

Getting Started with the OPEN-ROBOT

This document will help get you started with your OPEN-ROBOT. You will be introduced to your robot along with the different sensors and where they are located. *This document assumes that you have already assembled your robot.*

Getting to Know OPEN-ROBOT:

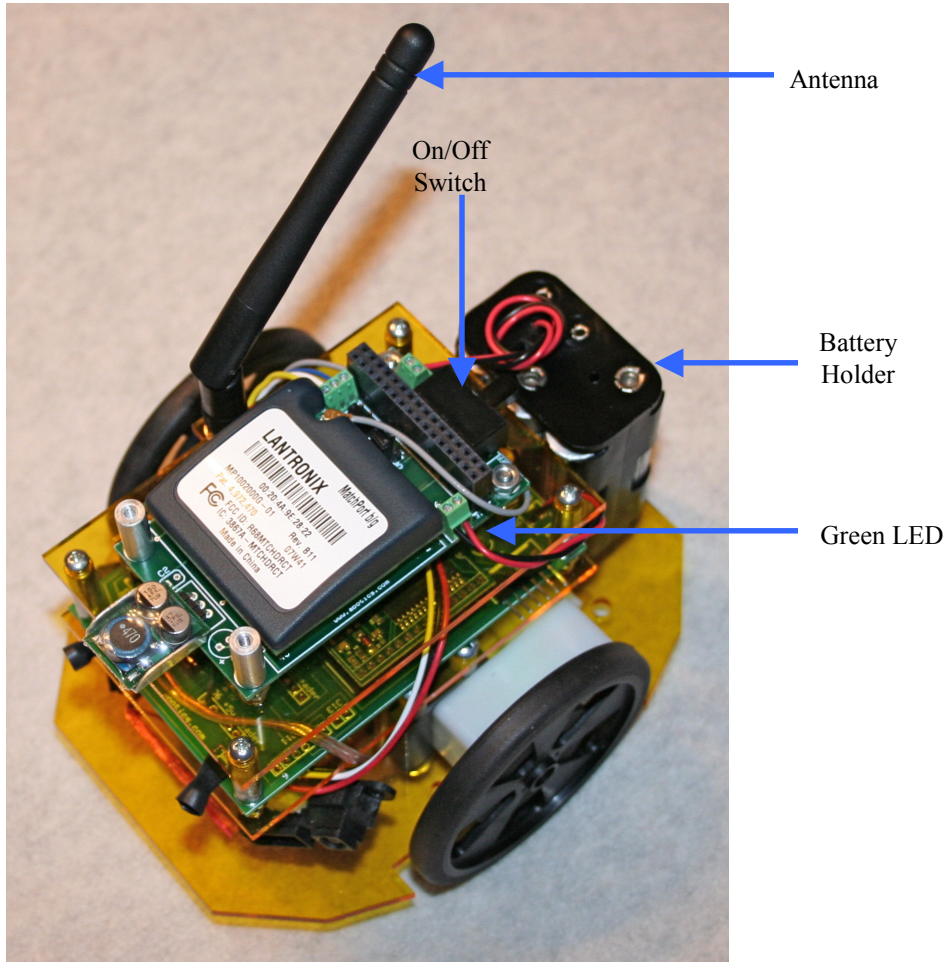


Figure 1. OPEN-ROBOT.

In figure 1 you can see the robot's on/off switch and the (6)-AA battery holder. Before we get started, remove the battery holder by unsnapping it from the robot's base plate. Firmly hold the robot with one hand while pulling the battery holder. Now load (6)-AA batteries into the holder while observing the proper insertion orientation. The negative (-) end of the each battery must be inserted such that it makes contact with the corresponding spring on the holder. ***Failure to do this will damage the robot's controller board.*** We recommend using 15-minute rechargeable AA-batteries, however, you can use regular alkaline batteries. After inserting the batteries snap the battery holder back onto the robot. You will feel the holder lock into place when you press it onto the robot's base plate.

Turn your robot on using the on/off switch. Once on you should observe a green LED on the controller board light up. If not be sure to check the orientation of each of the batteries and also make sure that they are fully charged if using rechargeable batteries.

