

Quick Start Guide



WHITE BOX™
ROBOTICS

PC-Bot 914

Disclaimer

Working with electronics and installing the plastics will require care and patience. **PROPER GROUNDING PROCEDURES** before handling the electronics. Touching the robot chassis (which is common grounded throughout) and at the same time touching something that is grounded in your home/office like metal pipes or the kitchen tap.

It is also expected that, working in a small area inside the unit that you perform careful and safe handling of the hardware so as not to cause short circuits. We ask that you make sure you give yourself enough working area and time for installation so as not to damage either the plastics or the electronics.

Liability

In no event will White Box Robotics, Inc. or Frontline Robotics, Inc. be liable for any damage, including loss of data or profits, cost of cover, or other incidental, consequential or indirect damages arising from the installation maintenance, use, performance, failure or interruption of White Box Robotics, Inc. or Frontline Robotics Inc. products, whatever the cause and on any theory of liability. This limitation applies even if White Box Robotics, Inc. or Frontline Robotics Inc. has been advised of the possibility of such damage.

Unpacking the Robot

The following image shows how the PC-BOT should have arrived in the shipping box.



STEP 1 – Un-packing the robot

Remove the peripheral equipment wrapped in bubble wrap.



STEP 2 – Un-packing the robot cont.

Carefully remove the side and front/back supporting foam.



STEP 3 - Un-packing the robot cont.

Reach into the box and grab the handles on the PC-BOT. They are somewhat hidden from above. Lift the robot straight up and out of the box.

WARNING! This robot is heavy. People with back problems should not attempt to lift this robot. Always use proper lifting technique when lifting heavy items. Keep you knees bent and your back straight and lift gently.



The following image shows where the handles are located, you'll have to feel for them when the robot is in the box. There are two handles front and back.



Setting-up the robot

STEP 1 – Charging the robot batteries

Now that the robot is out of the box, you should plug the charger in to charge the batteries. The charger connector is found behind the left rear vent door on the back of the robot.



Flip the door open as shown in the above picture.

Unpack the charger and plug the charger jack into the lower connector on the robot labeled “Charger”.



The charger LED will first be GREEN after the AC cord is plugged into the wall. It will then change to ORANGE when it is charging the batteries on the PC-BOT. It will then switch back to GREEN when the batteries are fully charged (it typically takes 2 -2.5 hours to charge the batteries from the auto-shutoff point).

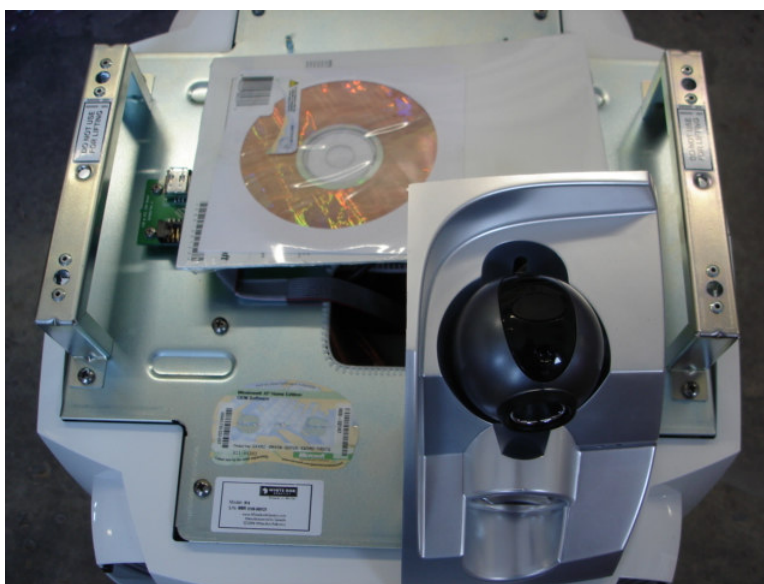


Charging and shutdown

If the battery level goes below **11.2V** the robot will auto-shutdown. Either while you are running the robot, and especially when you are finished with it for the day, **PLEASE REMEMBER TO RE-CHARGE THE BATTERIES.**

STEP 2 – Removing the head panel

The head and front/back torso body panels are attached with ball studs and sockets. This allows for easy removal of the panels without tools. Windows XP Home CD can be found under the head panel. Gently remove the head by grabbing under the separation (between the head and torso plastics) and pulling straight up.

