

Setting Up the Lego Mindstorms NXT with Bluetooth Under Mac OS X 10.5 and Windows XP

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Preface

The Lego Mindstorms NXT provides a way to interface with many computer languages over Bluetooth. The NXT in theory should simply connect in Windows and OS X with their native Bluetooth setup wizards. Due to a slew of possible hardware configurations and bad text communication on the NXT it does not work as well as it should. As evidenced by dozens of web posts this problem is a widespread issue without clear indication from Lego of what will work for each personal setup.

Hardware

Lego lists a series of Bluetooth adaptors¹ that work with the NXT. All but one of the tested adaptors is said to work. A much larger set of adaptors can be found online² through various forums and websites. There is a large number of adaptors that don't work so it is useful to research specific parts before buying.

My test system is a Macbook Pro, which is compatible with the NXT. I am doing testing in OS X natively as well as in Windows XP through VMware Fusion v2.0. For users with OS X 10.5 (Leopard) there is an update necessary to upgrade firmware³.

Connecting – OS X

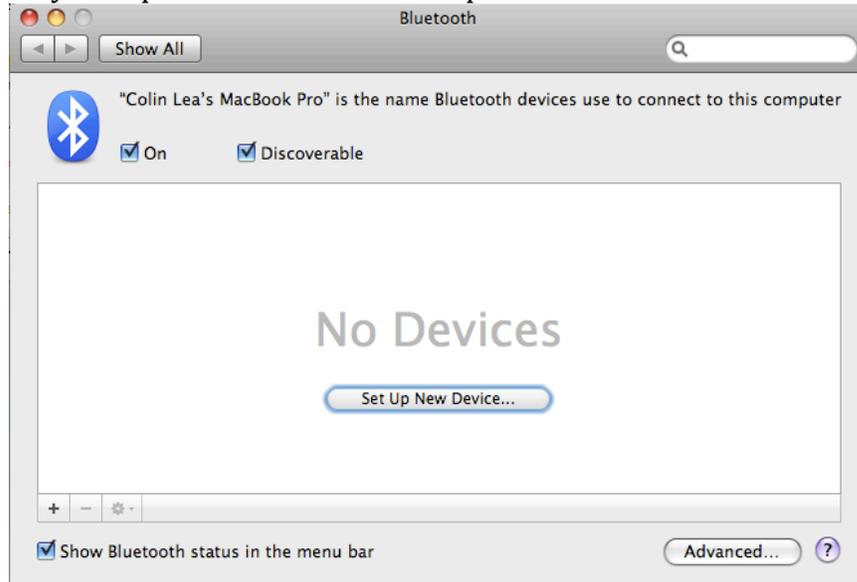
Connecting through OS X is relatively simple compared to Windows. Before trying to connect close any previous connections with the NXT that you might have with that computer. After closing any connections you should reset the NXT before trying to connect again.

