FTC Training Manual

ZTE Channel Changing App

FIRST Tech Challenge

8/3/2015

This document contains training material to introduce students and mentors to the next gen FIRST Tech Challenge robot controller platform.

Contents

1   Introduction

The *FIRST* Tech Challenge (FTC) has a new control system for its robot competitions. This new control system *point-to-point* system. This system has two main components, the *Driver Station* and the *Robot Controller*. The driver station communicates wirelessly with the robot controller.

Figure 1 - The new FTC platform is a point-to-point solution.

These two devices are *paired* together using a *WiFi Direct* connection. For this WiFi Direct connection, the Robot Controller device acts as the WiFi Direct *Group Owner.* If you are using a pair of ZTE Speed phones as your Driver Station and Robot Controller, then you can install a special app from the Google Play store that alløws you to change the WiFi channel that is used by your *Group Owner* to establish the WiFi direct connection.

Figure 2 – You can use a special app to change the WiFi Direct channel for ZTE Speed

2 Downloading the App from Google Play

The channel changing app is available on Google Play for free for download. Note that this app should be installed on the Android device that is acting as your Robot Controller (i.e., the device that is acting as the WiFi Direct Group Owner). You do not need to install this app on your Driver Station Android device.

IMPORTANT NOTE: This WiFi Direct channel changing app will only work on the ZTE Speed phone. It will not work on other Android devices. It can only change the WiFi Direct channel for a ZTE Speed phone.

The ZTE Speed channel changing app is located on Google Play. To install the app, you first need to connect the ZTE phone to an available wireless network that has access to the Internet. Launch the **Settings** activity on your phone, and select the **Wi-Fi** item to display the Wi-Fi activity.
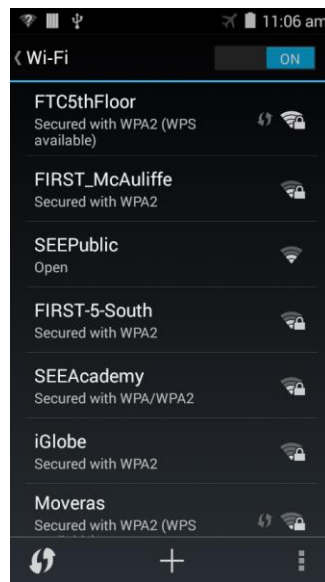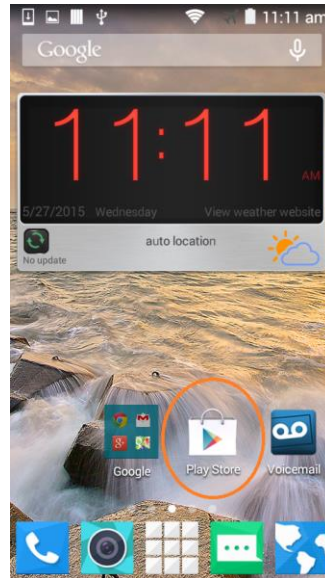

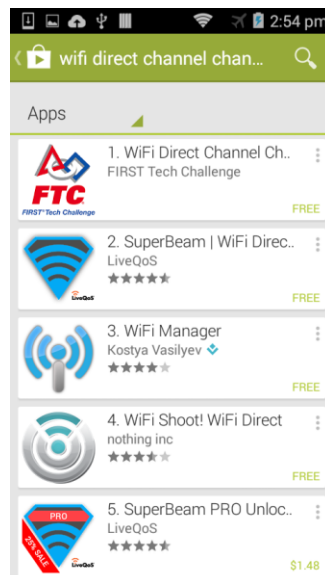Figure 3 - Select your wireless network from the Wi-Fi activity.

Select your desired wireless network from the Wi-Fi activity and provide the password information required to access the wireless network.

DRAFT: Contents Subject to Change

Figure 4 - Launch the Google Play Store app.

