MANTAROBOT™ CONTROLLER

for Android™

User Guide

And Operating Manual

Table of Contents

Version	Date	Change Summary
1.0	11/13/2015	- Initial Customer Release.
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		-

Note: New or significantly modified features from previous versions in the future will be marked as

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MantaroBot will not be held responsible for misuse of the telepresence robot that results in damage or harm to the robot itself, the user device (tablet or smartphone), other people or the surroundings in which the robot is used.

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MANTAROBOT

1 Introduction to the MantaroBot Controller for Android

The MantaroBot Controller for Android provides a convenient way to connect to and drive your MantaroBot just by downloading the "MantaroBot Controller for Android" app available on Google Play. Simply open the app on your device, add a new MantaroBot or select an existing one from the list, enter your user name and password and you are up and running.

There are two user interfaces available for controlling the MantaroBot with your Android mobile device: one with touchscreen joystick style controls and another using the device's accelerometers. The MantaroBot Controller is designed for everyday use and convenience. For more detailed information about your particular MantaroBot, please see their associated User Guide and Operating manual.

1.1 WARNINGS

USER DEVICE INSTALLATION – If you are using a TeleMe or TableTop TeleMe, PLEASE ensure that the user device (i.e. tablet or smartphone) is plugged all the way into the device holder and is fully mated with the docking connector inside the bottom of the device holder. If a landscape holder was purchased for a user device (e.g. iPad) that has the charging connector on the short side (normally designed for charging in portrait orientation), please insure the lock on the back of the holder is turned to the lock position. Improper installation could result in your device falling out of the holder and breaking!!!

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. Note that the risk of tipping increases with the weight of the tablet that is used in the holder. If you have purchased a Tablet weighing more than 20 ounces additional care should be taken such as reducing the acceleration setting in the controller.

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. It is recommended that the camera on the user's device be tilted down such that obstacles can be readily seen when driving the MantaroBot.

NETWORK DELAY – The video coming from the camera and the robot control commands may travel through the network with varying amounts of delay. Due to the varying delays, the video you are viewing may not represent the current location of the MantaroBot. Network delays can cause 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.
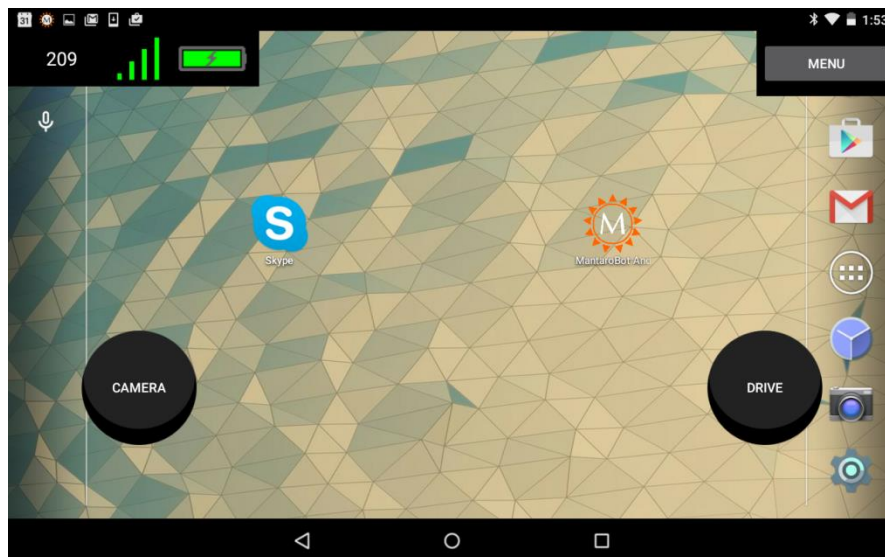
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SECURITY – The MantaroBot has user level password control to help prevent unauthorized access. However Skype and other video conferencing applications can be configured to various levels of permission for accepting calls as well. It is recommended that you review the Call Settings for the video conferencing application in use on your tablet or smartphone.

2   Connecting to MantaroBot

2.1   Using the MantaroBot Controller with your A/V Application

The MantaroBot Controller must be used with an Audio Video conferencing application such as Skype, Google Hangouts, Polycom, Jabber, Zoom or similar application. Such application allows you to see and hear what is going on around the MantaroBot. The MantaroBot Controller can share the screen and can run simultaneously with the audio/video conferencing application of your choice.

Note: It is suggested that a mobile device video camera be used at all times so 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.

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## 2.2   Connecting to your MantaroBot

The MantaroBot Controller has the flexibility to be configured to use one of two available robot control paths to provide the network connection between the MantaroBot Controller and the MantaroBot to control its various robot functions (e.g. drive, pan/tilt, laser, etc.). The control path is independent of the video application and allows the user to use any audio/video conferencing application.   The audio/video conference itself can be established from a separate device than the one running the controller if desired.

To establish a connection between MantaroBot and the MantaroBot Controller, user needs to select a robot control path for that particular call session. Below are the two available robot control paths and some differences between them. There is also a third option "AUTO" which will automatically choose one of the control paths below for you.
1. Direct Socket connection
    a. Use any application available (including Skype) for the user device for audio/video conferencing
    b. Can run audio/video conferencing application from a separate device than the device running the controller application
    c. Uses direct socket connection between MantaroBot and the Controller for communicating robot control commands (free, no additional user cost incurred) Primary use for within private/corporate networks (including remote user via VPNs) where traffic does not or cannot leave the IT infrastructure.
2. MantaroBot Communications Service (MCS)
    a. Use any application available for the user device for audio/video conferencing
    b. Can run audio/video conferencing application from a separate device than the device running the controller application
    c. Use MantaroBot Communications Service (cloud based service) for communicating robot control commands (monthly service plan required – please contact MantaroBot for more information)
    d. Uses port 80 for data transfer alleviating the need of port forwarding for NAT traversal

3. AUTO – This selection will automatically cycle through the above control options when attempting to log into the MantaroBot. The control path order that the AUTO selection tries is as follows: 1) Direct Socket 2) MantaroBot Communications Service

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2.3 Adding MantaroBot

1. Launch the MantaroBot Controller for Android app on your Android device. If you have added MantaroBot(s) to your app previously, a list of all the robots will be displayed as shown below.
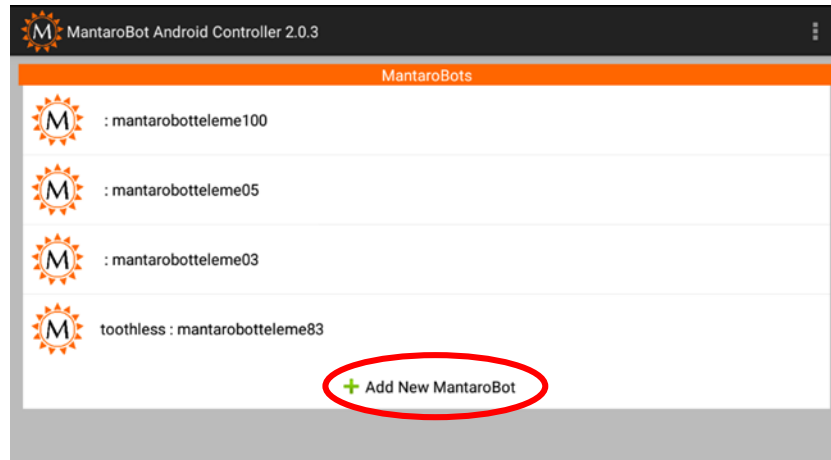

