

Using the NCPS to Wirelessly Upload Programs to a NewCDBot

By: Abraham Howell

In this article I will explain how to use the NewCDBot Programmer Software (NCPS) to compile and wirelessly upload programs to your NewCDBot robot. We make no guarantees with regards to the content of this article and will not be responsible for any damaged equipment. There are several prerequisites that must be satisfied before attempting this tutorial: (1) you must have an Embeddedblue transceiver properly installed on your NewCDBot, (2) you must have a USB Bluetooth Adapter (preferably an Orange Micro® Blue₂: <http://www.orangemicro.com/btusb.html>) that supports the Bluetooth Serial Port feature, (3) you will also need to remove the old OOPic I chip and install an OOPic II+ chip on your OOPic I board, (4) install latest NCPS version: http://www.abotics.com/NCPS_Installer.zip

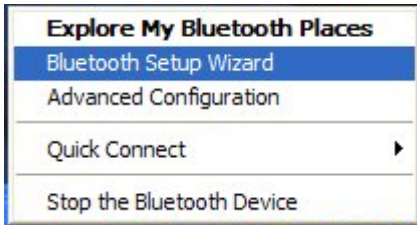
Step1. Install USB Bluetooth Adapter:

Once the above requirements have been satisfied you will be ready to start this tutorial. The first step will be to setup the USB Bluetooth Adapter. Simply follow the supplied instructions and install any necessary drivers and software. We recommend going with the Blue₂ USB Adapter because we have successfully tested this with the Embeddedblue transceiver. You will find a picture of the Blue₂ shown below.



USB Bluetooth Adapter. Blue2 is a Trademark of Orange Micro®.

After you have successfully installed the USB Adapter you must setup a Bluetooth Serial Port, which will connect your computer to the Embeddedblue transceiver. To do this simply right click on the Bluetooth icon in your system tray, then click on Bluetooth Setup Wizard as shown below.



Run Bluetooth Setup Wizard.

Next you will be presented with a form like the one shown below. You will now need to turn on your NewCDbot with the Embeddedblue transceiver, select the second option as shown below and then click the Next button.



Bluetooth Setup Wizard.

The Wizard will then begin searching for local Bluetooth devices and should find your Embeddedblue transceiver. The Embeddedblue transceiver will be listed as eb500 as shown below. Simply select the eb500 device and click the Next button.



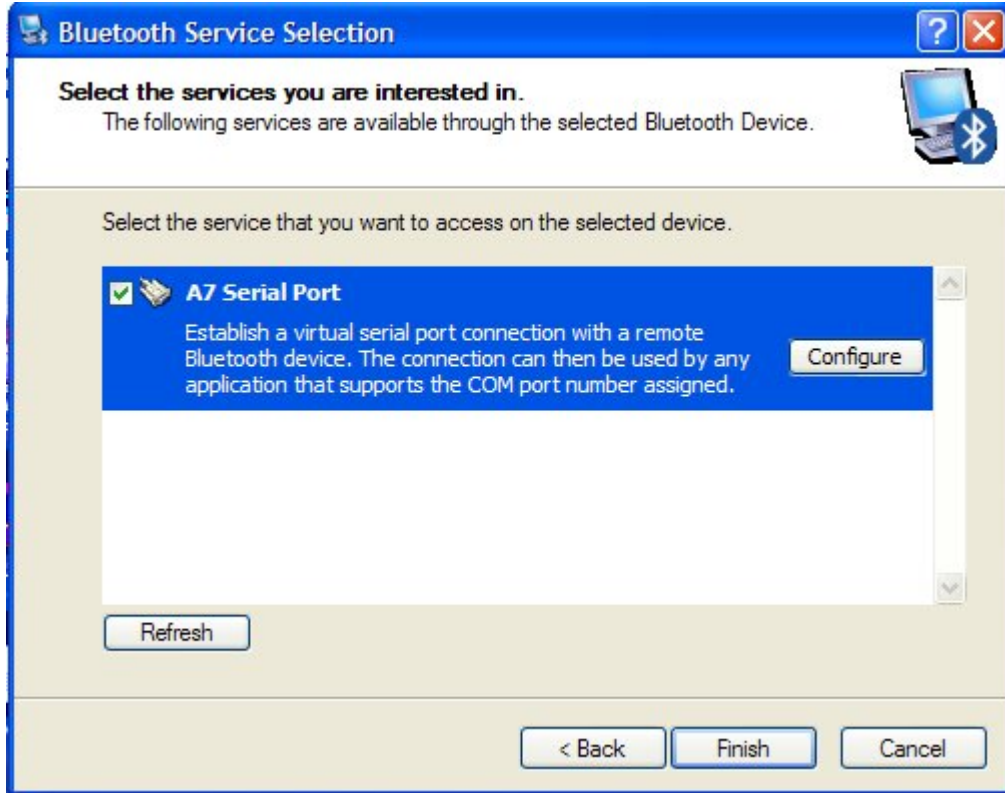
Select eb500 device.

