MantaroBot™ Classic

User Guide

and

Operating Manual

Mantaro®
20410 Century Boulevard • Suite 120 • Germantown Maryland 20874
www.MantaroBot.com • info@mantarobot.com
Phone 301 528 2244 • Fax 301 528 1933

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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.
1.1	6/21/2011	Added new details for release of Controller v1.5 and Robot v1.1
1.2	12/07/2011	Added new details for release of Controller v1.6 and Robot v1.2. Original MantaroBot renamed to MantaroBot Classic.
1.3	02/29/2012	Added new details for release of Controller v1.65. Major things listed below: - fixed bug with placing Skype™/MantaroBot call on hold to switch to another Skype call - added USB Joystick support
1.31	03/15/2012	No features changes from Version 1.3 User Guide. Added various trademark information. Added more detail to upgrading Robot Application software.

Note: New or significantly modified features from the previous versions are marked as

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

1 Checking the contents of your shipment

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

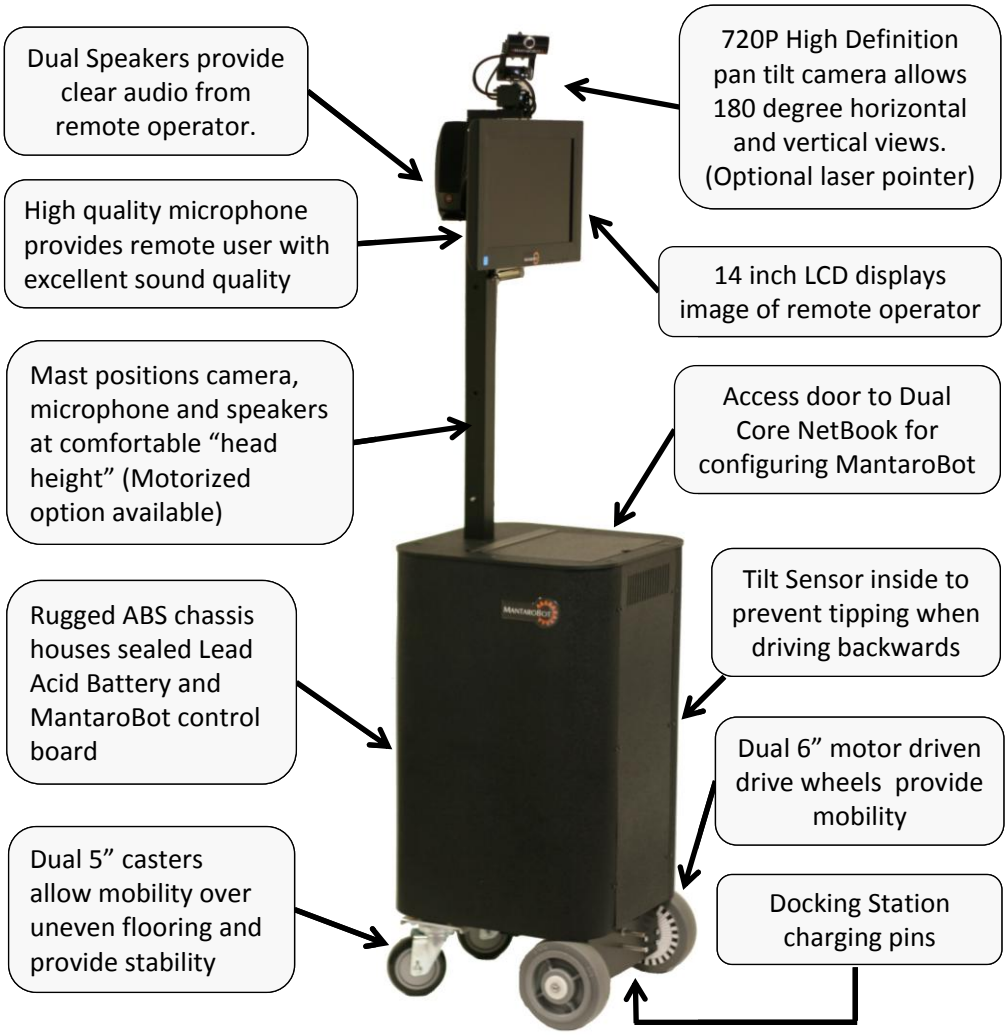
1. MantaroBot Classic

2. Battery Charger

3. A CD containing:
   a. The MantaroBot Classic User Guide (this document)
   b. The MantaroBot Controller Application
   c. Information sheet

4. Other accessories that you may have purchased may also be included in the same shipment.

2 Knowing your MantaroBot Classic and its limits



2.1 Overview

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.

Laser Pointer -- Factory available option. The laser pointer is mounted on the same pan tilt servo mechanism as the camera. The remote user has the ability to turn the laser on/off and point it with the camera control functions.

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 "desktop" 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 Manually 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 holding the mast in place.
3. Raise or lower the mast until the holes in the mast are aligned to the desired position.
4. Re-insert the pin through the desired hole.

Motorized Mast -- Factory available option (replaces 3 Position Manually Adjustable Mast). Remote users can adjust the height of the mast automatically using the controller application. More details are provided later in this manual.

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

Access Panel – The Access Panel provides access to the Sealed Lead Acid Battery (standard option) 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.

Tilt Sensor – Inside the MantaroBot there is a tilt sensor that will stop the MantaroBot from moving if the user is driving backwards (and into an obstacle) that causes it to tip forward. A message on the Controller application status bar will also be displayed.

2.2 Moving or Transporting the MantaroBot

To relocate the MantaroBot manually, hold on to the mast and tilt the MantaroBot onto the two rear casters wheels. It can then be pulled backwards and will roll easily 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 on the ground.

NOTE: The extended battery (LiFePO4), if you have purchased one, is restricted from being shipped on passenger airplanes.

2.3 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 accelerating 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 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 towards.

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.

SHIPPING – If the MantaroBot is ordered with the Extended Life (LiFePO4) battery option it cannot be transported on a passenger airline.

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3 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 Microsoft® Windows® to boot and the MantaroBot Robot Application and Skype to load.

Note: When the MantaroBot is powered, but not in an active call and *not* plugged into the charger, the Netbook screen will be turned off. To turn the screen on, hold down the Windows key and press the letter 'P' twice and press 'Enter' (Windows-P-P). This is useful for viewing the battery indicator directly on the MantaroBot Robot Application that is running.

When the MantaroBot is powered, not in an active call and *is* plugged into the charger, the user may see the MantaroBot logo if they open the lid on the Netbook. To switch to another application the user must first close the MantaroBot logo by using Alt+Tab to select the MantaroBot icon and then hitting Alt+F4 to close it.

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

4 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 to, 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 use of Skype.

5 MantaroBot Software

This section provides an overview of the software needed to use the MantaroBot before providing further details later in this user guide.

5.1 Robot Application Overview

The MantaroBot Robot application runs on the Netbook computer in the MantaroBot and is ***already pre-installed***. When new software updates are available they can be installed **only by someone local to the MantaroBot**, not remotely (information for updating is provided later). This application is where the configuration and initial user administration must occur for the MantaroBot. A user with administrator privileges will also be able to perform most administrative tasks remotely using the MantaroBot Controller application.

5.2 Controller Application Overview

The MantaroBot Controller application needs be installed on a computer of the user's choice (other than the Netbook on the MantaroBot). The requirements of this computer are described later in this guide. This application is used to connect to your MantaroBot for remote use. The Controller application allows the user to drive the MantaroBot and hold video teleconferences.

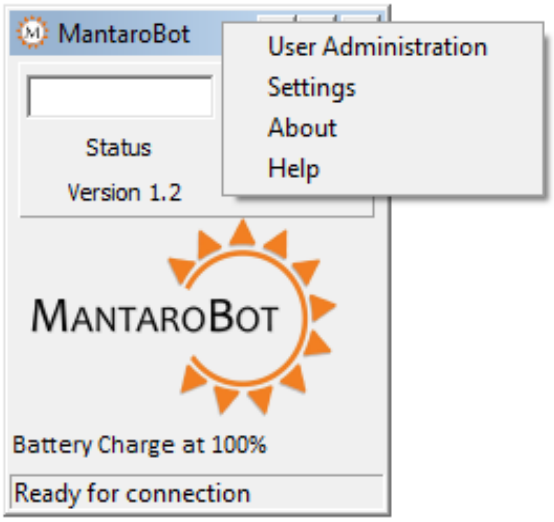
Once an administrator user account is created on the MantaroBot Robot application, an administrator will be able to remotely login to the MantaroBot using this Controller application and perform user and most robot administration tasks. There are certain configuration parameters that can only be done from the Robot application.

6 Robot Application

This section will provide important information regarding the MantaroBot Robot application that runs on the Netbook of the MantaroBot. It will provide details on all 'Options' sub-menus.

6.1 Options - User Administration

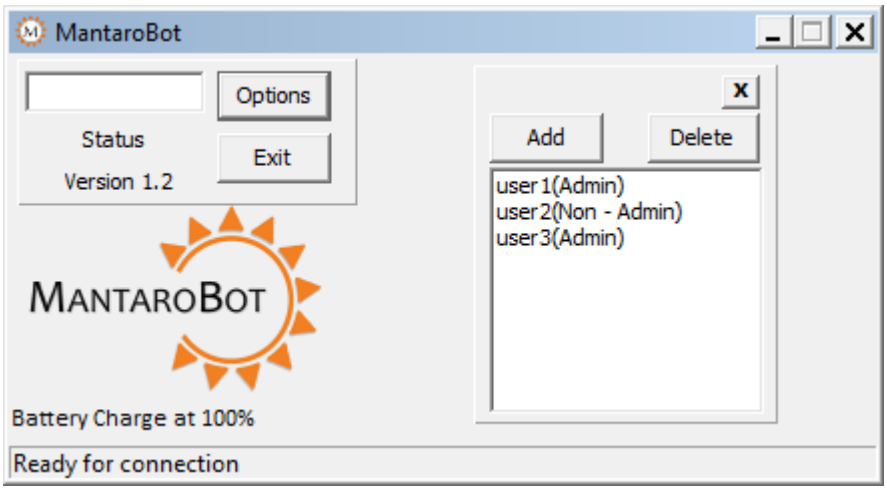
The MantaroBot requires a user name and password to connect to it. Prior to use you will need to setup User names and passwords for each of the users who will be accessing the MantaroBot.



