2017 FTC Kick-Off

Configure the Android Phones

Frog Tech University, FRC Team 503
September 1, 2017

Course 102

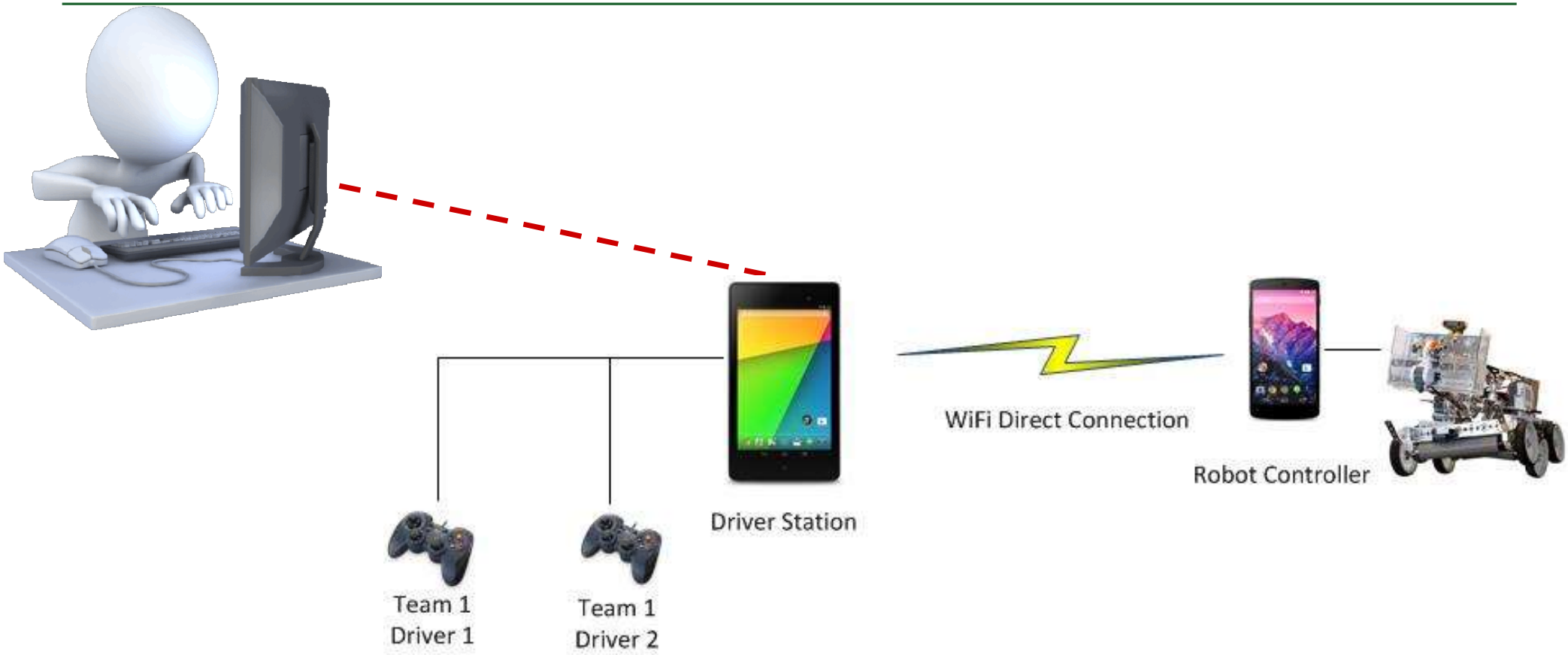
Today's Goal…..

The goal of todays session is to set up your Android phones to control your robot

FROG FORCE 503 A LEAP AHEAD

New Point to Point Communication System

Pair of Android phones provide ‘Wi-Fi Direct’ Communication



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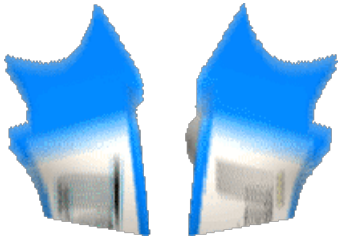
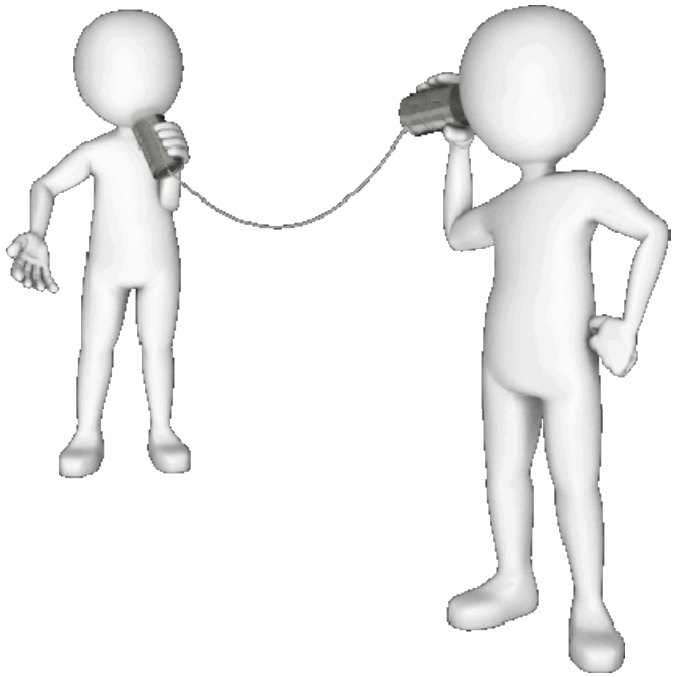
Acknowledgement



Many of todays slides are based on the work of Team #2843 in the PushBot Build Guide Series and the FTC Training Manual

Many thanks for your efforts!!!!

Android Phone Set-up
7 Easy Steps !!!!



1. Remove the SIM Cards
2. Configure both phones
3. Install USB driver on Robot Controller
4. Update USB driver on Robot Controller
5. Deploy the Robot Controller
6. Deploy the Driver Station
7. Network Cleanup

If talking to a robot were this easy …

Step 1 – Remove the SIM Cards

1. To prevent the phones from attempting connections to the Cell Phone network

Guide

- Power off both cell phones
- Remove the back covers leaving the phones face down
- There is a gap between the front and back covers located on the lower right hand corner of the device that can be used to remove the back cover.
- Inserting a fingernail all around the case will cause the case to pop apart.

Step 1 – Remove the SIM Cards
2. Remove SIM card

Guide

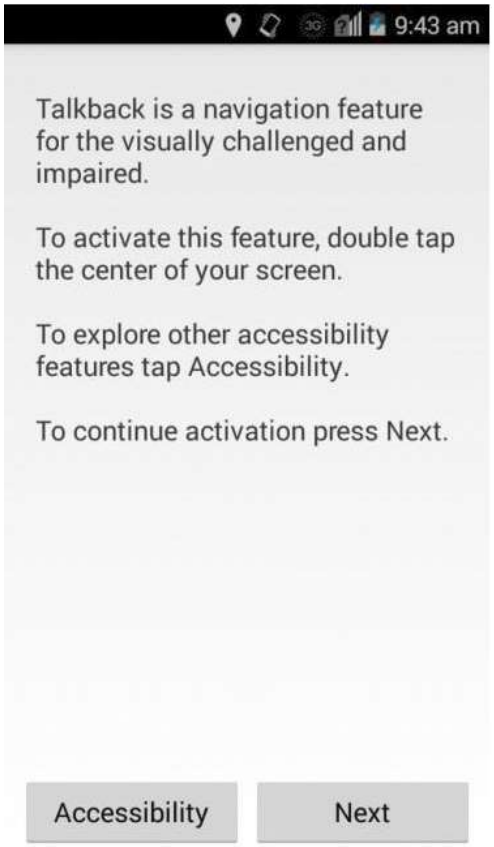
- The batteries are on the left and the SIM cards are on the right
- Gently push the SIM cards into the phone and release
- Pushing the SIM cards into the phone will activate the spring mechanism allowing the springs to push the SIM card out of the phone.
- Remove the SIM cards and put the min a safe place.
- Replace the back covers

Step 1 – Remove the SIM Cards
3. Turn on Phones

Guide

- Turn the phones face up
- Turn the power on each phone by depressing the power button

Step 2 – Configure both phones
1. Accept Default Talkback Setting



Guide

- Click ‘Next’ to accept default Talkback setting

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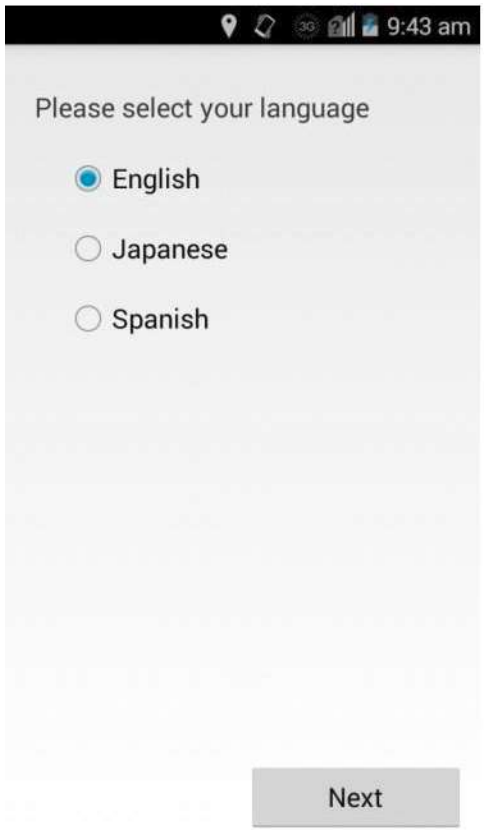
Step 2 – Configure both phones
2. Accept English



Guide

- Click ‘Next’ to accept language default of ‘English’

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Step 2 – Configure both phones
3. Configure WI-FI

Guide

- Click ‘Next’ to accept WI-FI

FROG FORCE 503 A LEAP AHEAD

Step 2 – Configure both phones
4. Configure WI-FI

Guide

- Do not select a WI-FI connection at this time.
- Click ‘Next’ to continue

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Step 2 – Configure both phones
5. Resolve UICC Error

Guide

- Ignore UICC Error
- Click ‘OK’ to continue

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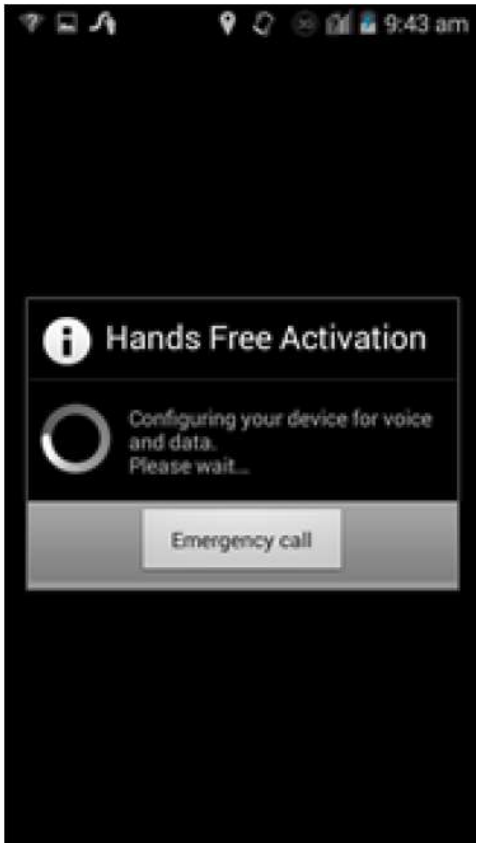
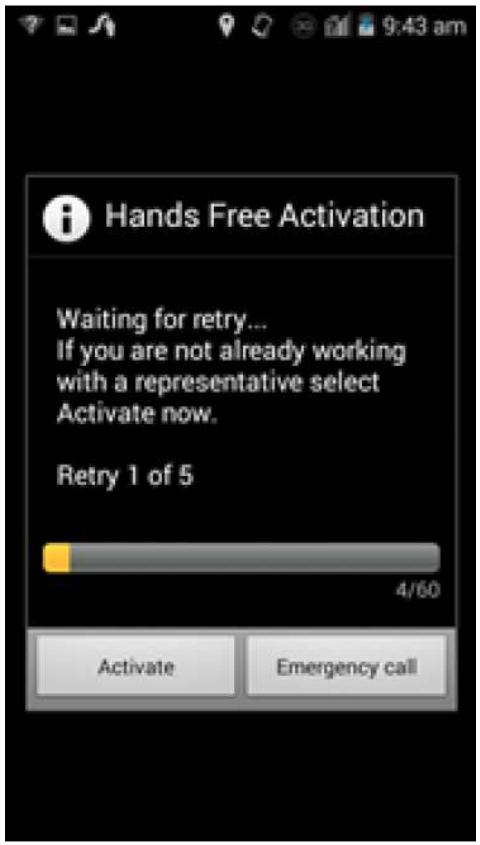
Step 2 – Configure both phones
6. Hands Free Activation





Guide

- When the Hands Free Activation first starts it shows the ability to make an emergency call, but this will change to the second screen on the right.
- Click ‘Activate’ to continue

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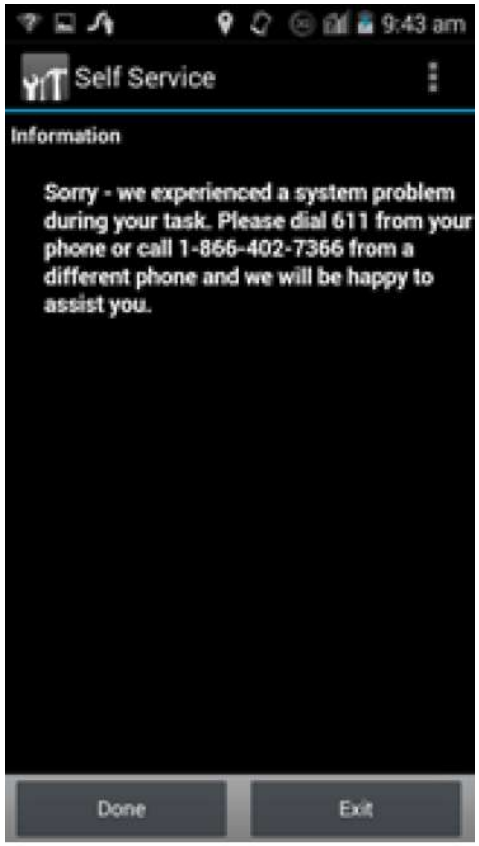
Step 2 – Configure both phones
7. Failed Hands Free Activation



Guide

- The Hands Free Activation will fail as we have removed the SIM cards.
- Click ‘Done’ to continue

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Step 2 – Configure both phones
8. Select Application Activity

Guide

- Android will return to the home screen.
- Select the application activity icon (shown in red circle)

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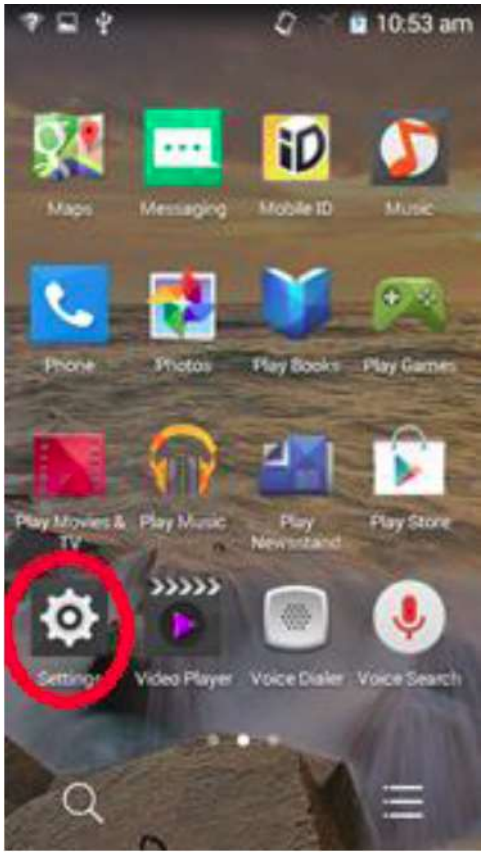
Step 2 – Configure both phones
9. Open Settings Activity



Guide

- Open the settings activity by selecting it's icon
- It may be necessary to swipe the screen left or right to find the icon.