Once you have connected successfully to your wireless network, launch the Google **Play Store** app from your phone. The Play Store app might prompt you to either login to an existing Google account or create a new one. Follow the onscreen instructions to either create a new (free) account or login to your existing account.
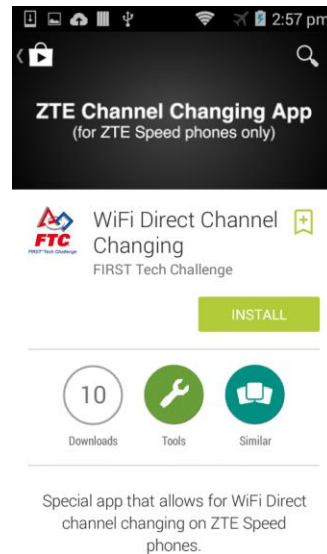
Once you have successfully logged in to Google Play, click on the search icon (a little magnifying glass) and search for the phrase "Wifi Direct Channel Changing"

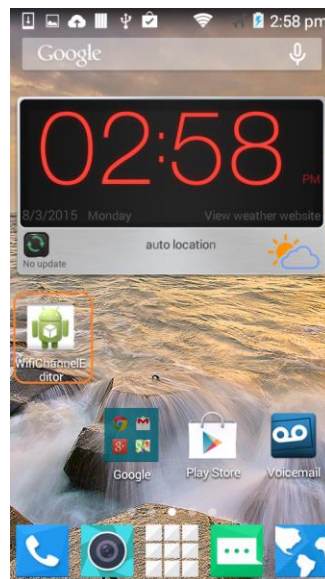Figure 5 - Search for the phrase "wifi direct channel changing"

Once you have found the WiFi Direct Channel Changing app, click on it and follow the onscreen instructions to install. Note that the application might prompt you to enter a credit card number or

some other method of payment. The app is free and no payment method is required. You should be able to hit the "Skip" button to skip the process of providing a method of payment.

Figure 6 - Follow the on-screen instructions to install the app.

If you were able to install the app successfully, then there should be WifiChannelEditor icon on your Android device.

Figure 7 - After installing the app, you should see an icon on your Android's screen.

IMPORTANT NOTE: After you have successfully installed the app, go to your Wi-Fi settings menu and "forget" the wireless network that you used to connect to Google Play. In general, you do not want to be connected to any wireless networks with the exception of your FTC Driver Station device.
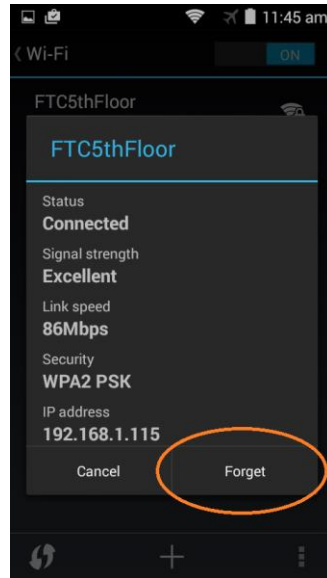
Figure 8 - Don't forget to forget the wireless network after the installation is complete!

3   Using the WiFi Direct Channel Changing App

3.1   Changing the Channel

After you have successfully installed the WiFi Direct channel changing app onto your Robot Controller ZTE Speed phone, you have two ways to launch it:

1. Click on the WifiChannelEditor icon to launch the app (see Figure 7).
2. You can also launch the app from the FTC Robot Controller app. Go to the **Settings** menu of the FTC Robot Controller app and select the **Change Wifi Channel** item to launch the channel changing app.
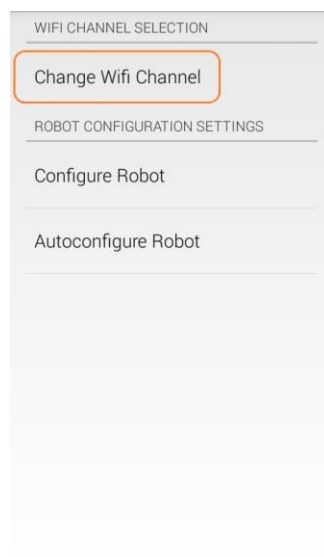
Figure 9 - Click on Change Wifi Channel from the Settings menu to launch the app.