¹ Bluetooth adaptors: <http://mindstorms.lego.com/overview/Bluetooth.aspx>

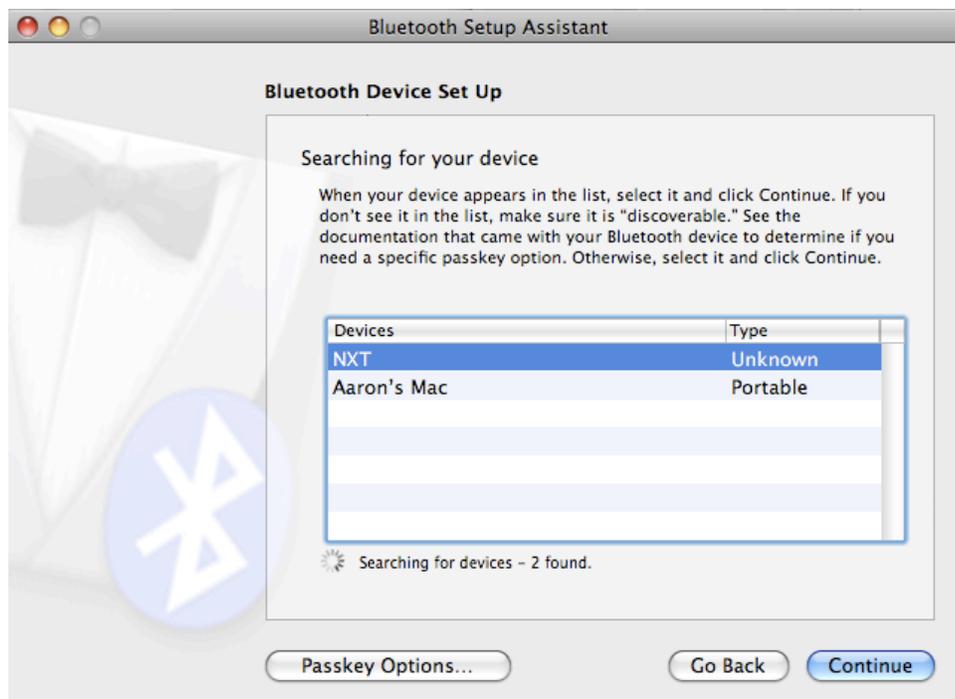
² <http://www.nabble.com/NXT-compatible-bluetooth-adapters-td5161928.html#a5161928>

³ <http://mindstorms.lego.com/support/updates/>

To connect you must first open the Bluetooth devices window, which can be found in system preferences. Click 'Set Up New Device...'



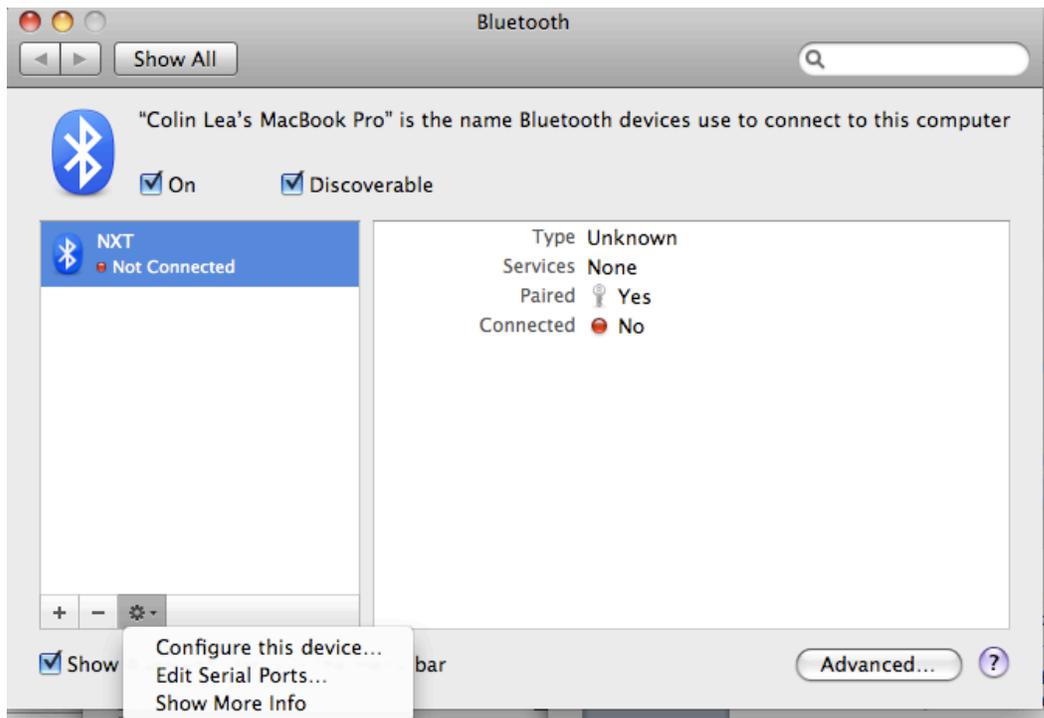
Click 'Continue' and then select 'Any Device' when asked what device type. On the next screen select 'NXT' and click continue.