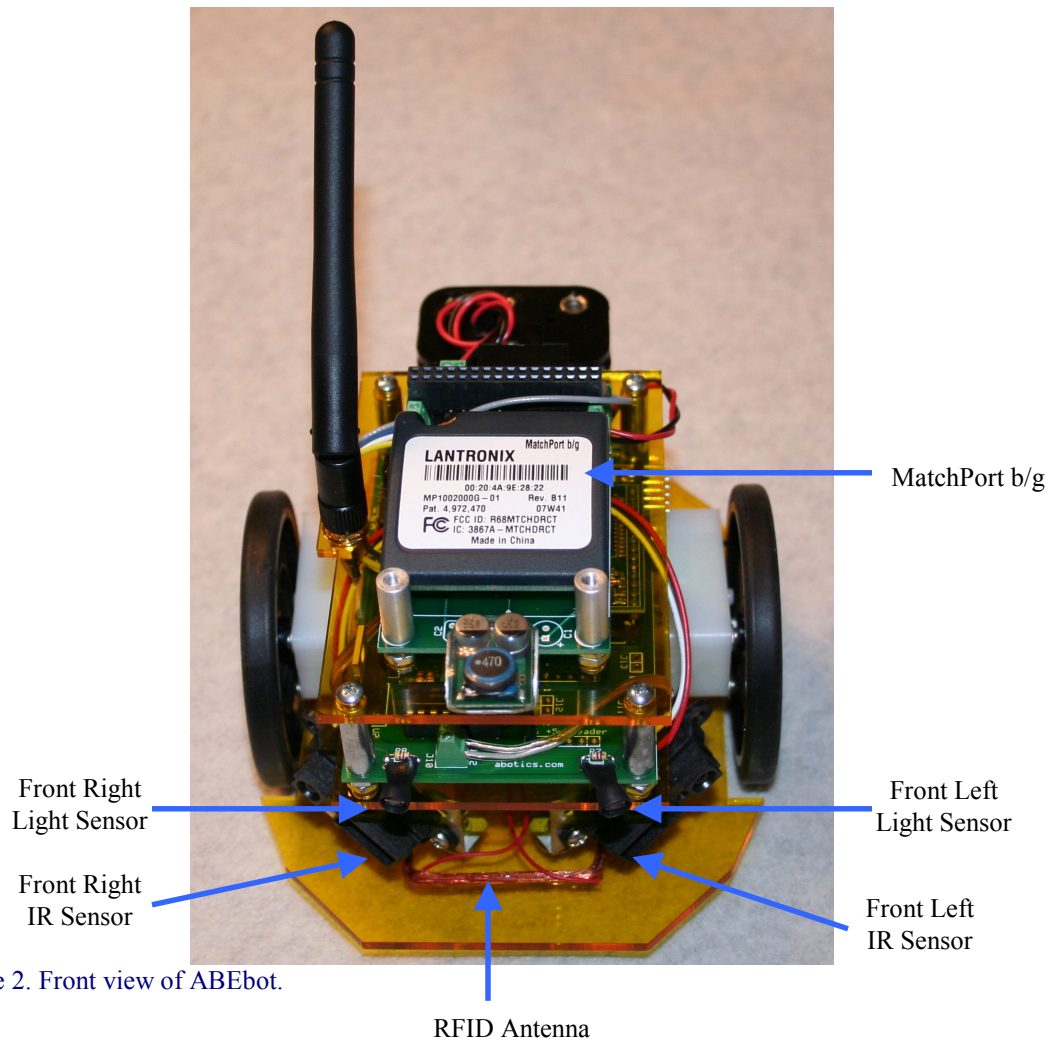


Figure 2. Front view of ABEbot.

In figure 2 the front left infrared (IR,) front left light, front right IR, and front right light sensors can be seen. Additionally the RFID antenna is located on the robot's base plate. The IR sensors help the robot to see obstacles, other robots or even to follow walls. Ambient light levels can be sensed using the light sensors, which means the robot can sense whether it is light or dark in a given environment. Passive RFID tags can be read or written to with the RFID antenna. Tags can be used to store x-y coordinate information so that your robot can find its way in a room or small environment. The tags can also store virtual food so that your robot has to search out tags in a game of survival of the fittest. There are numerous other possible uses for the RFID tags and we have only touched on two. The MatchPort b/g allows you to connect and control your robot using wireless 802.11 b/g, WiFi.

Connecting to OPEN-ROBOT for the First Time:

By default the MatchPort b/g module is configured in Ad Hoc mode. This means that you will need to open your Wireless Network Manager and browse for the LTRX_IBSS Ad Hoc network. Once the LTRX_IBSS Ad Hoc network is visible, simply connect. Be sure to wait for your computer to acquire an IP address before moving on to the next section.

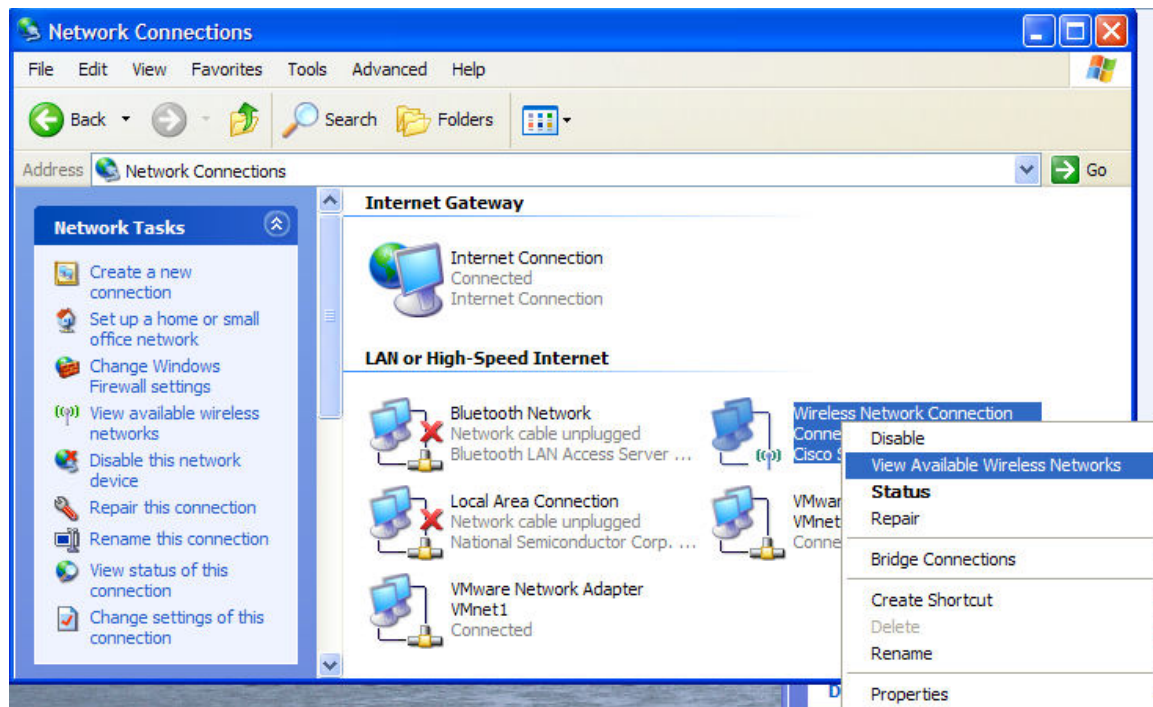


Figure 3. View Available Wireless Networks.