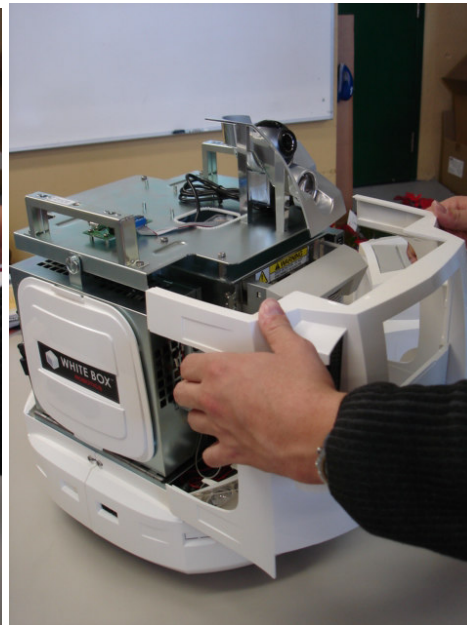


STEP 3 – Removing the body panels

The torso body panels are removed in the same way as shown, except pulled backwards or forwards depending on the torso body panel. You can use your thumbs to lever while pulling on the body panels with your finger tips.



Both body panels are removed in the same way.



STEP 4 – Plug in the monitor, keyboard and mouse

When viewing the back of the robot, you will see the External Power Supply jack (power supply not included) and Charger jack on the left side, and on the right side the back panel of the Mini-ITX.



Plug the monitor, keyboard and mouse into the Mini-ITX back panel in order to setup Windows. **You will also need an Ethernet connection to be able to register Windows.**



STEP 5 – Start your system



Switch on the Main Power switch (RED) **AND** M3 Power switch (GREEN) on the front of the robot. **WAIT 5 seconds** and the M2-ATX Power Supply will cycle the power to the PC automatically.

The M3 Power switch is used to turn on the M3 Controller. If this switch is OFF, the M3 will not be able to drive the motors or read the sensors.

When the battery voltage drops to **11.2V** (i.e. when the batteries need recharging, the M2-ATX will cycle the power to the PC again to auto-shutdown before the power is cut (45 seconds later) and the batteries are protected from total discharge.

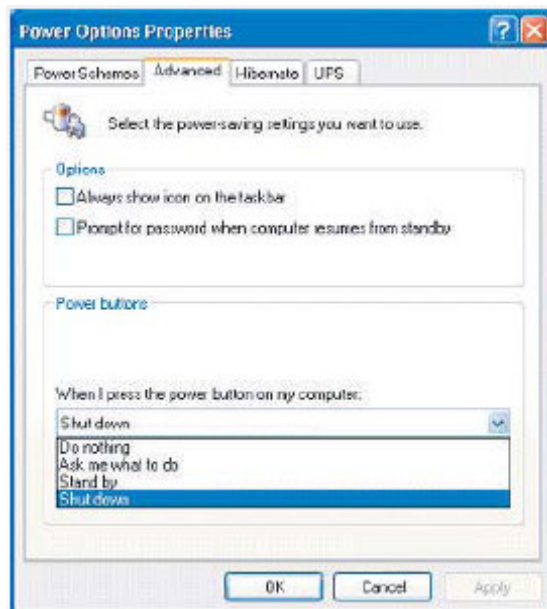
This is the same as the user pushing the PC ON switch on the CPU and shutting down the computer.



On the other side of the front of the robot, you can still use the PC ON and PC Reset switch just like on a regular computer.



As with other PCs, you may control the behaviour of the “PC Power” button from the Windows Control Panel. It is recommended to configure the power button to ‘Shutdown’, your robot’s PC should already be set in this way when you receive it.



Note: If your Control Panel is set to “Category View” (the default), access Start ->Control Panel -> Performance and Maintenance -> Power Options. If your Control Panel is set to “Classic View”, access Start -> Control Panel -> Power Options. Then select the “Advanced” tab.