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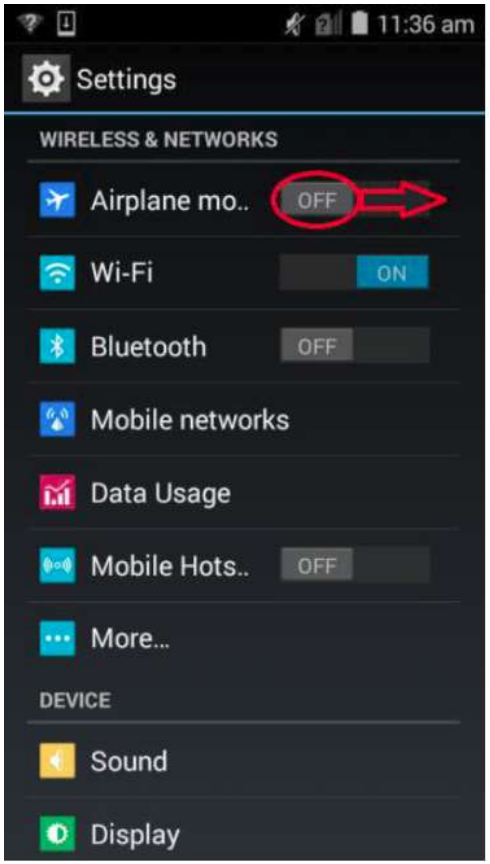
Step 2 – Configure both phones
10. Put phones into Airplane mode



Guide

- Slide the button from left to right until icon comes into view

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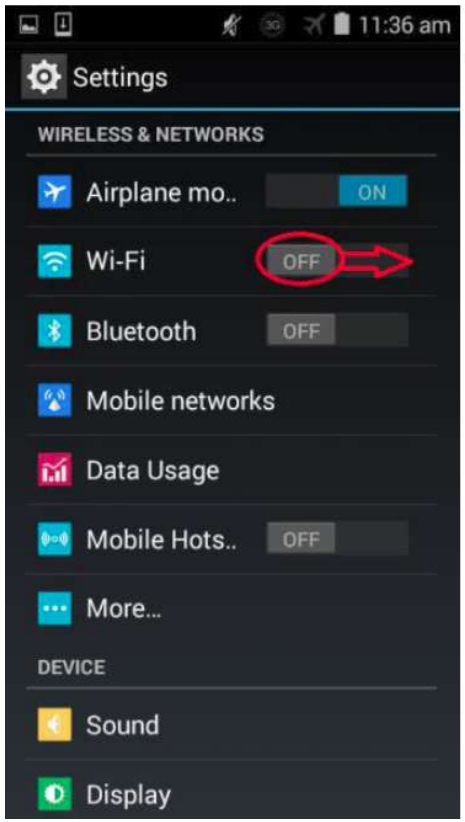
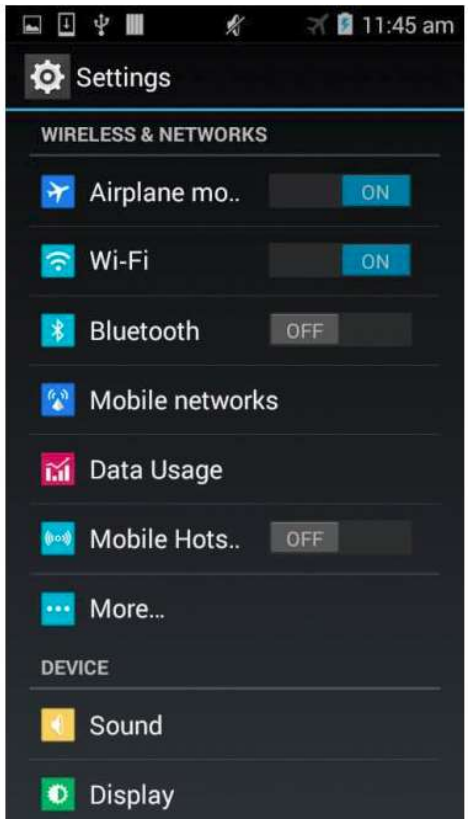
Step 2 – Configure both phones
11. Turn on WI-FI

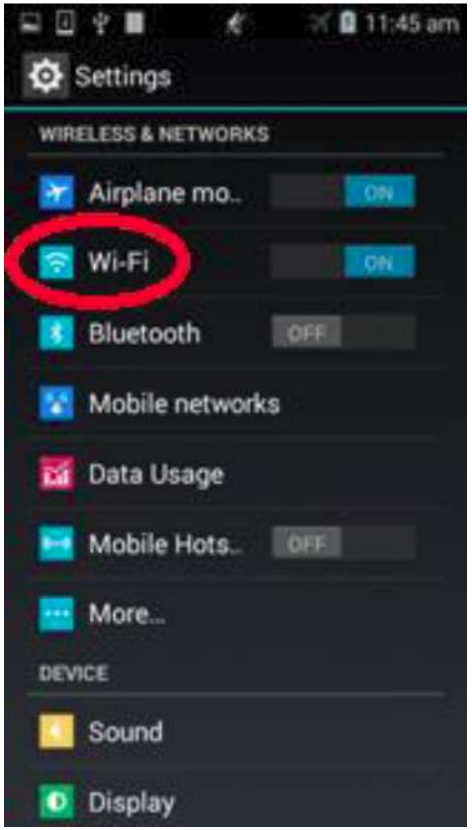




Guide

- Slide the button from left to right until icon comes into view

Step 2 – Configure both phones
12. Select WI-FI



Guide

- Click on the Wi-Fi button

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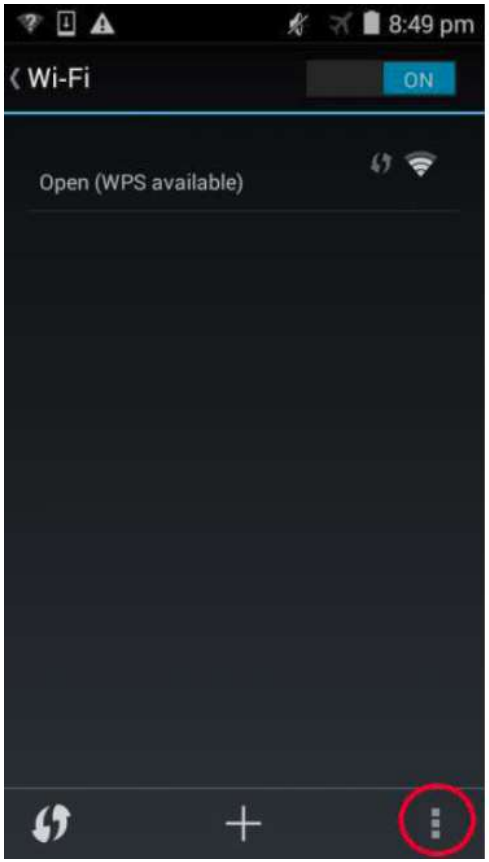
Step 2 – Configure both phones
12. Select WI-FI



Guide

- Select the overflow settings (three dots at bottom right)

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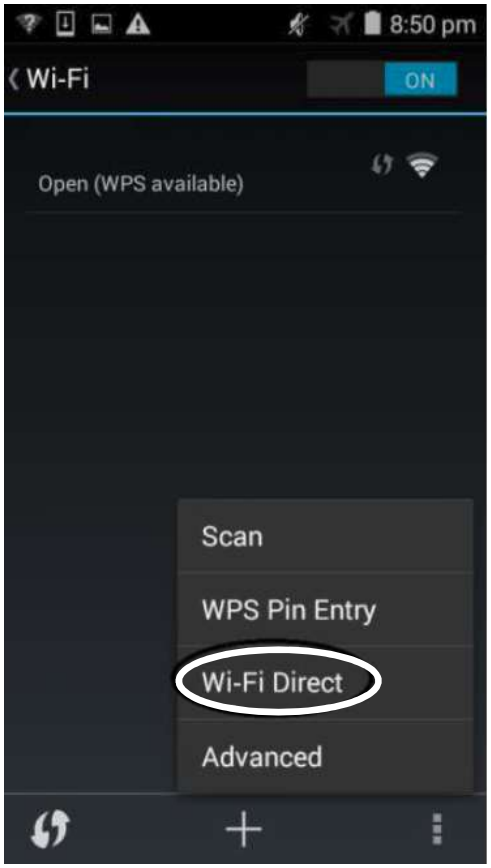
Step 2 – Configure both phones
13. Select WI-FI Direct



Guide

- Select Wi-Fi Direct

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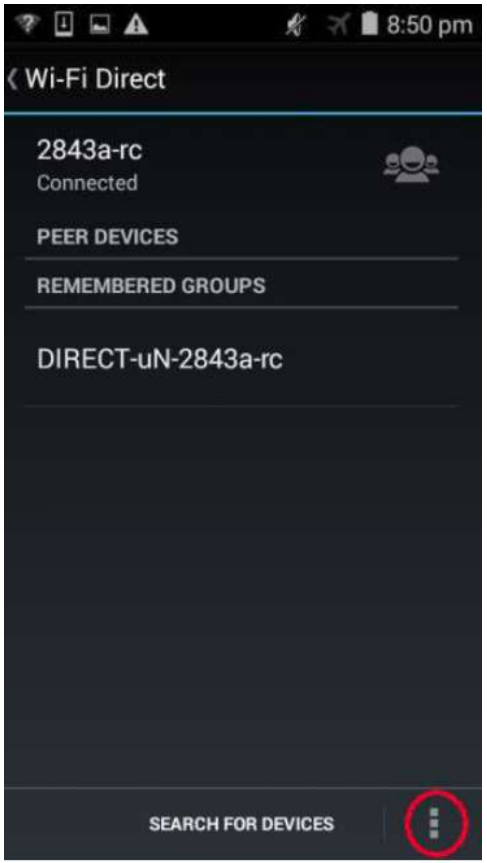
Step 2 – Configure both phones
14. Select Rename Device



Guide

- If rename device is not shown at the bottom of the screen then select the overflow settings (three dots) and then select “Rename device”
- Note in the image to the left, the phone had already been renamed. New phones will have a generic name

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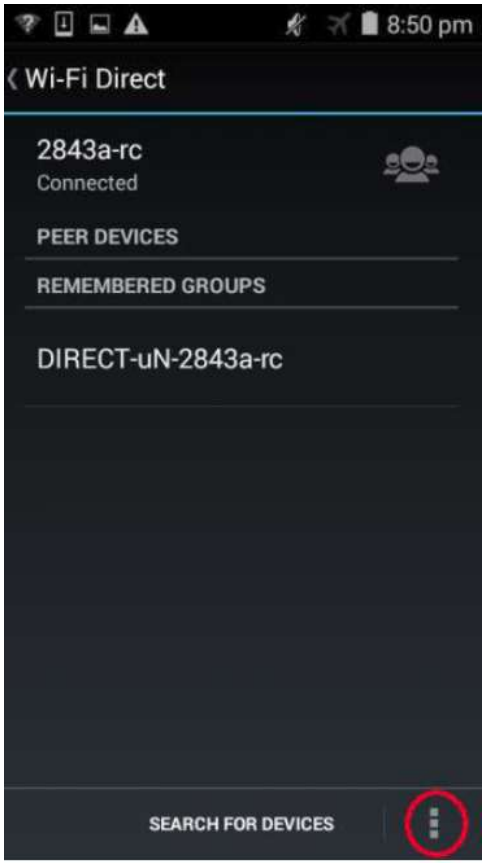
Step 2 – Configure both phones
14. Select Rename Device



Guide

- If rename device is not shown at the bottom of the screen then select the overflow settings (three dots) and then select “Rename device”
- Note in the image to the left, the phone had already been renamed. New phones will have a generic name

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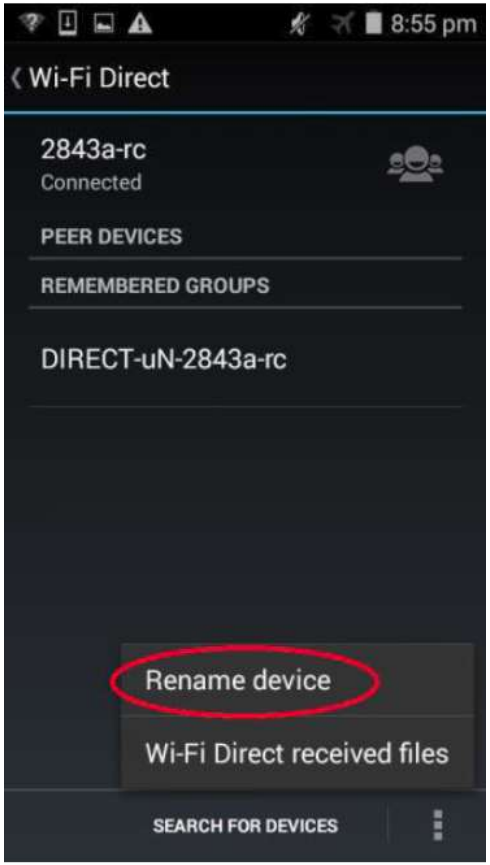
Step 2 – Configure both phones
15. Rename Device