IMPORTANT NOTE - if your host computer is configured to use a static IP address, you need to configure your computer to use DHCP, at least for communication with the Matchport, or you need to assign a static IP address in the 169.254.xxx.xxx subnet. This is because the Matchport acts as a DHCP server for the "LTRX_IBSS" Ad Hoc network, assigning addresses in the 169.254.xxx.xxx subnet, and if your host computer has a static IP address of 192.168.1.27, it will never be able to communicate with 169.254.0.10 because the network driver won't know how to route packets to a different subnet without explicit routing instructions.

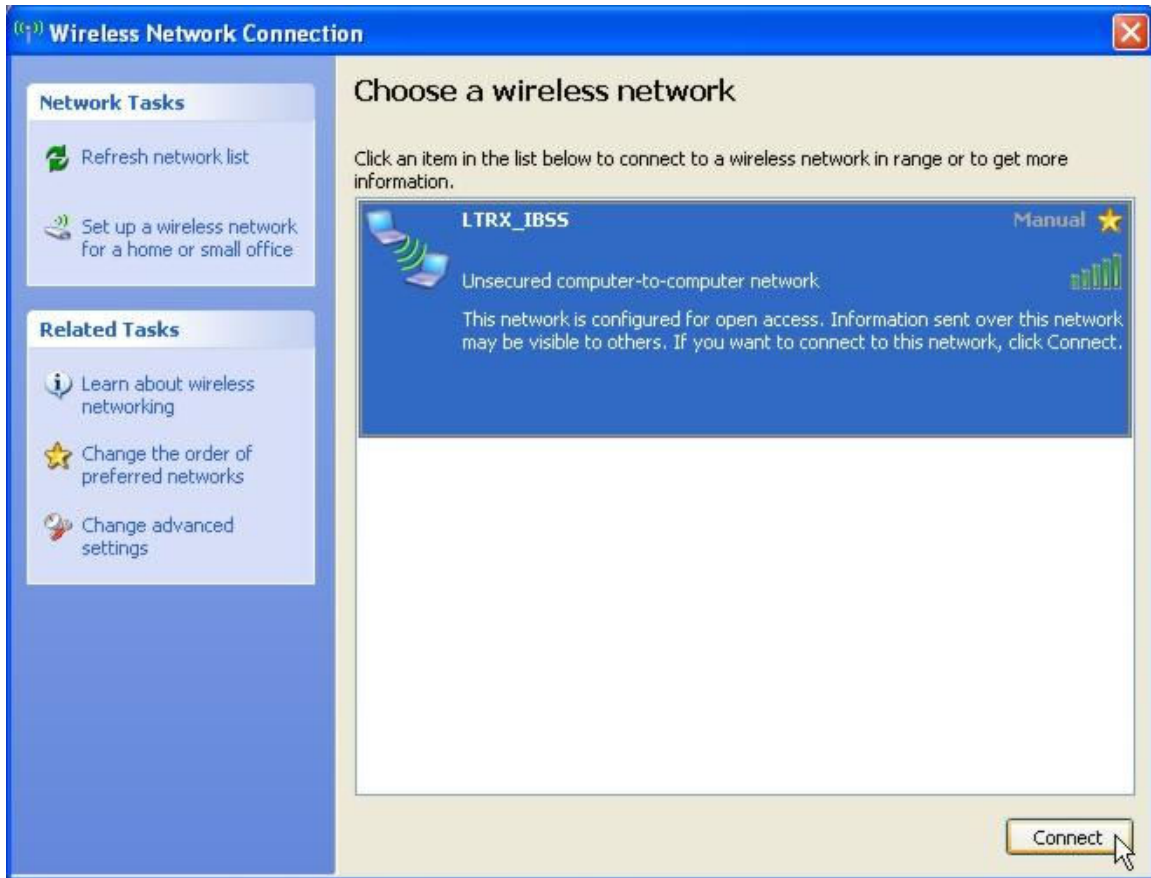


Figure 4. Browse for and connect to LTRX_IBSS Ad Hoc Network.

Click [Refresh network](#) list under Network Tasks. Once the LTRX_IBSS network is available simply click it and then click the [Connect](#) button. It may take a minute or so for your computer to acquire an IP address. Now that we are connected to the LTRX_IBSS network we can connect to the MatchPort b/g and set the baud rate to 115,200BPS to match OPEN-ROBOT's baud rate.

Change MatchPort Network Settings:

By default the MatchPort b/g's ship with a baud rate of 9600BPS, but OPEN-ROBOT's controller is set to 115,200BPS, so this needs to be changed. Additionally, you might not want to always have to connect to OPEN-ROBOT through the Ad Hoc network. You need to download the [Device Installer](#) utility from Lantronix. Go to the Lantronix downloads web page: <http://www.lantronix.com/support/downloads.html> and click on [Device Installer](#) under the [Configuration Utility](#) column. Download and install the Device Installer.

Connect to OPEN-ROBOT using the method described above. Run the Device Installer utility.