1. Open the Access Door and power ON the Netbook computer using the button on the right side of the Netbook (unless it is already powered on).

2. Click on the MantaroBot window (to view the MantaroBot Robot application). Select the 'Options' button and select 'User Administration'.

3. Click on 'Add' to add a new user. This will open a new a dialog box. You can edit an existing user by double-clicking on the user name.



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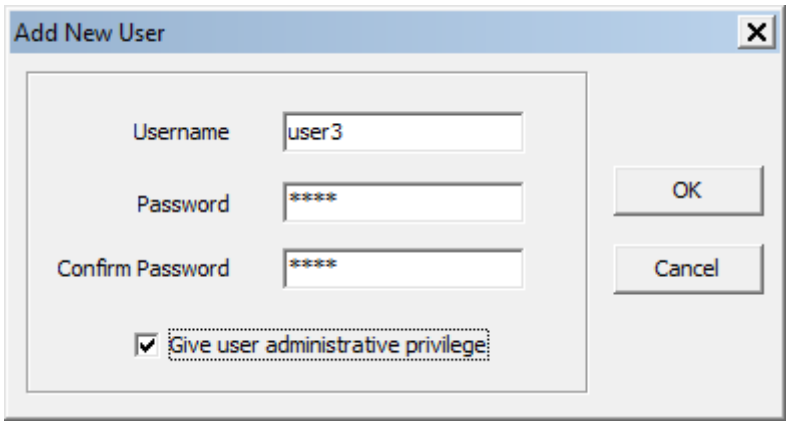
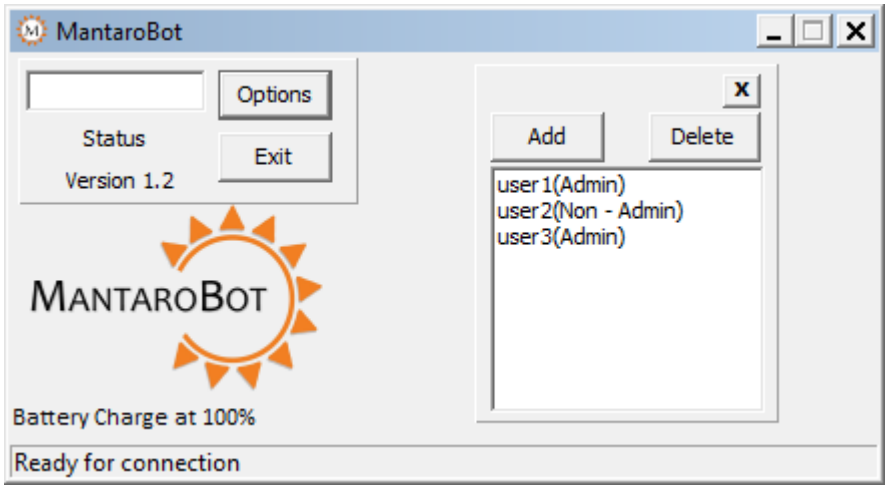
4. Type the User name and Password into the corresponding box. If the user is to be an Administrator click on the "Give user administrative privilege" check box and press OK.



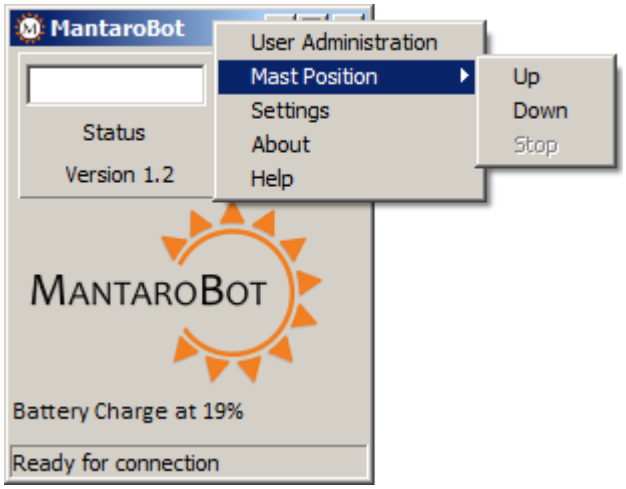
5. Each user will appear in the Window as you add them with a designation beside their name to indicate if the user is an Admin or a Non-Admin user.



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

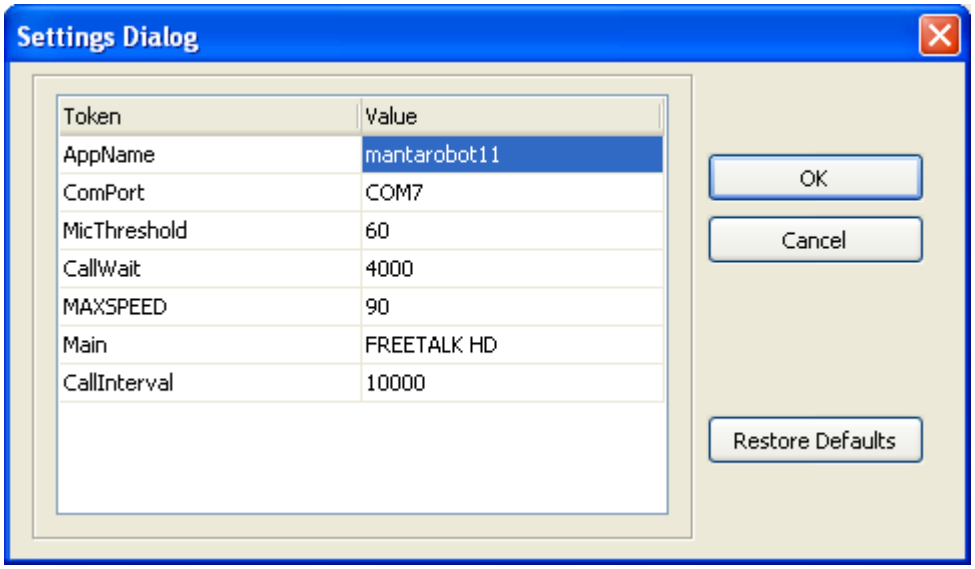
6.2 Mast Position

If the MantaroBot has a motorized mast, it can be moved all the way up or down. These controls are accessible by clicking the 'Options' button and selecting 'Mast Position'. Accessing these controls is particularly useful during transportation of the MantaroBot and in situations where you might need to move the mast down but can not have a remote person login and control it with the MantaroBot Controller application.



6.3 Options - Settings

The MantaroBot Robot application is pre-configured with all the necessary settings when shipped from the factory. If it becomes necessary for the MantaroBot administrator to change the robot settings the 'Settings' options menu can be used. Please note that the settings are tightly tied to how the MantaroBot functions and an incorrect setting may disable the MantaroBot.



A 'Restore Defaults' button is provided to restore settings to factory defaults.

The following is a description of each of the Settings.

AppName – Unique identifier required by Skype for its application stream connection. For MantaroBot purposes, it's always the same as the Skype User Name of the Robot. Please note that changing the AppName here will require all the remote users to update their MantaroBot Controller robot list to have the name to connect to the Robot.

ComPort – Virtual Serial Com port used by the MantaroBot Robot Application to talk to the internal control board. The port information can be found by looking at the Device Manager -> Ports (COM & LPT)-> USB Serial Port in the Windows Control Panel.

MicThreshold – Threshold in percentage of total speed at which to mute the microphone on the MantaroBot to prevent feedback noise from the MantaroBot. The allowed limits are from 0 – 100. Each MantaroBot Controller application can also configure this setting from the Options – Settings – Controller Settings menu.

CallWait – Waiting period (in milliseconds) to give time for internal control board to wake up from sleep state when a call is received.

MAXSPEED – Maximum speed at which the robot can be driven. The allowed limits are from 40 – 100. This parameter is also configurable by an administrator via the Robot Settings menu in the MantaroBot Controller application.

Main – Name of main camera as recognized by Skype in its Video Settings tab. It requires that the name be same letter for letter including the capitalization of the letter.

CallInterval – Waiting period (in milliseconds) between successive calls to give the MantaroBot enough time to gracefully shutdown all the electronics and unload the necessary driver before it can accept a new call.

Note: Any change in the settings requires the MantaroBot Robot application to be restarted so that the changes can take effect.

6.4 Options – Help / About / Accessories

6.4.1 Help

The 'Help' window selectable from the 'Options' button currently provides a link to where the latest version of this User Guide resides. The 'About' and 'Accessories' tab can be selected once the Help window is open.

6.4.2 About

The 'About' window in the MantaroBot Robot application shows the user the version numbers for the components of the MantaroBot - Robot Application, Firmware, Hardware and Serial Number. This information can be viewed by clicking on 'Options' button and selecting 'About'.

This window also provides links to the MantaroBot Support site and ability to check for software updates.

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6.4.3 Accessories

The 'Accessories' window is accessible by first selecting 'Help' or 'About' from the 'Options' button on the Robot application. Then click on the 'Accessories' tab at the top. This window lists all of the accessories installed on the MantaroBot. **NOTE: Optional Extended Battery is not considered an accessory and will not be displayed on the Accessories list.**

6.5 Upgrading the Software

1. To check for updates click on the 'Check for Updates' link in the MantaroBot Robot application 'Option' – 'About' window using the Notebook. Alternatively, checking for updates on a particular MantaroBot can be checked from the MantaroBot Controller application 'Option' – 'About' window when it is in an active call. However, upgrades on the MantaroBot can only be performed locally using the Notebook directly.