Guide

- Enter the new name according as follows:
  - The first portion of the name will be the team number
  - The driver station will have a suffix of –DS
  - The Robot Controller will have a suffix of –RC
  - Example:
    - 503-DS or 503-RC
- Click “Rename device” when ready

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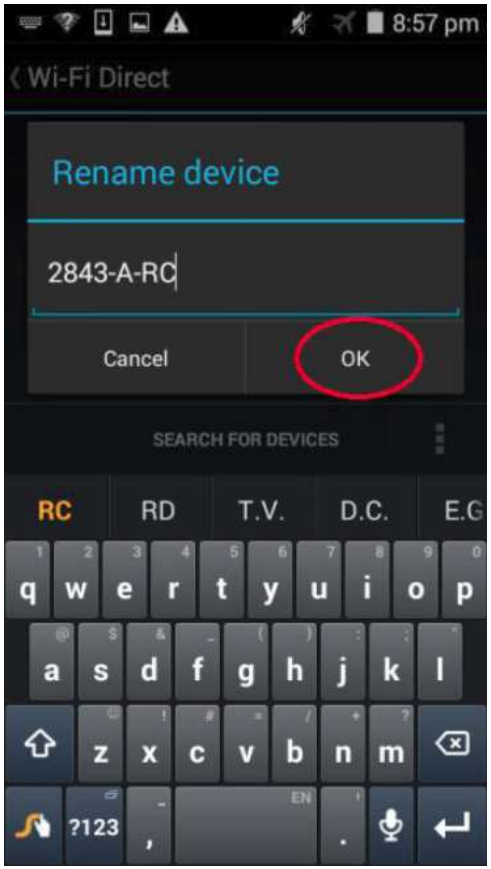
Step 2 – Configure both phones
16. Confirm Rename Device



Guide

- Click “OK”

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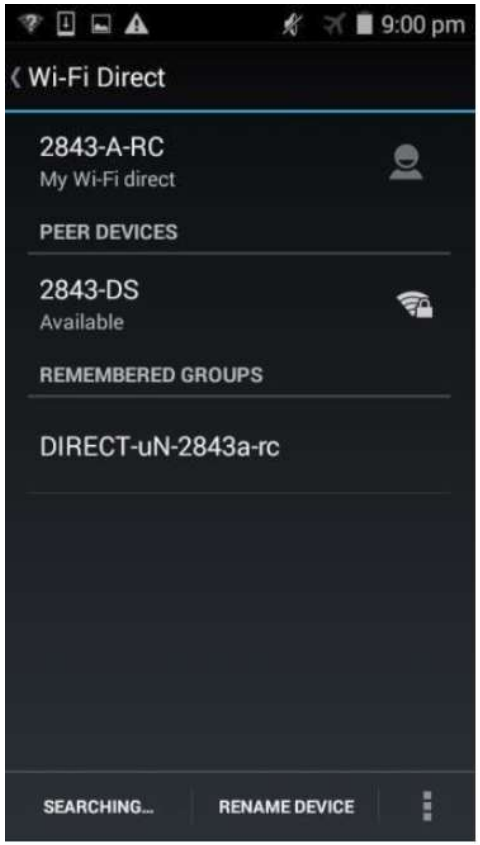
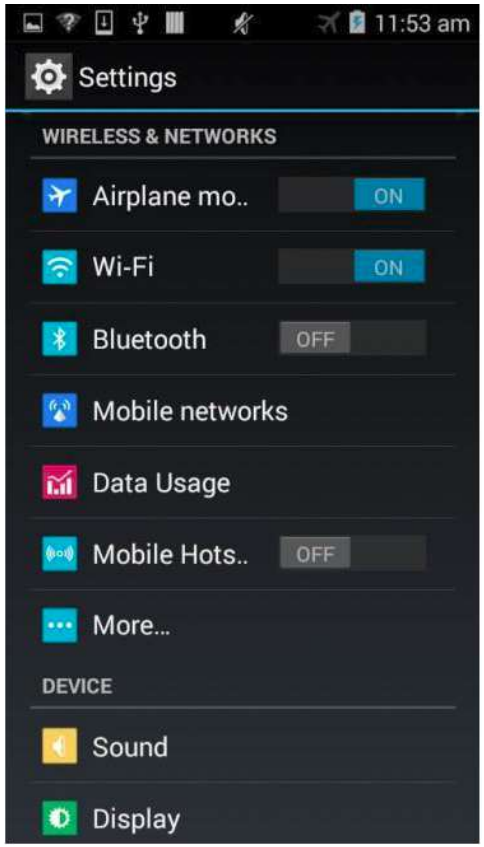
Step 2 – Configure both phones
17. Return to Settings Activity





Guide

- From the page shown at the far left, return to the settings activity by pressing the back button.
- It may take several presses to return to the settings activity page.
- The page you are looking for is on the right labelled “Settings”

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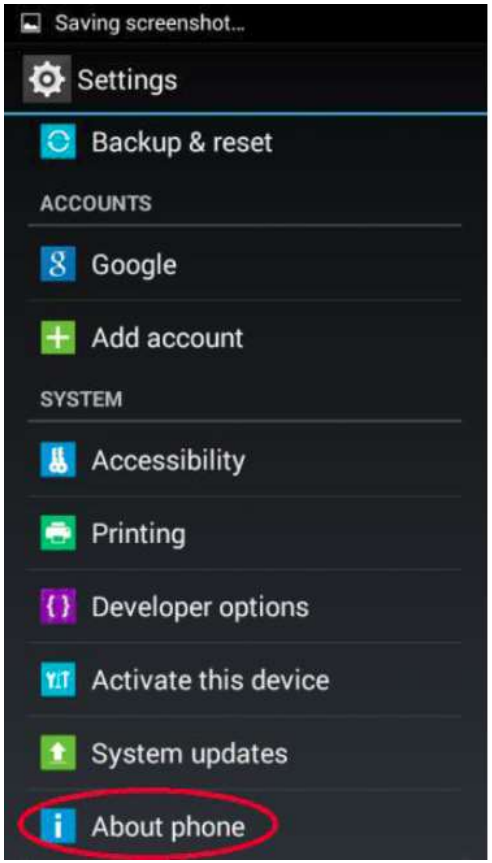
Step 2 – Configure both phones

18. Find About Phone on the Robot Controller



Guide

- Select the Robot controller phone
- Scroll downward on the ‘Settings’ page until you find the ‘About phone’

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Step 2 – Configure both phones

19. Enable Debugging Mode on the Robot Controller

Guide

- The ‘About phone’ page allows a developer to enable debugging.
- Scroll down until ‘SW Version’ is shown (right image)
  - On some Android phones the text says ‘Build Number’
- Tap ‘SW Version’ 7 times
  - A toast (a message that is displayed for a short amount of time) should display as the number of taps increase and finally should indicate that debugging is enabled
  - From the page shown at the far left, return to the settings activity by pressing the back button.

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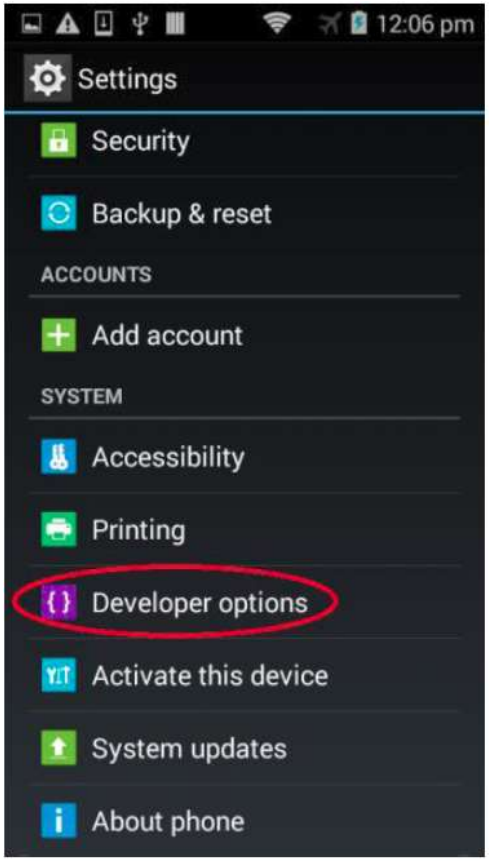
Step 2 – Configure both phones

20. Return to Settings Activity on the Robot Controller

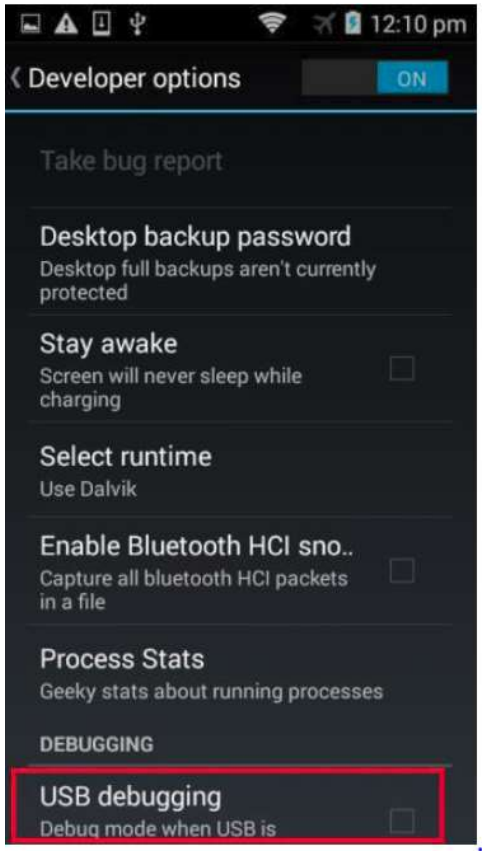


Guide

- If Android hasn't already switched to the 'Settings' activity page, then do so now.
- Scroll to the bottom of the page and select 'Developer options'
  - Note: The developer options button is invisible until debugging is enabled!

Step 2 – Configure both phones

21. Enable USB Debugging on the Robot Controller



Guide

- Select the ‘USB debugging’ checkbox

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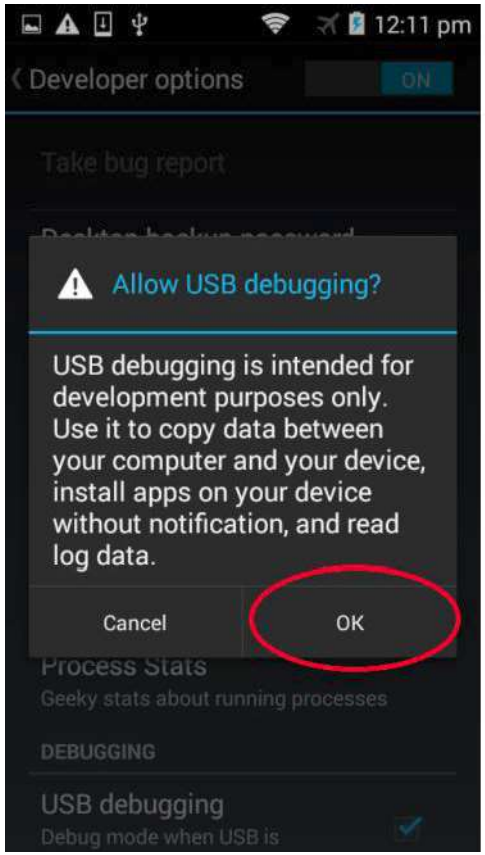
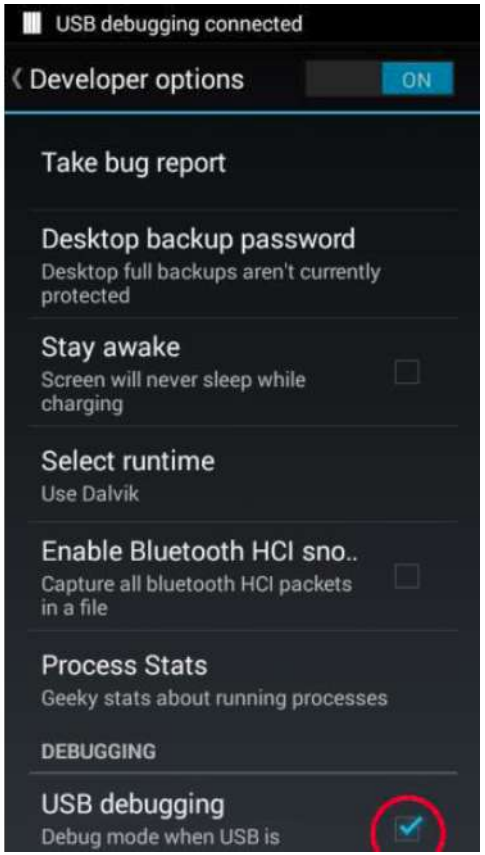
Step 2 – Configure both phones

22. Enable USB Debugging on the Robot Controller





Guide

- Select ‘OK’ to allow USB debugging between the phone and a computer when the phone is connected via USB to the computer hosting Android Studio.
- Note that the box has a check in it (right image)

FROG FORCE 503 A LEAP AHEAD

Don’t Give Up

Don’t give up yet
We are almost there …

Step 3 – Install USB Driver on Robot Controller

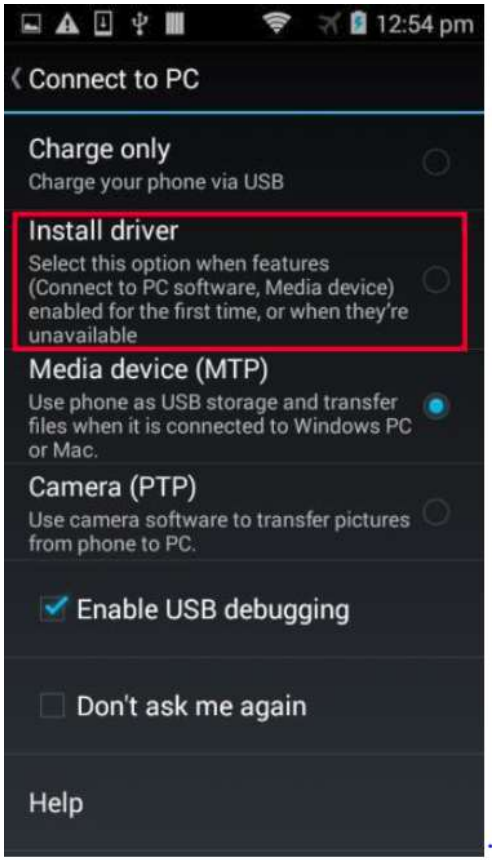
1. Connect Computer to Robot Controller

Guide

- Power on your Robot Controller phone phone and get to the home screen (Where you can selet applications)
- Using the cell phones power cable (with the charging block removed so that one end is a USB connector) plug the USB connector into the USB port on the phone

Step 3 – Install USB Driver on Robot Controller

2. Select “Install Driver” on Phone



Guide

- Once you plug in the USB cable you will see the page on the left on your cell phone.
- Select “Install Driver” on phone