NOTE: If the robot is sitting on a desk, it might be advisable to turn the M3 Switch OFF so that the robot cannot drive off the table.



STEP 6 – Connecting and Installing Peripheral Devices

After Windows is registered and running, install the drivers for the Wireless USB Network Adapter included in the box. You can connect the Wireless device to the USB board mounted on the head.



In this location the head can still be placed back on the robot and not interfere with the Wireless USB Network Adapter or its antennae.

You can also install the drivers for the web camera using the included CD.

Getting Started – Software

Your 914 PC-BOT comes with Windows XP Home Edition®, and you can use it just like any other PC. While you still have a keyboard, mouse, and monitor connected to your robot, you will want to do the following in order to set it up for "headless" (remote) operation:

Windows Setup:

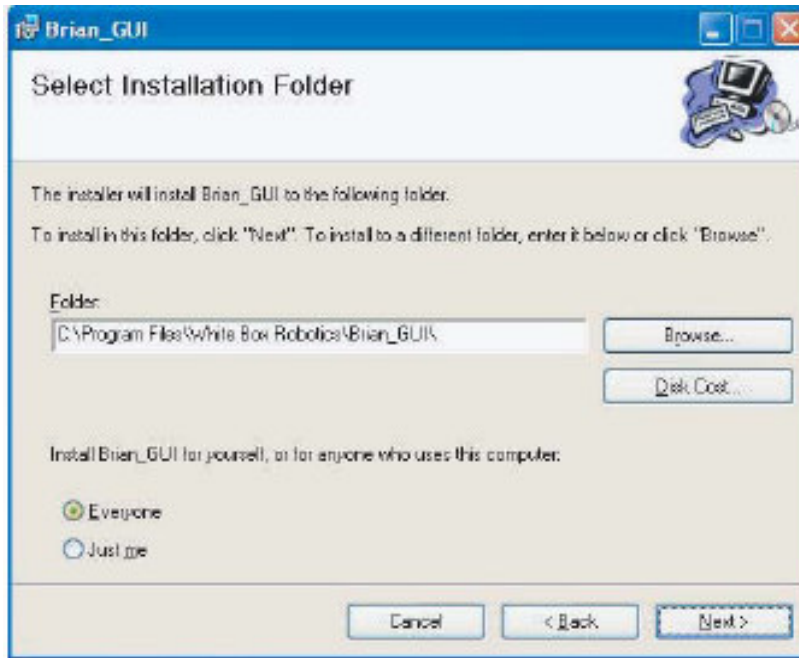
- Turn off the Windows Firewall, so that a remote BRIAN GUI can connect via TCP/IP to your robot's BRIAN service.
- Configure your wireless network settings. The recommended configuration is to use a WEP or WPA encrypted wireless network, using a firewall/router box attached to your cable/DSL modem. A Linksys Wireless-G Broadband Router (model number WRT54GS), or any similar product, will work fine.
- You may wish to configure your robot's PC to participate in your Windows workgroup, which will allow you to use file sharing between the robot and other computers, allow the robot to access networked printers, etc.
- Run Windows Update to install any critical service patches. You can connect the robot to the internet either using your wireless LAN, or you can plug an Ethernet cable into the robot's PC chassis.
- You may find it convenient to add a "remote desktop" product such as Microsoft Remote Desktop (requires upgrade to Windows XP Professional Edition®), or there is a shareware product called RealVNC (<http://www.realvnc.com/>). This way you won't have to keep hooking up the keyboard/mouse/monitor when you want to access your robot's PC.