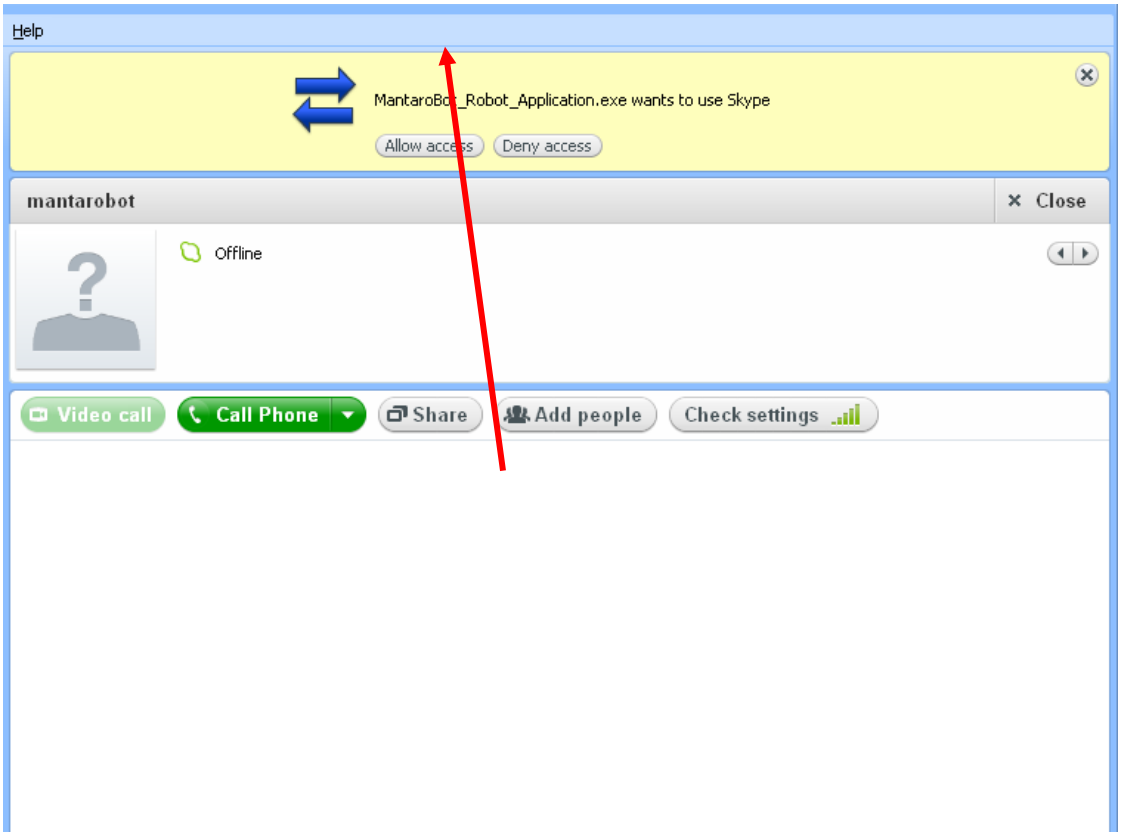
2. If an update is available, download it to the MantaroBot from the MantaroBot's support website. Make sure to close all running MantaroBot applications before the next step. Generally, there are two apps that will have to be closed: MantaroBot Robot Appication and MantaroBot Watchdog Console.

3. Now, right click on the installer file and select 'Run as administrator'. It will install the new application in the same path the application was installed when shipped from the factory.

4. Restart Windows on the netbook when prompted after installation.

5. After restart, verify Skype is running on the MantaroBot.

6. Once the MantaroBot Robot Application launches, switch to the Skype window and observe the request for permission to allow access to the MantaroBot Robot Application. Please click on "Allow access". If the user decides to upgrade the Skype application on the MantaroBot, the "Allow access" button will also have to be clicked one time (even if the MantaroBot Robot application was not upgraded).



NOTE: On occasion, Skype will force updates for major releases. In these rare cases, the remote user will not be able to log onto the MantaroBot until someone locally clicks the "Allow access" button once.

7. The upgrade is now complete and you may close the lid to the Netbook.

7 Controller Application

7.1 Remote PC Requirements

To use the MantaroBot Controller application, the computer must meet the following requirements:

1. A PC with at least a 1 GHz processor
2. A 32-bit or 64-bit version of Windows® XP or Windows® 7 Operating system running
3. The latest version of Skype installed
4. A desktop mouse or USB Joystick (DirectX® compatible). (The MantaroBot can be controlled from a touch pad but it is not recommended.)
5. Headphones and microphone (will improve audio experience)
6. A webcam (if two-way video is desired)

Note: It is suggested that a webcam be used at all times such that people interacting with the MantaroBot can see who is controlling it. This practice improves the interpersonal dynamics and changes the way the MantaroBot is perceived by those local to it: from a surveillance drone to that of a person.

7.2 Installation & Upgrades

The MantaroBot Controller application is plugged into Skype™ to control the MantaroBot. The following steps describe the installation and/or upgrade process:

1. Install and run the latest version of Skype if it is not already installed on the PC that you will use to control the MantaroBot.

2. Run the MantaroBot_Controller_Setup_verXXX.exe installer. This file is available on the CD that came with the MantaroBot. This file and any newer versions are available for download via the support link on the MantaroBot website at www.MantaroBot.com.

3. If this is an upgrade to an existing installation, it is necessary to point the update to the existing installation path so the files can be replaced.

7.3 Creating MantaroBot Contact List

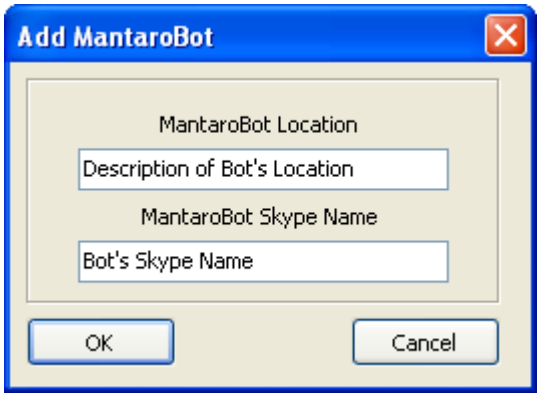
To connect to a MantaroBot, you must first add it to the Controller contact list. (Picture on the right shows a box with an empty contact list.)

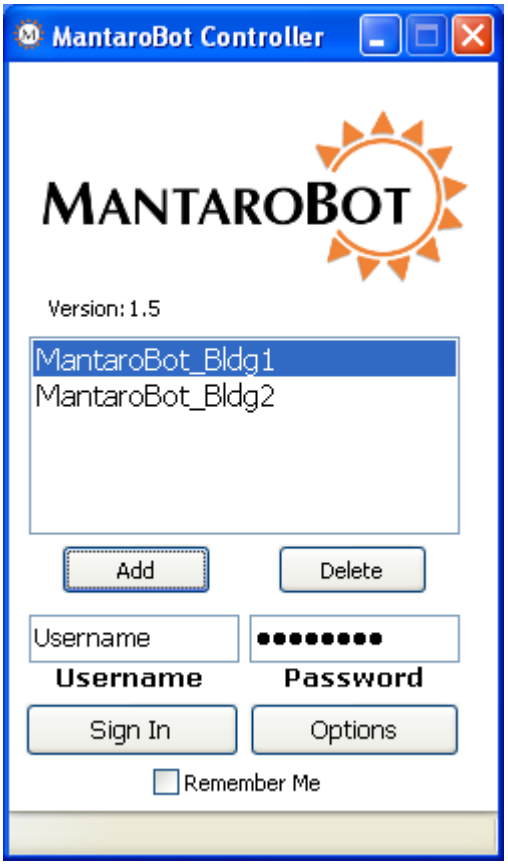
1. Launch the MantaroBot Controller program and the following window on the right will appear.

2. Click on the 'Add' button to add your first MantaroBot to the Controller list. You can add more as necessary.

3. When the 'Add' button is clicked, the window shown on the left below will appear. In the MantaroBot Location field, type the name that you want to see appear in the Controller contact list. This can be any descriptive text you choose. (suggestion: the place where the MantaroBot is physically located)

4. In the MantaroBot Skype Name field, type the exact Skype User Name of the MantaroBot to be controlled. This name must match the Skype User Name (same as AppName value from Options-Settings menu in MantaroBot Robot application) for it to connect. The default Skype User Name is provided on the Information Sheet provided with your MantaroBot.





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7.4 Connecting to a MantaroBot

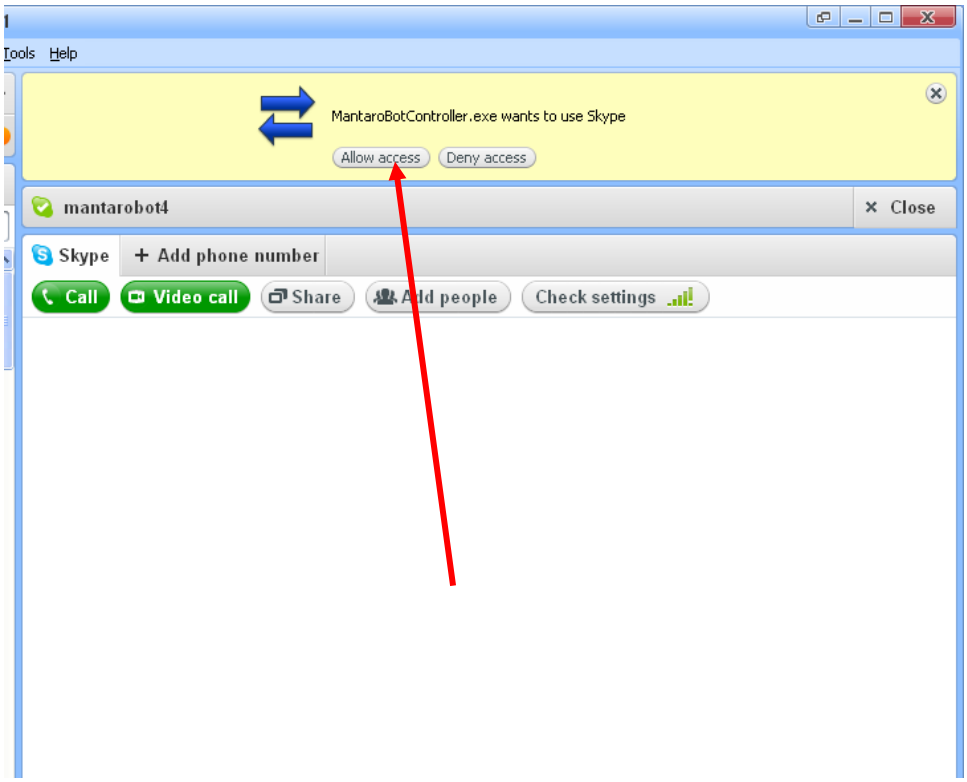
7.4.1 The First Time or after Software Updates

1. To connect to a particular MantaroBot for the first time, add the MantaroBot's Skype username into your Skype contact list (this is in addition to creating a MantaroBot Contact list described earlier).