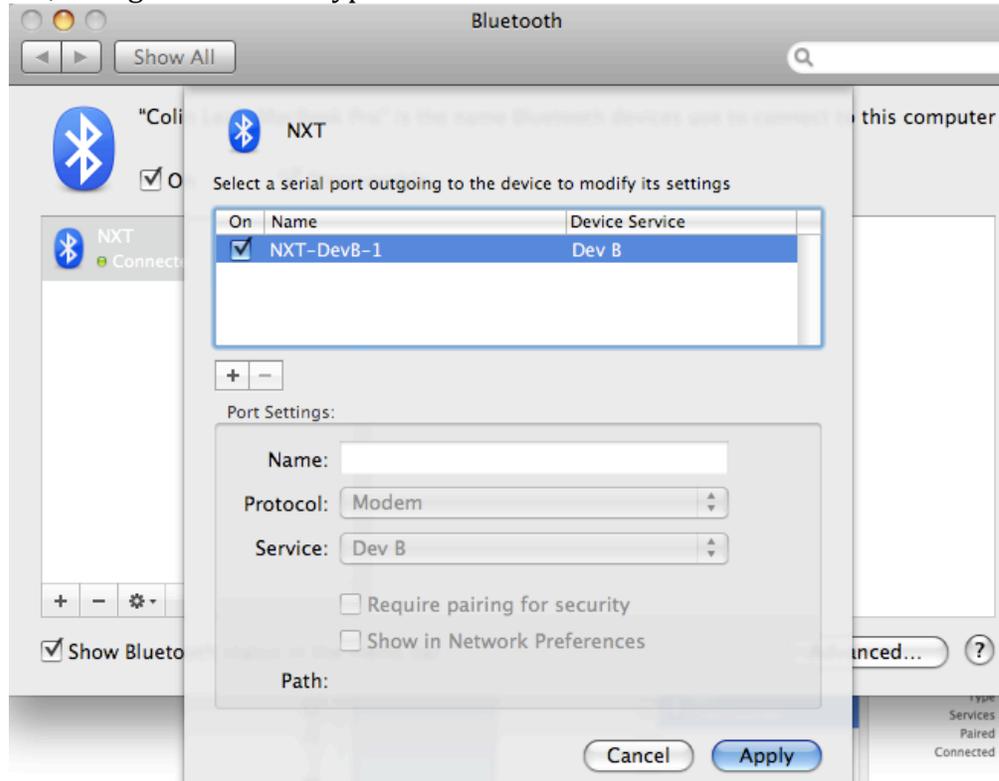
On the NXT it will ask for a passkey. It should default to '1234'. Click the orange button for OK. It will then ask for the passkey on the computer. If you chose anything other than '1234' you will have to repeat the passkey on the NXT.

Click continue on 'Gathering more information'. The next screen will say it cannot find any information about the device. This is correct.

You should now be *paired* with the NXT. This is not the same thing as being connected. At this point you cannot communicate between the platforms. Connecting requires one more step. In the Bluetooth window on your computer go to 'Edit serial ports...'



Click the '+' to add a serial out. By default the device service should be 'DevB'. If it is not, change the service type.



To check information about the NXT there is a program called NXTBrowser⁴. This gives information such as battery life and firmware version as well as it allows you to run built-in commands on the robot.

If you get a 'Line is Busy' error on the robot it means you did not set it up correctly in OS X. It may still work intermittently but it is not fully connected.

Connecting – Windows XP

Connecting through Windows XP gives more problems if you don't do it correctly. While the connection may work temporarily even if you don't do it right, it is more prone to flaking out. To connect you must use either Window's native Bluetooth drivers or drivers from Widcomm/Broadcom.