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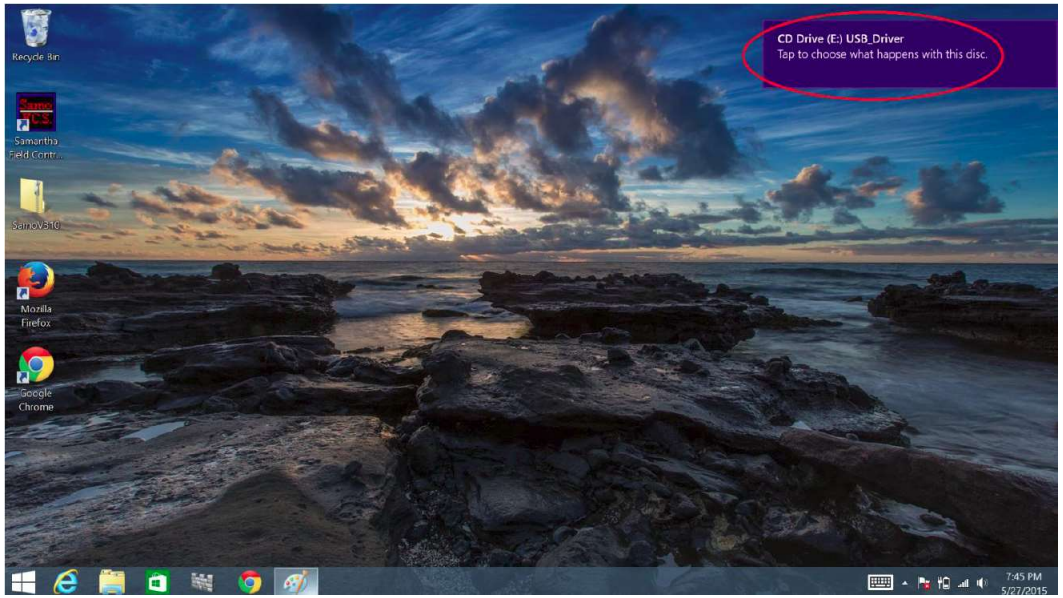
Step 3 – Install USB Driver on Robot Controller

3. Confirm Driver Install



Guide

- When the “Install Driver” is selected on the phone the computer will detect the connection.
- Confirm the computers prompt

- Note this will look very different on other versions of Windows

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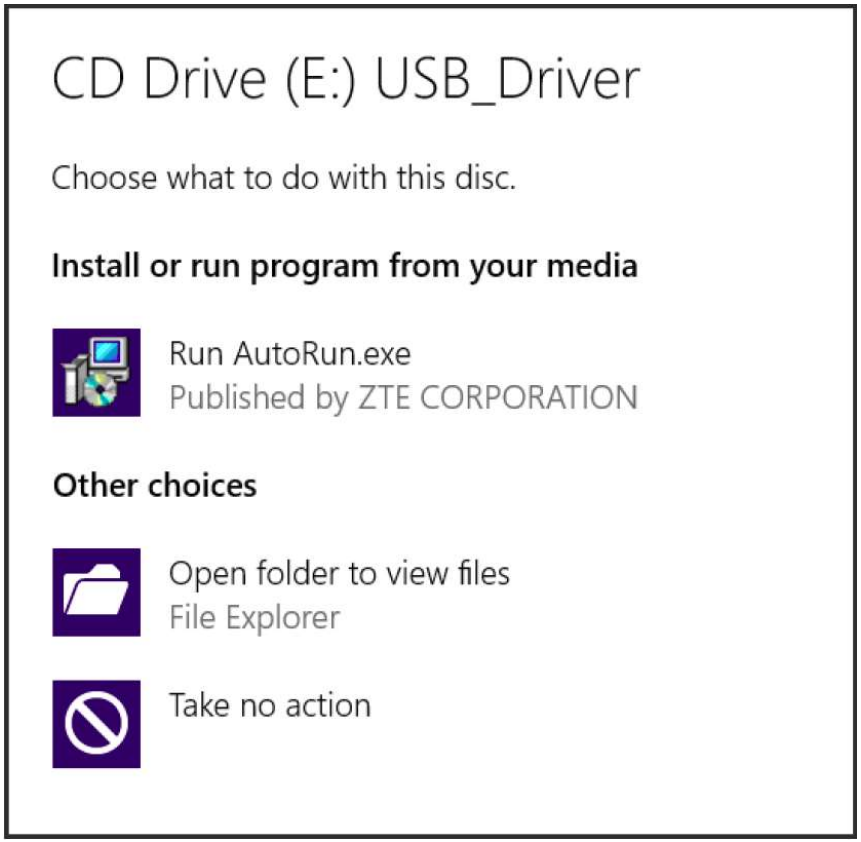
Step 3 – Install USB Driver on Robot Controller
4. Confirm Driver Install

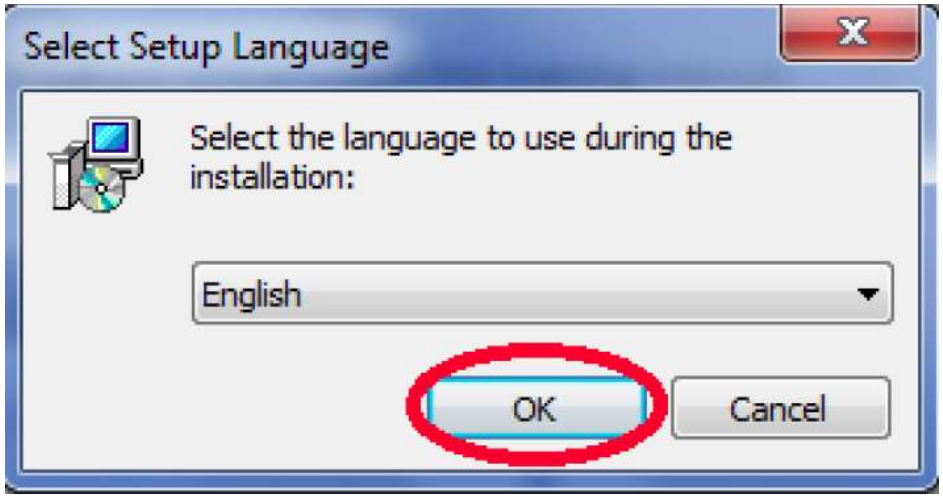


Guide

- After confirming the prompt, another prompt will be displayed similar to the page at left.
- Click “Run AutoRun.exe”

Step 3 – Install USB Driver on Robot Controller

5. Select Language

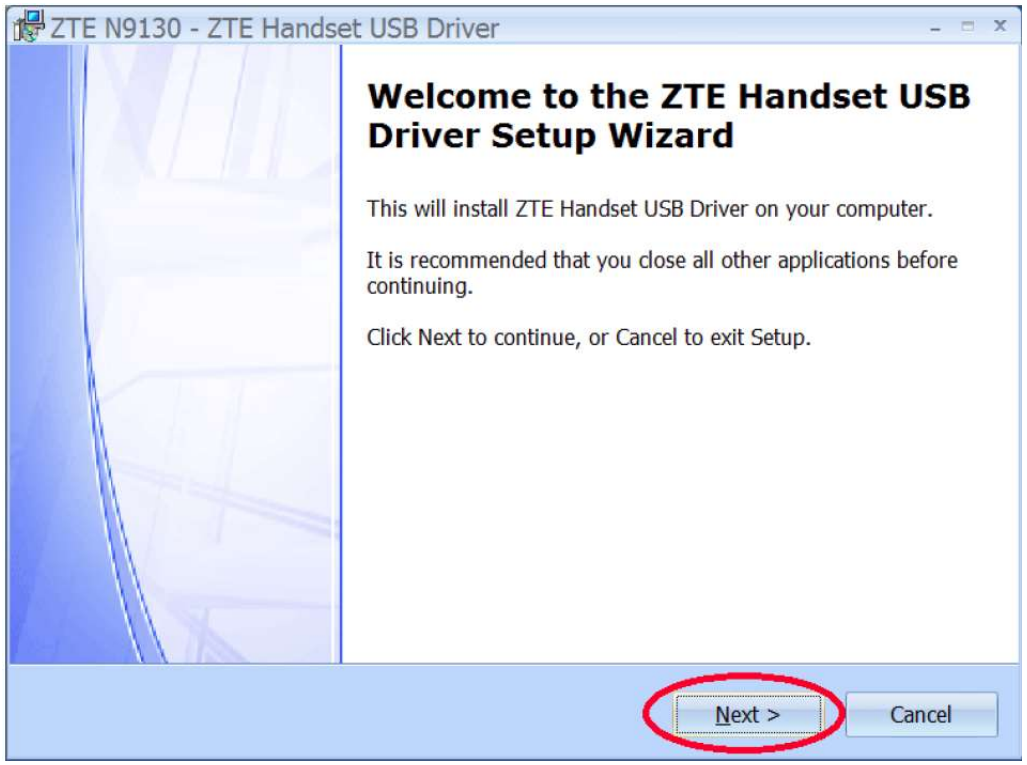


Guide

- Set language to “English” (Should be the default)
- Click “OK”

Step 3 – Install USB Driver on Robot Controller

6. Confirm ZTE Driver Setup



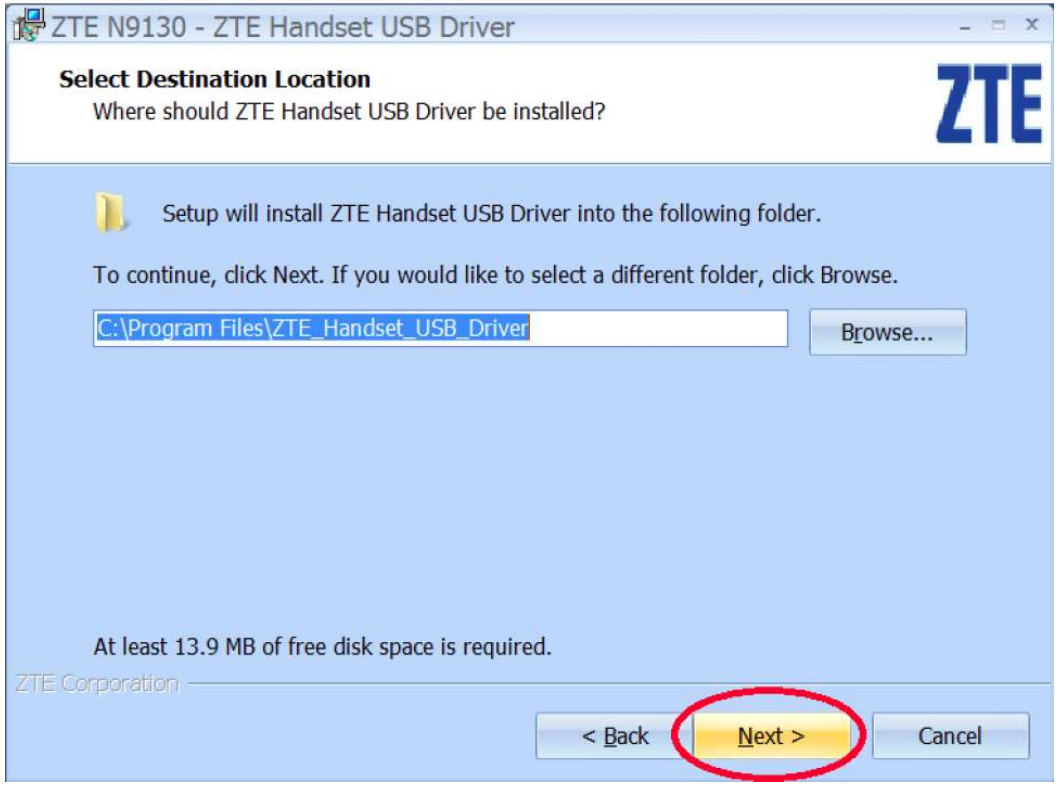
Guide

- Click “Next”

FROG FORCE 503 A LEAP AHEAD

Step 3 – Install USB Driver on Robot Controller

7. Confirm Install Location

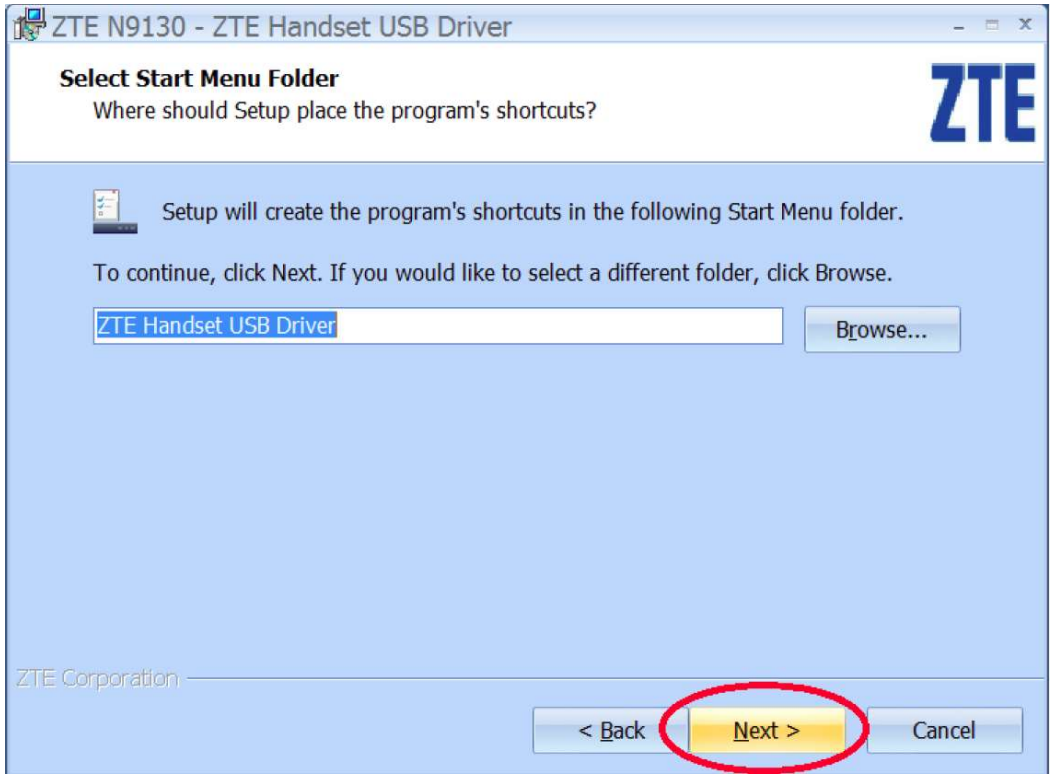


Guide

- Accept default install location for driver
- Click “Next”