2. If you have not added any MantaroBots to your app, click on "+Add New MantaroBot". Enter the name/serial number (mantarobottelemexx) or IP address of the MantaroBot (xxx.xxx.xxx.xxx) and the alias you wish to call it.
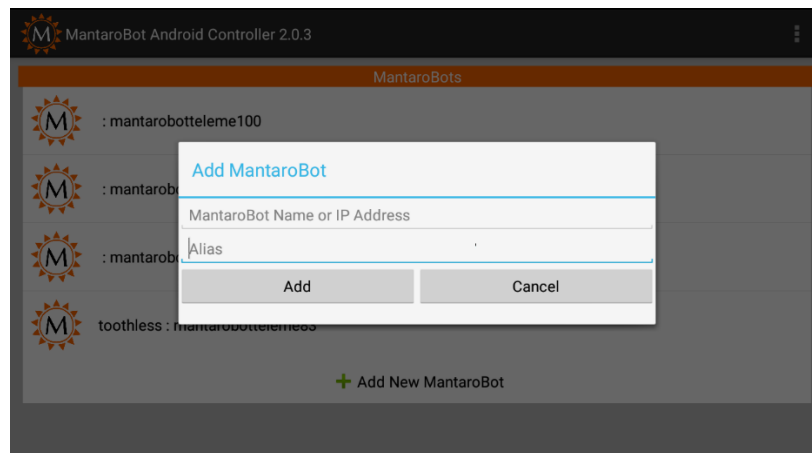
2.4 Login Step by Step Instructions

1. First, dial into the MantaroBot using the Audio/Video conferencing application of your choice. This will allow you to view the MantaroBot's camera before logging in to control the robot.

2. Launch the MantaroBot Controller for Android app on your Android device. Select a MantaroBot to connect to from the list. Then, enter your username and password credentials in to the fields.
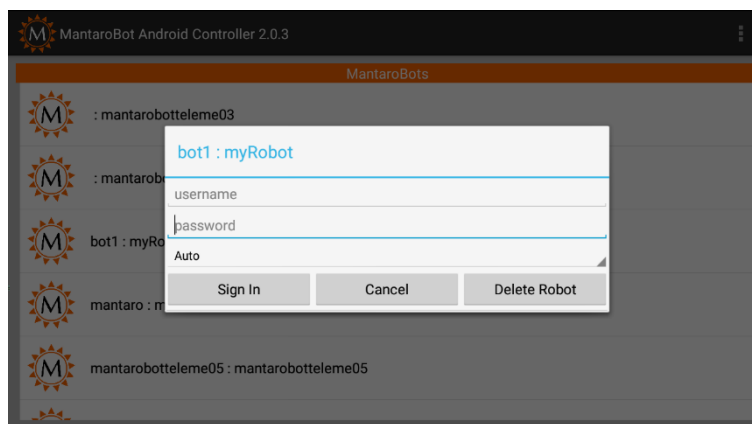
3. Select the robot control path using the drop down list.
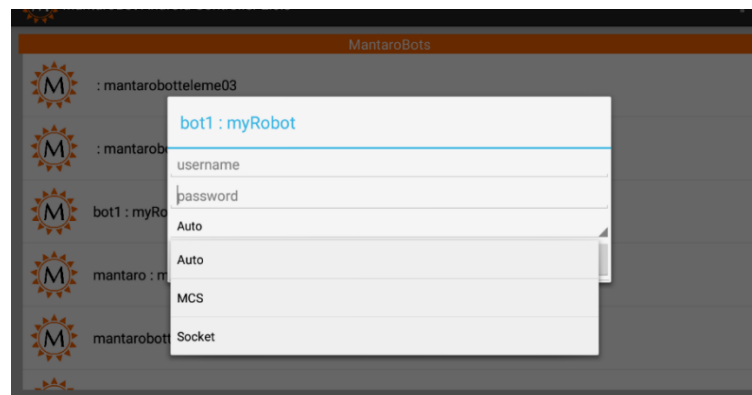
4. Once you have entered your information you can log in by clicking the "Sign In" button.
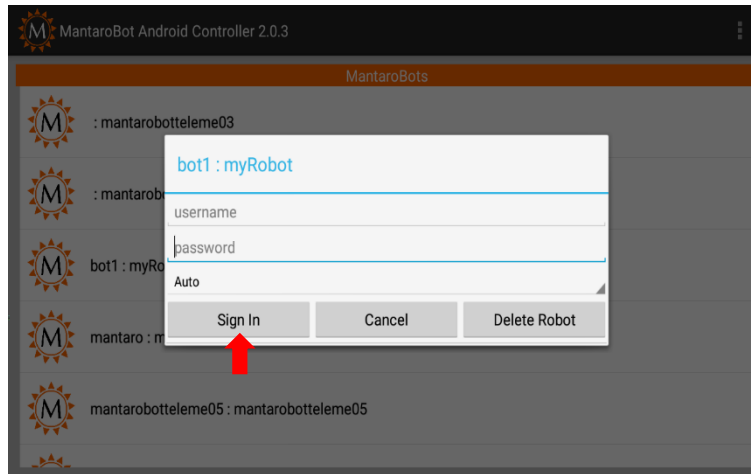
2.5 Deleting MantaroBot

Select a MantaroBot you want to delete from the list and click on "Delete Robot".
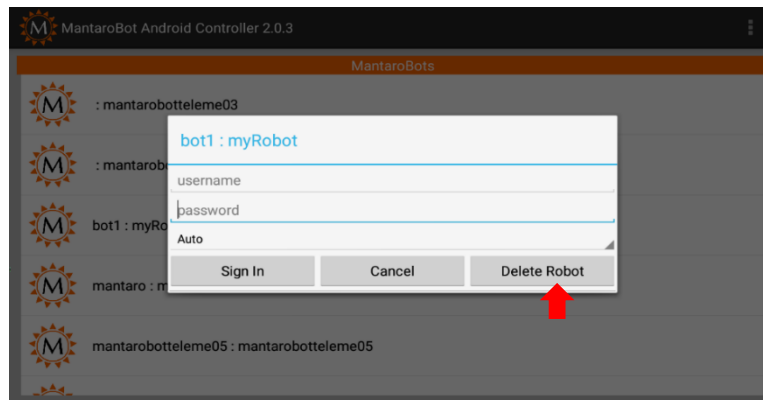
3   Control Overlays

Once you login to a MantaroBot you will see the controller user interface overlaid on the mobile device's screen. The MantaroBot Controller user interface has four sections. The top left corner is for providing status of the robot, the top right corner is for the "Menu" options, the bottom left corner is for camera control (Tilt / Pan Control) and the bottom right is the control for driving the MantaroBot.