BRIAN GUI Setup:

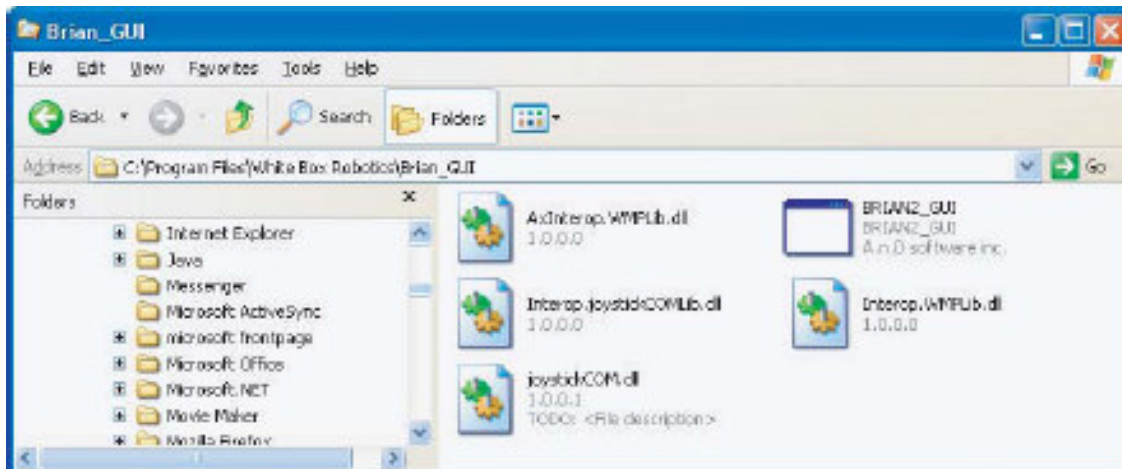
- The BRIAN GUI comes preinstalled on your robot, you will see a shortcut to it on the robot's Windows desktop.
- To install the BRIAN GUI on another computer, download BRIAN GUI setup at: http://www.whiteboxrobotics.com/2006/PCBOTs/Support/Brian_GUI_Setup.zip Copy this to any other PC that you want to use to control your robot. Run the "setup.exe", after unzipping the file, to install the BRIAN GUI on your remote PC.

Installing the BRIAN_GUI (on another computer)

You can install this GUI on client computers in order to control the robot remotely.



This installer will create a shortcut on the Desktop which will run the following BRIAN_GUI application.



Running the BRIAN GUI

First run the GUI from the robot directly. Double click the shortcut on the desktop or open the GUI application in the folder it was installed in.

As this GUI is being run from the robot locally, the Robot Name 'localhost' is used to access it.

Note: DON'T forget the Connection Port # 13000.

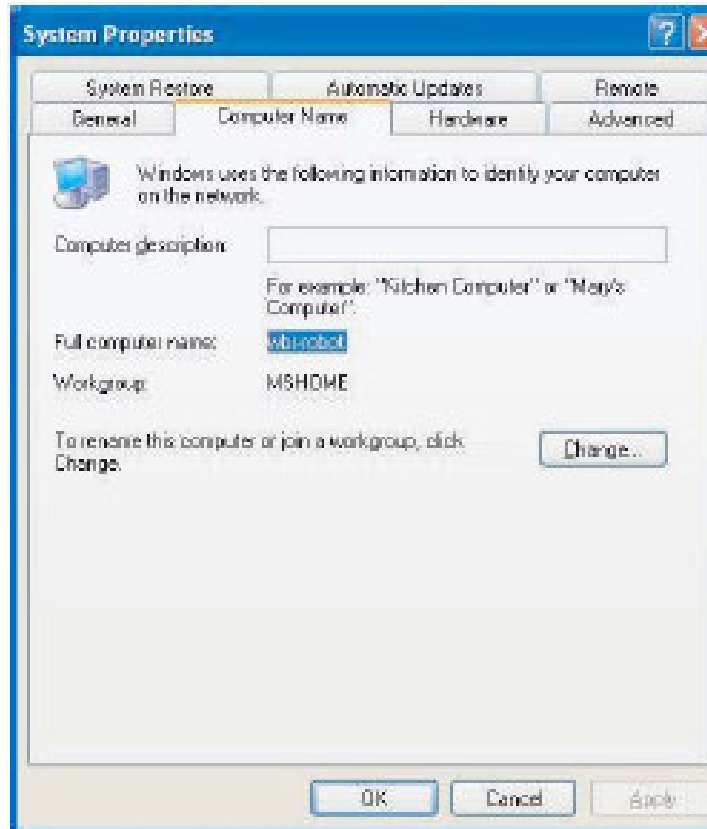


Push the Connect button and you should hear that a connection was established if your speaker is turned ON. Push the Disconnect button to break your connection to the robot.