2. In the MantaroBot Controller window, select the MantaroBot you want to connect to.

3. Enter your username and password and click the "Sign In" button. The MantaroBot administrator should provide you with your username and password. Administrators should refer to Section 6.1 if this is the first time a user account is being created.

4. If it is the first time that this application has been launched on your computer (or a software update to the Controller application or Skype has just been installed), observe that the Skype window requests permission to allow access to the MantaroBot Controller application. Please click on "Allow access".



5. Once the access has been provided to MantaroBot Controller and the user authenticated, the MantaroBot will initiate a Video call back to your Skype client.

6. Accept the Video Call and you will see the control pad as shown below. If "Auto-Answer Call" is selected in the 'Controller Settings', the user is not required to Accept the Video Call manually. Before clicking the 'Sign In' button, the 'Controller Settings' can be modified by clicking on the 'Options' button on the Login window. The 'Controller Settings' can also be modified after signing on to a MantaroBot. See Section 7.6.3 Controller Settings for more details.

7.4.2 Normal Operation or Busy Indication

1. In the MantaroBot Controller window, select the MantaroBot you want to connect to.

2. Enter your username and password and click the "Sign In" button.

3. The MantaroBot will initiate a Video call back to your Skype client.

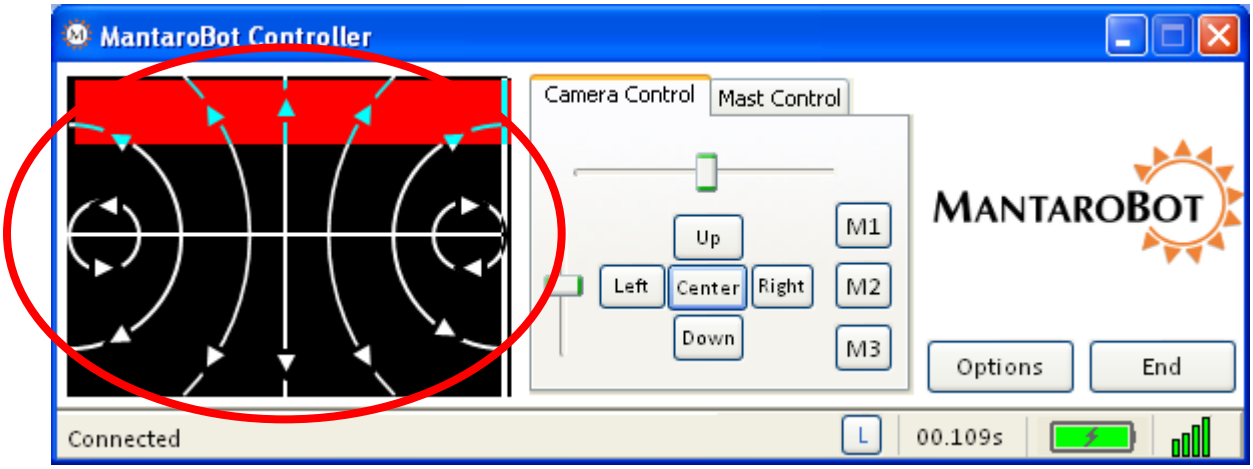
4. Accept the Video Call and you will see the control pad as shown in the next section.

5. If the MantaroBot is already in a call, the status bar of the Controller will give a Busy indication. Once the MantaroBot is free, it will automatically send a Skype IM message saying "MantaroBot available for use now".

7.5 Controlling a MantaroBot

The MantaroBot Controller is split into four sections. The left side is the Drive Motor Control Pad, the middle is for Camera and Mast Control, the right side is for various Options and ending the call, and the bottom is for providing status and control for additional accessories.

7.5.1 Drive Motor Control Pad



7.5.1.1 Driving MantaroBot

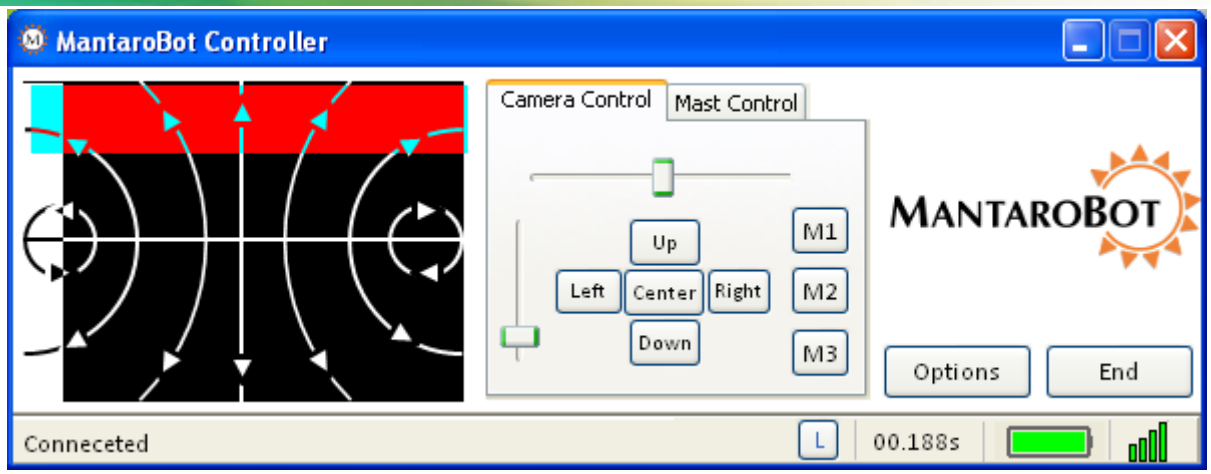
To move the MantaroBot, position your cursor on the center of the left area of the controller and hold down the left mouse button. Dragging the cursor up will cause the MantaroBot to move forward. The speed will increase as the cursor is moved further from the center. Moving to the right or left will 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. The reverse direction speed is limited to 50% of the forward direction speed.

The MantaroBot can also be controlled using a USB joystick. Please see Section 8.2 for more information.

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

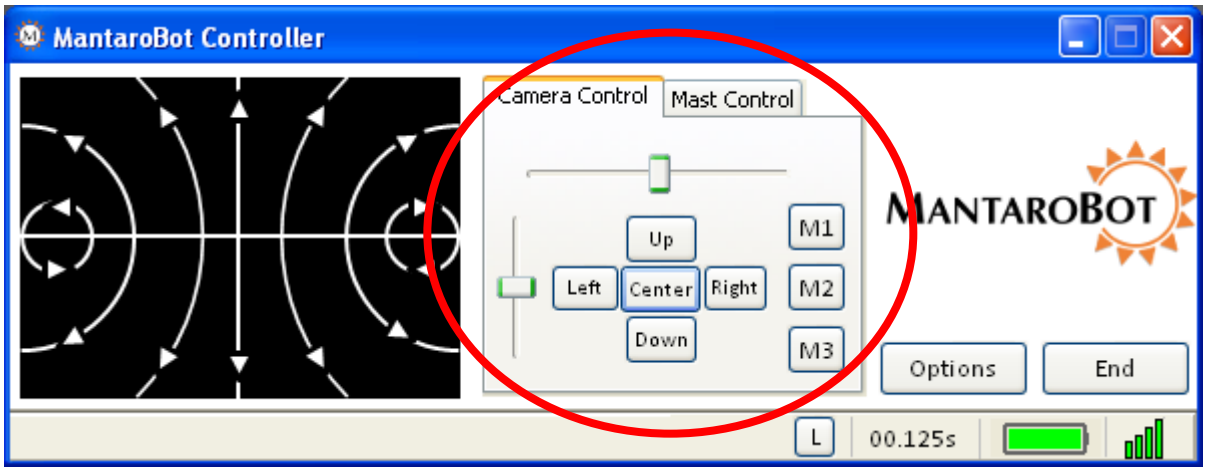
7.5.1.2 Proximity IR Sensors

MantaroBot is equipped with 4 proximity IR sensors to detect obstacles while driving the robot. When the sensors detect any obstacle approaching, it will inform the user through the MantaroBot Controller Drive Motor Control Pad. As the Robot approaches an obstacle a red or white area representing the distance from and the relative direction of the obstacle appears on the screen as shown below.



Note: To reduce the likelihood of a high speed collision (e.g. driving the MantaroBot into a wall) a feature has been included in the MantaroBot that reduces the robot's forward speed when it detects an obstacle 60 cm ahead of it. A red area will appear on the pad to indicate that the speed has been limited. <u>These sensors will not detect all types of wall surfaces or prevent the MantaroBot from falling down steps or stairs</u>.

7.5.2 Camera Control



Selecting the Camera Control tab displays available controls for the camera. (Mast Control tab only shown if Motorized Mast accessory is present on the MantaroBot.)

7.5.2.1 Pan/Tilt

The Camera Control buttons allow the pan/tilt camera on the MantaroBot 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 driving the MantaroBot around. The camera will move in the direction of the buttons. The "Center" button causes the camera to re-center from any position.

Another method of moving the camera is to use the two sliders. The horizontal slider actuates the pan control while the vertical slider actuates the tilt control of the camera. This provides users with finer control of the camera and the ability to position it in the desired position with one or two drag operations.