NOTE: The next two sections 3.1 and 3.2 and section 3.5.3 do not apply to the TableTop TeleMe. The user interface for the TableTop TeleMe will not include drive controls shown on the bottom right in the picture on the next page.

3.1   Driving MantaroBot

MantaroBot Controller for Android allows the user to control the MantaroBot's drive motors. There are two modes for driving the MantaroBot.

1. Joystick Control Mode (Select 'Use Joystick' in the Menu): Joystick is the default setting when the user logs into a MantaroBot. Press your thumb on the drive button and drag your thumb in the direction you wish the robot to go. To stop the robot, release your thumb.
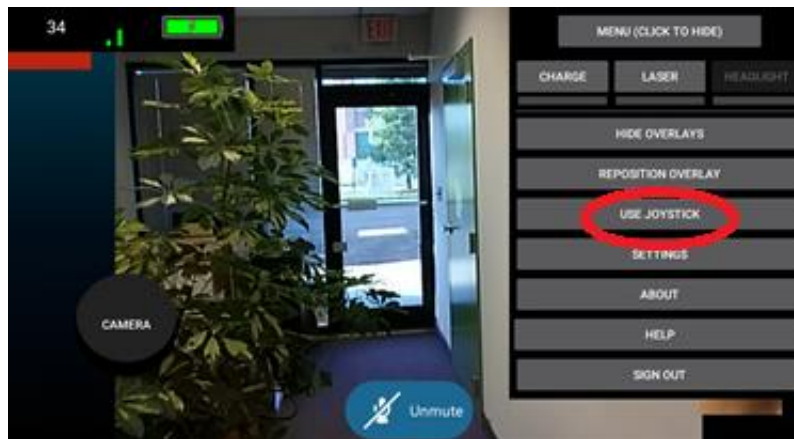
2. Accelerometer Control Mode (Select 'Use Accelerometer' in the Menu): Press your thumb on the drive button and tilt the device in the direction you wish the robot to go. To stop the robot, release your thumb.

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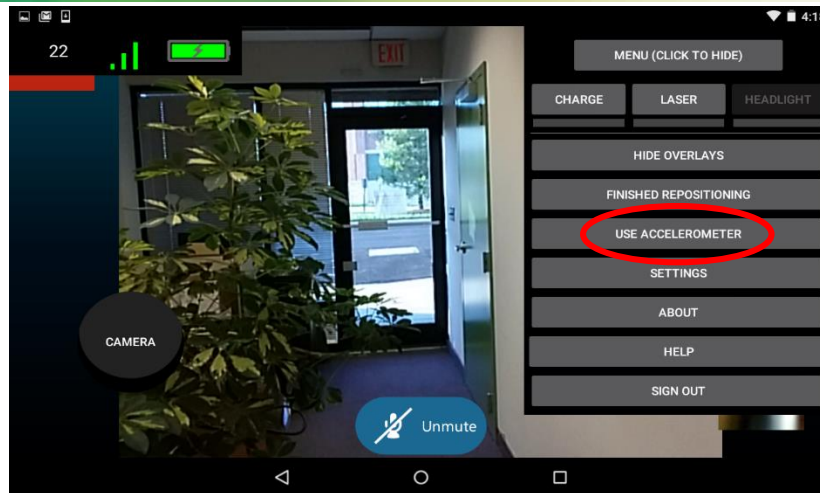
Below is a picture displaying the drive button that must be pressed to move the MantaroBot.

3.2 Proximity IR Sensors

Some of the MantaroBot products are equipped with obstacle detecting IR sensors. The sensors detect obstacles approaching and will inform the user through indicators on the Controller's screen. In the example below, feedback is shown from two IR sensors on a MantaroBot TeleMe (located near left and right drive wheels). As the left drive wheel of the robot approaches an obstacle in the front, a half red or white bar will appear on the top left corner of the device, and if the right drive wheel of the robot approaches an obstacle in the front, a half red or white bar will appear on the top right corner of the device (as shown in the following picture).
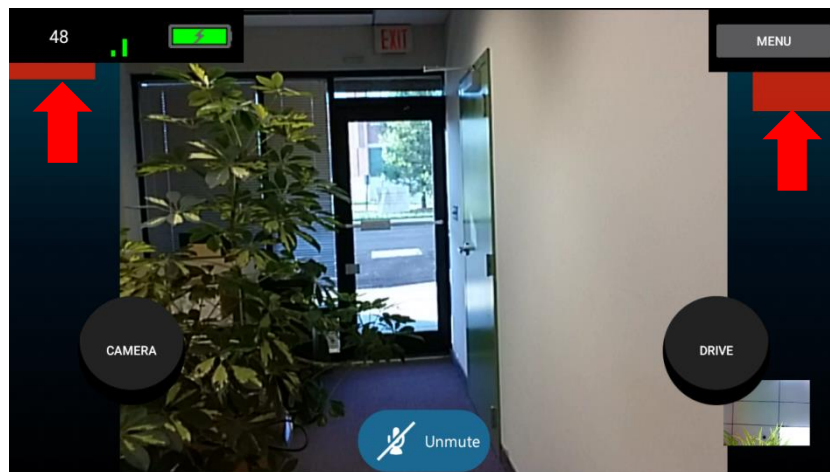
Note: To reduce the likelihood of a high speed collision (e.g. driving the MantaroBot into a wall) a feature has been included in the MantaroBot that reduces the robot's forward speed when it detects an obstacle 30 cm ahead of it. Note forward speed is not reduced if the robot is moving slowly. A red 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>.

3.3 Camera Control
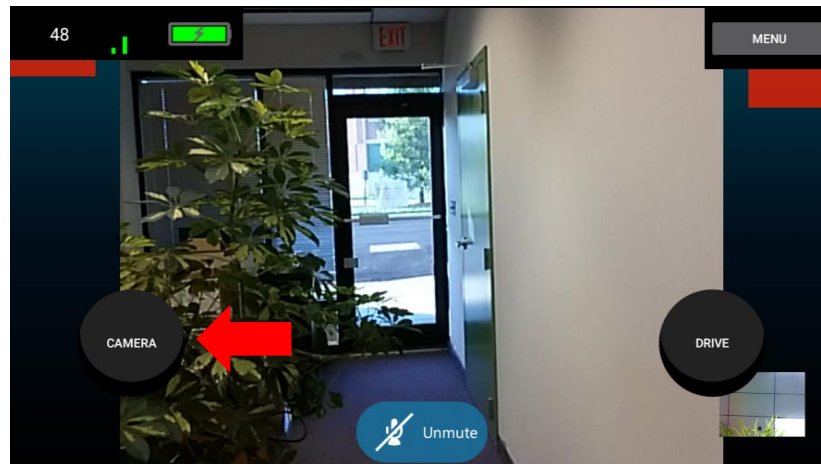
NOTE: References to "Pan" in this section only apply if your TeleMe is equipped with the factory installed optional Mast with Motorized Pan Mechanism. If your TeleMe does not have this option, the associated camera button will not work.