Warning! BE CAREFUL as the robot is possibly tethered to the monitor, keyboard, mouse and charger so driving the robot now would be possibly dangerous. It is best to put the robot on the blocks so that the wheels can spin freely and it will not drive off with everything attached.

Running the BRIAN GUI continued...

If you are running the application from a client computer, in other words remotely, then the robot will need to be connected to your LAN using either a wireless link or Ethernet. The name of the robot (i.e., the robot computer) will need to be used by the client computer when trying to connect to it. So for the default robot, we use the name WBR-ROBOT. This name can be found and changed under 'System Properties'.



Running the BRIAN GUI continued...

Now if the GUI is run from the client computer, you can refer to your robot by its "Windows" name (you may need to configure your robot computer and your client computer to both participate in the same Windows workgroup.)

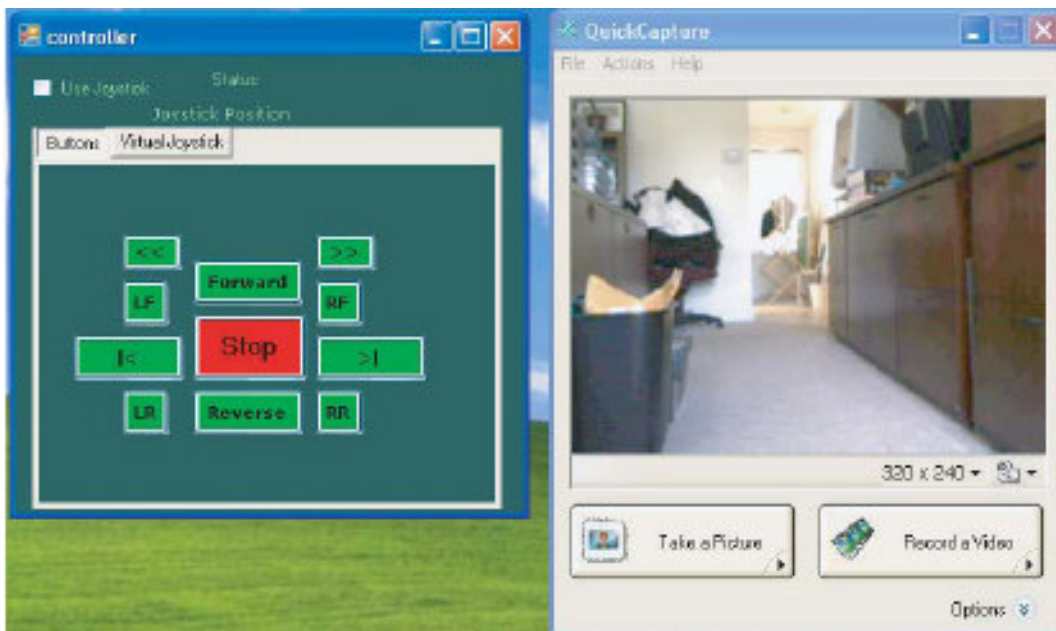
Again remember that Port # 13000 should be used.



