



MantaroBot™ User Guide and Operating Manual



Mantaro Product Development Services®
20410 Century Boulevard • Suite 120 • Germantown Maryland 20874
www.mantaro.com • info@mantaro.com
Phone 301 528 2244 • Fax 301 528 1933

MantaroBot™ User Guide



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| Version | Date | Change Summary |
|---------|-----------|---|
| A | | Initial Customer Release |
| 1.0 | 5/11/2011 | Changed version number to numeric, updated few screenshots. No feature changes. |
| | | |

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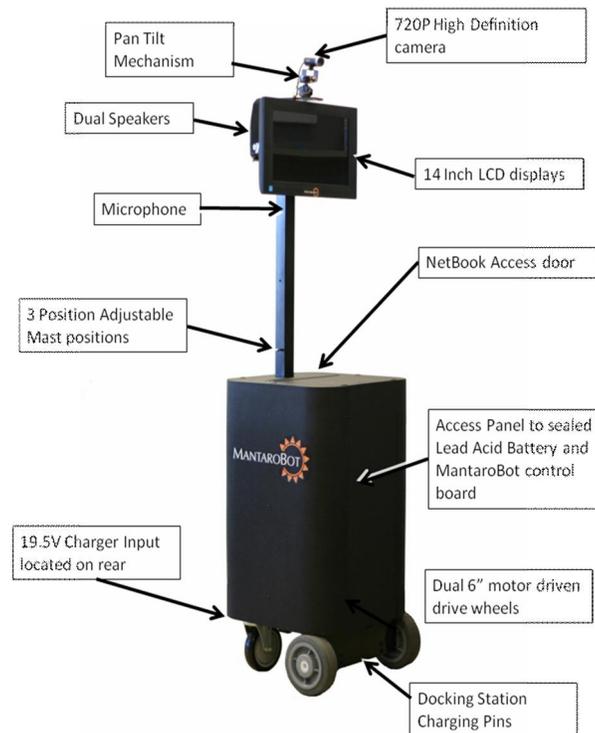
Thank you for purchasing a MantaroBot. Please read the contents of this User Guide completely before using your MantaroBot.

Checking the contents of your shipment

The following items should be in your shipment(s):

1. MantaroBot
2. Battery Charger
3. A CD containing:
 - a. The MantaroBot User Guide (this document)
 - b. The MantaroBot Controller Application

Knowing your MantaroBot and its limits



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The diagram above shows the hardware features of the MantaroBot. Each of these features is discussed below.

720P High Definition Camera – A 720P capable camera is mounted on the top of the MantaroBot. It allows the remote operator to view the local surroundings. The actual resolution of the video image will depend on the communications link quality and is automatically reduced in resolution by Skype to accommodate slower links.

Pan Tilt Mechanism – The Camera is mounted on a pan tilt servo mechanism which allows the camera to be positioned to convenient viewing angles without moving the MantaroBot.

14 Inch LCD Display – The display shows the remote operator’s camera view. This is useful for showing the people local to the MantaroBot who is driving it. The display can also be used to show the remote user’s computer “desk top” which can be helpful during a discussion.

Dual Speakers – Two speakers are located behind the display. The speakers have volume control allowing adjustment of the audio volume. The volume can also be adjusted from within the Skype program.

Microphone – A high sensitivity microphone is located below the display. The microphone allows the remote user to hear the local conversations.

3 Position Adjustable Mast – The Mast can be adjusted to three positions. The height adjustment is beneficial to the remote operator and people local to the MantaroBot as it allows “eye-to-eye” contact without looking up or down depending on whether you are sitting or standing. In general the highest position is best for most applications.

To adjust the mast:

1. Grab hold of the mast to support the weight of the display, speakers and camera
2. Pull out the pin
3. Raise or lower the mast until the upper and lower mast holes are aligned.
4. Insert the pin through the holes in the upper and lower mast

Netbook Access Door – The Access Door allows convenient access to the Netbook so that Skype call parameters and user privileges can be set. The Netbook cover and Access Door should be closed during

in call use of the MantaroBot. Powering on the Netbook puts the MantaroBot in to a ready state for a call.

