Robonova Tutorial 2 - Bluetooth introduction

The Bluetooth adapter allows the Robonova to communicate with a host computer wirelessly. It replaces the serial link used in the previous tutorial. To install the Bluetooth adapter, you'll need:

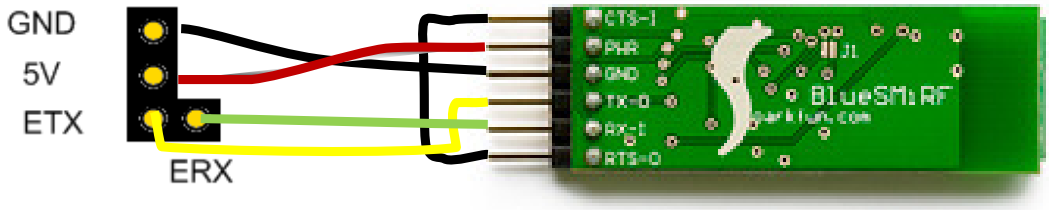
Figure 1 - BlueSmirf 5V TTL serial to Bluetooth adapter

Figure 2 - 6 pin to 4 pin connector cable

Figure 3 - Host-side Bluetooth adapter (or integrated Bluetooth)

Figure 4 - Serial Level shifter

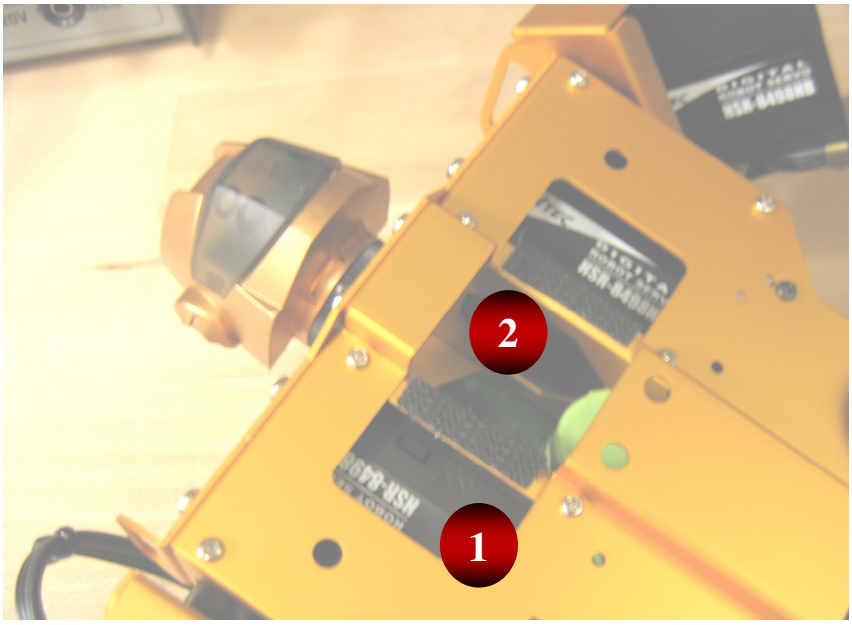
Wiring diagram



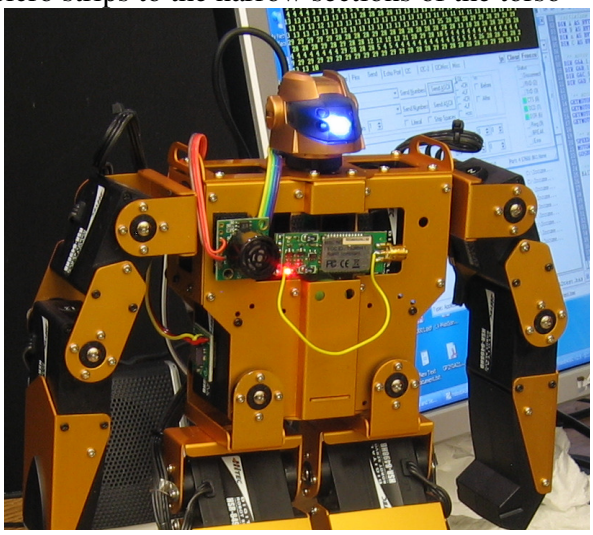
Making the connections to Robonova

The Bluetooth antenna will be concealed inside the chest area to prevent damage.

1. Remove the front and rear covers of the Robonova body to expose the control board and the front of the torso



2. Attach narrow Velcro strips to the narrow sections of the torso



3. Place Bluetooth adapter (with complementary Velcro) firmly in place, and route the wire over the shoulder to the rear.