We don't want to setup pairing so simply click the Skip Pairing button.



Skip pairing setup.

Now you will be presented with a list of Bluetooth Services. Select the A7 Serial Port.



Select A7 Serial Port.

Click the Finish button to connect to the Embeddedblue transceiver. After clicking the Finish button you should be presented with a message box, like the one shown below, confirming that the connection was successful. The message box will also list the COM Port used in making the connection. For our example you can see that COM8 was used in making the connection.



Successful connection.

Finally, you can click the OK button to exit the Bluetooth Setup Wizard. You should notice that the LED on the Embeddedblue transceiver is now lit. You can now turn off your NewCDbot.

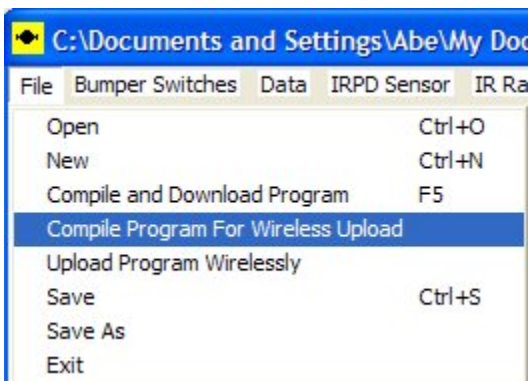
Step2. Run the NCPS:

Open the NCPS and create a new program. For our example we will create a simple program that commands the NewCDbot to remain still until either of its bumper sensors is pressed, at which time the robot will back up for approximately 0.5 seconds. The code has been listed below.

```
Sub RunRobot()  
  speed= 15  
Do  
  STOP  
  If ((LeftSwitch = cvPressed) or (RightSwitch = cvPressed)) Then  
    BACK  
    OOPic.Delay= 50  
  End If  
Loop  
End Sub
```

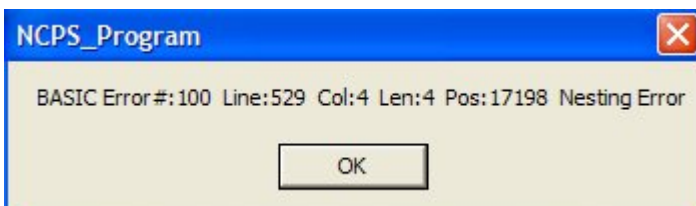
Code listing for simple bumper program.

After creating the program you can save it using Save As and also give it any name you like. Now we are ready to compile the program for wireless upload. To do this we need to click on the File menu and then select Compile Program For Wireless Upload as shown below.