Access Panel – The Access Panel provides access to the Sealed Lead Acid Battery and the MantaroBot Controller Board. The Access Panel can be removed by carefully prying out the six plastic pegs. The Access Panel should not be removed unless the MantaroBot requires service such as replacing the battery.

19.5V Charging Input – The Charging Input is located underneath the rear of the MantaroBot. The MantaroBot should be plugged into the Charger whenever it is not in use. It can also be used in a call while plugged in but care must be taken to disconnect the charger before it is driven away.

Docking Station Charging Pins – Two pins are located at the front of the motor bracket that allow the MantaroBot to be charged in the optional Docking Station. No voltage is present on these pins unless it is connected to the Docking Station.

WARNINGS

TIPPING HAZARD – The remote operator is responsible for keeping the MantaroBot under control. The MantaroBot has been designed to reduce the potential of tipping during normal operation. Rapid acceleration and stopping or sharp turns while moving at full speed may cause the MantaroBot to tip over and cause injury. The MantaroBot is the most stable when the mast is in the lowest position.

INCLINES - The MantaroBot is intended for indoor applications on level ground. Inclines of more than 10 degrees may cause the MantaroBot to tip over.

DRIVING IN REVERSE - It is not recommended that the MantaroBot be driven in reverse for more than a short distance. The camera cannot be faced to see in the rearward direction. It is recommended that the MantaroBot be turned around and driven forward in the direction desired whenever possible. The MantaroBot is more susceptible to tipping when driven in reverse.

STEPS AND STAIRS – Great care should be taken to avoid driving the MantaroBot down stairs or steps. The camera should be aimed in the direction that the robot is moving and aimed down such that obstacles can be readily seen.

CAMERA VIEW – It is the remote user's responsibility to have an awareness of where the MantaroBot is being driven. When the camera is facing straight ahead the remote operator's view from the camera presents an illusion that the MantaroBot is 2 to 4 feet ahead of its actual position. This can

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result in collisions with obstacles (chairs, door frames etc.). It is recommended that the camera be positioned slightly down such that obstacles can be readily seen. Similarly if the camera is directed down such that it is looking at the ground the remote user may not be able to see obstacles that the MantaroBot is being driven toward.

NETWORK DELAY – Network delays can cause control commands that are sent to the MantaroBot to be buffered and delivered at a later time. When network delays exceed one second great care is required by the operator to ensure that the MantaroBot remains in control.

SECURITY – The MantaroBot has user level password control to help prevent unauthorized access. However the Skype application can be configured to various levels of permission for accepting calls. It is recommended that you review the Options - Call Settings on the MantaroBot's Skype for your application.

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Powering On

The MantaroBot's Netbook computer is located under the Access Panel on top of the MantaroBot chassis. The MantaroBot is powered ON by pressing the power switch on the **RIGHT SIDE** of the Netbook. This will cause Windows to boot and the MantaroBot application and Skype to load. When the Netbook is powered ON, the USB connection to the MantaroBot Controller Board powers up the MantaroBot.

Note: Installing other software applications on the Netbook computer may cause the MantaroBot to behave erratically.

Connecting to Wifi Network

The MantaroBot's Netbook computer is equipped with Wifi capability that **must** be configured to connect to your Network.

1. Open 'Connect to a Network' by clicking the network icon in the notification area. (bottom right of screen)
2. In the list of available wireless networks, click the network you wish to connect, and then click Connect.
3. Most networks require a network security key or passphrase. To connect ask your network administrator or Internet service provider (ISP) for the security key or passphrase.

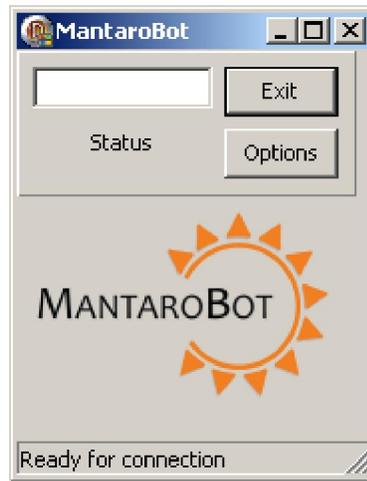
Note: Your network must have an Internet connection that will allow connection to Skype.