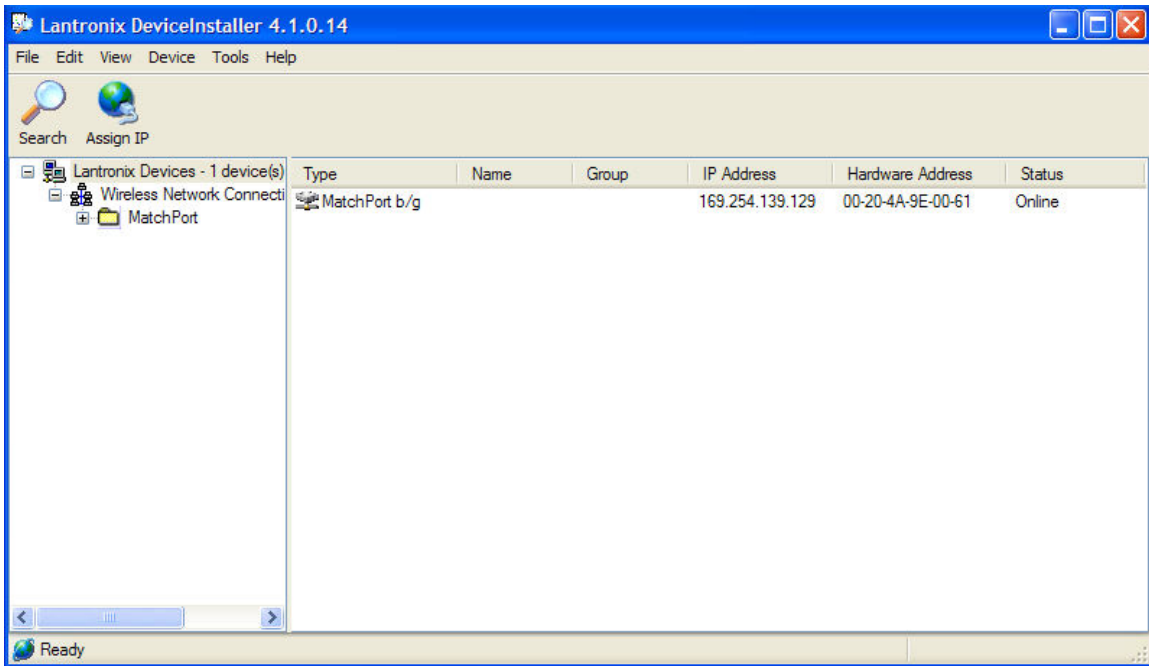


Figure 5. Device Installer Utility.

Device Installer should recognize OPEN-ROBOT's MatchPort module and then populate the list box as shown above in figure#5. Double-click the MatchPort b/g listing in the list box to bring up the device details.

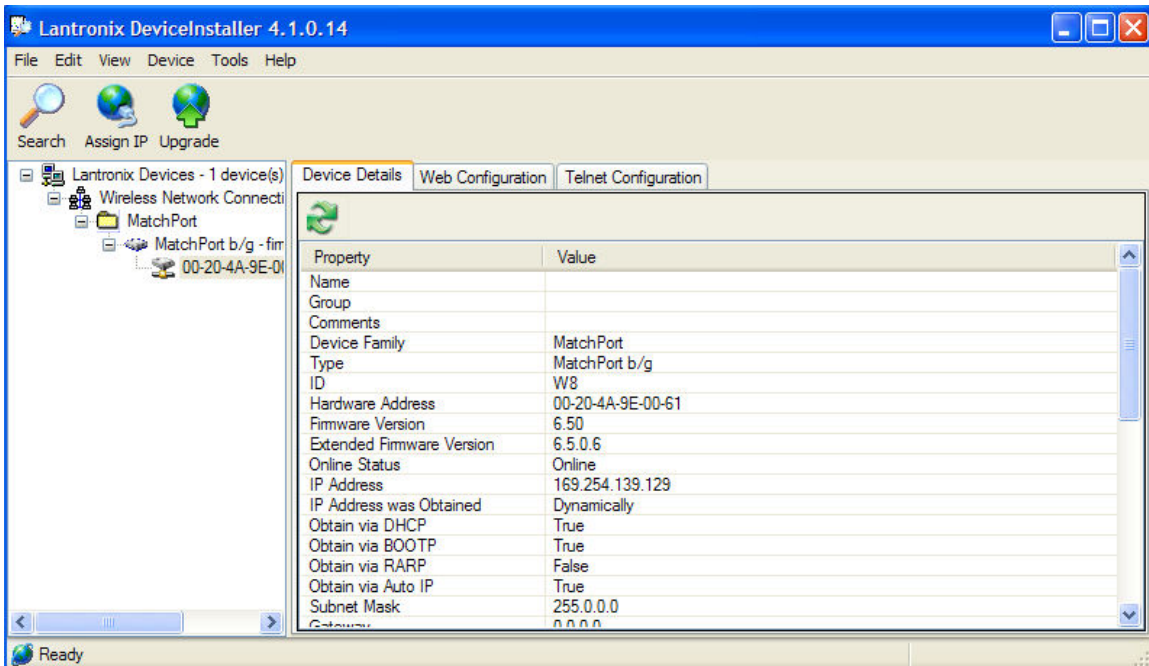


Figure 6. Device Details.

Now click on the Web Configuration tab.