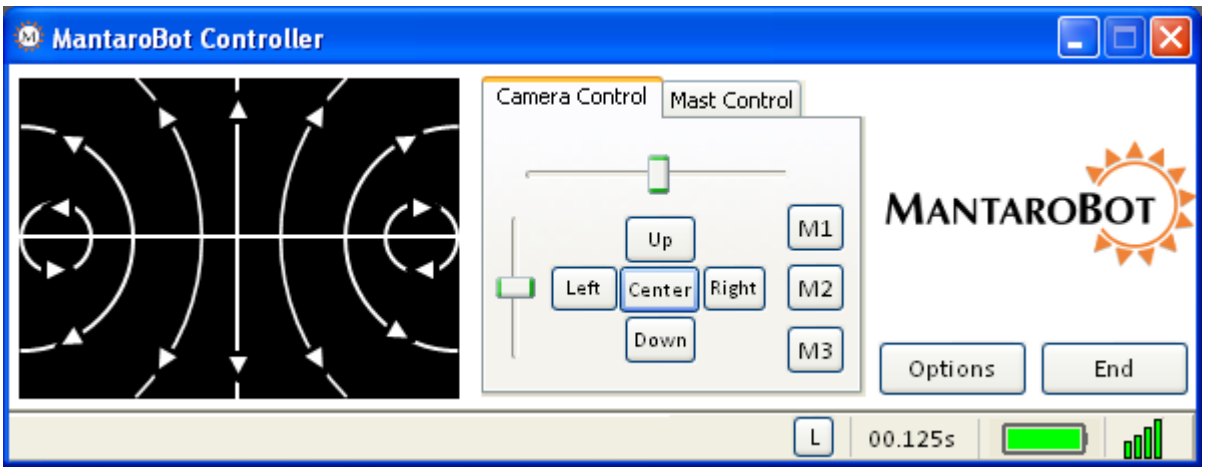
Additionally, the camera can also be controlled with the A-S-D-W-C keys of the keyboard. This is useful for moving the camera with one hand while driving with a mouse in the other.

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

NOTE: The Camera Pan control should be centered prior to moving the MantaroBot. There is also a Controller Setting option to 'Auto-Center' the camera when driving.

7.5.2.2 Memory Positions

Three memory position buttons on the side of the camera control (M1, M2, M3) are provided to save and recall three camera positions for easy pointing of the camera. To operate the memory buttons, point the camera to the desired position and press the button for 3 seconds to store the present position. The user is notified via a message on the status bar when the position is successfully stored.

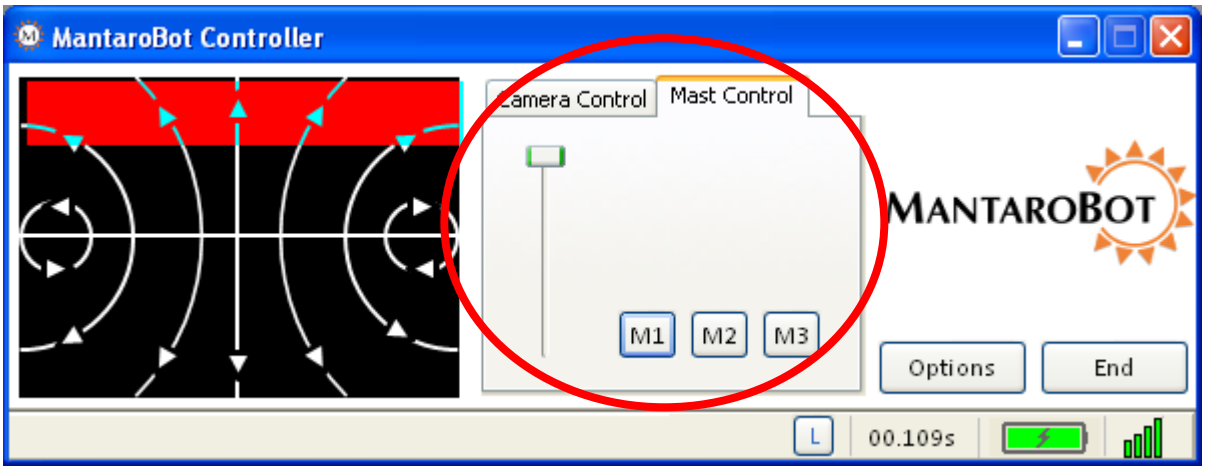


Any subsequent clicks of the memory button will point the camera to the stored position and the status bar will indicate that the memory position was recalled.

Additionally, the camera positions can be recalled using the 1, 2, or 3 key on the keyboard. This is useful for recalling previously stored camera positions with one hand while driving with a mouse in the other. Note: The keyboard keys can not be used for saving memory positions. They are for only recalling memory positions.

1 = recall M1 camera position
2 = recall M2 camera position
3 = recall M3 camera position

7.5.3 Mast Control



When equipped with a motorized mast selecting the Mast Control tab displays available controls for the Motorized Mast. The motorized mast allows the user to change the height of the display and camera to a convenient height.

Note: This tab is only shown if the Motorized Mast accessory is present on the MantaroBot.

7.5.3.1 Up/Down

The mast can be moved up or down using the vertical slider. In the full "up" position the mast is at a height of 62"' and in the full "down" position the mast is at a height of 49"'. Moving the mast up or down is particularly useful when the image being viewed is very near to the MantaroBot. Viewing images far from the MantaroBot will not requiring moving the mast as the camera has a wide angle view.

Please note that the default user controller setting is set to mute the audio from the MantaroBot while the mast is moving. Please see Section 7.6.3 for configuring this setting. Care must be taken when raising the mast to make sure that it does not hit anything that may be above it. If the mast hits an object while moving up or down a safety protection condition may occur on the mast drive motor and the motor will be stopped.

7.5.3.2 Memory Positions

Three memory position buttons on the side of the mast control (M1, M2, M3) are provided to save and recall three mast positions for adjustment of the mast. These M1, M2, and M3 memory positions are separate from the camera memory positions. To operate the memory buttons, move the mast to the

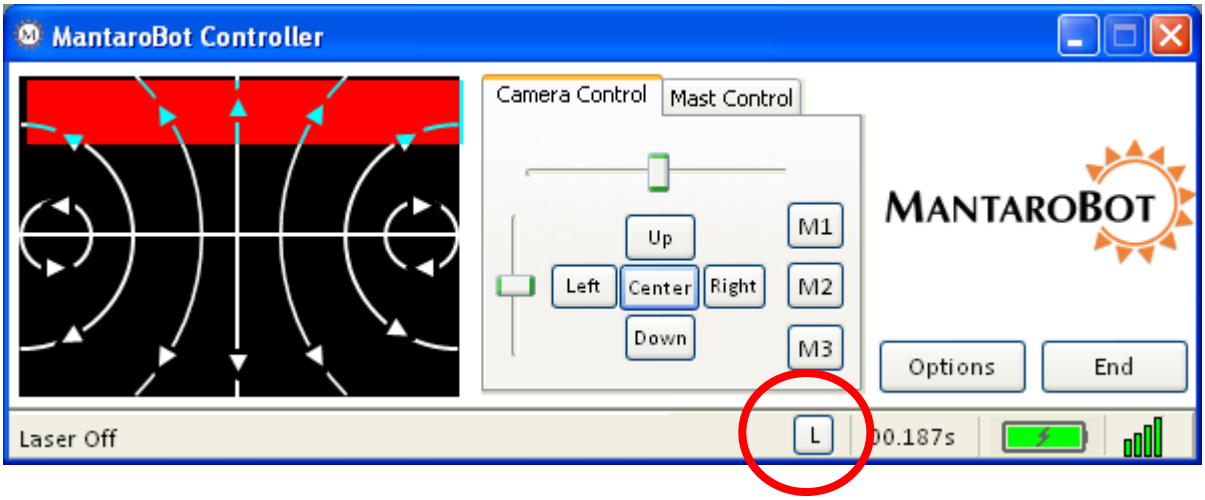
desired position and press the button for 3 seconds to store the present position. The user is notified via a message on the status bar when the position is successfully stored.

Any subsequent clicks of the memory button will adjust the mast to the stored position and the status bar will indicate that the memory position was recalled.

Additionally, the mast positions can be recalled using Shift + 1, 2, or 3 key on the keyboard. This is useful for recalling previously mast positions with one hand while driving with a mouse in the other. Note: The keyboard keys can not be used for saving memory positions. They are for only recalling memory positions.

Shift-1 = recall M1 mast position
Shift-2 = recall M2 mast position
Shift-3 = recall M3 mast position

7.5.4 Laser Pointer



If the MantaroBot is equipped with a Laser Pointer the "L" button at the bottom of the Controller window will not be grayed out. Clicking on the "L" with your mouse or alternatively hitting the "L" button on your keyboard will turn the laser on/off. The laser can be pointed by using the Camera Control functions.

WARNING: Care must be taken to avoid shining the laser at someone's eyes. This can be dangerous and may cause permanent eye damage.