3.4 Pan/Tilt

The Camera overlay button allows the user to pan/tilt the "head" of the MantaroBot (which has an integrated camera) independently of driving the MantaroBot. This is useful in a meeting environment where you want to observe items or people in the room without driving the MantaroBot around. It may also be necessary to look down at times to avoid obstacles when driving. The camera will move in the direction of the thumb movement. Quickly double-tapping the Camera button will cause the head to re-center from any position.

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.

3.5 Menu

The Menu tab allows the user to control the tablet charging mode and optional laser and headlights. The menu tab also allows the user to view and change user, robot and controller settings.
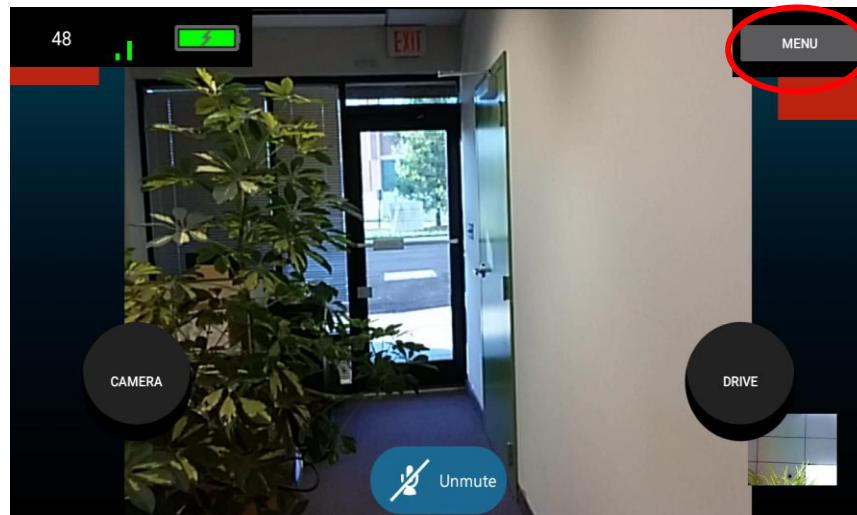
3.5.1 Laser Pointer
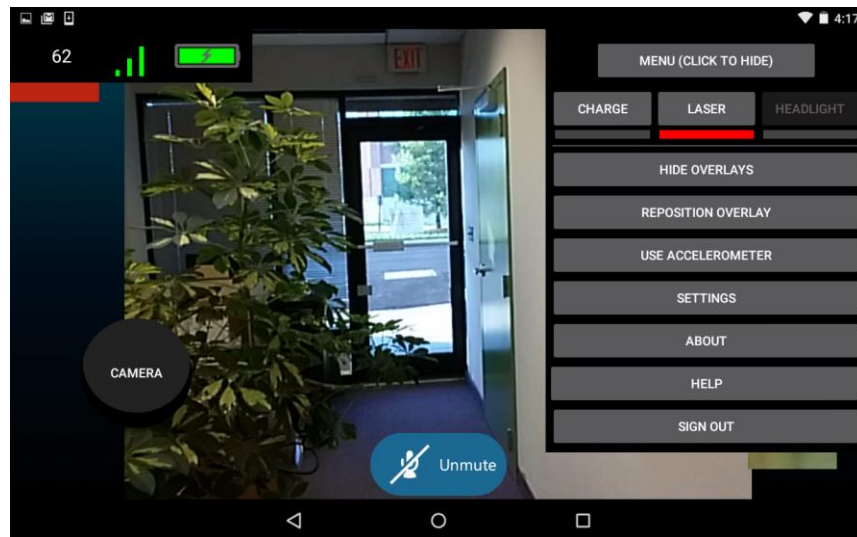
If the MantaroBot is equipped with a Laser Pointer, user will be provided with the "Laser" button inside the pull down menu. Selecting the "Laser" button will toggle the laser on/off. The laser can be pointed by using the Camera Control functions and turning it on while the camera is facing the location of interest.

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

3.5.2 Charging User Device
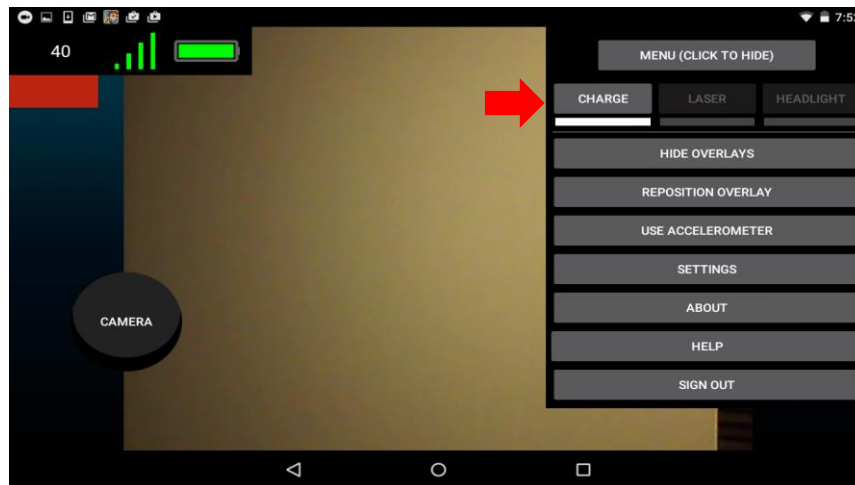
This feature applies to MantaroBot TeleMe. During a call, there may be instances when the internal battery of the MantaroBot has plenty of charge but a person local to the TeleMe may notice that the user device plugged into the device holder is running low on charge. In those instances, the remote user has the option to charge the user device (only while the call is on) by drawing power from the MantaroBot's internal battery. To do this, simply click on the 'CHARGE' button inside the pull down menu. When the call ends, the charging of the user device will also end.

If the MantaroBot is plugged into a charger, the 'CHARGE' button will not work as the user device is already being charged.