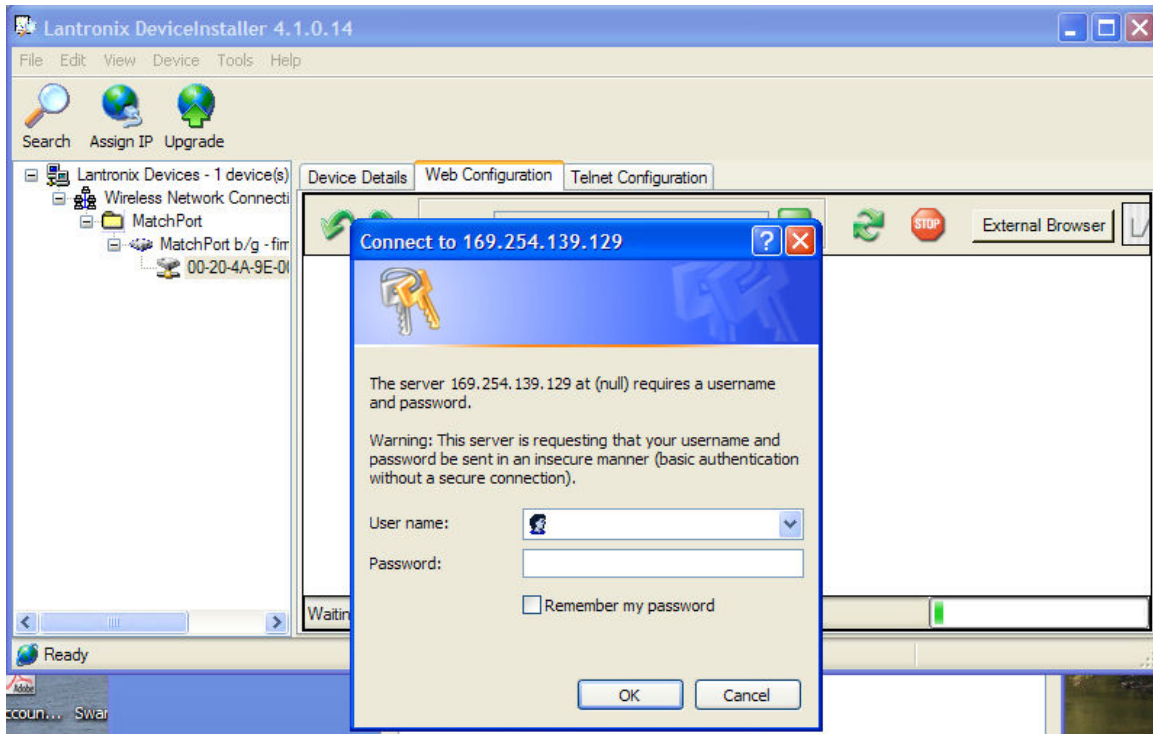


Figure 7. Connect via Web Configuration.

A password message box will appear. Simply click on the **OK** button and don't enter anything in the **User name** and **Password** fields.

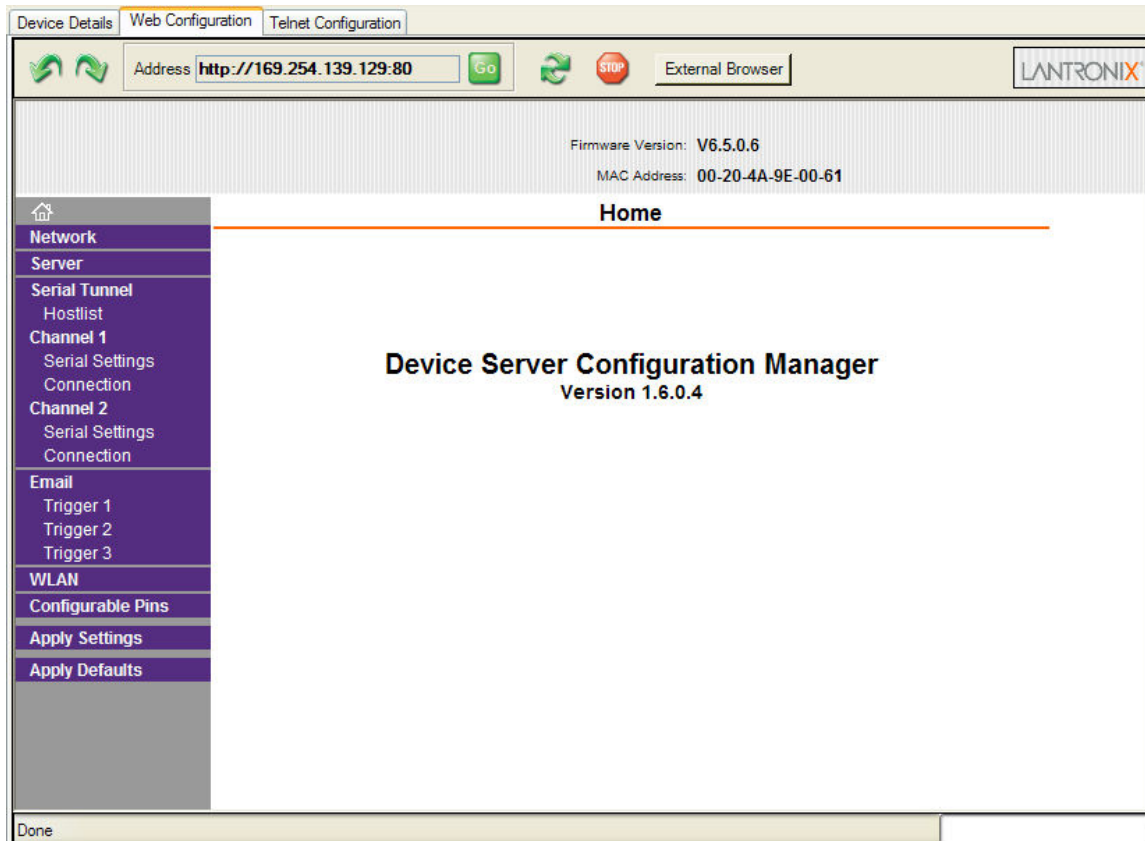


Figure 8. Web Configuration Home.

Click on the [WLAN](#) link so that we can change these settings. By default the MatchPort is configured for Ad Hoc mode and the Network Name (SSID) is set to LTRX_IBSS. We need to change from Ad Hoc to [Infrastructure](#) under Network Type and you also need to change the Network Name (SSID) to match your own wireless network name. For this example I will be using [abes_wireless](#) as shown below in figure#9. Also be sure to [disable Radio Power Management](#) under the Advanced Settings section. Once you have made these changes be sure to click on the [OK](#) button.