To change the channel, use the drop down spinner control to select your desired channel.
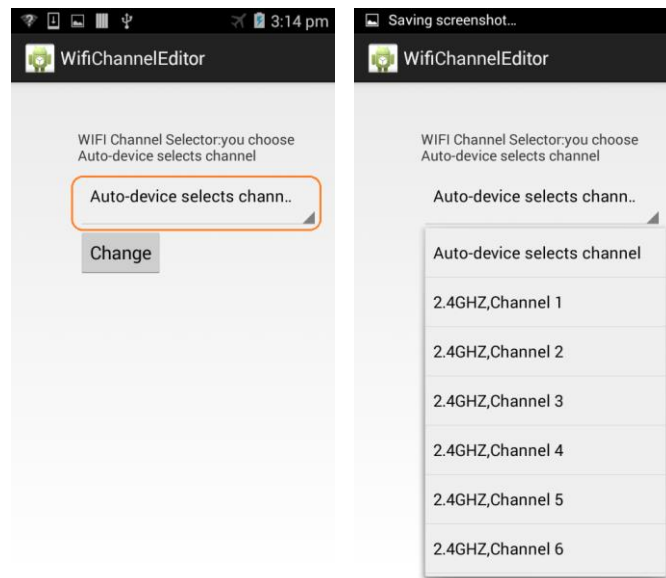

Figure 10 - Use drop down spinner to select the desired channel.

Once you have selected your desired channel, press the **Change** button to force the Robot Controller device to change its channel.
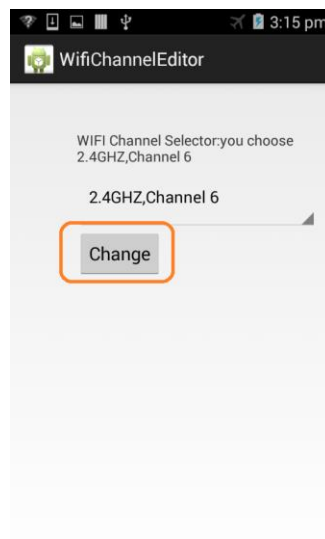

Figure 11 - Press the Change button to force the channel change.

The app should display a notification indicating that the listening and operating channel for the WiFi group owner has been changed.
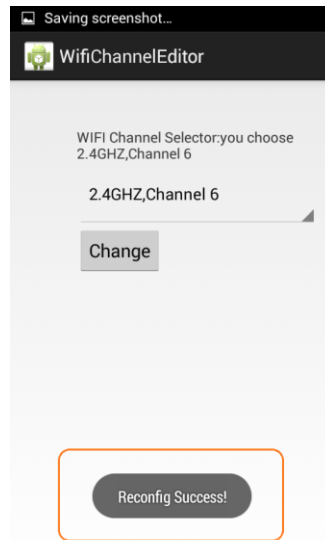
Figure 12 - The app should display a notification ("Reconfig Success!") once it has completed the channel change.

3.2 Un-Pairing then Re-Pairing the Driver Station to the Robot Controller.

Note that after you have changed the channel on your Robot Controller Android device, you might have to un-pair your Driver Station from the Robot Controller, and then re-pair the Driver Station back to the Robot Controller.

To un-pair the Driver Station from the Robot Controller, launch the **Settings** menu from the Driver Station app and select the **Pair with Robot Controller** item.
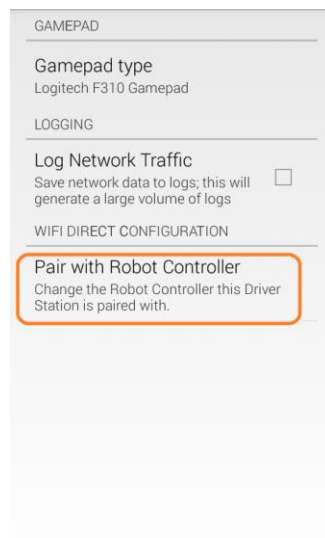

Figure 13 - Select Pair with Robot Controller.

