialPort.DataBits = 8 ' 8 bits

        SerialPort.StopBits = IO.Ports.StopBits.One ' one stop bit

        SerialPort.ReadTimeout = 1000

        SerialPort.Open() ' open the port

        SerialPort.DiscardInBuffer() ' clear the input buffer

        SerialPort.Write("Hello World")

        SerialPort.Close()

    End Sub
```

What is this code doing? Well, you start the code off with the “Imports System.IO”. You will not use this much in simple programs, but what it does is Import the “IO” object into the program

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to be used for the USB control. The “Private Class” is a label much like the “PUB” routine in SPIN. The “Dim” commands are not important now, but they are used for declaring variables and strings, which we will be doing later. The “Private Sub Form1\_load...” command lets the commands inside the loop execute when the form loads. After that we have the “port = InputBox(“Select the COM port you wish to open”, “COM port”, “COM9”)”. What is this doing? There is a system command, “InputBox”, which puts up a little popup box with a text entry and an “OK” button. The first string in the command, “Select the COM port you wish to open” is the message displayed above the text box. The second string, “COM port”, is what appears in the windows bar (the thing with the minimize, maximize, close.....), and the third string, “COM9”, is the default text in the text box. What you are doing when the text box comes up is typing in the COM port that the Propeller/microcontroller is going to be communicating on. You could do a dropdown box, but this is just the basics now. How does the computer store the string that is typed in? That is what the “port =” prefix is for. When you put the “port =” before the input box command you are setting that as the variable that the string will be stored in. I have declared the “port” variable at the top with “Dim port as string” which is basically setting the “port” variable as a string. You can also set variables as integers, doubles, Booleans, etc. Go down to the “SerialPort.PortName = port” and you can see that I am pointing this function to the string stored in “port” so that it opens up that COM port. Down below that you have “SerialPort.BaudRate = “9600””. This sets the default baud rate at 9600. If you wanted the user to select this too, you could have an Input box for that as well. Just make the baud variable (Dim baud as string) and make an input box for it. The rest you shouldn’t worry about until the “SerialPort.ReadTimeout = 1000” which you can change the timeout in milliseconds. It is 1 second right now. Note that you could not accept a text string to set this as this is an integer number and not a string. The “SerialPort.Open()” command opens the port and insures that the hardware (the FTDI chip) is found. The input buffer is then discarded, then the valuable “SerialPort.Write()” command is called, the object sends the string “Hello world” to the serial port. The serial port is then closed with the “SerialPort.Close()” method. Show over!

Now what is going to run on the Propeller side to watch this all happen? You will need a connection to the computer, a Propeller, and composite video hardware to do this demo. I would use the Parallax Serial Terminal, except, whoops, THIS is a PC program! Run the following code on your Propeller:

CON

```
_clkmode = xtall + pll16x
_xinfreq = 5_000_000
```

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OBJ

```
ser : "FullDuplexSerial"  
tv  : "TV_Text"
```

PUB Start

```
tv.start(12)  
ser.start(31,30,0,9600)  
tv.str(string("TV Serial terminal v.1.0",13))  
repeat  
    tv.out(ser.rx)
```

This very short and very simple program simply outputs the data coming in from the serial port directly onto the screen. What you do is load this program into RAM (or EEPROM), making sure that you get the COM number during the download. Then double click on your .exe file\*. When the program runs, it will request the COM number. Enter it, being sure to remember the COM prefix with no spaces between it and the COM number. Then click OK and you should see "Hello world" appear on the video screen. If you don't, check your USB connection and video hardware and make sure that they are functioning and that the Propeller can be identified on the COM port. There you are! All done!

\*-The .exe file can be obtained by going to VB 2008 and clicking "debug" when your program is up (it's a little green arrow). It will then show your form as a window. Close it however you can and go to "My Computer" Then find "Documents" then "Visual Studio 2008" (or "Visual Basic 2008") then "Projects" then [project name], then [project name] (the folder), then "obj", then "Debug" and then your application awaits in wonderful Executable form!

Now this is all that I'll go in to on this simple tutorial, but if you are like me, you can see this and take off with it. If you use the online tutorials from Windows and other resources you can get the full perspective and be able to build great programs with VB 2008. I have covered the serial/ USB port here simply because I can never find the resources I want through the internet. I want to spend less time looking and more time programming, so I hope that this helps a lot of people.