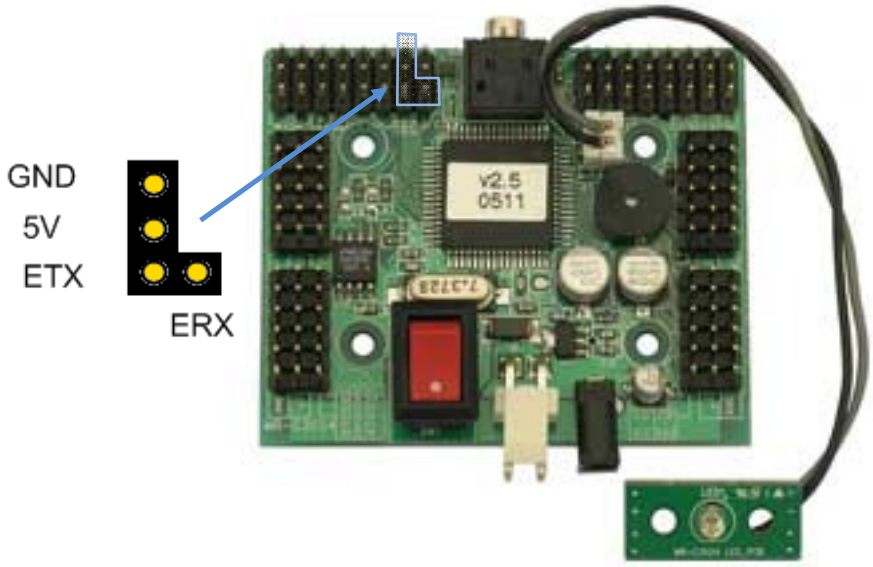


Figure 5 - Controller Bluetooth connection at ETX/ERX pins

4. Connect the cable so that the bottom of the "L" faces inwards. This orientation connects TX & RX (green & yellow) to the ERX & ETX pins on the board
5. Power up the Robonova and verify that the status light blinks green on the BlueSmirf.

Connecting over the Host PC

The Bluetooth connection is made using the SPP protocol, which creates a virtual Com port. Essentially, the Bluetooth connection over SPP acts just like a serial cable. Since your adapter has been configured for 57600 baud communication, you won't have to change any settings on the BlueSmirf itself.

To connect with standard Bluetooth dongle or integrated Bluetooth:

1. Plug in and install drivers for the dongle. For the ASUS dongle, make sure to install the drivers & software found in the tutorial files

2. Power on the Robonova, and search for the BlueSmirf in "My Bluetooth Places". The name of each module is written on the adapter, so be sure to choose the correct one.

3. Right click on the BlueSmirf and select "Connect over SPP" to establish a connection. This will create a virtual com port, usually COM5 or higher. If at any point, the program requests a security code, it is "1234". The BlueSmirf's status light will go solid red if it connects.

4. Go to system properties->device manager, and find the virtual com port in the "ports" branch. Select "properties " and configure it with:

- 57600 baud
- 1 start bit
- 1 stop bit
- No parity
- No flow control

That's it! Repeat the previous tutorial on serial communication to verify that you can send commands and receive data just like the serial cable.

With the FireFly adapter, the COM port is installed when you plug it in. Follow the same steps to set the hardware settings in the device manager. From there, use a terminal program and set it to communicate through this port.

Type "$$$" (without the quotes) to enter command mode. Type "I" and enter to start an inquiry, and it will list back all the Bluetooth devices in range. Note the address of the BlueSmirf, and type C<*address*>, then enter. The firefly will then connect to your BlueSmirf, and you will see the green status light become solid green. You are now ready to complete the serial tutorial and work over Bluetooth.

Troubleshooting tips

- The BlueSmirf does not power up
  - Check that the cable is in the correct orientation
  - Check the battery connection and charge (low battery causes intermittent brownouts of components)
- BlueSmirf does not connect with host adapter
  - Make sure your Bluetooth software knows the BlueSmirf's security code is "1234"
  - The Bluetooth adapter could be accidentally paired with another adapter (very unlikely). Check the RN-41manual for additional information, or contact me for help
- Characters transmit inconsistently or are garbled
  - Make sure that the baud rate for the virtual com port is set to 57600 in both the port hardware properties (device manager) & the terminal software.
  - Make sure to use the correct baud rate in the RoboBasic code
  - Check that the cable is securely connected and free of defects (baud rate is low enough that minor kinks or chips shouldn't make much difference)
- After checking everything, nothing works
  - Try the serial port tutorial to bypass Bluetooth, and troubleshoot from there