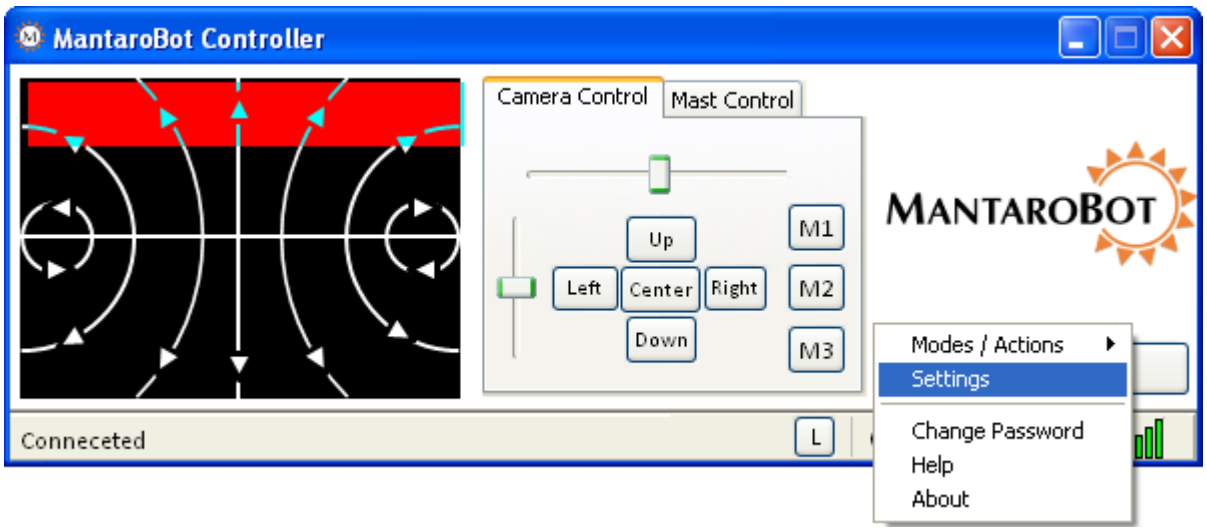
7.6 Options – Settings

Clicking on 'Options' and then 'Settings' provides three tabs of menus for User Administration, Robot Settings, and Controller Settings. The User Administration and Robot Settings tabs will only appear if the user logged in has administrative privileges.

7.6.1 User Administration

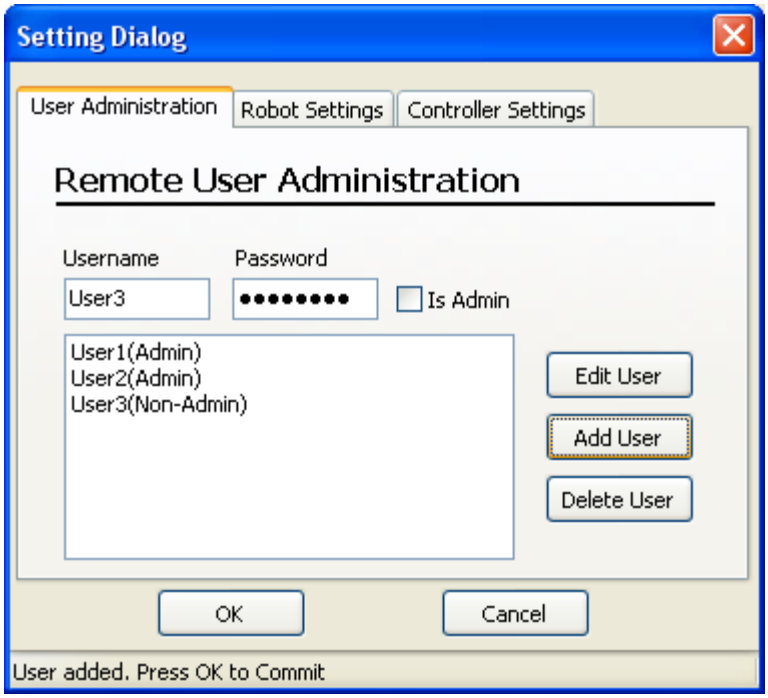
The User Administration tab allows administrators to add, delete, or edit users to the MantaroBot it is currently logged into while using the MantaroBot Controller. In other words, the user credentials can be changed remotely without having to physically go to the MantaroBot location and use the MantaroBot Robot application. This is useful for providing temporary access credentials to a guest or adding a new user. The following steps describe the procedure:

1. Click on the 'Options' button and select 'Settings'.



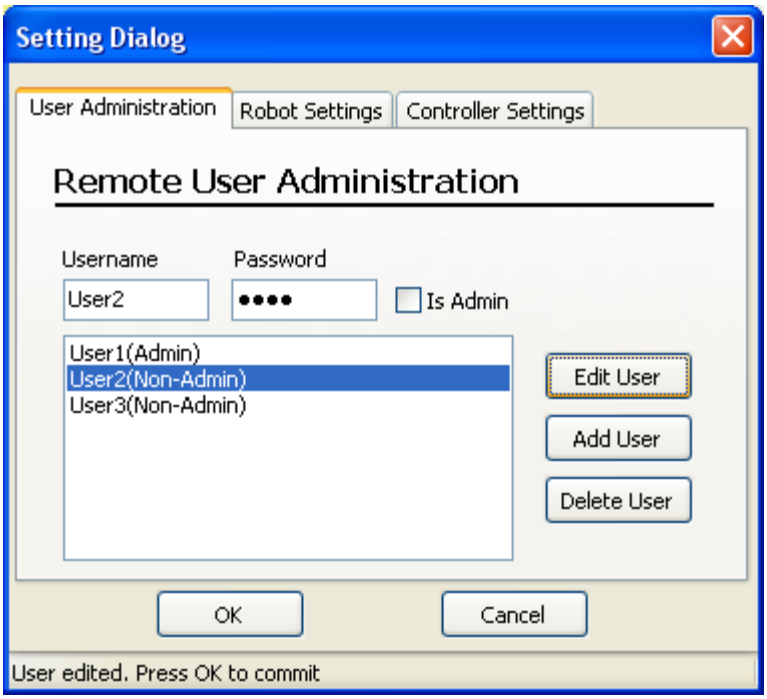
2. Click on the User Administration tab to add or delete users.

3. You will see the current user list in this dialog box. To add a new user, fill in the Username and Password fields. Then select "Is Admin" if the user is to have administrator privileges and click on "Add User".

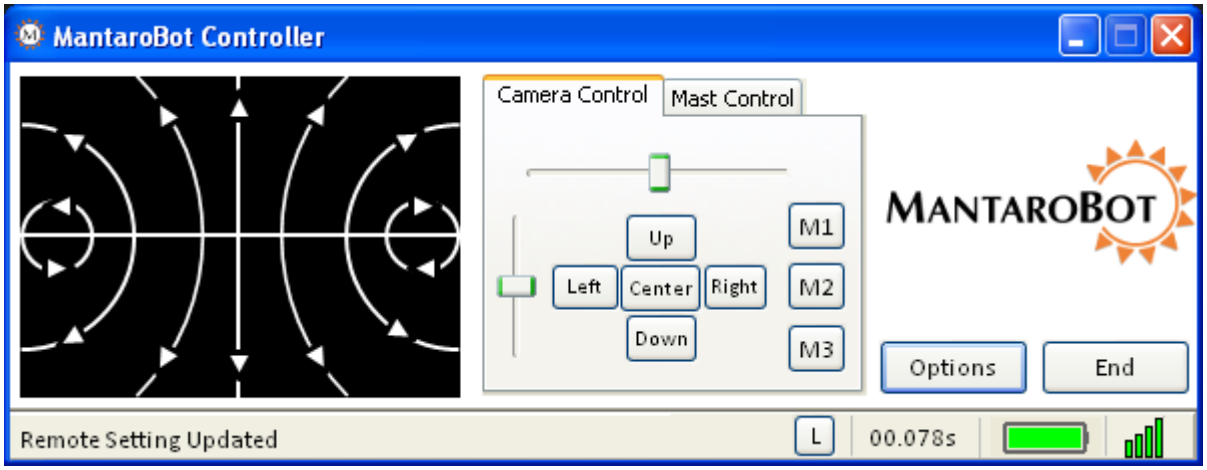


4. To delete a User, select the user and click "Delete User".

5. To edit a user's information, click on the user and edit his username and password. Once you are done editing press 'Edit User' to make the modification.



Note: The changes to 'Add User', 'Delete User', or 'Edit User' are not uploaded and saved to the remote MantaroBot (the robot currently logged into) until the 'OK' button on the bottom of the window is clicked. The message, 'Remote Settings Updated', will appear on the Controller status bar to indicate that the user names and passwords have been stored once the 'OK' button is pressed. If the 'Cancel' button is pressed before the 'OK' button, all changes will be lost!



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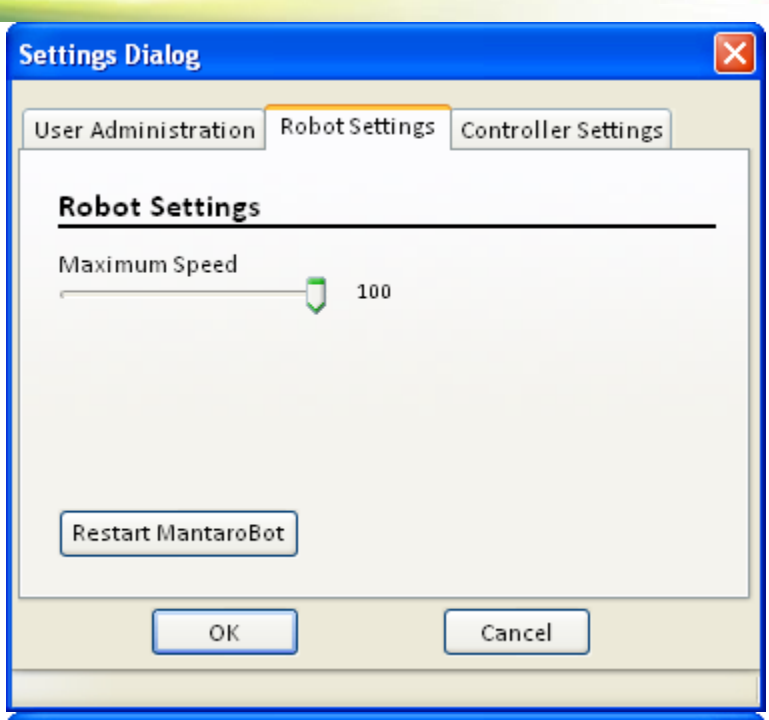
7.6.2 Robot Settings

The Robot Settings tab allows administrators to set the maximum speed (value 40 to 100) of the MantaroBot currently logged into. Similar to the User Administration tab, changes will not be saved and uploaded to the MantaroBot, until the 'OK' button is pressed. The Restart MantaroBot button allows the user to cause the Netbook computer to be restarted.