3.5.3 *LED Headlights*
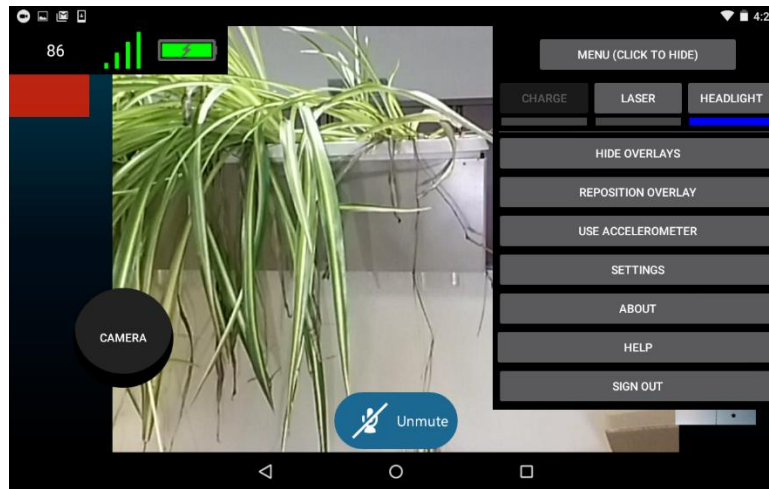
If the MantaroBot is equipped with LED Headlights, the "Headlight" button inside the pull down menu will be activated. Selecting the "HEADLIGHT" button will toggle the LED Headlights from the following states: Low beam – Med beam – High beam -OFF. The color of the "H" button will also cycle through the respective states as the button is repeatedly clicked (white – blue – red – black).

The LED Headlights are very useful for driving the robot in a poorly lit environment, for instance at night.

3.5.4 *Hide/Show Overlays*

1. Hide Overlays: The MantaroBot Controller allows the user to temporarily hide the on screen overlays by selecting "Hide Overlays" button in the Menu. This is useful in cases when the

overlay buttons prevent access to controls in the audio video conferencing application.
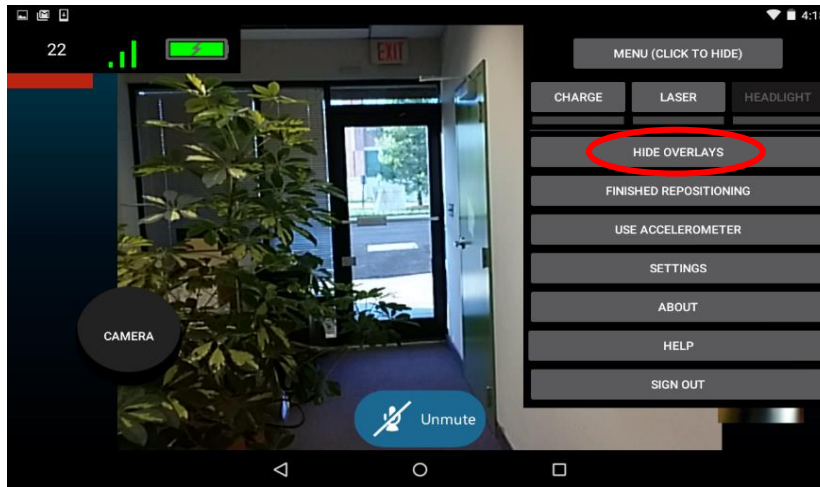
2. Show Overlays: The MantaroBot Controller allows the user to show the hidden on screen overlays by selecting the "Show Overlays" button in the Menu.
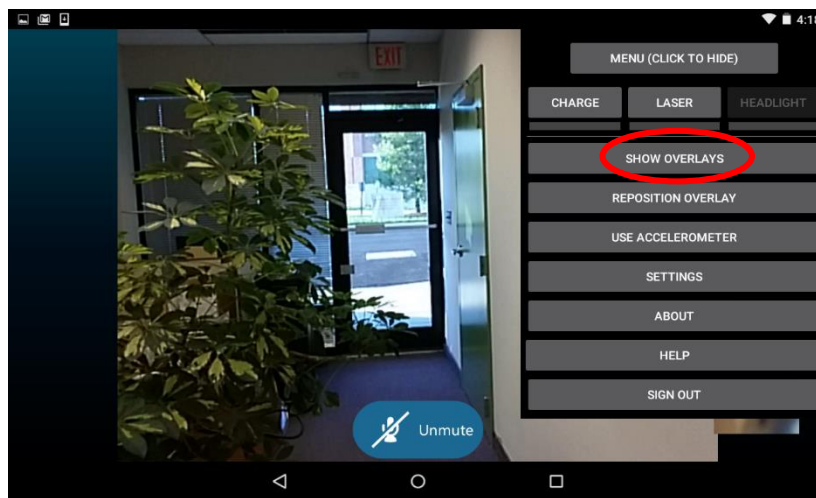
3.5.5 *Reposition Overlay*

The Reposition Overlay tab allows the user to drag the DRIVE and CAMERA buttons to the desired position. Click on 'Finished Repositioning' to save new positions.
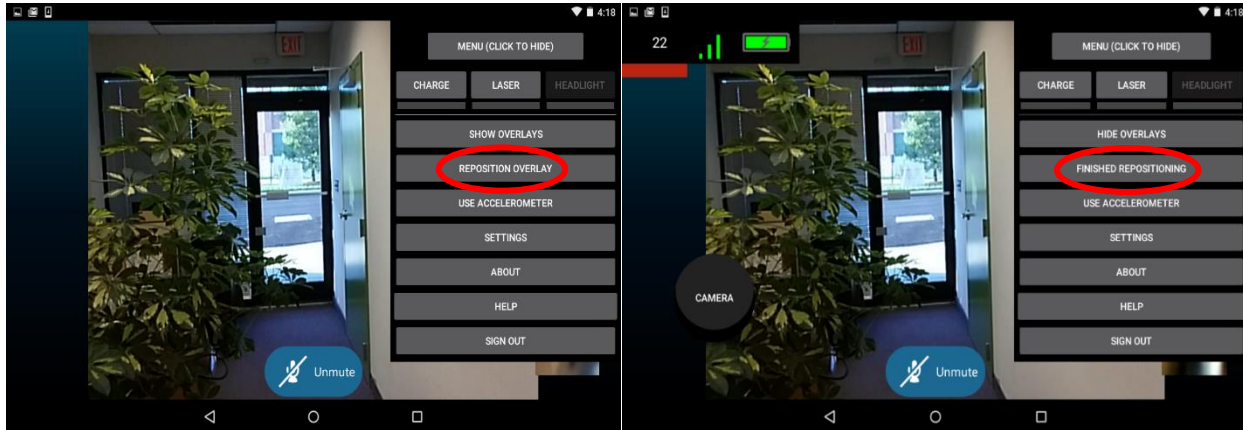
3.5.6 *Use Accelerometer/Use Joystick*