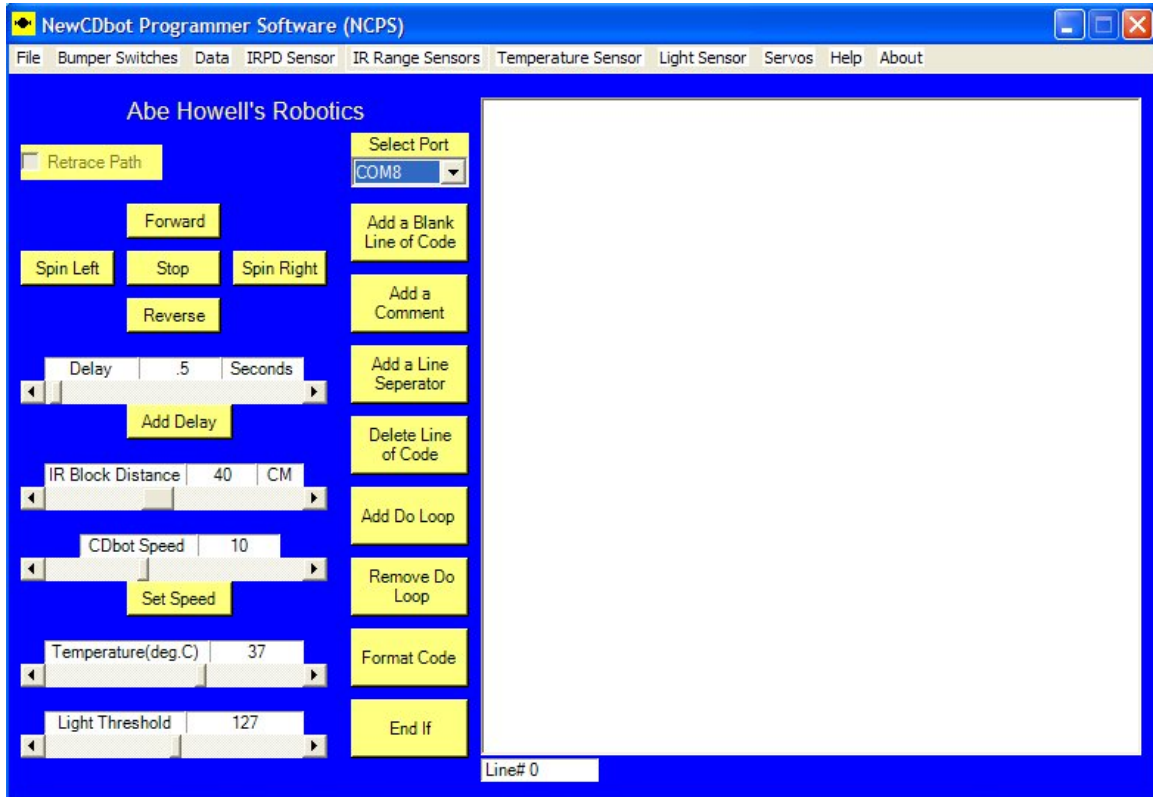


Compile program for wireless upload.

If you used our example program the compilation should be successful. However, if you created a different program or say deleted the End If statement, you may receive a compilation error similar to the one shown below.

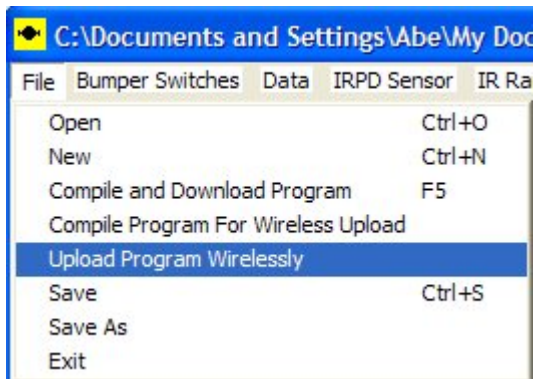


Now that we have a successfully compiled program, we need to open up the appropriate COM Port using the Select Port drop-down menu. This is where you will need to recall which COM Port your Bluetooth Serial Port was configured to use. For our example it is COM8, but maybe different on your computer. You will need to turn on your NewCDBot before selecting the COM Port.