Sample Applications

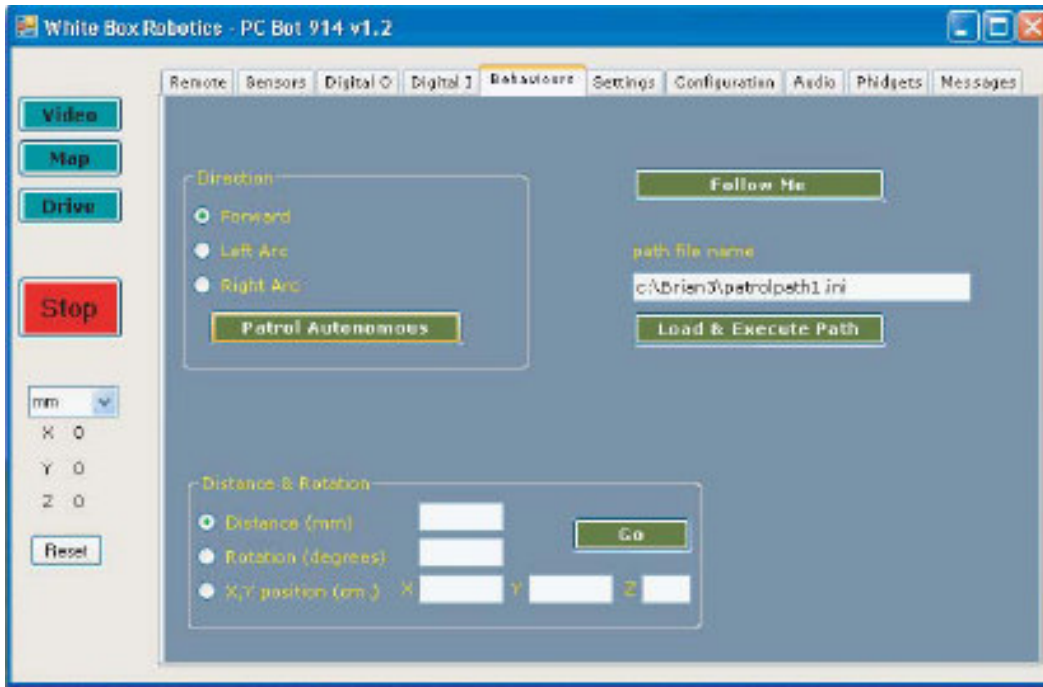
Telepresence can be performed using various combinations of programs. One easy example is shown below. To set it up you'll need:

- The BRIAN GUI running, press the "Drive" button to get the controller window shown on the left. You can drive with a real joystick, a virtual joystick, or the button controls shown in the picture below. You can run the BRIAN GUI on a remote client computer, or use a "remote desktop" application to access the GUI that is preinstalled on the robot.
- Any "remote desktop" application will allow you to run programs such as the Logitech "QuickCapture" application shown below (this application is included on your webcam's install CD.) You can view the video through the remote desktop, and use it to drive your robot around:



Sample Applications continued...

Open the "Settings" tab and UN-check the 'Sensor Assisted Driving' check box. Now autonomous patrolling can be turned on using the BRIAN GUI, go to the "Behaviors" tab and press "Patrol Autonomous":