Step 3 – Install USB Driver on Robot Controller

8. Confirm Shortcut Location

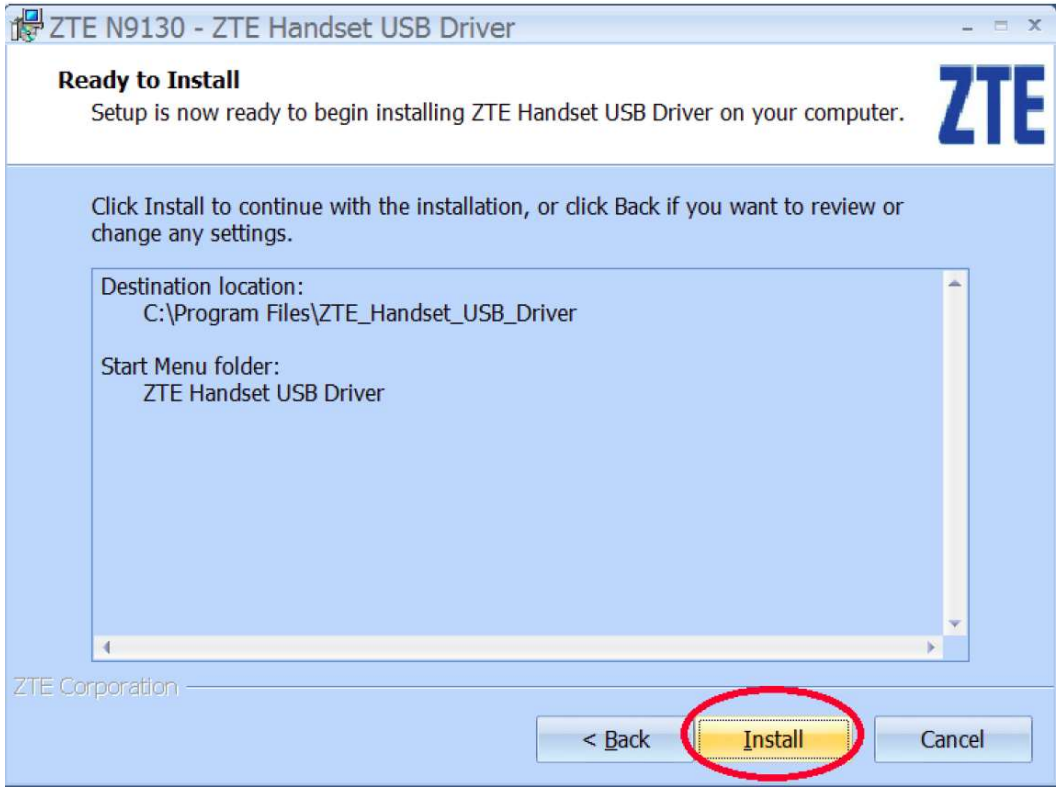


Guide

- Accept default install folder location
- Click “Next”

Step 3 – Install USB Driver on Robot Controller

9. Install the Driver

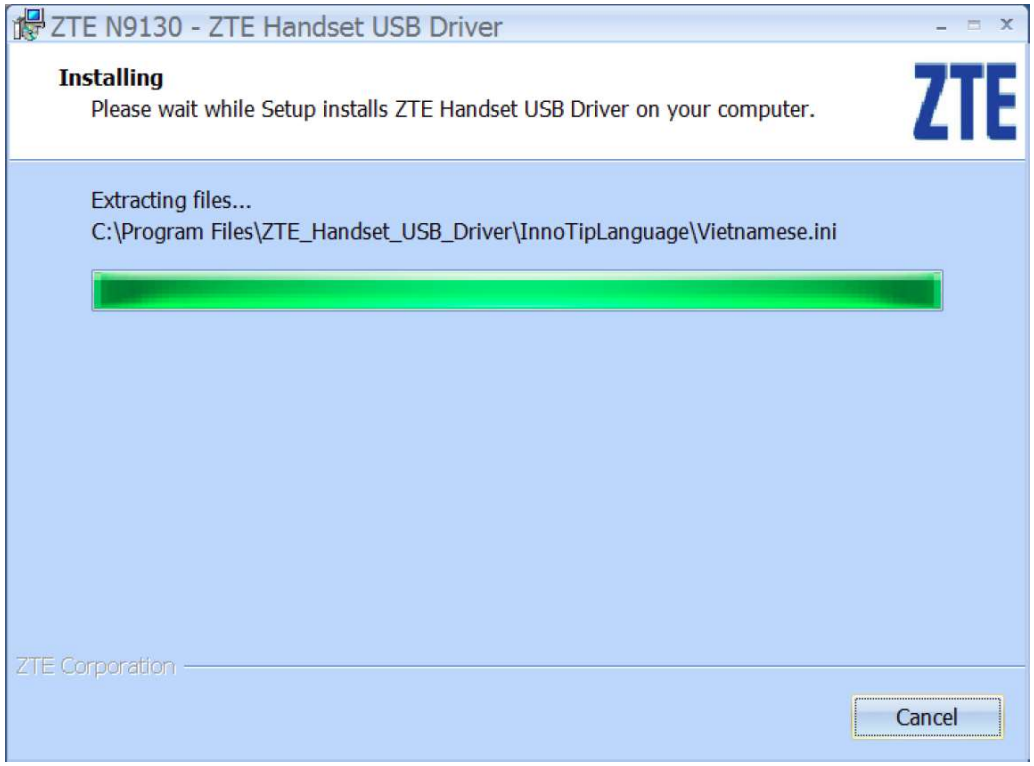


Guide

- Click “Install

Step 3 – Install USB Driver on Robot Controller

10. Progress bar during install

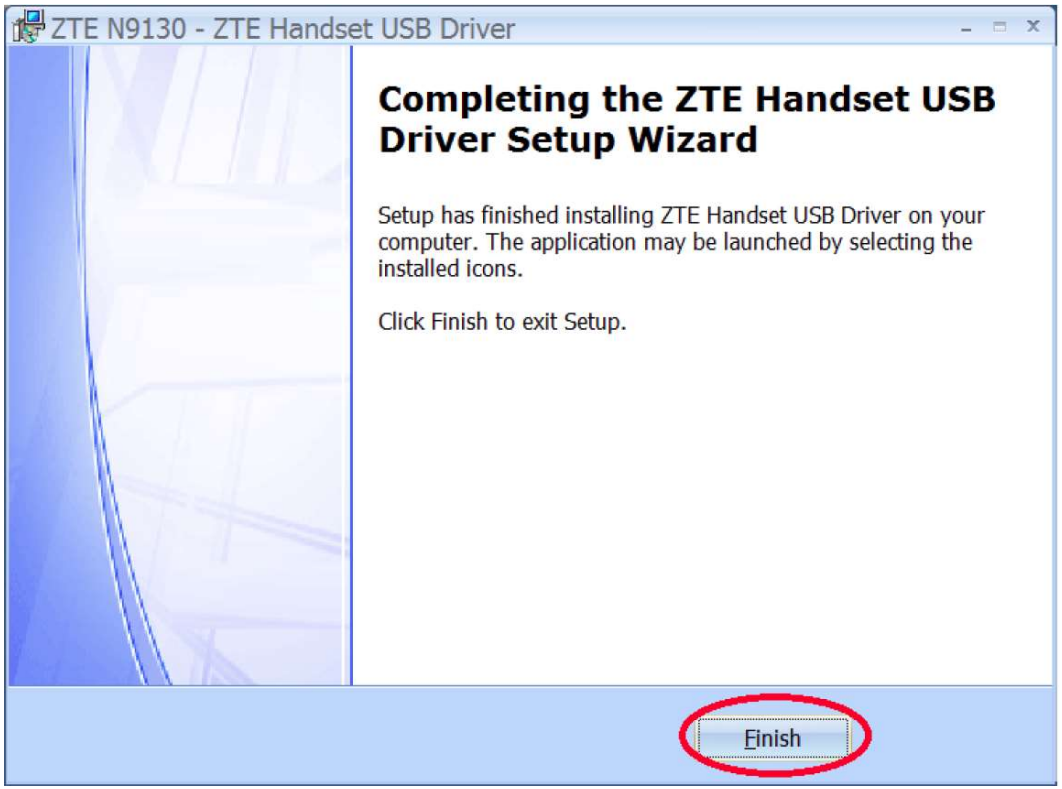


Guide

- Fuel gauge displays install progress

Step 3 – Install USB Driver on Robot Controller

11. Install Confirmation



Guide

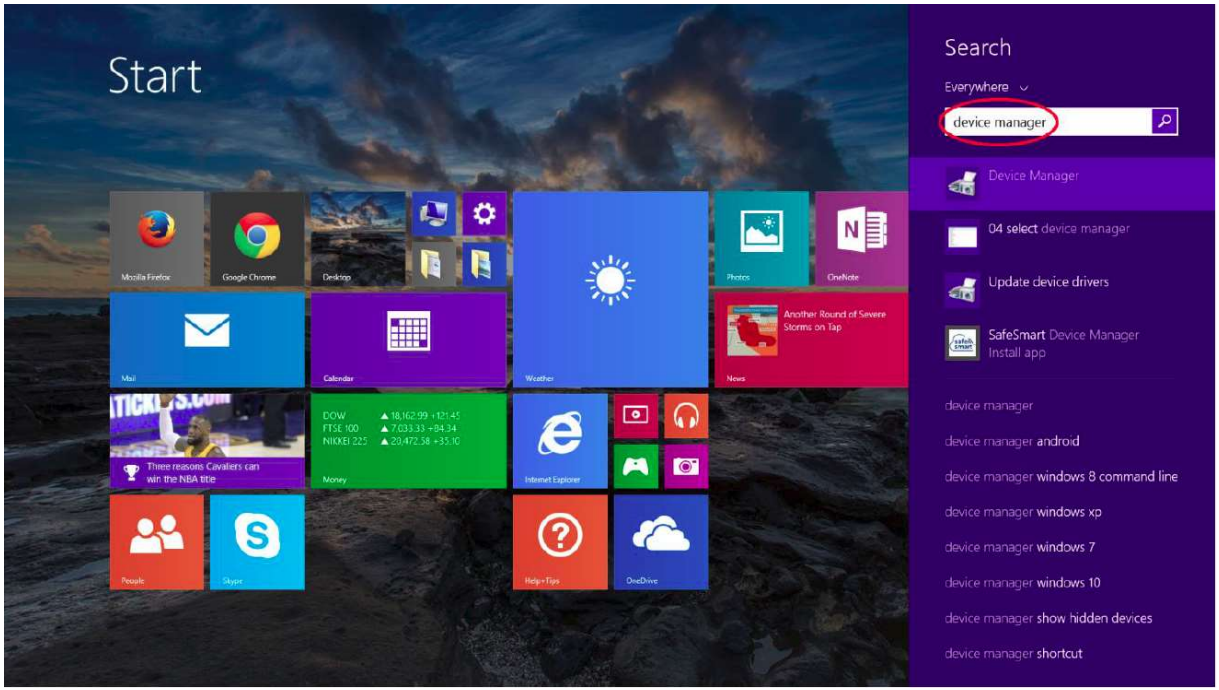
- Click ‘Finish’ to close install process

Congratulations you have installed the USB Driver!!!

FROG FORCE 503 A LEAP AHEAD

Step 4 – Update USB Driver on Robot Controller

1. Execute Device Manager on Windows PC



Guide

- Press the ‘Windows’ key
- Enter “device manager” in the search box and press “enter”

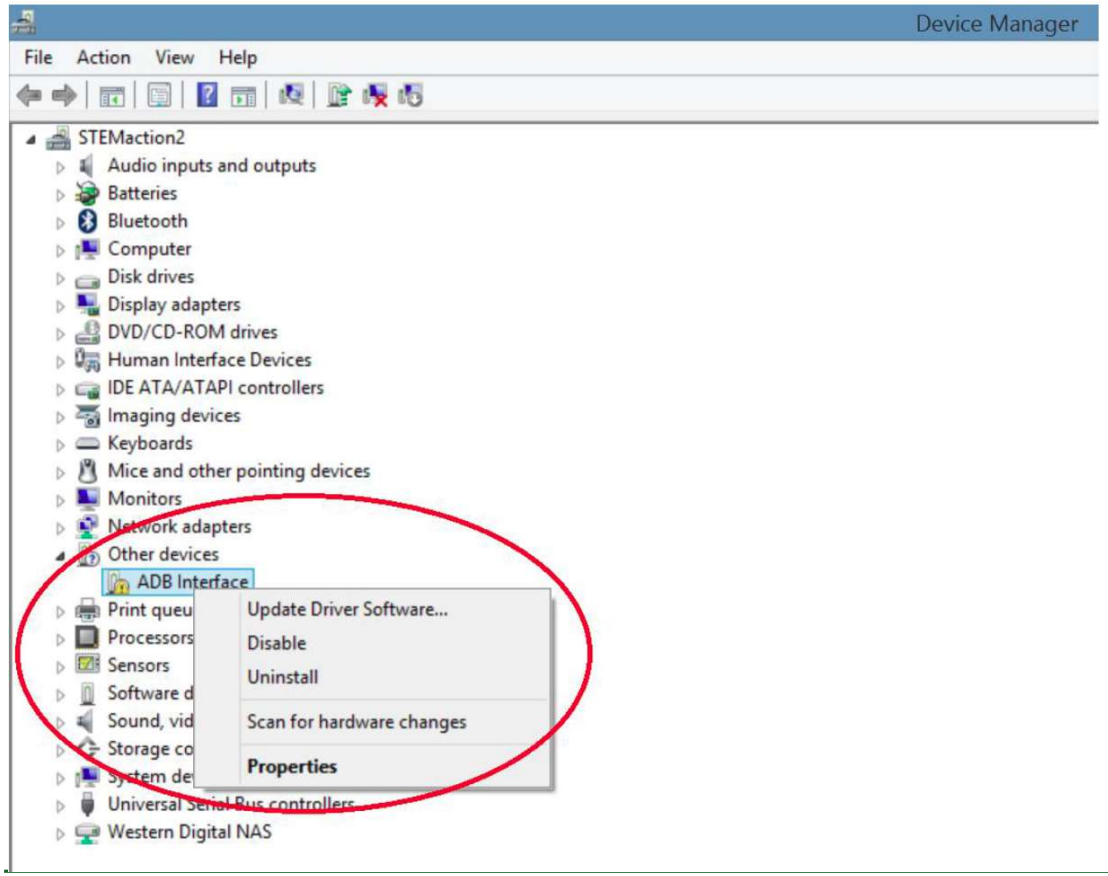
On Windows 7:

- Click on the Windows key
- Select Devices and Printers
- Select Android

FROG FORCE 503 A LEAP AHEAD

Step 4 – Update USB Driver on Robot Controller

2. select Update Driver Software



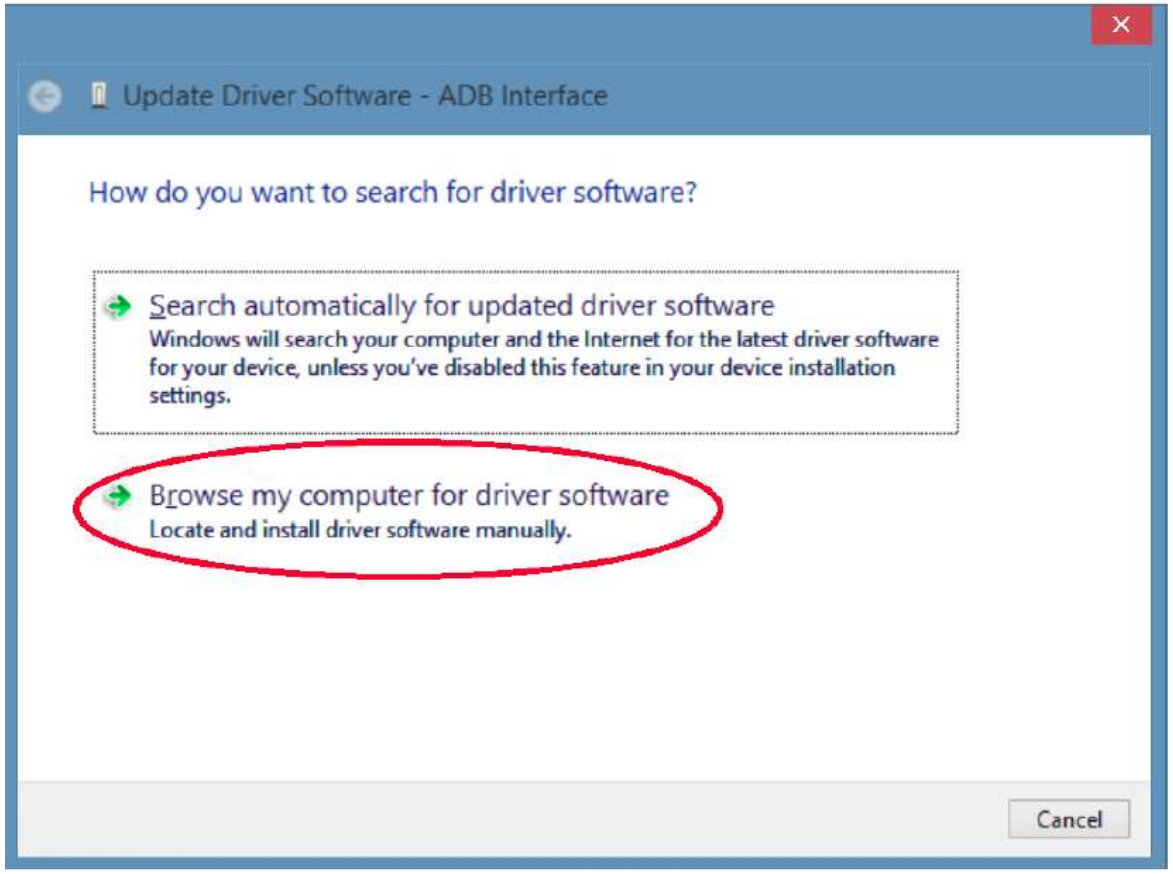
Guide

- Find ‘Other devices’ in device tree
- Click on ‘Other devices’
- Right click on ‘ADB Interface’
- Select ‘Update Driver Software’

- On Windows 7:
  - Right Click on Android icon
  - Select Properties
  - Select Hardware tab
  - Select Properties
  - Click “Change Settings”
  - Select Driver Tab
  - Click “Update Driver”

FROG FORCE 503 A LEAP AHEAD

Step 4 – Update USB Driver on Robot Controller
3. Browse Computer for Driver Software



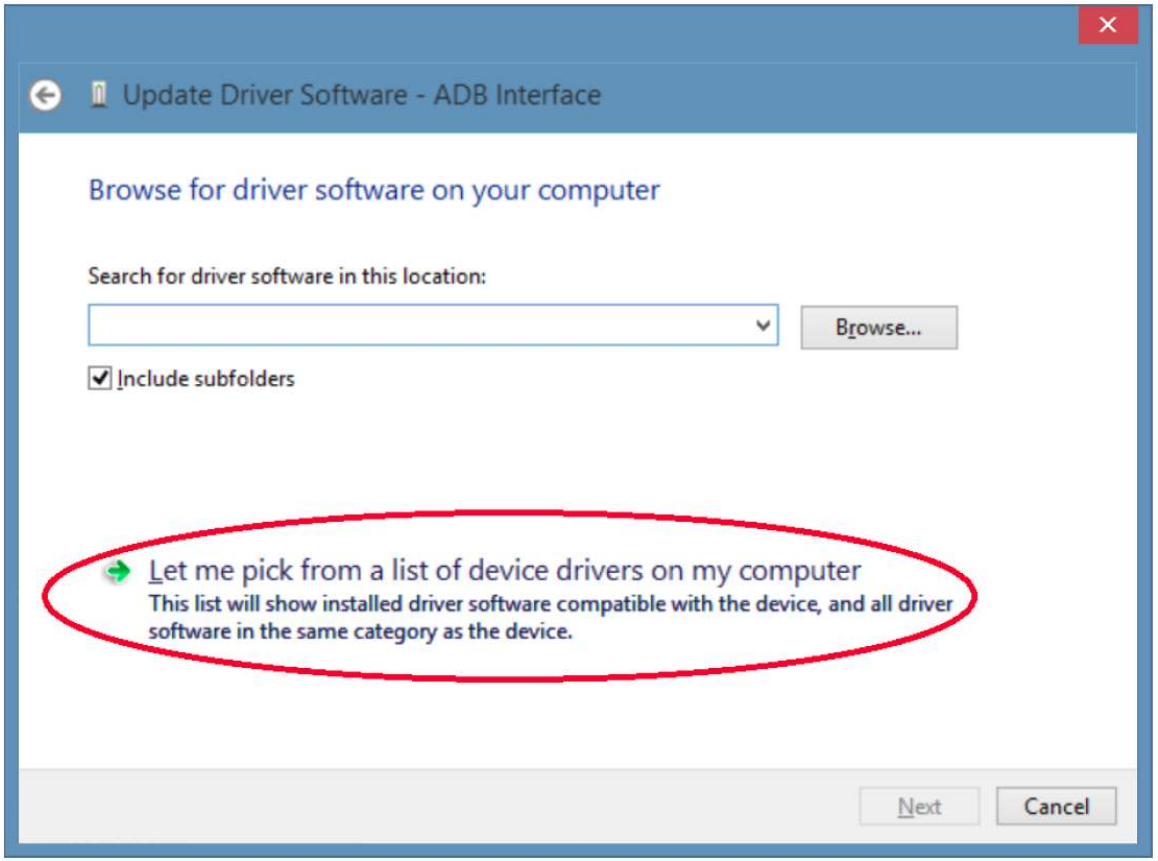
Guide

- Select “Browse my computer for driver software’

FROG FORCE 503 A LEAP AHEAD

Step 4 – Update USB Driver on Robot Controller

4. Pick Driver



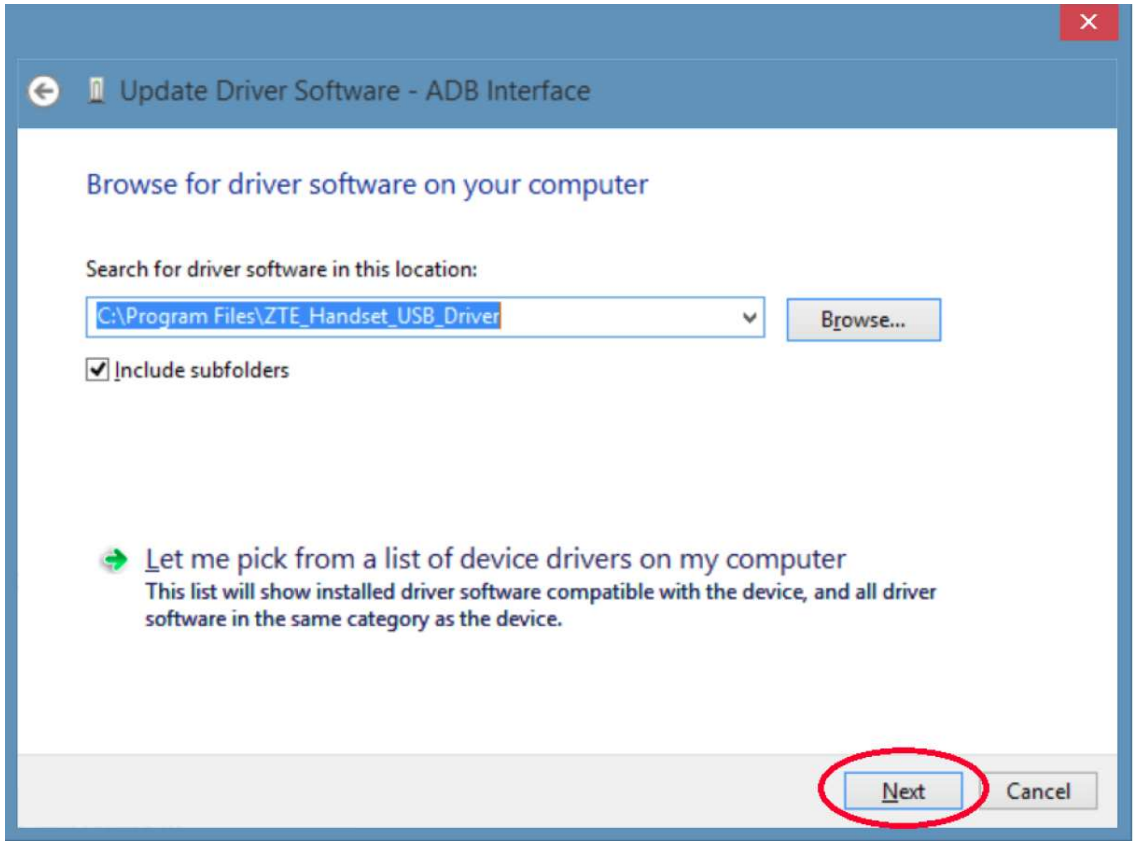
Guide

- Select “Let me pick from a list of device drivers on my computer”

FROG FORCE 503 A LEAP AHEAD

Step 4 – Update USB Driver on Robot Controller

5. Enter Driver Location

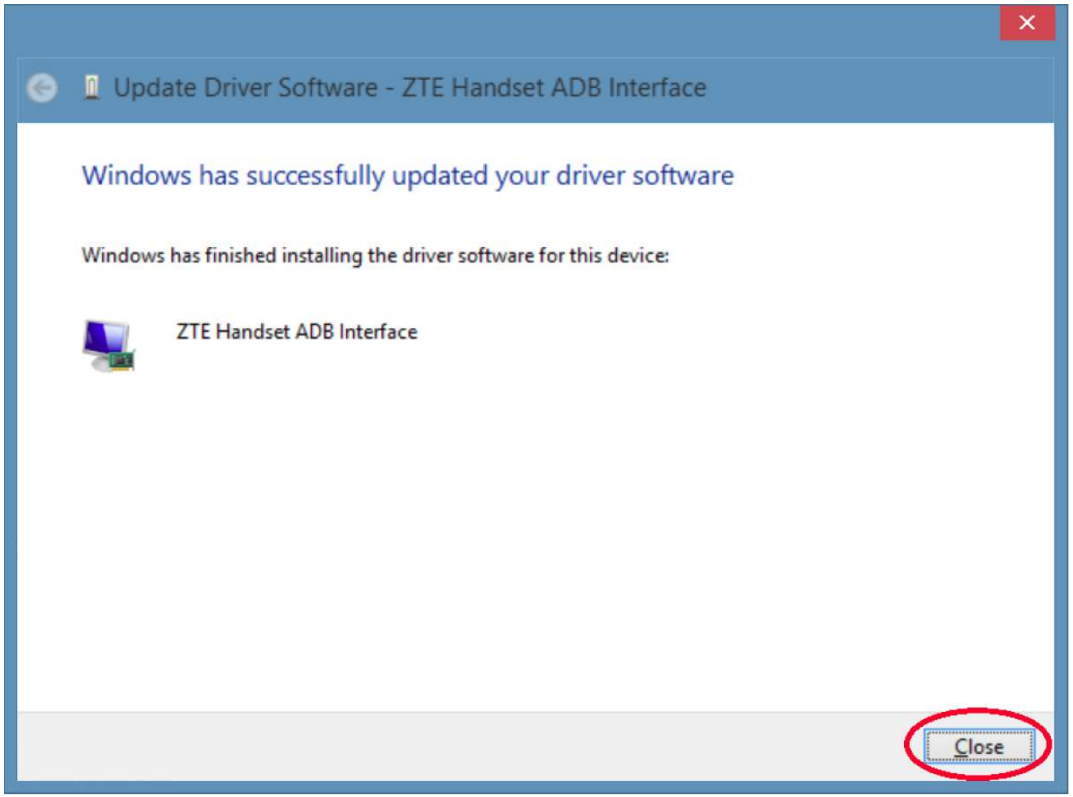


Guide

- Ensure that the location is set to :
  - C:\Program Files\ZTE_Handset_USB_Driver
- Click “Next”

FROG FORCE 503 A LEAP AHEAD

Step 4 – Update USB Driver on Robot Controller
6. Driver Update Confirmation



Guide

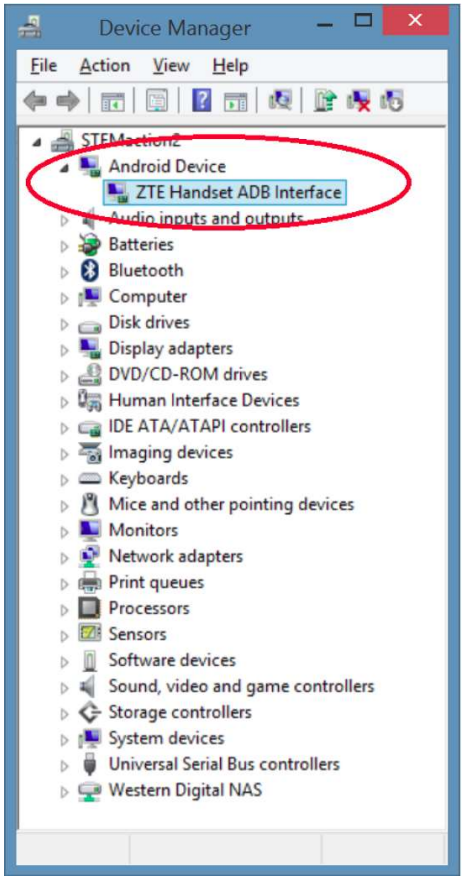
- Windows confirms that the driver was updated correctly.
- Click ‘Close”

Congratulations you have Updated the USB Driver!!!