Firmware Version: V6.5.0.6
MAC Address: 00-20-4A-9E-28-22

WLAN Settings

- Network
- Server
- Serial Tunnel
- Hostlist
- Channel 1
- Serial Settings
- Connection
- Channel 2
- Serial Settings
- Connection
- Email
- Trigger 1
- Trigger 2
- Trigger 3
- WLAN
- Configurable Pins
- Apply Settings
- Apply Defaults

Wireless Network Configuration

Network Name (SSID):

Network Type: Infrastructure Ad Hoc

Channel: United States

Wireless Network Security

Security:

Authentication:

Encryption:

Key Type: Hex Passphrase

Key:

Retype Key:

Advanced Settings

TX Data rate: Auto fallback

Radio Power Management: Enable Disable

Figure 9. New WLAN Settings.

Now we need to change the Network settings, so click on the [Network](#) link, which is right below the Home icon. Under the IP Configuration we need to select [Use the Following IP Configuration](#) and then enter a suitable IP Address for the MatchPort, a Subnet Mask, and a Default Gateway. The settings shown in figure#10 should work for most wireless setups, but you must be sure to check your own setup and verify that the IP Address you enter is an available address on your network otherwise you will be unable to connect to the MatchPort. The Subnet Mask and Default Gateway must match your network setup as well. Once the new information is entered be sure to click on the [OK](#) button. If you do enter the wrong settings and reset the MatchPort the recovery process is not that simple. Surveyor Corp does have a suitable recovery process:

<http://www.surveyor.com/cgi-bin/yabb2/YaBB.pl?num=1200515001>

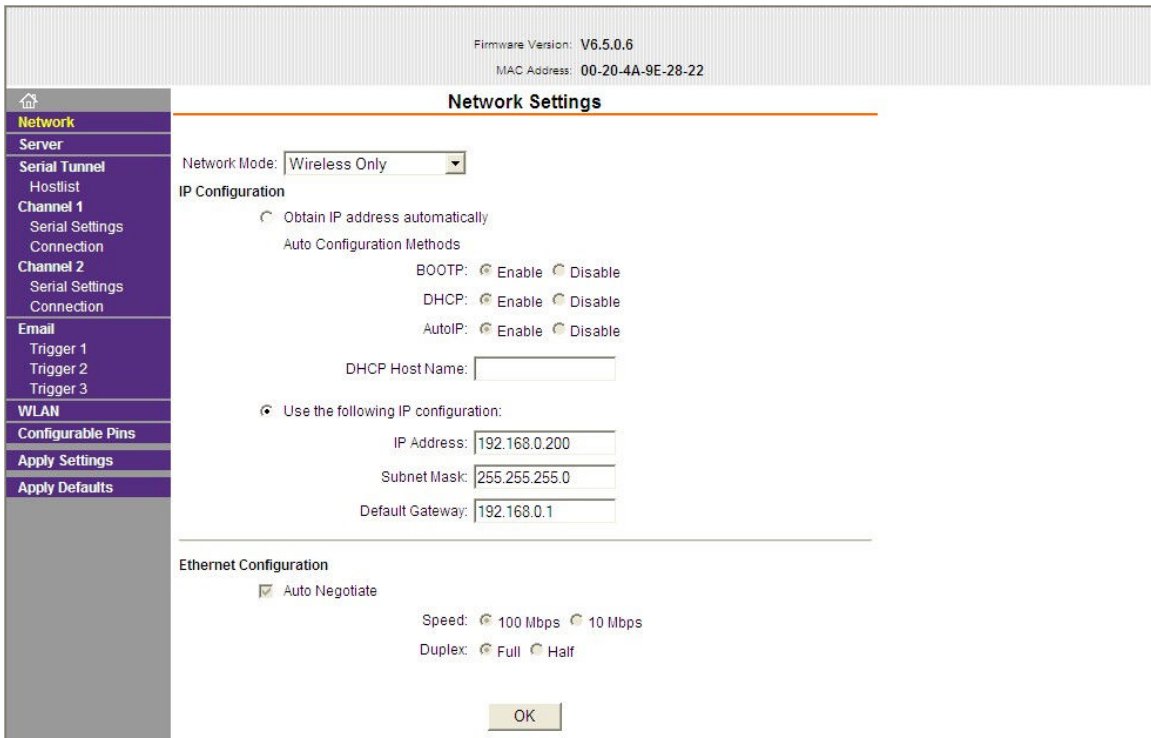


Figure 10. New Network Settings.

You may want to change the CPU performance mode to High. Click **OK** when done.