Under my test setup (running Windows XP through VMware) connecting can be very tricky and inconsistent. I will be installing Windows through Bootcamp and re-testing it in the next couple days. There is little documentation online about using

⁴ <http://web.mac.com/carstenm/Lego/NXT/NXT.html>

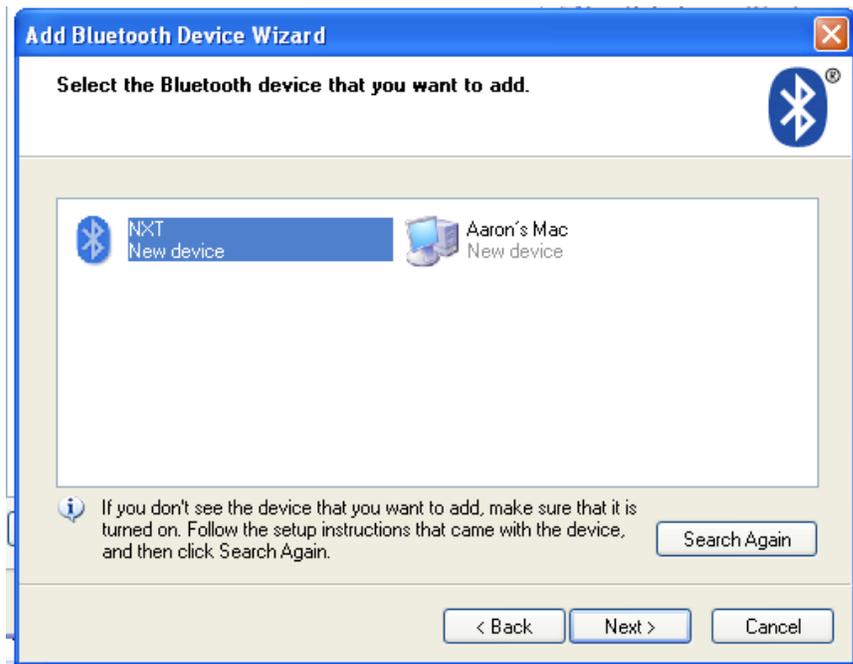
the NXT with VMware and after spending many hours I cannot find a way that always works. There are several different methods that when combined will often, but not always, give results.

Start off by resetting closing any connections and resetting on the NXT and clearing any previous NXT Bluetooth devices from the Bluetooth control panel in Windows (which can be found in the system tray or in the control panel).

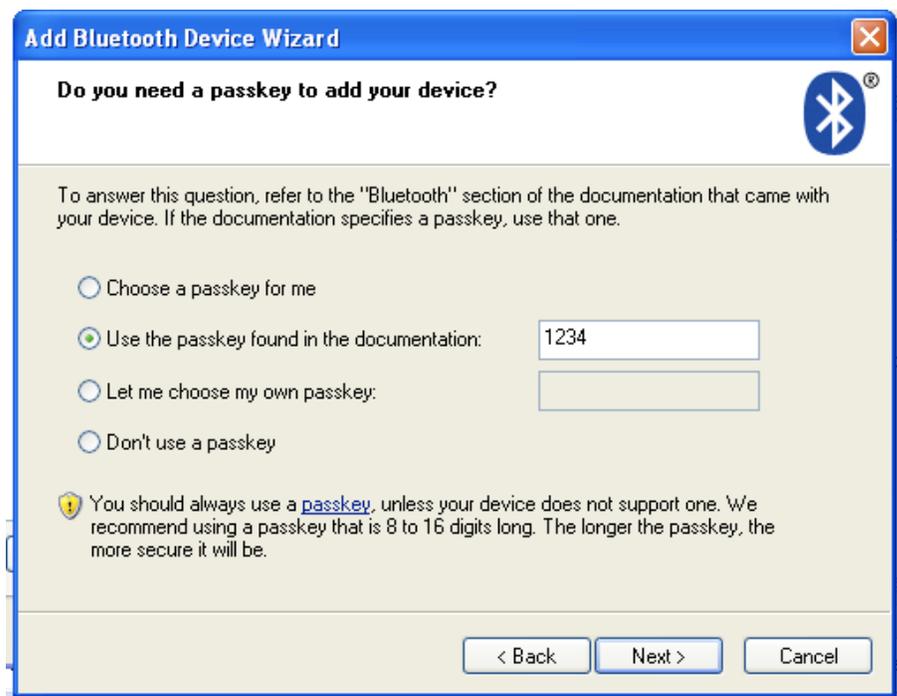
In 'Bluetooth Devices' click 'add' under the 'Devices' panel. Check 'My device is set up and ready to be found' and click 'Next.'