FROG FORCE 503 A LEAP AHEAD

Step 4 – Update USB Driver on Robot Controller

7. The Android Phone is now connected to the PC



Guide

- On The PC:
  - Note that the device is now connwcted
  - This window can be closed.
  - Click “X” in upper right hand corner

FROG FORCE 503 A LEAP AHEAD

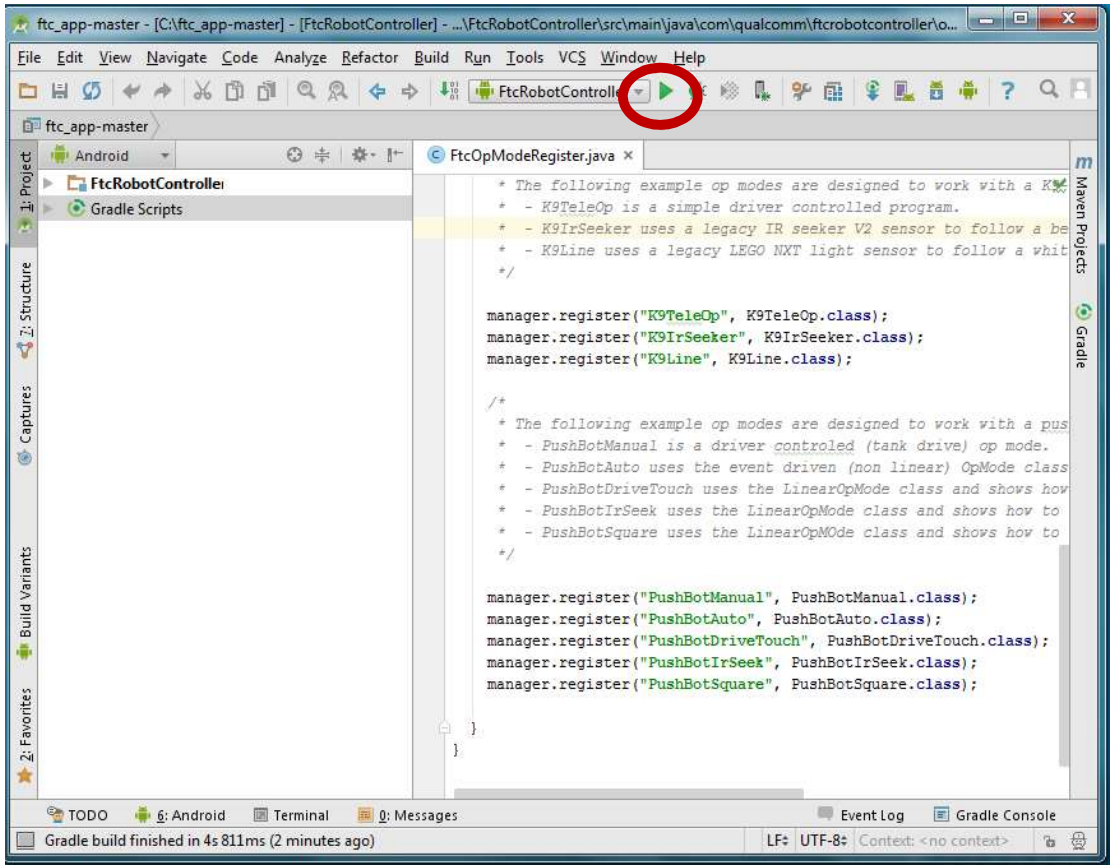
Step 5 – Deploy the Robot Controller
1. Start up Android Studio

Guide

- Go to the Windows Start Menu
- Click on “All Programs”
- Locate the Android Studio folder, click to open folder
- Select Android Studio application by clicking on it
- You should see the start up screen on the left

Step 5 – Deploy the Robot Controller

1. Start up Android Studio

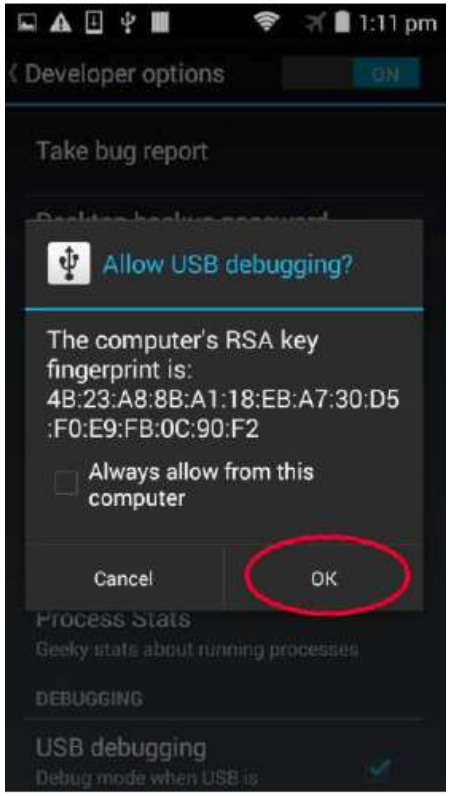


Guide

- Android Stuio will pick up where it left off by loading the FTC_app-master project
- Find the green right arrow button (RUN) to run the application
- Click “Run”

FROG FORCE 503 A LEAP AHEAD

Step 5 – Deploy the Robot Controller
2. Allow USB Debugging



Guide

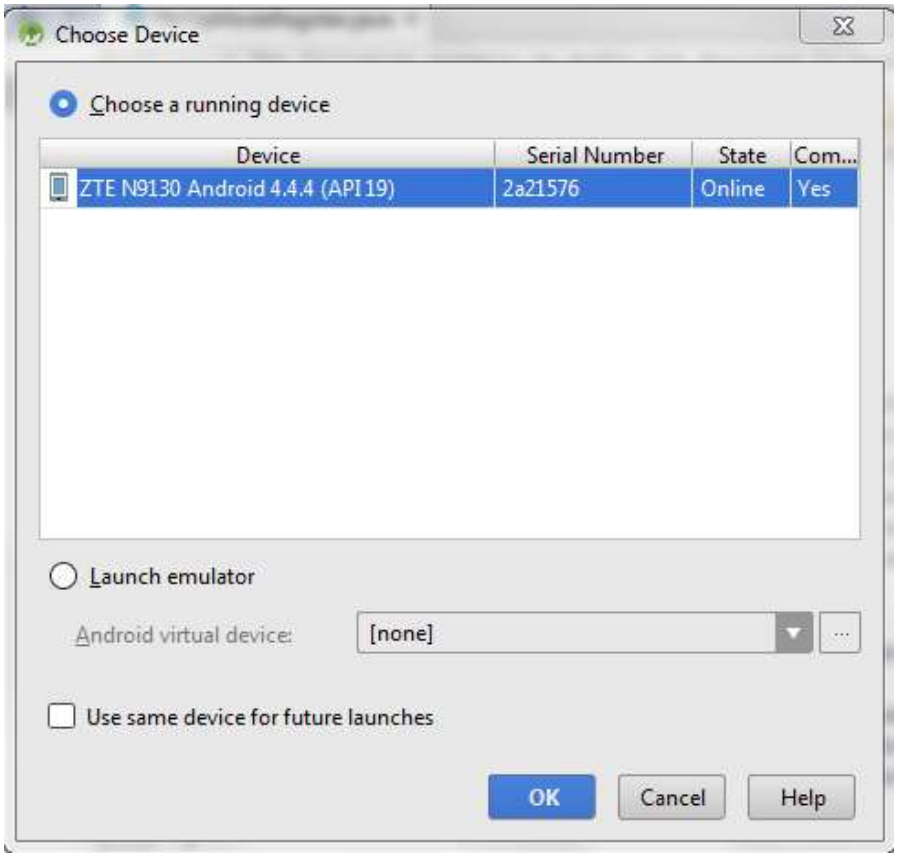
- On the Android phone
  - Note that the cell phone is now displaying the ‘Allow USB debugging’ window
  - Click ‘OK’

- If you see ‘Unauthorized’ message on PC:
  - Click the OK on the Android phone Allow USB debugging message
  - Click ‘Cancel’ on the windows PC
  - Then Click ‘Run’ button again

FROG FORCE 503 A LEAP AHEAD

Step 5 – Deploy the Robot Controller

3. Android Studio now shows an Android Device



Guide

- Android Studio has found the Robot Controller phone.
- Click ‘OK’ to download software

FROG FORCE 503 A LEAP AHEAD

Step 5 – Deploy the Robot Controller
4. Application Starts on Robot Controller

Guide

- The Android phone will display the page at the left indicating that the application has started.

Congratulations you have a working FTC Robot Controller!!!

Step 6 – Deploy the Driver Station

1. Open Application Activity

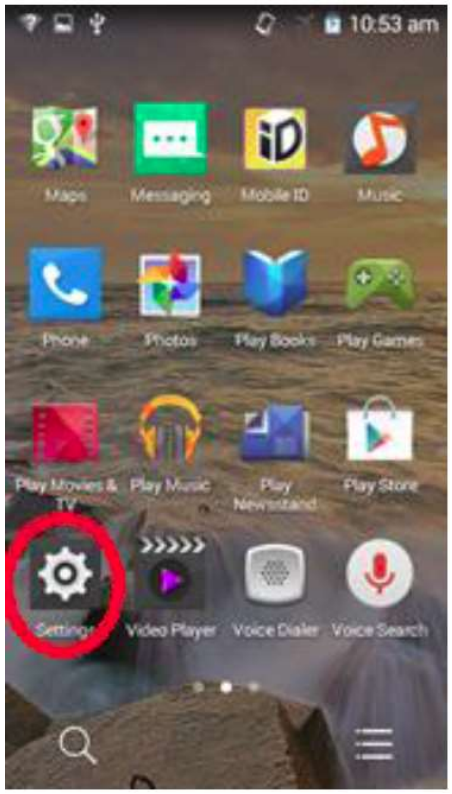
Guide

- Open the application activity page by selecting it's icon (red circle).

FROG FORCE 503 A LEAP AHEAD

Step 6 – Deploy the Driver Station

2. Open Settings Activity



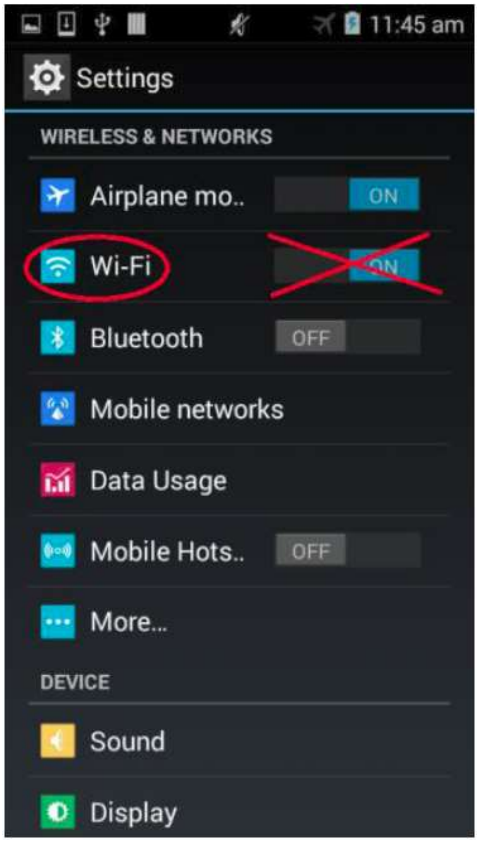
Guide

- Open the settings activity page by selecting it's icon (red circle).
- Note: it may ne necessary to swiupe left or right until the icon comes into view

FROG FORCE 503 A LEAP AHEAD

Step 6 – Deploy the Driver Station

3. Click on “Wi-Fi”



Guide

- Click on the word “Wi-Fi”, not the on-off button

FROG FORCE 503 A LEAP AHEAD

Step 6 – Deploy the Driver Station

4. Connect to External Internet Connection

Guide

- Connect to a Wi-Fi network that can reach the internet.
- Obtain Wi-FI logon information from host
- Once Provided , network will be shown at page at left.
- Select network and connect to the internet

FROG FORCE 503 A LEAP AHEAD

Step 6 – Deploy the Driver Station
5. Launch Google Play

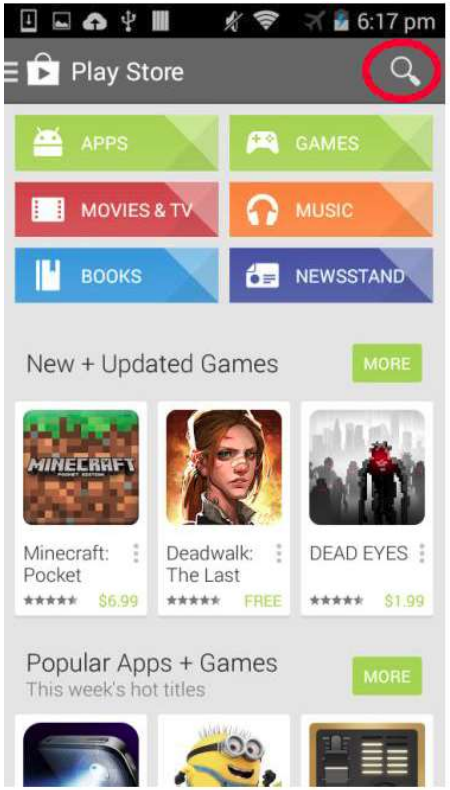
Guide

- Return to Home Screen
- Launch Google “Play Store” (red circle)
- The Play store might prompt you for login information to an existing Google account or ask you to create one. Follow the on screen instructions.
- The Driver station app is free and no payment method is required.
- If a screen requests a credit card or other form of payment select the skip button.

Note: You will need to have a Google account to download the Driver station. If you don’t already have an account you will need to create one. There is no charge or cost for this software.