From the Pair with Controller screen, select **None** to un-pair your phone.
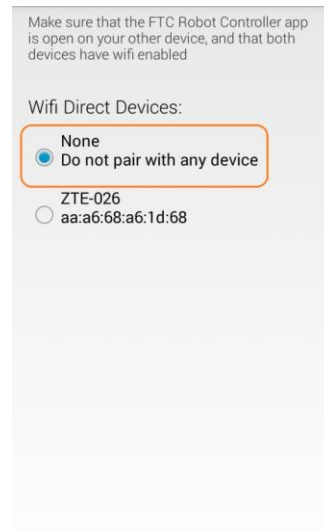
Figure 14 - Select None to un-pair the device. Use the back arrow to return to the main screen.

Use the back arrow to return back to return to the main Driver Station screen. The screen should now indicate that the Driver Station is not paired with any WiFi Direct device.
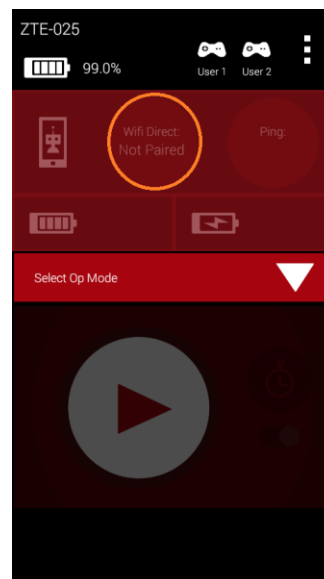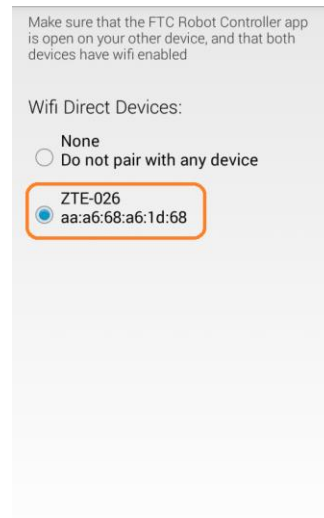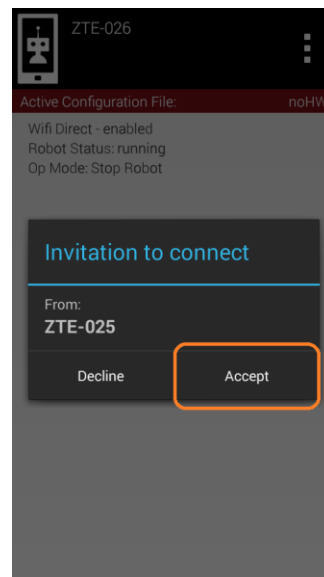

Figure 15 - The Driver Station should now be un-paired from the Robot Controller.

To re-pair the two devices, launch the **Settings** menu from the Driver Station app again and select **Pair with Robot Controller** again (see Figure 13). Find the listing for your Robot Controller Android device (in this example "ZTE-026") and select this item.

Figure 16 - Select your target device (in this example ZTE-026), then use the back arrow to return to the main screen.

Note that your Robot Controller Android device might prompt you to make sure you approve the connection request. On the Robot Controller device, click on the Accept button to approve the connection request.

Figure 17 - Click Accept to approve of the connection request.

Once you have accepted the connection request, the Driver Station screen should display that it has successfully connected to the Robot Controller.
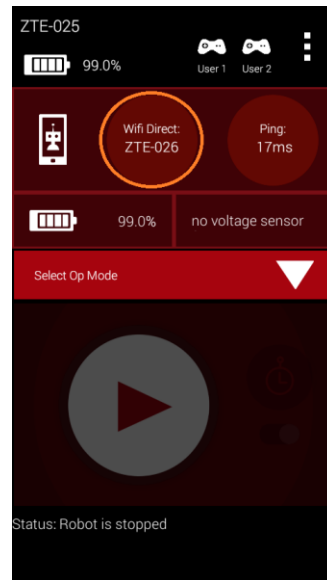
Figure 18 - Once the connection request is accepted, the Driver Station should connect to the Robot Controller.