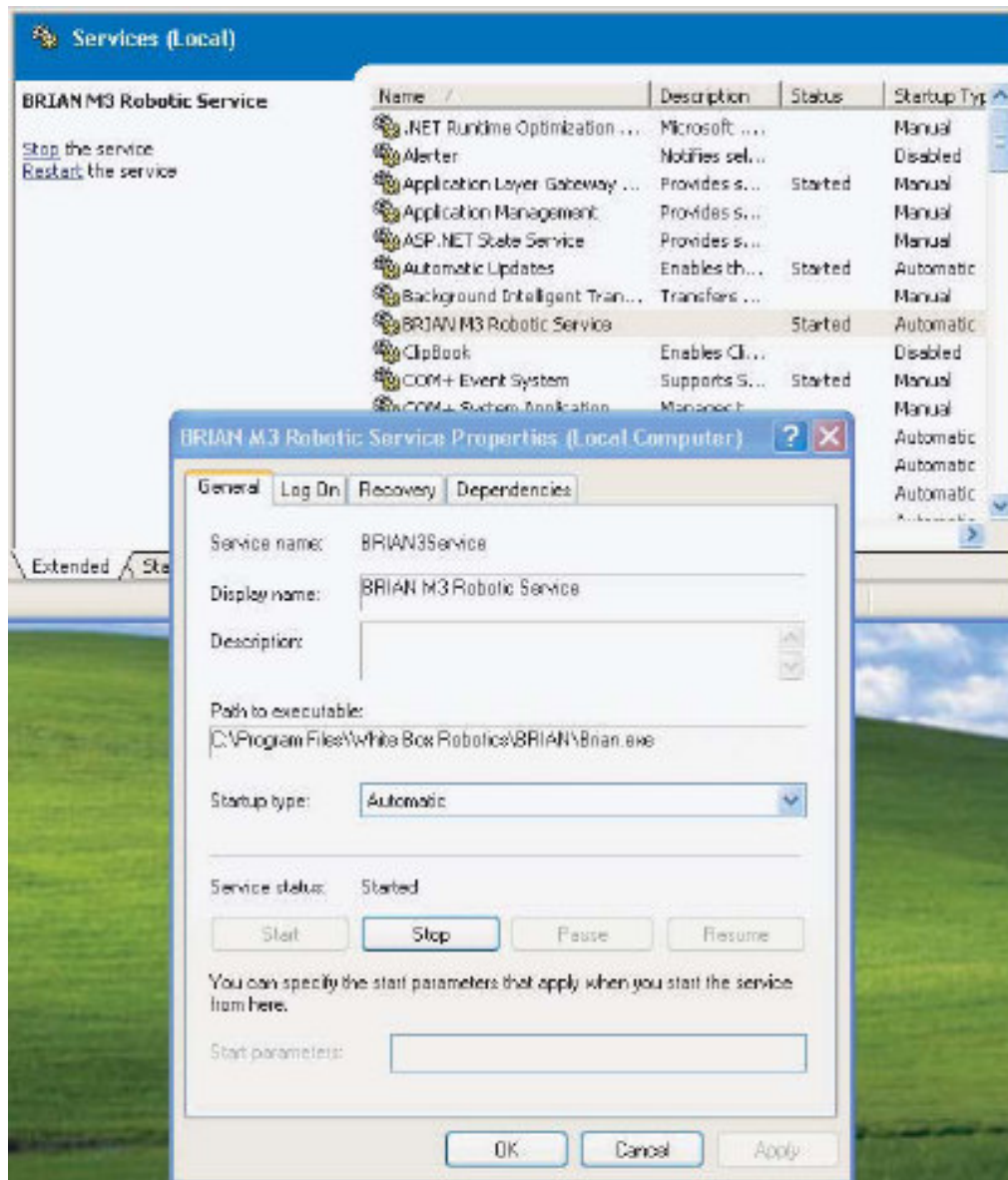


You will need to keep an eye on your robot and be ready to press the red "Stop" button until you have properly configured your robot's IR sensors, speed, velocity, acceleration, etc. to your robot's environment. You may even change the positions of the 8 IR sensors that are provided. Consult the BRIAN Developer's Guide for details, and please see our forums at:

<http://www.914pcbots.com/>

BRIAN M3 Robotic Service

BRIAN runs as a Windows service. It will start up every time you boot the robot's PC. This is can be changed from inside the Control Panel , on the Services list you will find "BRIAN M3 Robotic Service". From this screen you can turn off the BRIAN service and/or prevent it from automatically starting:



Note: If your Control Panel is set to "Category View" (the default), access Start -> Control Panel -> Performance and Maintenance. If your Control Panel is set to "Classic View", access Start -> Control Panel. Then double-click on "Administrative Tools" and then "Services".

Reference Documents and Links

White Box Robotics Webpage: <http://www.whiteboxrobotics.com/>

The Official Enthusiast Site for the 914 PC-BOT: <http://www.914pcbots.com/community/>

Support Documents – (Quick Start Guides, Basic Unit Computer Installation, Plastics Assembly, etc.)
<http://www.whiteboxrobotics.com/2006/PCBOTs/support.html>

BRIAN & PC-BOT Setup software:
http://www.whiteboxrobotics.com/2006/PCBOTs/support_brian.html

Technical Specifications

Wiring and Power: http://www.whiteboxrobotics.com/2006/PCBOTs/pdf/PC-Bot_Tech_Spec-WiringPowerv1.1.pdf

I/O Board Block Diagram: http://www.whiteboxrobotics.com/2006/PCBOTs/pdf/PC-Bot_Tech_Spec-IOBoardBlockDiagramv1.1.pdf

Infra-red Sensors: http://www.whiteboxrobotics.com/2006/PCBOTs/pdf/PC-Bot_Tech_Spec-Infra-redSensorsv1.1.pdf