User Administration

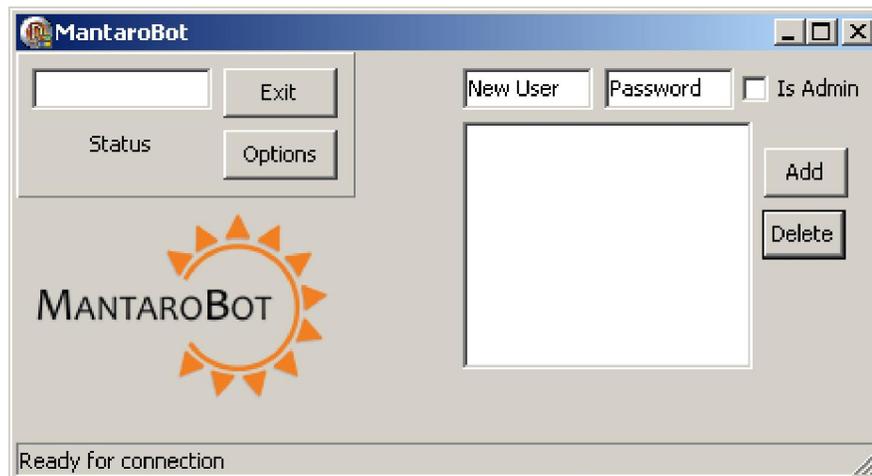
The MantaroBot requires a user name and password to connect to it. Prior to use you will need to setup User Names and passwords for each of the users who will be accessing the MantaroBot.

1. Open the Access Door and power ON the Netbook Computer using the button on the right side of the Netbook.

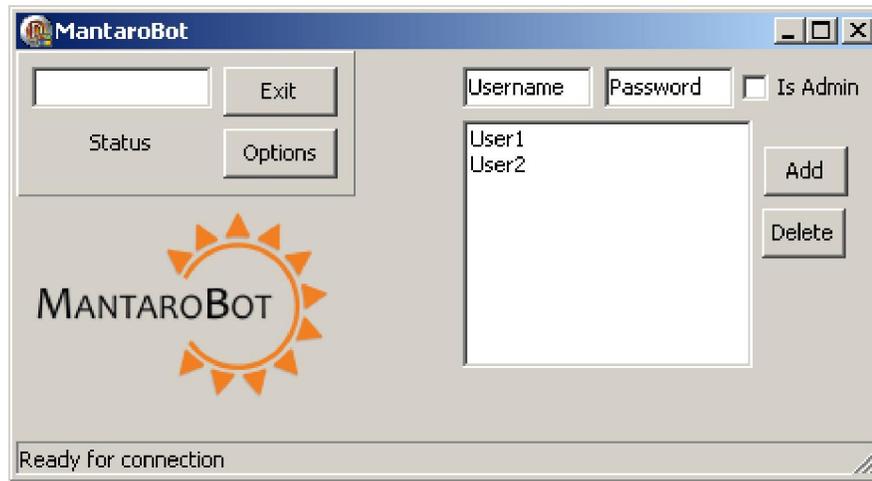
2. Click on the MantaroBot window and select the Options button.



3. Type the User name and password in to the corresponding windows and click on "Add" button. If the user is to be an Administrator click on the "Is Admin" check box.



- Each user will appear in the Window as you add them.



Note: setting up a User as an Admin will allow that user to add and delete users remotely using the Controller Application.

MantaroBot Controller Application

The MantaroBot Controller Application is the remote user's control interface for the MantaroBot. This user guide describes how to install and use the MantaroBot Controller Application on the remote PC.

Remote PC Requirements

The MantaroBot Controller Application requires the following of the remote user's PC:

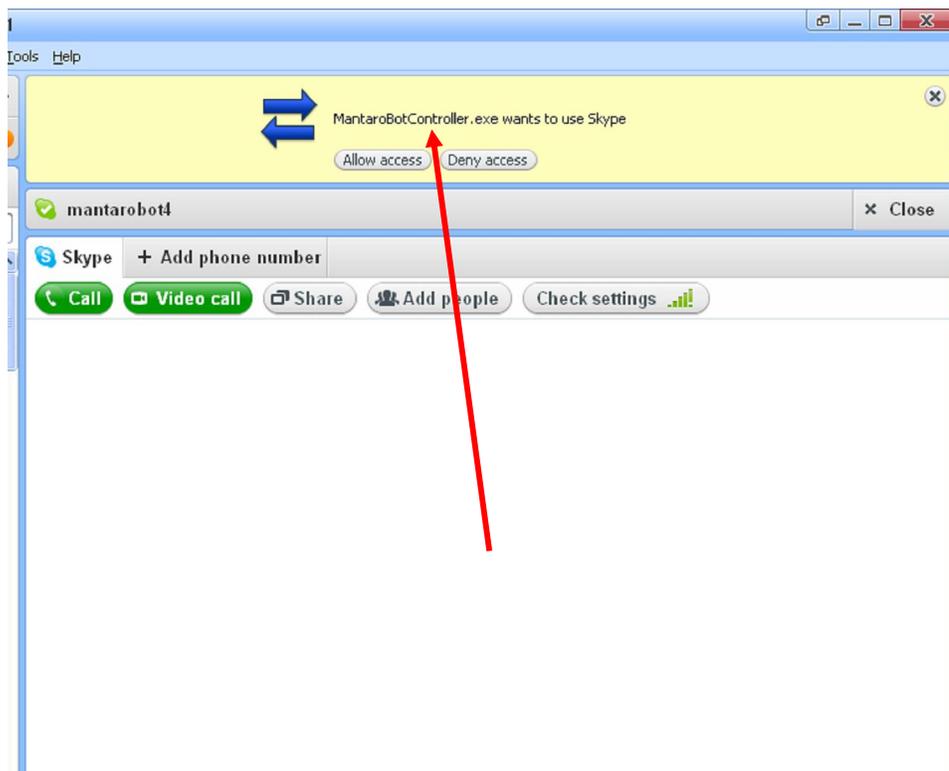
- A 32 bit version Windows XP or Windows 7 Operating system
- A PC with at least a 1 GHz of processor.
- The latest version of Skype
- A desktop mouse. (The MantaroBot can be controlled from a touch pad but it is not recommended.)
- Headphones and microphone (will improve audio experience)
- A webcam

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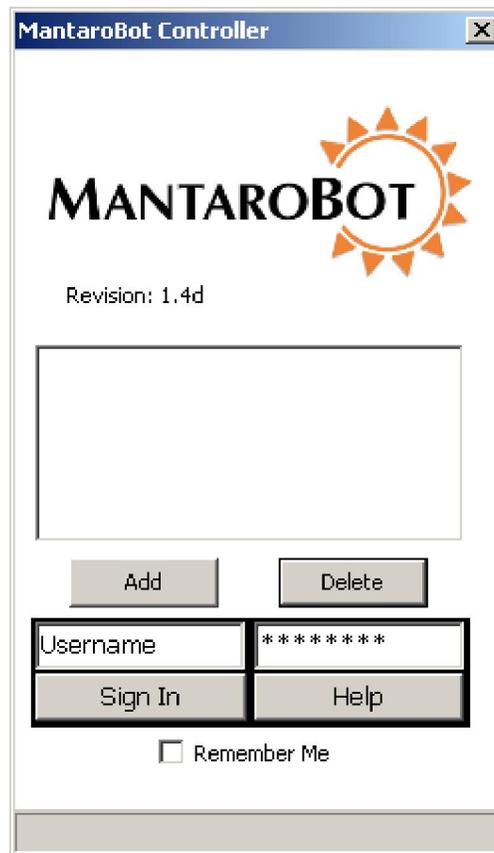
Installation

The MantaroBot Controller Application works in conjunction with Skype™ to control the MantaroBot. The following steps describe the installation process:

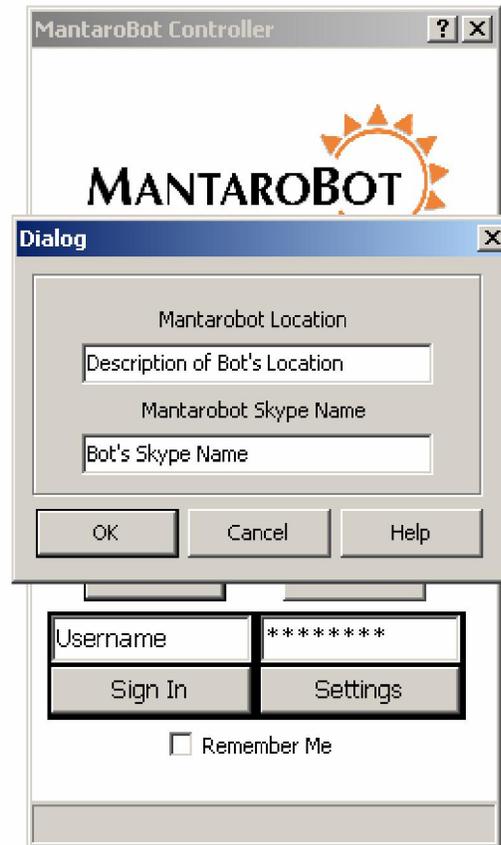
1. Install and run the latest version of Skype on the PC that you will use to control the MantaroBot.
2. Run the MantaroBotSetup_verXXX.exe installer. This file is available on the CD that came with the MantaroBot or available for download on the Mantaro website at www.mantaro.com/products/mantarobot/support.htm.
3. Launch the MantaroBot Controller program and observe that the Skype window requests permission to allow access.



4. Click “Allow access” to connect MantaroBot Controller to Skype and the following window will appear.

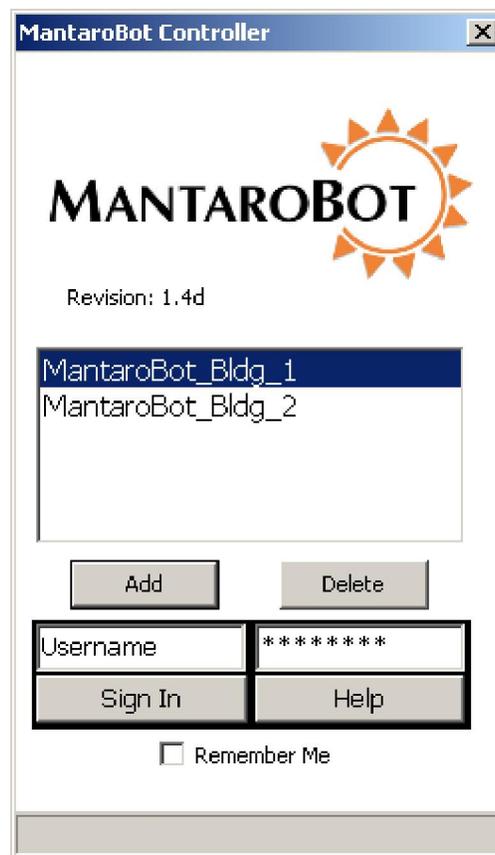


5. Click on the Add button to add a MantaroBot to the controller. Once entered the controller allows you to select which MantaroBot to drive.



6. In the MantaroBot Location window type the name that you want to see appear in the list. This can be any descriptive text or the location where this MantaroBot can be found.

7. In the MantaroBot Skype Name window type the exact Skype name of the MantaroBot to be controlled. This name must match the Skype name for it to connect.

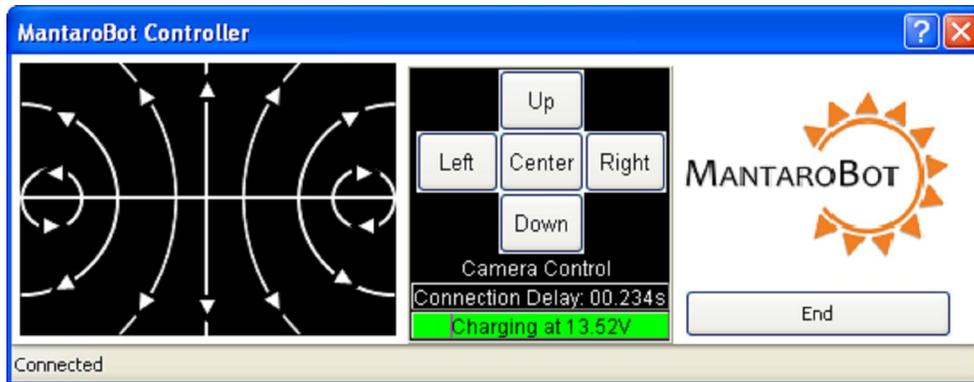


Connecting to the MantaroBot

1. To connect to the MantaroBot add the MantaroBot's Skype username into your Skype contact list. The factory default username/password is provided on the information sheet provided with your MantaroBot.
2. In the MantaroBot Controller window enter your username and password and click the "Sign In" button.
3. The MantaroBot will initiate a Video call back to your Skype client.