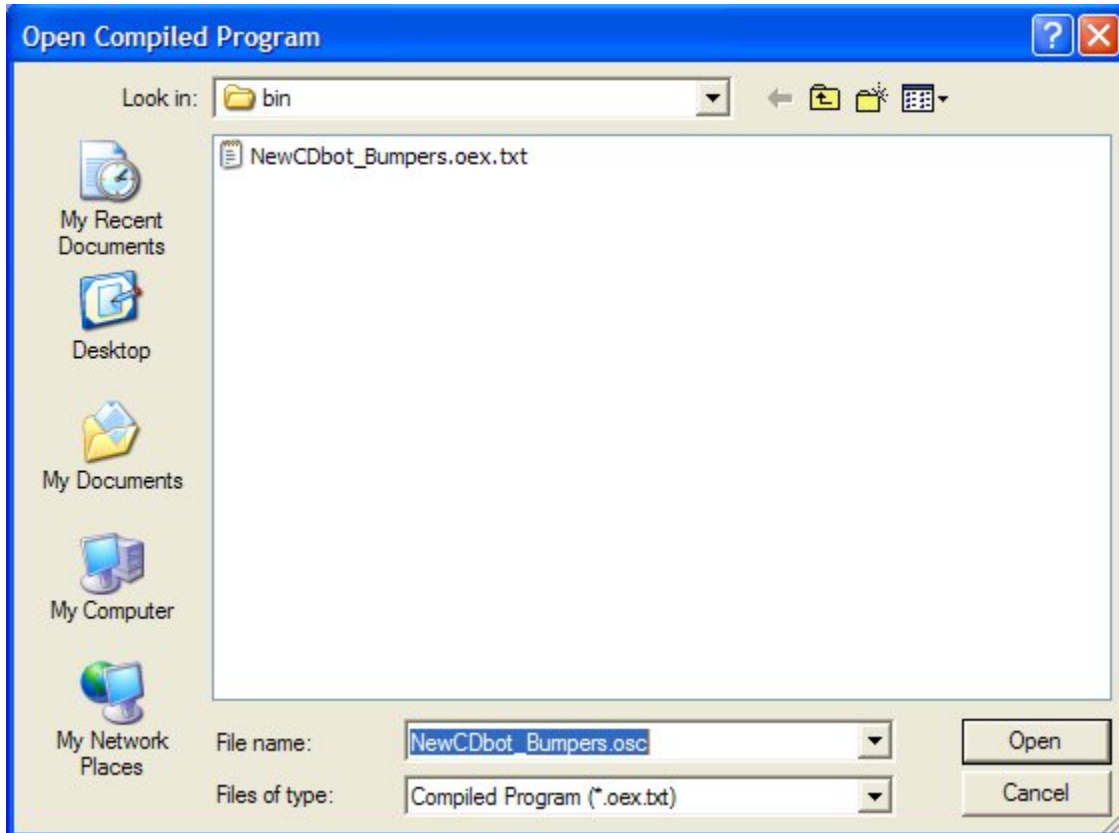
Use Select Port drop-down menu to connect Bluetooth Serial Port to Embeddedblue transceiver.

If the connection was successful the LED on the Embeddedblue transceiver should light up. You are now ready to upload the compiled program. Simply click on the File menu and then select Upload Program Wirelessly as shown below.