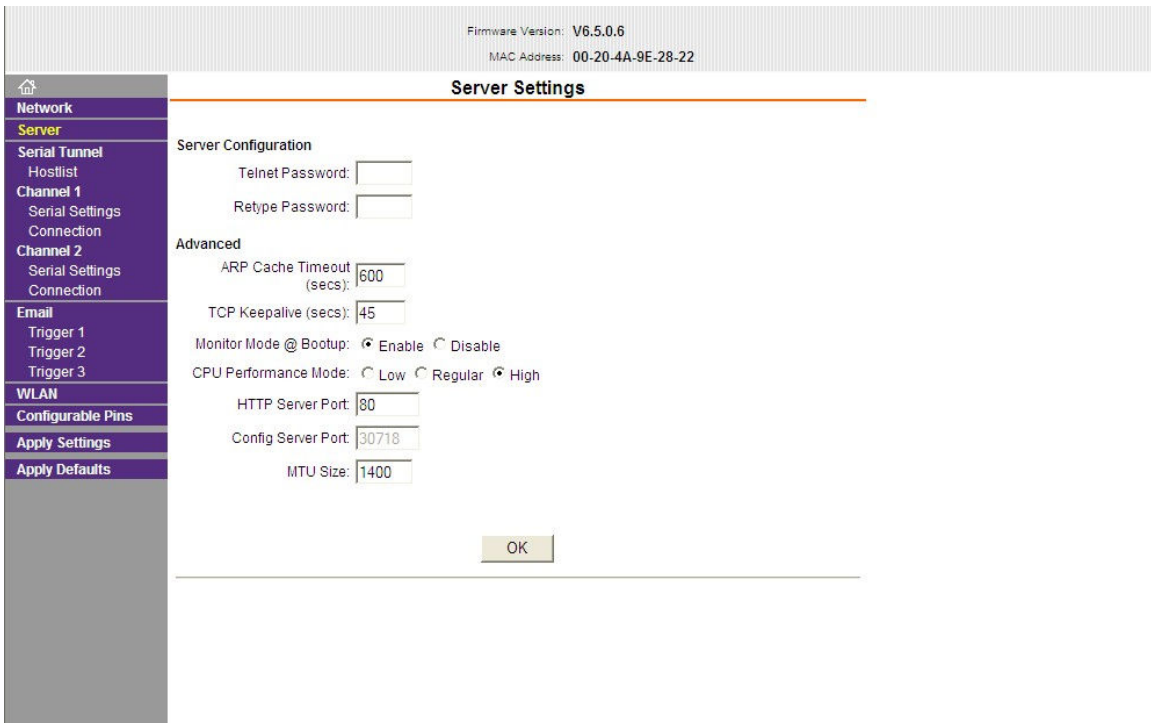


Figure 11. Set CPU Performance Mode to High.

If you purchased your OPEN-ROBOT fully assembled then the serial port settings should already be set. However, if you need to set them please enter as shown in figure#12 below. You should only have to change the Baud Rate to 115200, Flow Control to None, Data bits = 8, Parity = None, and Stop Bits = 1. Click **OK** when done.

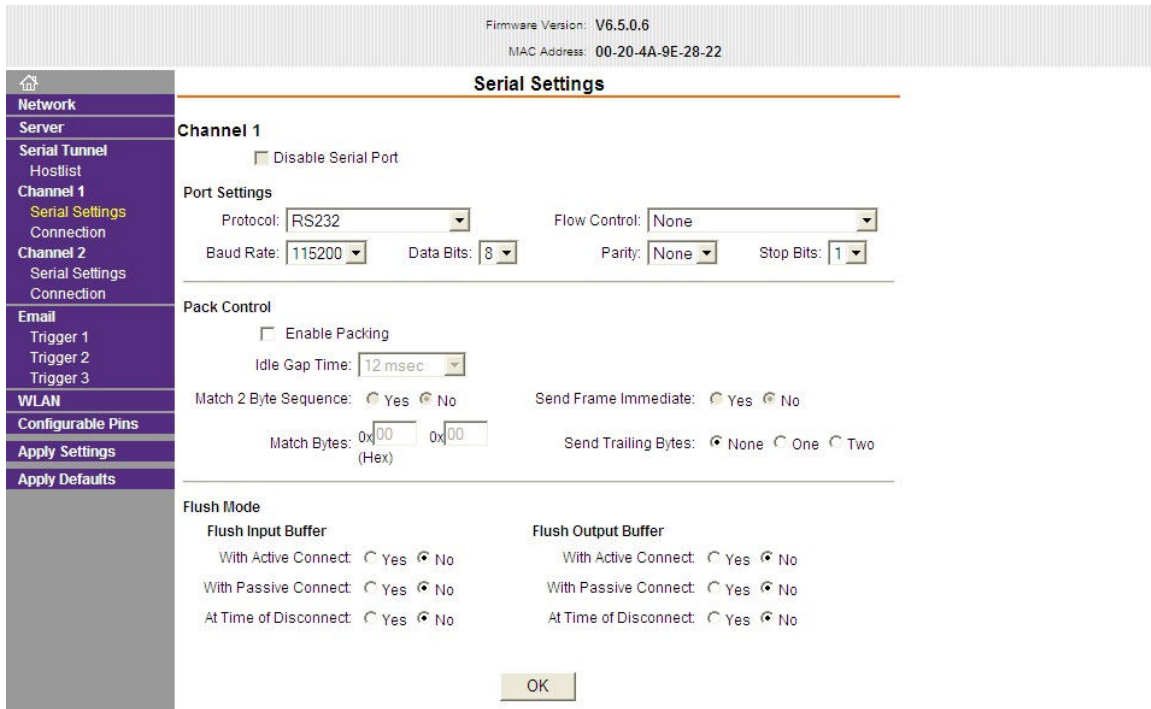


Figure 12. Channel 1 Serial Settings.

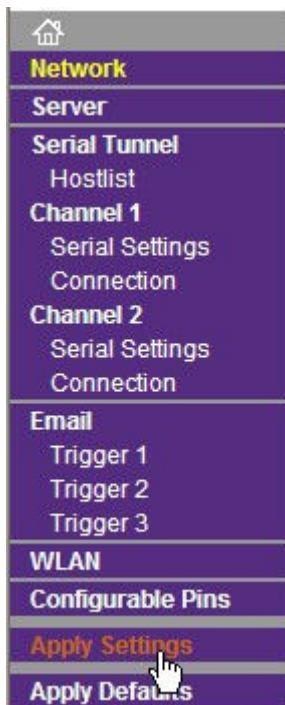


Figure 13. Apply Settings

None of the settings you have changed are permanent until you click on the Apply Settings link as shown above in figure#13. Once you click on Apply Settings, the MatchPort will save the new values and then reboot so that they take effect.

Connect Using the OPEN-ROBOT TCP-Socket Manual Control Program:

Download and install the [OPEN-ROBOT TCP-Socket Manual Control Program](#). Run the program and enter the [169.254.0.10](#) IP address and select **Open** from the **Socket** menu. The program will now attempt to create and open a TCP-Socket connection with the MatchPort, so be sure that the robot is powered up. If you purchased your OPEN-ROBOT unassembled then you will need to proceed to the Change MatchPort Settings section first so that you can setup the MatchPort's Serial Port.