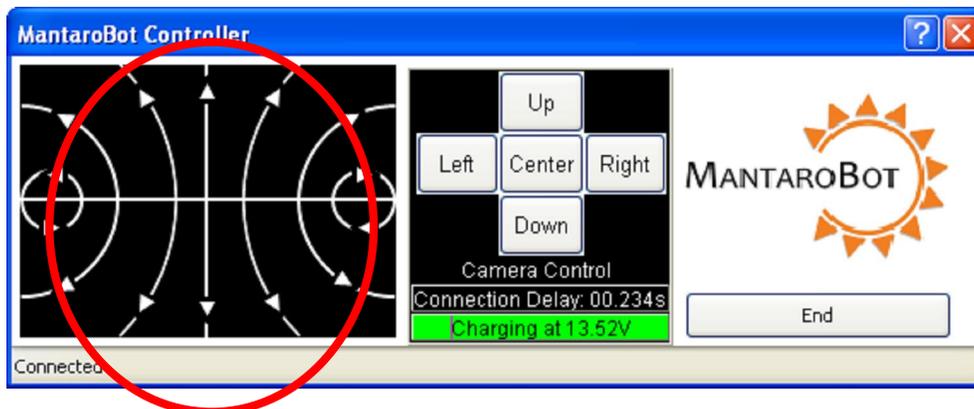
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4. Accept the Video Call and observe that the MantaroBot status will change to “Connected”.



Controlling the MantaroBot

Drive Motor Control Pad



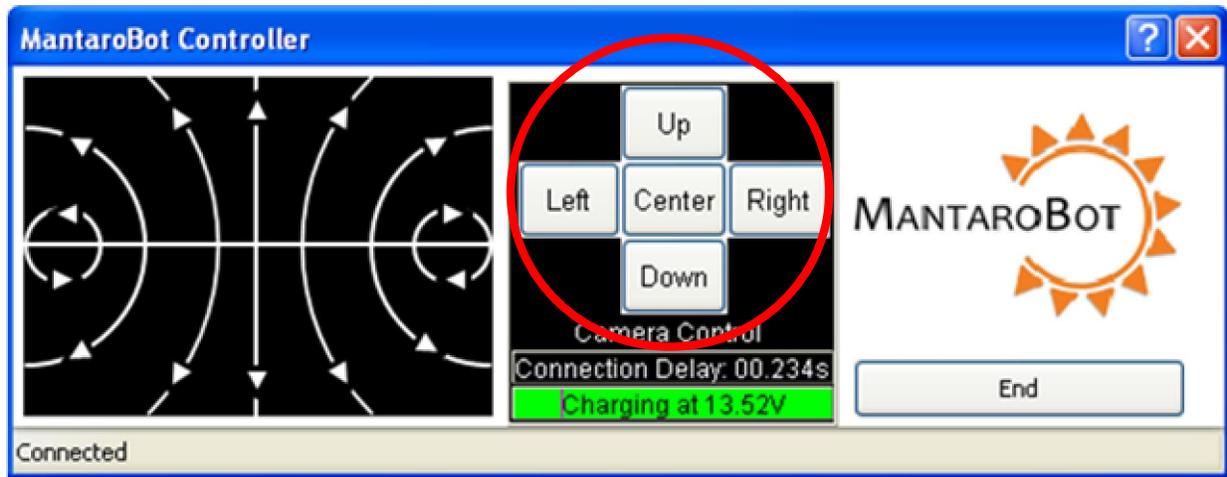
To move the MantaroBot, position your cursor on the center of the left area of the control pad and hold down the left mouse button. Dragging the cursor up will cause the MantaroBot to move forward. The speed will increase as the cursor is moved further from the center. Moving to the right or left will cause the MantaroBot to turn right or left. The further the cursor is moved to the left or right the sharper the turn is made. Similarly, movement in the reverse direction can be made by moving the cursor down the control pad area.