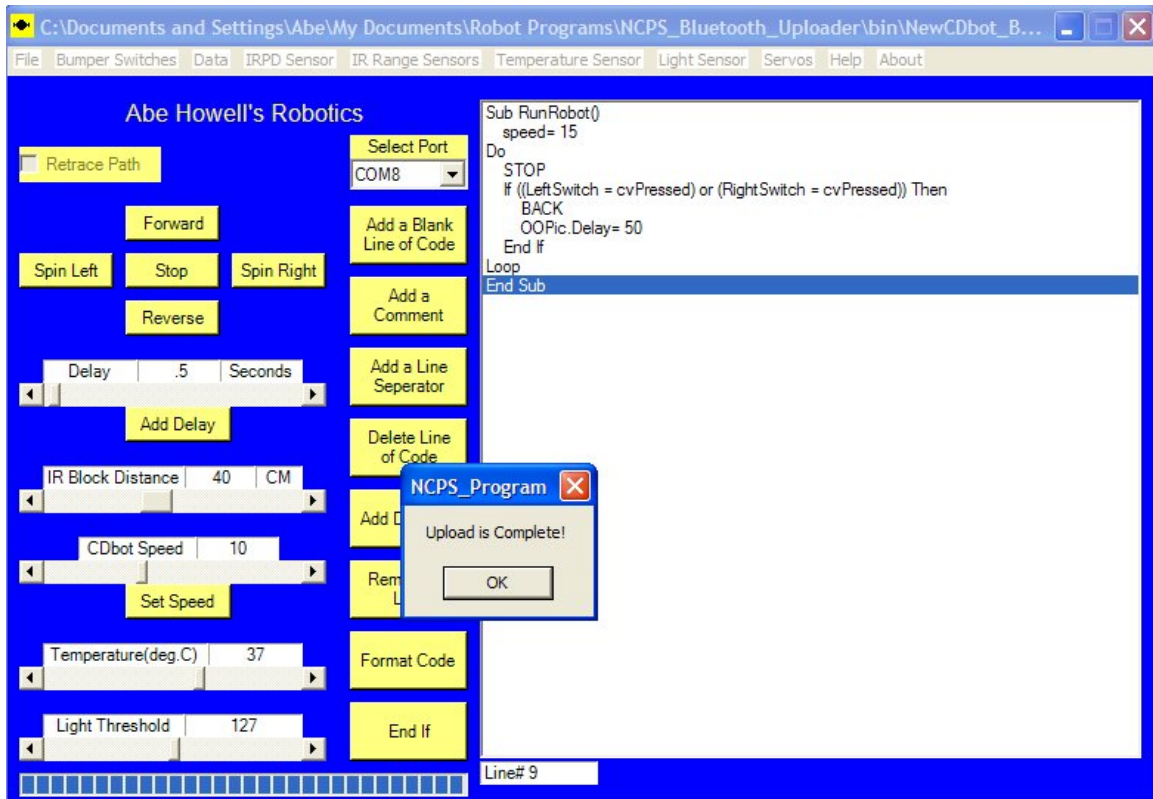
Upload program wirelessly.

Select the name of the file you just created and compiled as shown below. For this example we gave our program the following name: “NewCDBot_Bumpers”. You will notice that the file has two extensions, a .oex and a .txt extension. This file actually contains the compiled program, but it is in terms of what the OOPic firmware understands and can read. The file is also in the correct format, which allows it to be uploaded to the OOPic using the Serial Control Protocol (SCP).



Open previously compiled program.

After selecting the appropriate file click the Open button and the upload will begin. Once the upload is complete you will be presented with a message box notifying you that the upload was indeed a success. You will also notice that a progress bar provides the current status of the upload. The upload should take less than a minute, but this will strongly depend upon the size of your program. If there is an error during the upload process, you will be presented with a small message box explaining the error. The most common error will be a Read Time Out error. This will occur if the Bluetooth Serial Port connection is severed or lost. The Bluetooth Serial Port connection can be severed if the NewCDBot is turned off, out of range of the Bluetooth device, or if you select another port other than the correct one, which in our case was COM8.



Successful upload.

Your robot should now begin executing the just uploaded program. For our example, the robot should remain still until we press one of the bumper sensors.

You can go back and modify your program, but remember to compile it before attempting the wireless upload.

If you have any questions regarding this tutorial please contact Abe at abe@abotics.com