The NXT should show up as a new device. Select it and click 'Next.' If it is not listed make sure the NXT is turned on and click 'search again.'



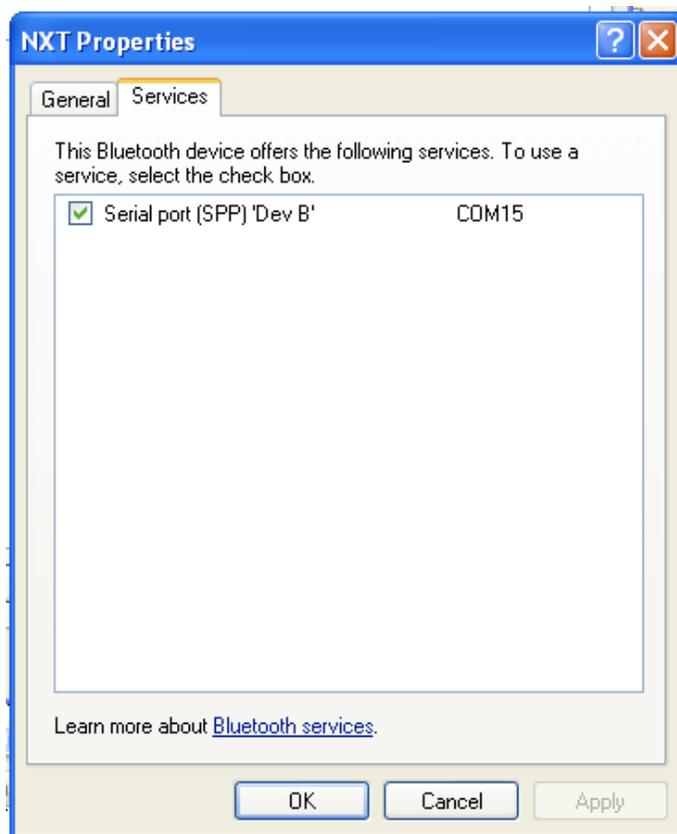
Next select 'Use the passkey found in the documentation' or 'Let me choose my own passkey.' I have had better luck using the latter but either should work. Enter '1234' as the passkey.



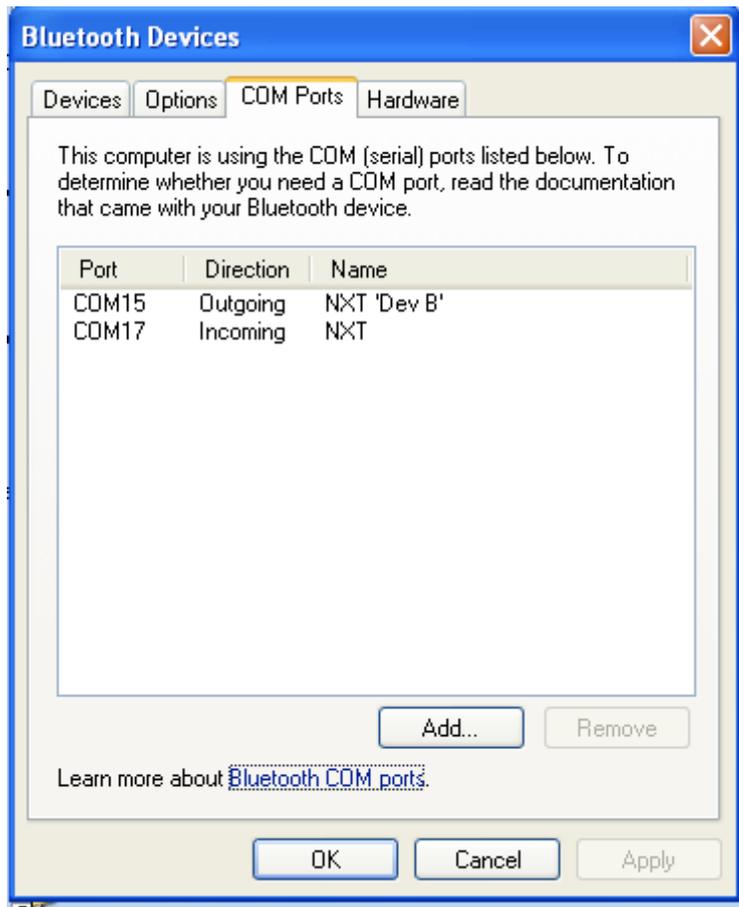
By default the passkey for the NXT is '1234'. Unless you choose a different passkey, click the orange button (enter) on the NXT. Click next on the computer and you should now be paired. This does NOT mean you are connected. Your computer and NXT are now connected but they cannot communicate.