MantaroBot Controller allows user to drive MantaroBot either in Accelerometer Mode or in Joystick Mode. By default the Controller enables the joystick mode. To switch between accelerometer mode and joystick mode user needs to toggle the "USE JOYSTICK/USE ACCELEROMETER" menu option.
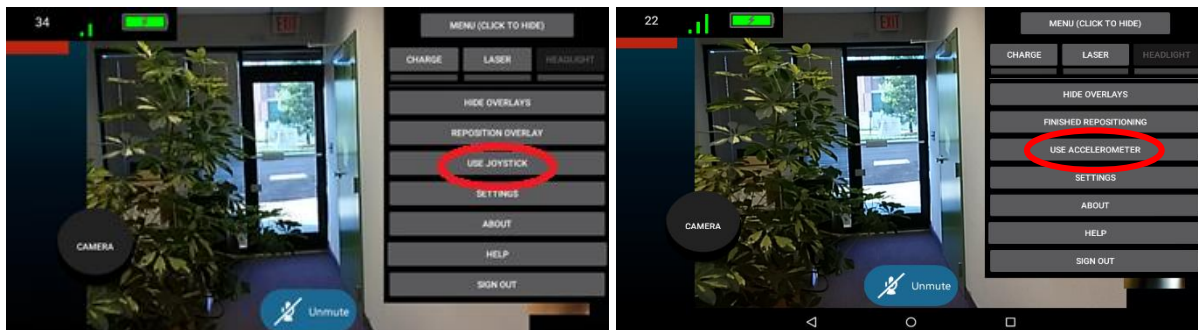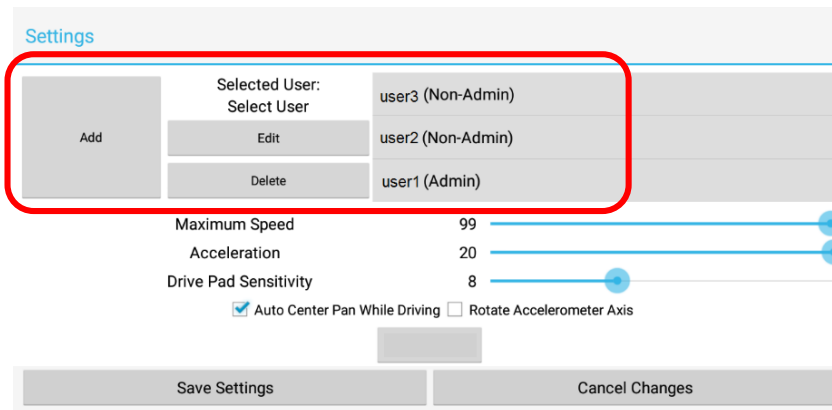
3.5.7 Settings

Clicking on 'Settings' allows user to configure the settings for User, Robot, and Controller. The Settings screen below will only be displayed if the user logged in has administrative privileges.
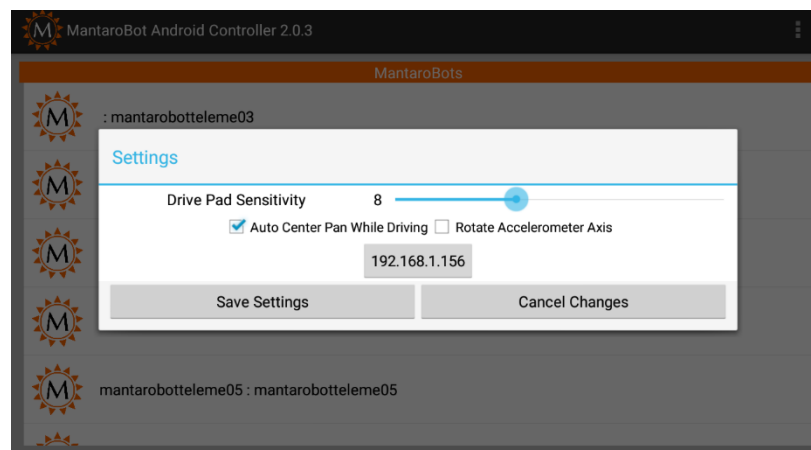
The User and Robot Settings options will only appear if the user logged in has administrative privileges. Figure below depicts the Settings Screen for the users without administrative privileges.
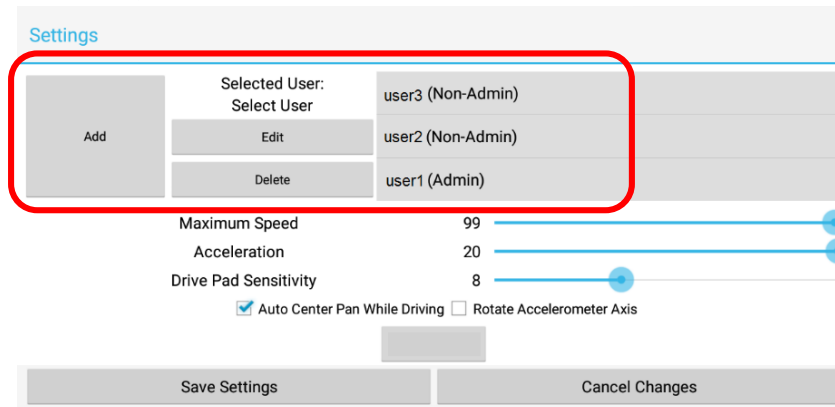
Settings allows the user to configure the settings of the Android Controller while connected to the MantaroBot. Some of the settings are MantaroBot specific and will only appear based on which MantaroBot you are connected to (TeleMe/2, or TableTop TeleMe).

3.5.8 User Settings
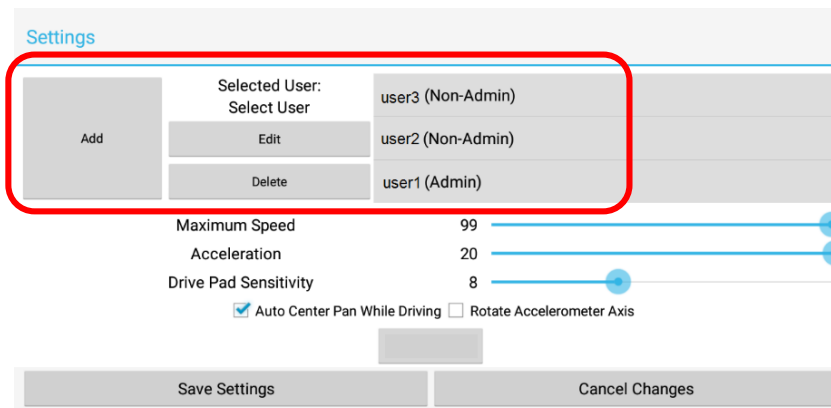
The Settings screen allows administrators to add, delete, or edit users of the MantaroBot that the Controller is currently logged in to. In other words, the user credentials can be changed remotely without having to physically go to the MantaroBot location and use the MantaroBot Robot application or MantaroBot Web front. This is useful for providing temporary access credentials to a guest or adding a new user. The following steps describe the procedure:

1. To add a User, select the "Add" button.

2. 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 "Confirm".
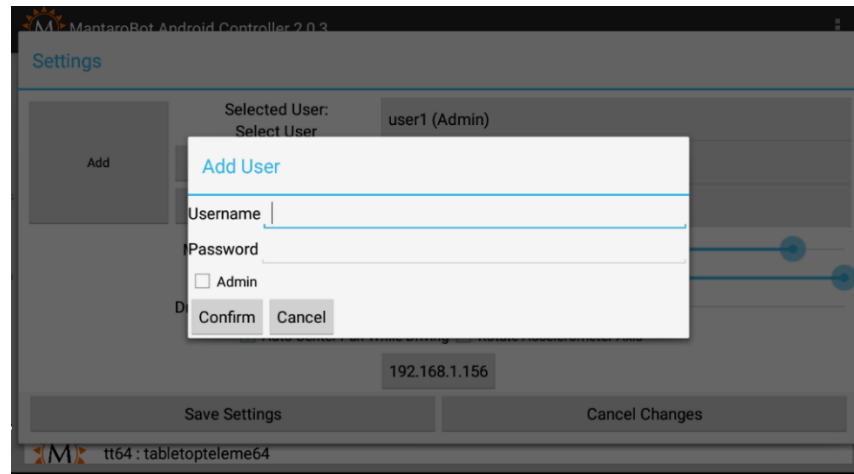
3. To Edit User's Password, select the user and fill in the "Current password" and the "New Password" and click "Confirm".
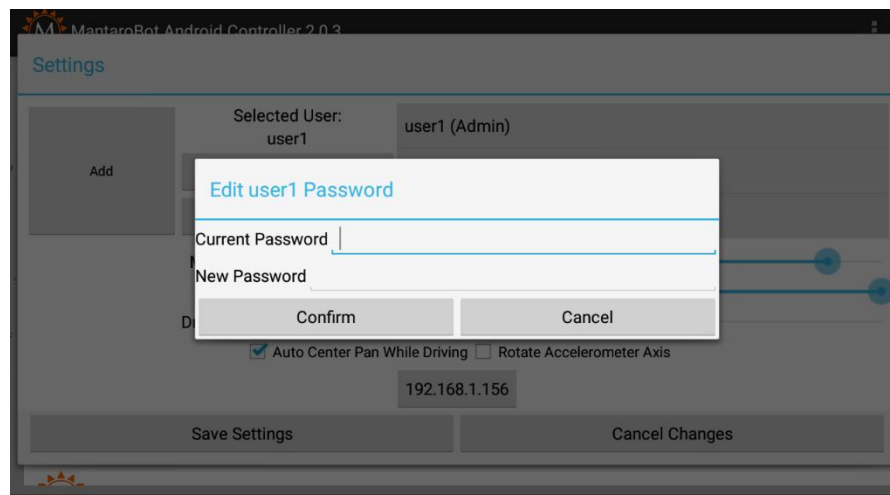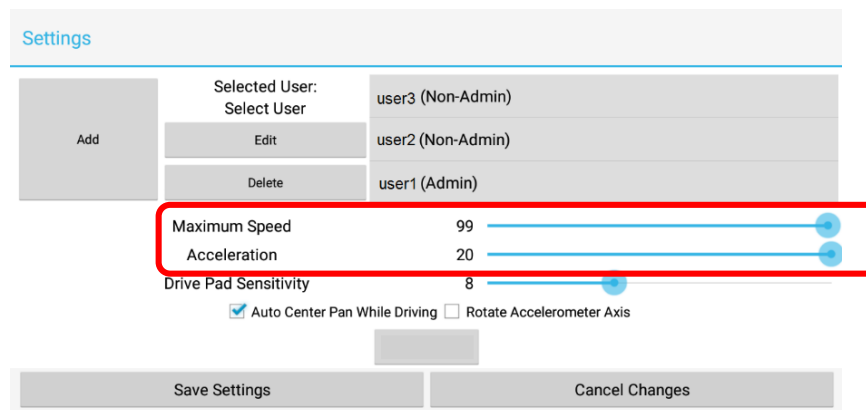
4. To delete a User, select the user and click "Confirm Delete".
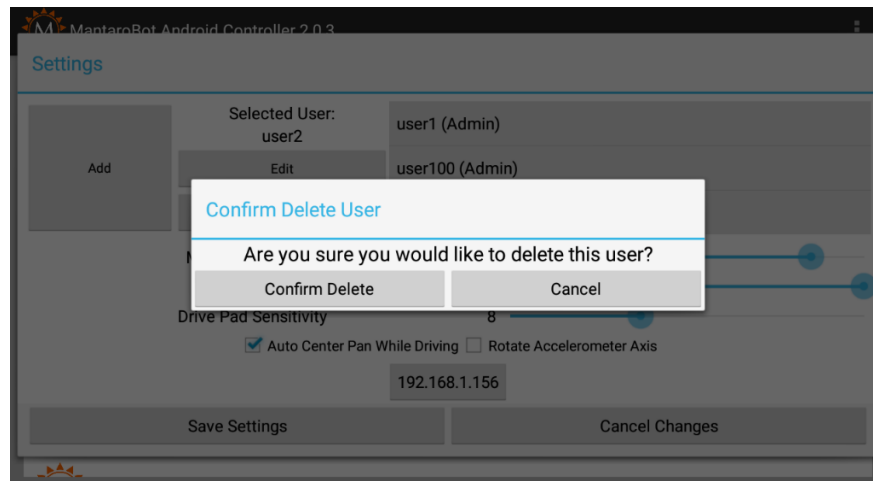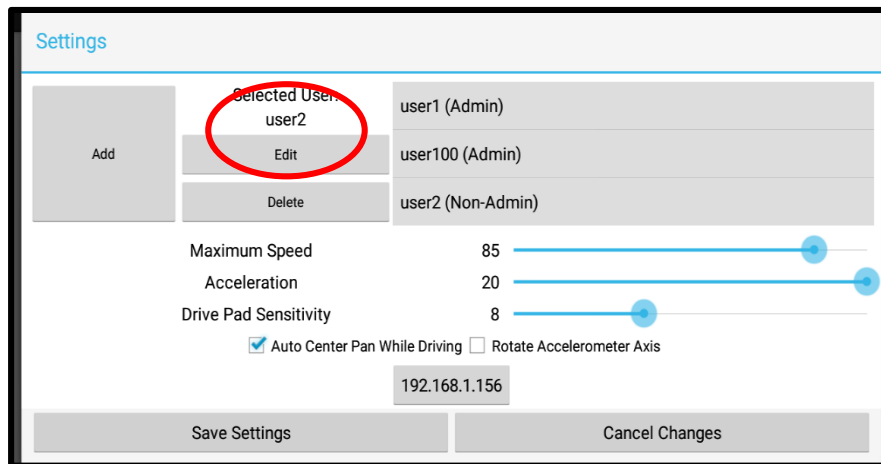
Note: The changes to 'Add User', or 'Delete User' are not uploaded and saved to the remote MantaroBot (the robot currently logged into) until the 'Save Settings' button on the bottom of the window is clicked. If the 'Cancel Changes' button is pressed, all changes will be lost!
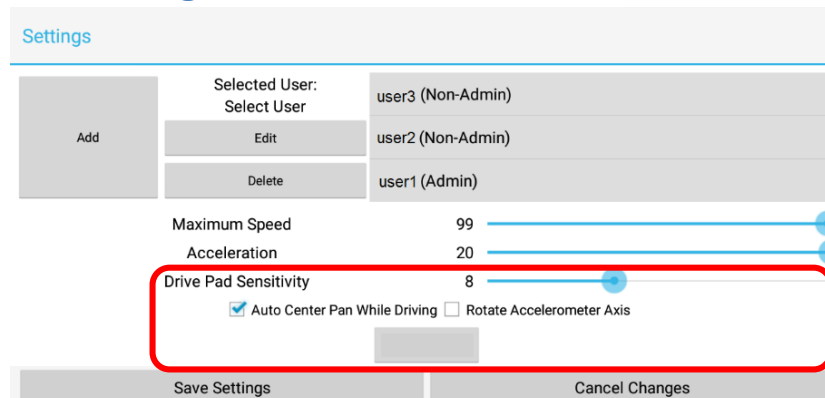
3.5.9 Robot Settings

