Setting up a Bluetooth Serial Connection

MATLAB communicates with the LEGO Mindstorms NXT through a Bluetooth serial interface. To set up this interface, you need to:

1. Get a Bluetooth USB adapter that is compatible with the Bluetooth on the LEGO NXT.

2. Get a Bluetooth driver (aka. "Bluetooth stack") that implements a "virtual serial port" interface

3. Set up the actual Bluetooth connection between your PC and the LEGO NXT.

If you have questions or comments about the MATLAB Bluetooth interface to the LEGO NXT, please send an email to mindstorms@mathworks.com.

Steps 1 & 2: Getting the Bluetooth USB adapters and drivers

During development of the MATLAB/NXT interface, we were able to successfully use the following configurations (this is with MATLAB ver 7.5, R2007b):

- Abe Bluetooth Adapter Model UB22S,
  using the BlueSoleil stack (www.bluesoleil.com)

- D-Link Bluetooth Adapter DBT-120 (hardware version C1),
  using the Toshiba Bluetooth stack

See the following websites for information about NXT and Bluetooth:
http://mindstorms.lego.com/Overview/Bluetooth.aspx
http://www.lego.com/eng/education/mindstorms/home.asp?pagename=fqnxt

Please note that we cannot provide any assistance with finding or configuring the Bluetooth USB adapter; this is outside the scope of MATLAB and depends on a variety of factors (e.g., the particular USB devices, the driver software, operating system). These questions may be better addressed in a LEGO NXT user forum such as the following:
http://forums.nxtasy.org/
http://news.lugnet.com/robotics/nxt/
http://thenxtstep.com/smf/

Step 3: Setting up the connection

1. Start the LEGO NXT brick by pressing the orange button.

2. On the PC, start the Bluetooth software. This will typically have an option like "Search for Bluetooth Devices" or "New Connection". Select this option. You will see a list of nearby Bluetooth devices; select the device named "NXT".

3. At some point, the LEGO NXT will chirp and display a message:
   ```
   Passkeys:
   1234
   ```
   Make a note of the number (here, 1234) and press the orange button to confirm the passkey.

4. The Bluetooth software on the PC will ask for the Bluetooth passkey or PIN. When prompted for this, enter the number from the above step (e.g., "1234"). This will complete the "pairing" of the LEGO NXT with the PC. You typically need to do this only once.

5. The Bluetooth software will also inform you of the serial port to which the NXT device will be assigned (e.g., "COM6", "COM40"). Make a note of this serial port name.

6. Whenever you want to control to the LEGO NXT from the PC, open the Bluetooth software, choose the "NXT" Bluetooth device and open a connection (typically, right-click and choose "Connect"). Once this is done, you can use the serial port name in MATLAB, e.g.:
   ```
   >> nxtdemo('COM40')
   >> nxt = legoNXT('COM40');
   ```