Note: To limit noise from the motor for remote users, the microphone on the MantaroBot is muted at 60% in the forward direction. The reverse direction speed is scaled to 50% of full speed for safety.

Tip: It is recommended that you use a mouse to drive the MantaroBot.

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Camera Control



The Camera Control buttons allow the camera to be moved independently of the MantaroBot drive wheels. This is useful in a meeting environment where you want to observe items or people in the room without moving the entire MantaroBot. The camera will move in the direction of the buttons. The “Center” button causes the camera to center from any position.

The camera can also be controlled with the A-S-D-W-C keys of the keyboard. This is useful for moving the camera while driving with a mouse at the same time.

- A = left
- D = right
- S = down
- W = up
- C = center

< Hint > The Camera should be centered prior to moving the MantaroBot.

Connection Delay

The Connection Delay displays a measurement of the approximate round trip delay from the MantaroBot Controller application through the network to the MantaroBot. If the network that you are connected to has significant delays you can compensate by moving the MantaroBot slowly or in short movements. Any change you may see in the connection delay over time does not indicate an issue with your MantaroBot. Increasing connection delays only indicates that your wireless and/or internet access is or has become slow.

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Maintenance

Battery Maintenance

The MantaroBot is equipped with a Sealed Lead Acid Battery. The life of this type of Battery is impacted by the depth of discharge. If the battery is repeatedly fully discharged the life of the battery will be reduced. The MantaroBot should be fully recharged after each use by connecting it to the charger. The battery charge level can be determined by connecting to the MantaroBot using the MantaroBot Controller Application. When the battery level is indicated at the Battery Low level it should be recharged as soon as possible.

Note: The MantaroBot should be connected to the charger or Docking Station whenever it is not in use to keep the battery topped up.

Replacing the Battery

The following steps should be followed should it be necessary to replace the battery.

Note: Pushing the MantaroBot without the Battery installed may damage the control circuitry.

1. Remove the front access panel of the MantaroBot by pulling out the 6 black pegs.
2. The battery brackets are held in with a Velcro strap. Unfasten the strap to remove the battery.
 - a. If this is the first battery replacement cut the plastic shipping strap.
3. Disconnect the battery connectors from the battery terminals.
4. Remove the battery.
5. Place the new Battery in the battery brackets.
6. Fasten the Velcro strap around the battery and the battery brackets.
7. Connect the Red wire to the Positive terminal of the battery first.
8. Connect the Black wire to the battery negative terminal.
9. Close and secure the front access panel using the 6 black pegs removed in Step #1.
10. Plug the charger in and charge the battery for at least 8 hours or until fully charged before driving it on battery power.

Netbook Maintenance

The Netbook computer is loaded with Microsoft Windows Version 7 and the latest version of Skype. Windows Automatic update has been disabled to prevent unnecessary applications from being enabled when updates are installed. If enabled these applications use processing bandwidth that may cause a reduction in the MantaroBot response to control commands or may reduce the video quality. Skype updates will be installed automatically. These updates may at times require updates to other software components. Check the MantaroBot support website periodically for software updates and advisories.

It is recommended that the MantaroBot Netbook not be used for general purpose email or web browsing as no virus scanning software or firewalls are enabled. Enabling virus scanning and firewalls may reduce the performance and responsiveness of the MantaroBot.

Moving the MantaroBot

To relocate the MantaroBot manually hold on to the mast and tilt the MantaroBot on to the two rear casters wheels. It can then be pulled backwards and will roll on the two rear casters to the location that you want to place it. It is not recommended that the MantaroBot be moved manually while resting its drive wheels.

Warranty

Mantaro warrants the MantaroBot to be free from malfunctions and defects in both materials and workmanship for 90 days from the date of purchase. If this product is found to be defective within the warranty period, Mantaro will either repair or replace the product. This warranty does not cover circumstances beyond the control of Mantaro. We make no other express or implied warranty for this product. Some states or jurisdictions do not allow exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you. Some states or jurisdictions do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. This warranty gives you specific rights, and you may have other rights which vary from state to state or by jurisdiction.