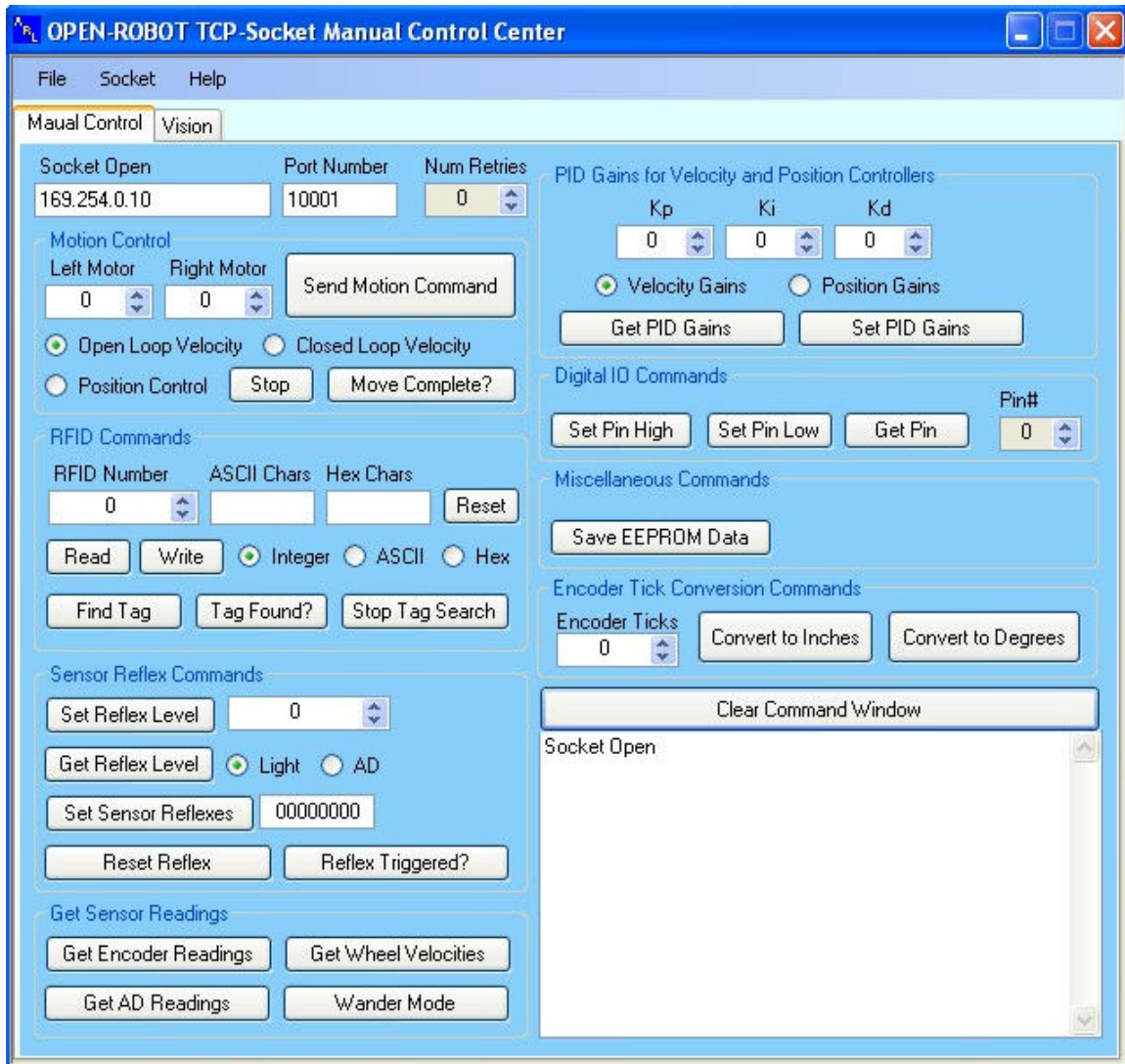


Figure 14. Use Manual Control program to test out OPEN-ROBOT.

Once the socket is open you can try out OPEN-ROBOT. Try getting the analog-to-digital sensor readings by clicking on the [Get AD Readings](#) button.

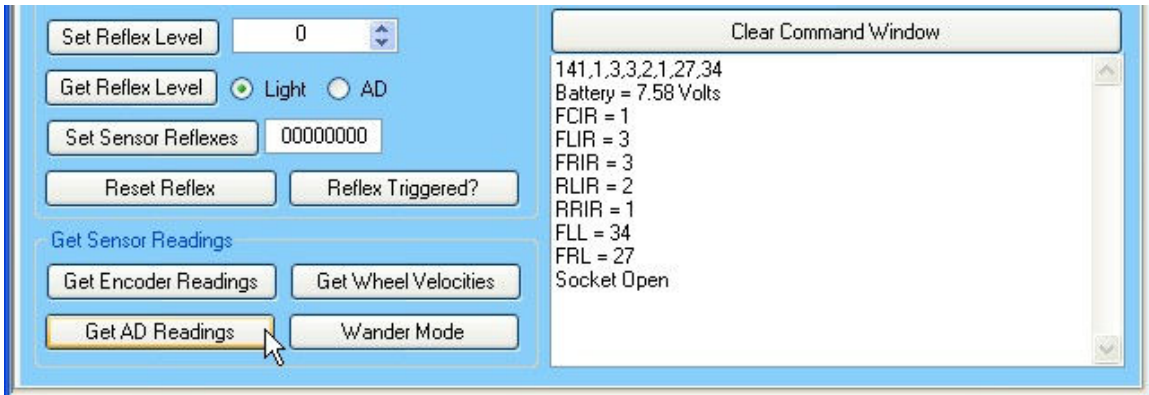


Figure 15. Get AD Sensor Readings.

Please send all questions and issues to abe@abotics.com