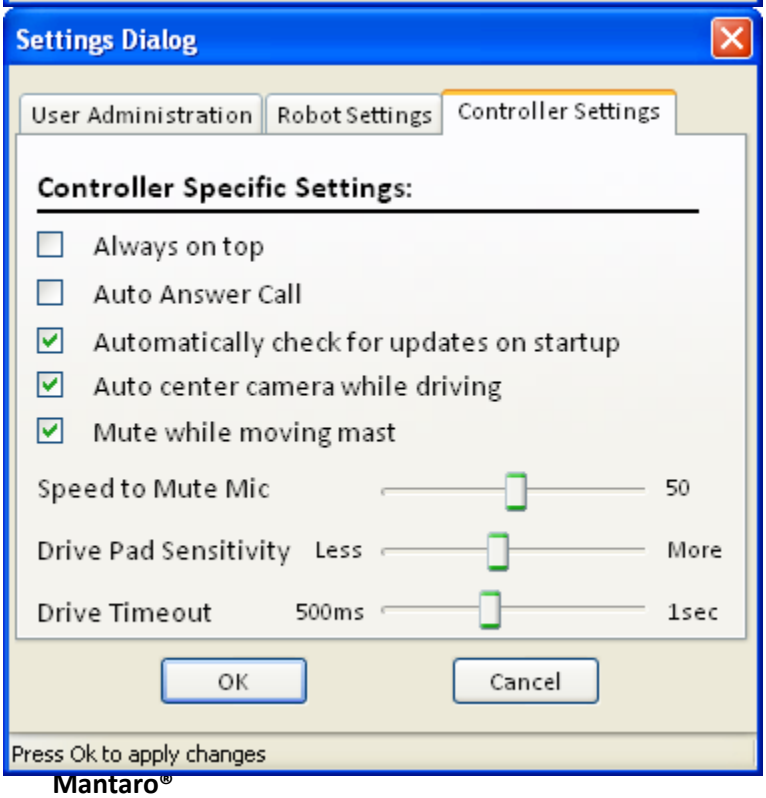


7.6.3 Controller Settings

The Controller Settings tab is accessible to all users and allows the user to configure the settings of the MantaroBot Controller application installed on the remote computer. **NOTE: These settings are not MantaroBot specific and will apply regardless of which MantaroBot the user is connected to. The Controller Settings tab is also accessible from the 'Options' button on the Login screen.**

The user can:

1. Select if the application window is 'Always on top' or not.



2. Enable/Disable Controller application to auto answer the call when MantaroBot calls back during login process. [Default: Disable]

3. Enable/Disable checking for software updates when Controller application launches. Checking for updates for the Robot Application must be done via the About window after logging into a MantaroBot. [Default: Enable]

4. Set the turning radius sensitivity of the Drive Motor Control pad.

5. Select percentage of total drive speed at which to mute the microphone on the MantaroBot to prevent feedback noise.

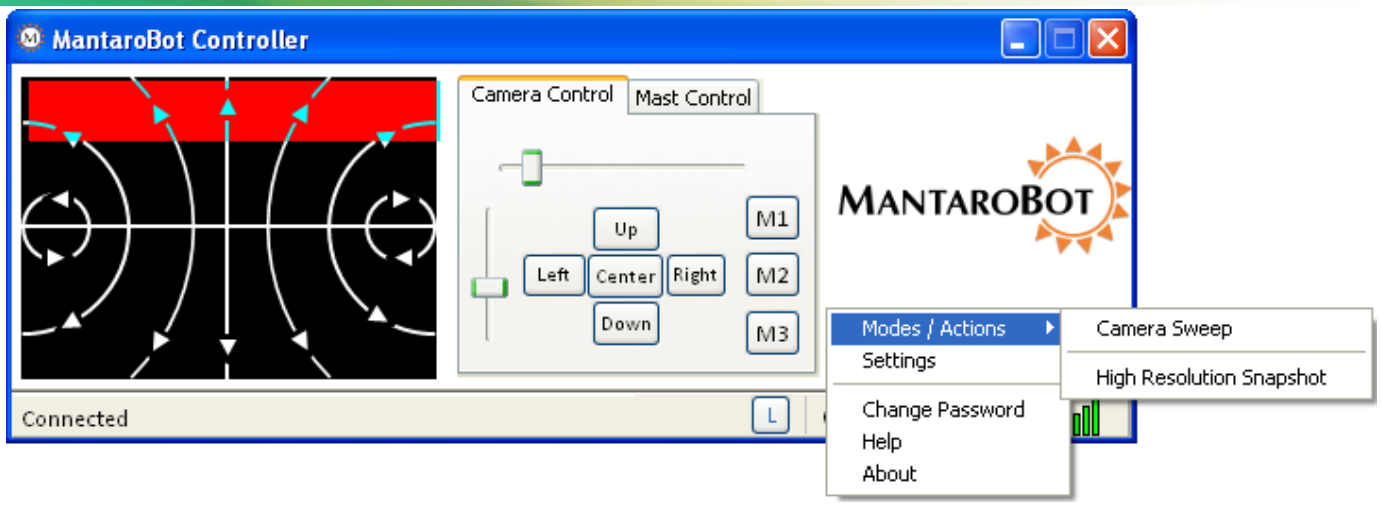
6. Drive timeout is a setting related to connection delay. When the Drive timeout crosses the current setting threshold (equal to a certain connection delay value), the MantaroBot will be stopped from moving. Set the drive timeout to be high or low depending on the quality of your connection. If the connection is bad, set the drive timeout to a higher setting to prevent the MantaroBot from stopping drive movements. However, setting the drive timeout to a high setting with a bad connection also means that drive control movements could be quite delayed.

7. Enable/Disable Muting of Microphone when Mast is moving (only for MantaroBots equipped with a motorized mast). When enabled, the microphone on the MantaroBot will be muted while the motorized mast is moving up or down. [Default: Enable]

8. Enable/Disable Auto-Centering of the camera when the MantaroBot is being driven. Enabling the auto-center feature will center the camera in the pan direction once the MantaroBot has reached a predefined speed. The tilt of the camera will not be auto adjusted and will remain under user control to tilt up/down as the user desires. Recalling memory positions while driving the MantaroBot will recall the tilt position only. [Default: Enable]

7.7 Options – Modes/Actions

There are several 'Modes / Actions' that the MantaroBot can take or be placed into for various applications. Clicking on 'Options' and then 'Mode / Actions' will show the currently offered choices.



7.7.1 Modes

Camera Sweep – Placing the MantaroBot in this mode will automatically pan the camera side to side a full 180 degrees (at the current camera tilt setting). One use for this mode is to provide surveillance of an area. To enable/disable this mode simply select it from the menu.

7.7.2 Actions

High Resolution Snapshot – The camera on the MantaroBot has the ability to take high resolution pictures. This is useful if the video image is degraded due to poor link quality. Clicking on this menu item (keyboard shortcut: Shift-P) will temporarily suspend the video to take a picture. The picture will automatically be transferred to the remote user's computer and be placed in the "My Pictures" directory under "My Document". The status bar on the Controller application will provide file transfer status.

7.8 Options – Change Password

The user can change their password by clicking on 'Options' and then 'Change Password'. This password is only updated for the MantaroBot that the user is currently logged into.

7.9 Options – Help / About / Accessories

7.9.1 Help

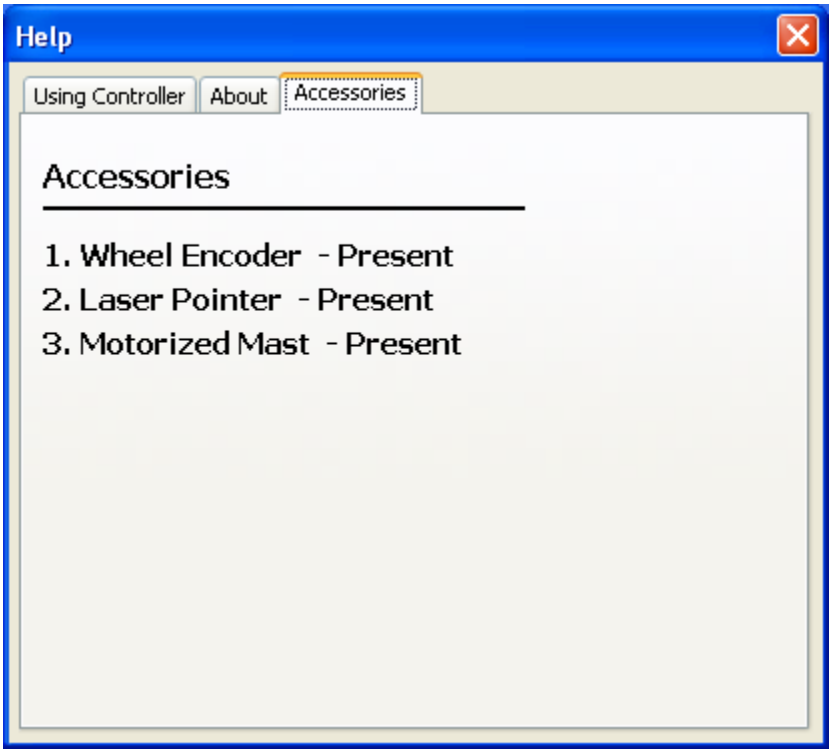
The 'Help' window selectable from the 'Options' button currently provides a link to where the latest version of this User Guide resides. The 'About' and 'Accessories' tab can be selected once the Help window is open.