The Robot Settings tab allows administrators to set the maximum speed (value 40 to 99) of the MantaroBot currently logged into as well as the Acceleration/Deceleration of the MantaroBot. Acceleration/Deceleration sets how abruptly or smoothly the MantaroBot will respond to drive button or accelerometer movement commands. It is recommended that the Acceleration be set to slow initially until users become familiar with the drive controls. Similar to the User settings, changes will not be saved and uploaded to the MantaroBot, until the 'Save Settings' button is pressed.


3.5.10 Controller Settings

The Controller Settings is accessible to all users and allows the user to configure the settings of the MantaroBot controller. **NOTE: These settings are not MantaroBot-specific and will apply regardless of which MantaroBot the user is connected to.**

Following features can be updated by the user:

1. Enable/Disable Auto-Centering pan of 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. If the MantaroBot is not equipped with the pan feature this setting will not be displayed in the window. [Default: Enable]

2. Set the Drive Pad Sensitivity (turning radius sensitivity) of the Drive Motor Control pad.

3. If you are logged in and on the same local area network (LAN) as a MantaroBot TeleMe/2 or TableTop TeleMe (could be via VPN), the Configuration web pages of the MantaroBot can be accessed by clicking on the button that displays the "IP Address" of the MantaroBot. This will launch the web browser on your Android device.

4. If your device has accelerometers, one additional control will appear that will allow you to tailor the controller for the attributes of your particular device. The Rotate Axis allows you to select the preferred orientation of your device for driving the MantaroBot. Adjust this control as required to match your Android Device accelerometer orientation for your preferred device orientation.

3.5.11 Help
The 'HELP' button will open up to the latest version of this User Guide from the web.
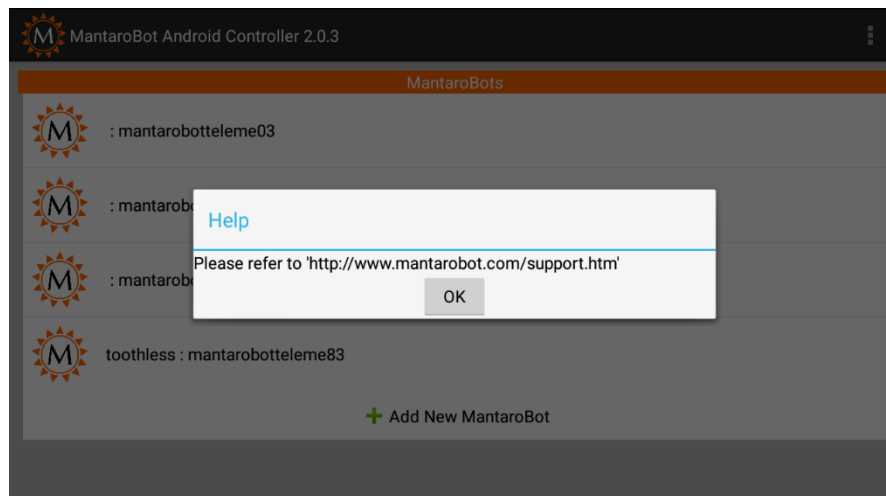
3.5.12 *About (Accessories)*

The 'ABOUT' button shows the serial number and version numbers of the components of the MantaroBot it is currently logged into, as well as the device holder type. It also lists all the possible accessories for the particular MantaroBot device and indicates their presence. Based on the accessories that are present (or absent), the MantaroBot Controller will enable (or grey out) certain features or enable (or remove) certain graphics (e.g. user will not see a drive button if user is logged into a TableTop TeleMe). This information is useful in any tech support inquiries.

NOTE: Optional Extended Battery is not considered an accessory and will not be displayed on the Accessories list.

About	
Device Holder:	other
Serial Number:	05
Robot Application Version:	4.5.1
Firmware Version:	0I
Hardware Version:	0I
Hardware Serial Number:	91
Pan Present:	true
Pan 360 Present:	true
Multiple Radio Present:	false
LED Headlight Present:	true
Check for Robot Software Updates	
Ok	

Note: Updates that are available for the MantaroBot Robot Application can only be installed by a user local to the MantaroBot.

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3.6 Miscellaneous

This section describes the in-call status information provided at the top left of the Controller application.
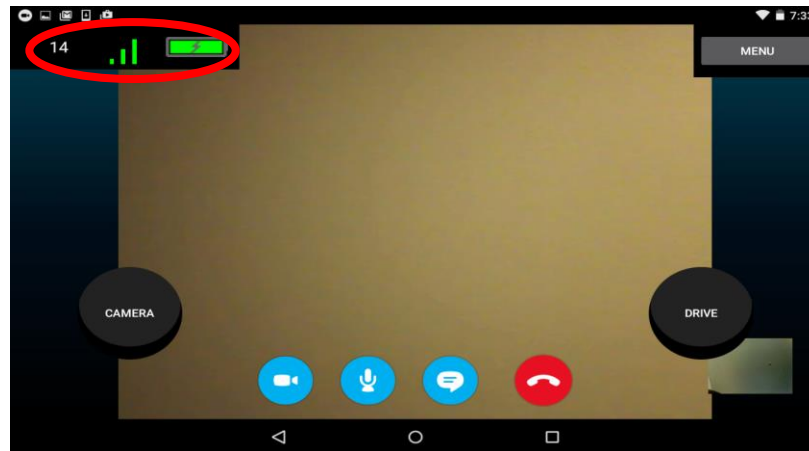
3.6.1 Connection Delay

The Connection Delay displays a measurement of the approximate round trip delay from the MantaroBot Controller 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.

3.6.2 Battery Indicator

The battery indicator provides status of the internal MantaroBot battery (it does not provide battery status for the user device being used as the "head'). 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.

If the battery charge drops below a certain 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.

3.6.3 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 closer to the area with strong Wifi connection, 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.