FROG FORCE 503 A LEAP AHEAD

Step 6 – Deploy the Driver Station
6. Select Search

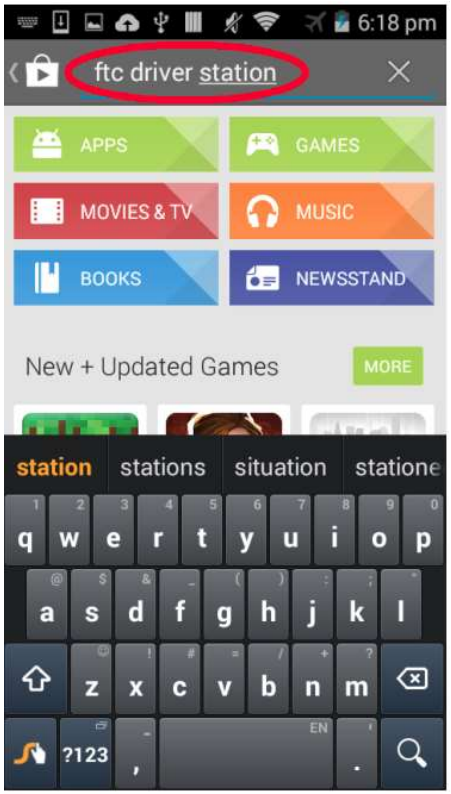


Guide

- Select the Search icon

FROG FORCE 503 A LEAP AHEAD

Step 6 – Deploy the Driver Station
7. Search for FTC Driver Station

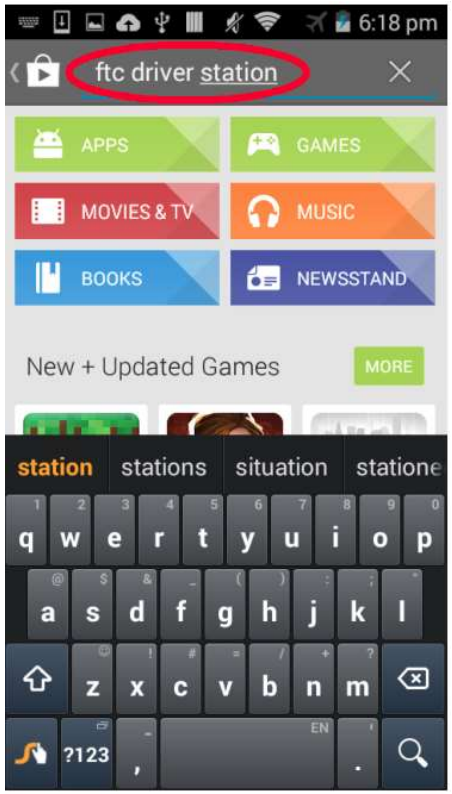


Guide

- Enter ‘FTC driver station’ in the search text box

FROG FORCE 503 A LEAP AHEAD

Step 6 – Deploy the Driver Station
7. Search for FTC Driver Station

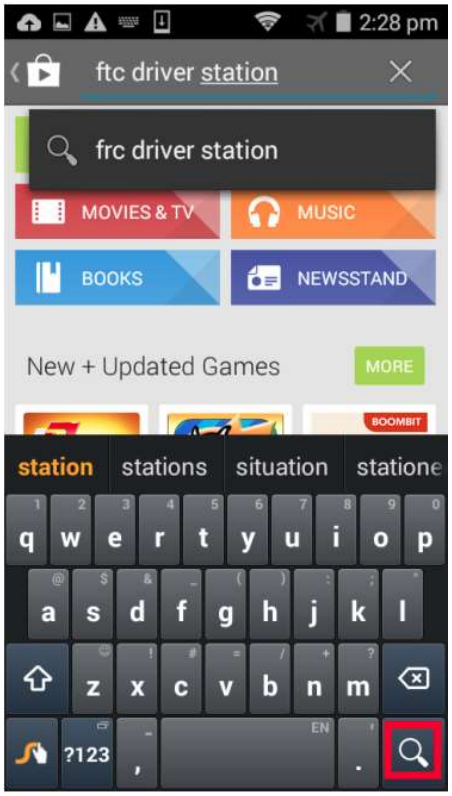


Guide

- Enter ‘FTC driver station’ in the search text box

FROG FORCE 503 A LEAP AHEAD

Step 6 – Deploy the Driver Station
8. Execute Search

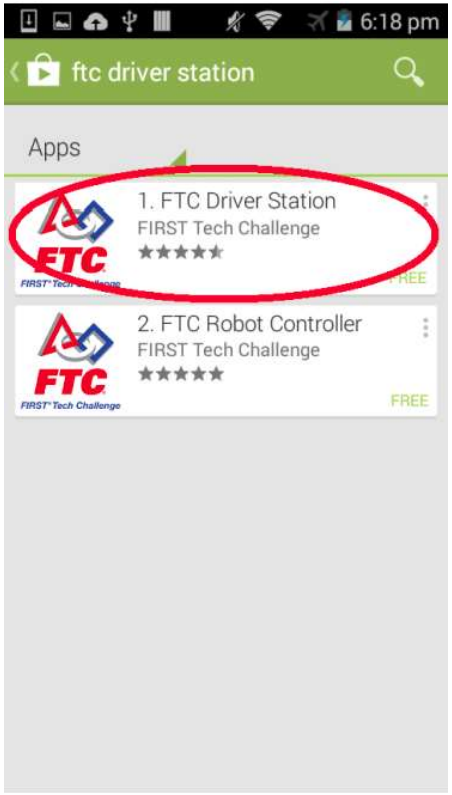


Guide

- Press the magnifying glass in the bottom right corner of the keyboard to execute the search.

Step 6 – Deploy the Driver Station

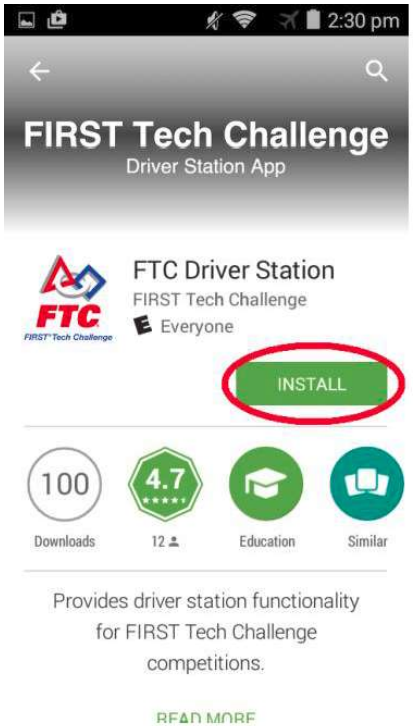
9. Select Driver Station



Guide

- Select the FTC Driver Station block

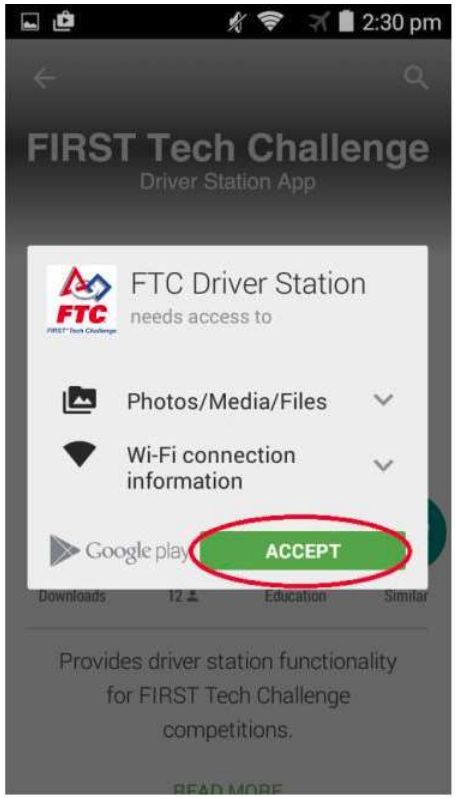
Step 6 – Deploy the Driver Station
10. Install



Guide

- Select “Install”

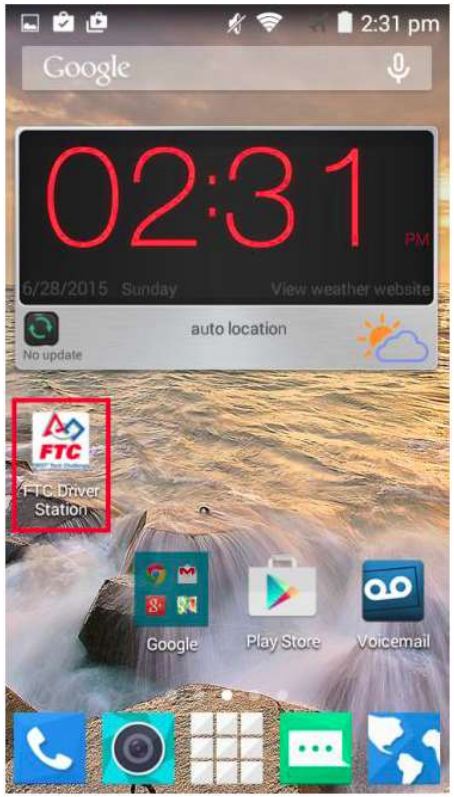
Step 6 – Deploy the Driver Station
11. Accept



Guide

- Select “Accept”

Step 6 – Deploy the Driver Station
12. Return to Home Page



Guide

- Return to Home Screen
- Note the FTC Driver Icon has been installed!

- Important
  - You must delete (forgotten) the internet connection that you have setup on this device to prevent connection issues between the Driver Station and Robot Controller
  - Continue onto next steps

Congratulations you have a working FTC Driver Station!!!

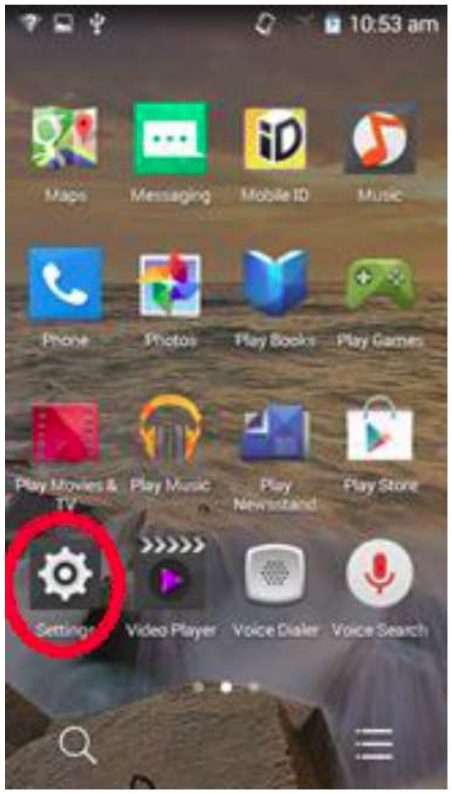
FROG FORCE 503 A LEAP AHEAD

Step 7 – Network Cleanup
1. Open Application Activity

Guide

- Open the application activity page by selecting it's icon (red circle).

Step 7 – Network Cleanup
2. Open Settings Activity



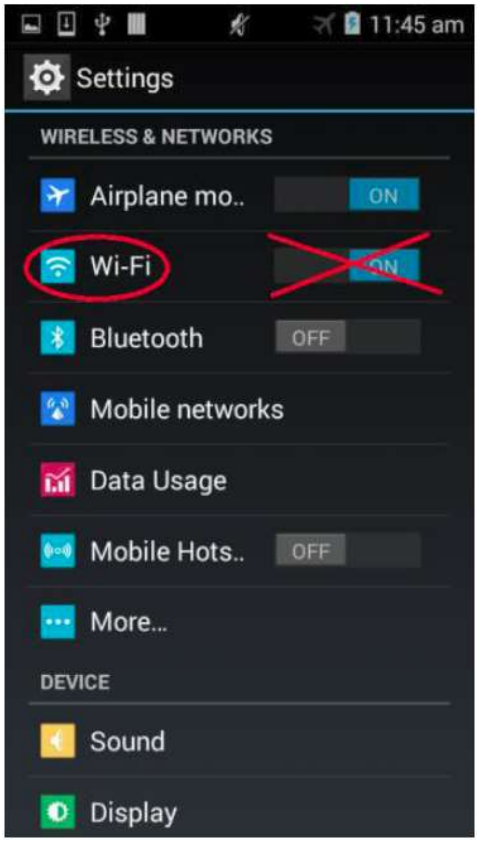
Guide

- Open the settings activity page by selecting it's icon (red circle).
- Note: it may ne necessary to swiupe left or right until the icon comes into view

FROG FORCE 503 A LEAP AHEAD

Step 7 – Network Cleanup

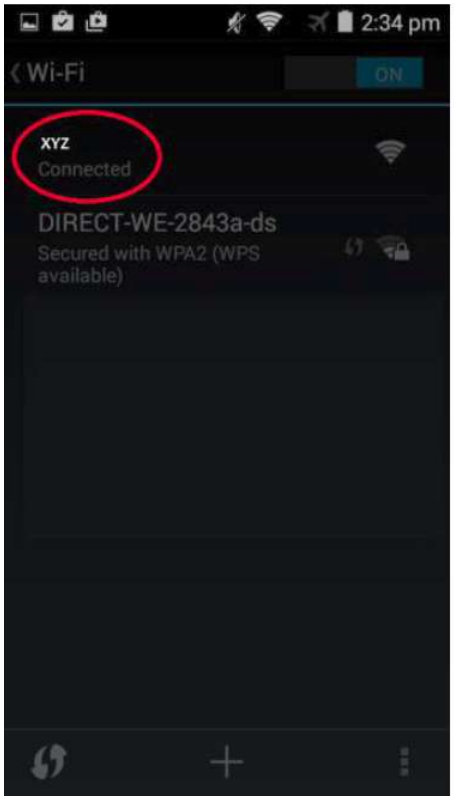
3. Click on “Wi-Fi”



Guide

- Click on the word “Wi-Fi”, not the on-off button

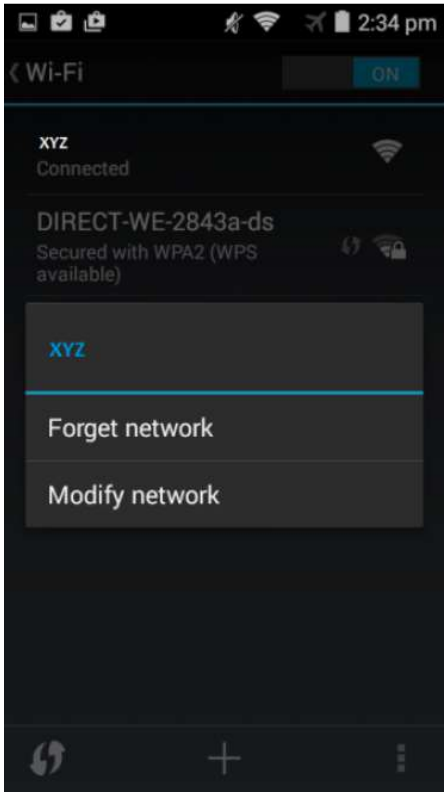
Step 7 – Network Cleanup
4. Select Wi-Fi Internet Connection



Guide

- Find the Wf-FI network that connects to the Internet
- Long hold the name of the network

Step 7 – Network Cleanup
5. Forget Wi-Fi Internet Connection



Guide

- Select ‘Forget network’
- In general, the Driver Station and the Robot Controller cell phones should not be connected to any wireless networks with the exception of the ‘Wi-Fi Direct’ connection between the two cell phones.

FROG FORCE 503 A LEAP AHEAD

Congratulations you have a working robot Communication environment!!!!!!

Questions?

What we are doing today will transform tomorrow's culture.