7.9.2 About

The 'About' window selectable from the 'Options' button shows the version number of the MantaroBot Controller application and components of the MantaroBot (if in an active call). When the controller is not logged on to any MantaroBot, the window shows the version number for MantaroBot Controller application only. However, once the call is established, the version number for the remote MantaroBot's Robot Application, Firmware, Hardware and serial number will be displayed. This information is useful in any tech support inquiries. This window also provides links to the MantaroBot support site and ability to check for updates. Available updates will be checked for the MantaroBot Controller and if in a call, will also check for updates for the MantaroBot itself. **Note: Updates that are available for the MantaroBot Robot Application can only be installed by a user local to the MantaroBot.**

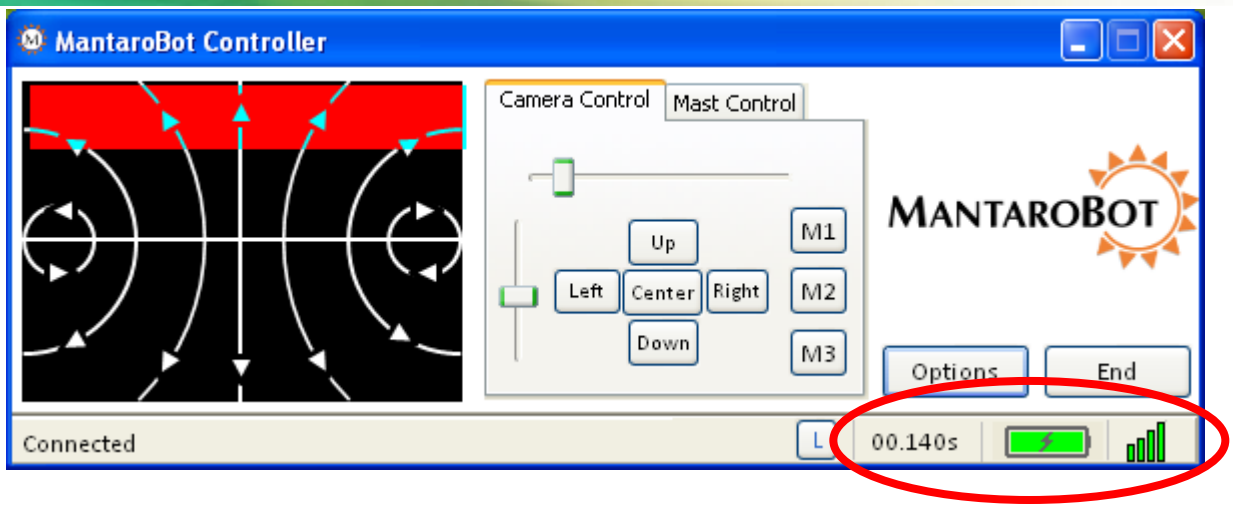
7.9.3 Accessories

The 'Accessories' window is accessible by first selecting 'Help' or 'About' from the 'Options' button on the Controller application. Then click on the 'Accessories' tab at the top. This window lists all of the accessories for the MantaroBot the user is currently logged into. Based on the accessories that are present (absent), the Controller application will enable (grey out) certain features or enable (remove) certain tabs (e.g. user will not see a Mast Control tab next to the Camera Control tab if a Motorized Mast is not installed). **NOTE: Optional Extended Battery is not considered an accessory and will not be displayed on the Accessories list.**



7.10 Miscellaneous

This section describes the in-call status information provided at the bottom right of the Controller application.



7.10.1 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.

7.10.2 Battery Indicator

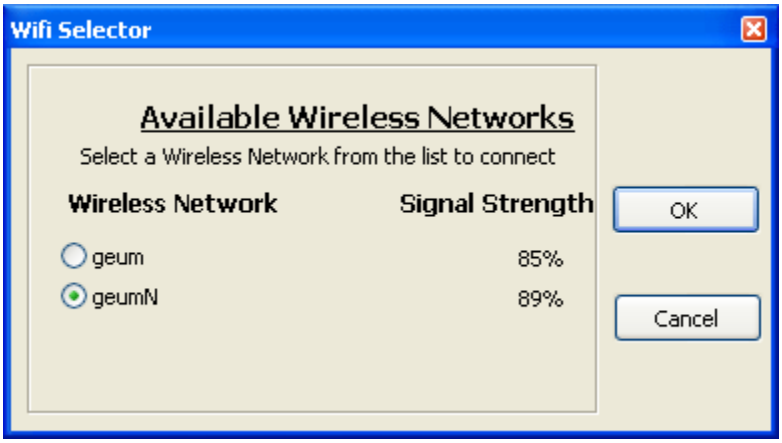
The battery indicator provides status of the internal MantaroBot battery. A lightning bolt will display in the indicator when the battery is being charged. When it is not being charged, rolling the mouse over the indicator will provide remaining time information for the battery.

Below a certain battery charge level, the color of the indicator will turn red and the status bar will show a message stating “Battery very low. Charge now!” If the battery reaches a very low voltage, the call will automatically end.

7.10.3 Wifi Meter

The Wifi meter provides Wifi strength information for the location where the MantaroBot is currently located. It is a good idea to keep the MantaroBot away from an area where Wifi coverage is poor, otherwise you may lose connection to the MantaroBot and not be able to regain it. Using the Wifi meter to determine if you are driving into an area with poor coverage will prevent this situation from occurring.

Double-clicking on the Wifi meter will provide more details (example below) and also allow the user to switch the MantaroBot to a different Wifi network if one is available. Switching to a different Wifi network, generally, will not cause the call to drop.



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8 Using 3rd Party Accessories

The MantaroBot can accommodate the use of several third party accessories. One accessory that can be quite useful for those local to the MantaroBot is a Bluetooth® Headset and another is a USB joystick for controlling the MantaroBot instead of a mouse. The notebook computer used in the MantaroBot supports Bluetooth.

8.1 Bluetooth® Headset

In situations where the remote user wants to have a more private conversation (rather than his/her sound coming out of the speakers for everyone to hear), or in noisy environments where the MantaroBot may be located, using a Bluetooth Headset can be very beneficial.

MantaroBot has been used with the "VXI BlueParrott Roadwarrior B250-XT Bluetooth Wireless Headset" and the "Motorola MOTO**ROKR** S305". To use this particular Bluetooth Headset follow these steps:

1. Turn on Bluetooth in the Robot's notebook computer. Go to "Device and Printers" from the Windows Start menu (or by using the "control" shortcut in the RUN window), select the Bluetooth built in module, right click on it and select "Bluetooth settings". When the Bluetooth options settings window opens, select the option that says "Allow Bluetooth Devices to Find This Computer" and click the "OK" button to save the setting and close the window.

2. Next, get Windows to search for the Bluetooth headset. Go to the Windows Control Panel and click on "Add a device" under "Hardware and Sound". Windows will now begin to look for Bluetooth devices and display them in the window once found.

3. Turn on the Bluetooth headset. Look on the headset for the main function button. Press it and hold for a few seconds. Majority of the Bluetooth headsets begin to blink an LED once turned on. Once the LED is blinking, the Bluetooth headset will become discoverable by Windows.

4. Shortly after turning on the Bluetooth headset, Windows will detect and pair the Bluetooth headset with Windows and show it in the list of available Bluetooth devices. Once the name of the Bluetooth headset is shown on the computer screen, select it with the mousepad and click the "Next" button. Windows will ask for a passkey. Enter the passkey, which is almost always "0000". In case it is not accepted, look for the passkey supplied with the Bluetooth headset manual.

5. Once the above Windows Bluetooth configuration process is complete, the Bluetooth headset will connect to the notebook computer and will be available for use to make Skype Calls.

6. To have the Bluetooth headset answer the call when the headset is on configure Skype's audio option such that Bluetooth headset is used, when available as the audio gateway.

    - Go to Tools -> Options -> Audio Settings in Skype
    - Click on 'Show advanced options'
    - In the window, select the Bluetooth microphone in 'Microphone' box and move it all the way up in the list. Do the same with Bluetooth speaker in 'Speakers' box.
    - This will guarantee that when the Bluetooth headset is turned on and available for use with Skype, Skype will select Bluetooth as the audio gateways as opposed to Microphone and USB-Audio included in MantaroBot.

Please note that once the call has been answered using the Bluetooth Parrot RoadWarrior headset or the MOTO**ROKR** S305, the call can not be switched to using MantaroBot speakers and microphone without hanging up the call. To revert to using the MantaroBot speakers and microphone, disconnect the call, and restore the original Skype audio settings.

8.2 Joystick

Instead of using a mouse to control the MantaroBot, a USB joystick can be used as well. The USB joystick must be DirectX compatible.

Note: The USB joystick must be connected prior to launching the MantaroBot Controller Application.

The buttons of the joystick have been mapped to control the pan/tilt camera as well as the optional laser pointer accessory.

Drive:	**Pan/Tilt Camera Control:**
Joystick Up = drive forward	Button 1 = laser on/off
Joystick Down = drive reverse	Button 2 = tilt down
Joystick Right = turn right	Button 3 = tilt up
Joystick Left = turn left	Button 4 = pan left
	Button 5 = pan right

9 Maintenance

9.1 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 off.

NOTE: The extended battery (LiFePO4), if you have purchased one, is restricted from being shipped on passenger airplanes.

9.2 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. Disconnect battery terminals from the battery. Remove Black first then Red.
3. Remove 4 nuts holding the battery bracket in place.
4. Remove the battery bracket and battery.
5. Replace old battery with new battery, put back battery bracket and install 4 nuts.
6. Connect the Red wire to the Positive terminal of the battery first then the Black wire to the battery's Negative terminal.
7. Close and secure the front access panel using the 6 black pegs removed in Step #1.
8. Recycle or discard old battery properly.

9. Plug the charger in and charge the battery for at least 8 hours or until fully charged before driving it on battery power.

9.3 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.

10 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.

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11 Appendix A

11.1 Keyboard Mapping

Below is a map for all the keyboard shortcuts that can be used to control the MantaroBot.

Pan/Tilt Camera Control:

A = pan left
D = pan right
S = tilt down
W = tilt up
C = center camera

1 = recall M1 camera position
2 = recall M2 camera position
3 = recall M3 camera position

Laser Pointer:

L = laser on/off

Modes/Actions:

Shift-P = take high resolution snapshot

Mast Control:

Shift-1 = recall M1 mast position
Shift-2 = recall M2 mast position
Shift-3 = recall M3 mast position

11.2 Joystick Mapping

Below is a map for all the USB joystick buttons that can be used to control the MantaroBot

Drive:

Joystick Up = drive forward
Joystick Dn = drive reverse
Joystick Right = turn right
Joystick Left = turn left

Pan/Tilt Camera Control:

Button 1 = laser on/off
Button 2 = tilt down
Button 3 = tilt up
Button 4 = pan left
Button 5 = pan right