Getting the devices to connect is more complex and can create problems. One or a combination of the following should allow you connect.

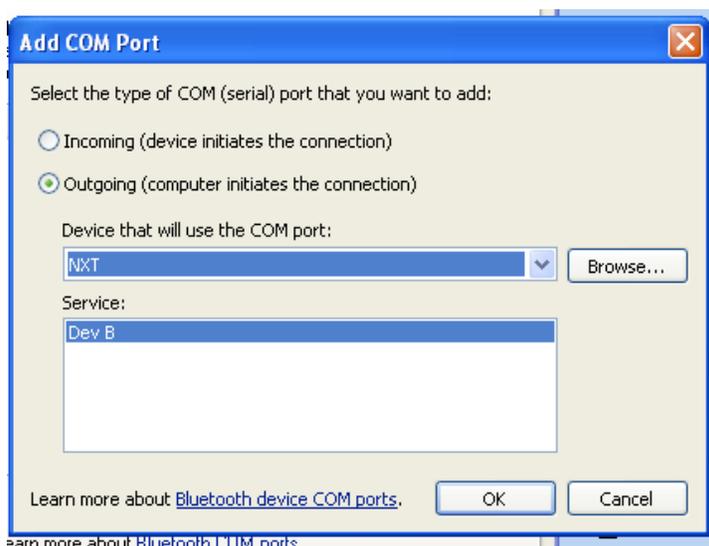
1) In Bluetooth Devices select the NXT and click properties. In the 'Services' panel all of the services should be connected. By default this may have between zero and two options, all of which may be either checked or not. Check all of them if they are not already.



2) In Bluetooth Devices select the 'COM Ports' panel. There should be two connections - One that is outgoing and one that is incoming.



If the outgoing is missing then go to 'Add' at the bottom of the window. Select 'Outgoing' and change the device to 'NXT' in the drop down menu. Choose Dev B and click 'OK'



3) Go to Bluetooth on the NXT and select 'search.' You should see your computer once it's done searching. Select it and choose any of the number 1-3. It should say "Connecting." Once it's done it will either say "Failed," "Line is busy," or it will return to computer selection.

If it returns to the computer selection screen it means that the NXT is connected. You can check the connection by going back to Bluetooth on the NXT and selecting 'Connections.'

If it says "Failed" reset the NXT, delete the connection on the computer, and try again.

If it says "Line is busy" then it can mean a couple of things. It may actually work with the computer as is. If this is the case you're going to have to test it with whatever program you are using to control it. If it doesn't work then you need to try something else. A combination of the other solutions may make it work. In this case it sees the computer but is missing a connection.

To use the connection with other programs go to the COM Ports panel in Bluetooth Devices to check which port is 'outgoing.' This is the port you need to give the NXT commands.

Closing

If you still cannot get the NXT to work, search online. There are dozens of web posts dedicated to the NXT over Bluetooth. Many go unsolved but a lot help in individual cases. Make sure you are using the right drivers and have a compatible device. Sometimes if you try the same method several times it will work. If you have the NXT-G software it is somewhat simpler to set up. However, this software only comes with the consumer NXT set and must be bought separately for the Educational version. Bluetooth on the NXT is far from perfect and aside from using it with Lego's own NXT-G does not have the best support from Lego.