

Users of the Android version of CrewNerd may be interested in accessing a faster, more accurate GPS source than that which is available from their phone or tablet. What follows is a description of the solution that I am using. As you read through it, keep in mind that I'm not a GPS expert nor am I a salesman for any GPS products. I just wanted a smoother, more stable speed source for CrewNerd than I was getting from the built-in GPS radio on my phone. There's no guarantee that this solution will work for you. You may discover that it works better with a different brand of GPS receiver, enabling app or with different settings. All I can say is that this setup is working for me.

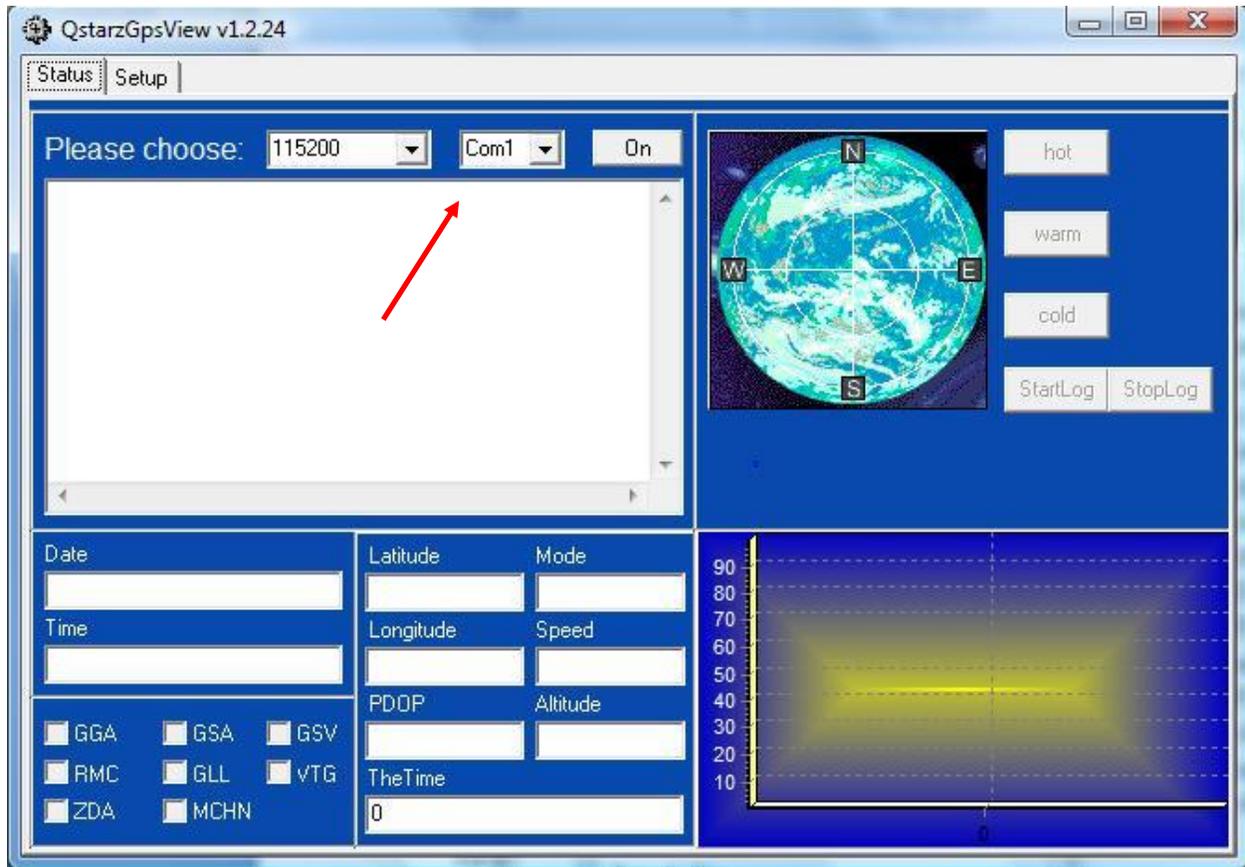
I'm using the [QStarz BT Q818XT](#) GPS receiver and the [Bluetooth GPS Provider](#) app on my Nexus 4 with Lollipop V5.0.1. The receiver can provide up to a 10 Hz (10 times per second) GPS update signal compared to a smart phone's typical 1 Hz. In addition, it can take advantage of differential GPS (DGPS) which is an error correcting system that results in significantly better accuracy. In practice, I found that the combination of increased update speed and DGPS results in a much smoother speed plot without the usual erratic data.

The QStarz BT Q818XT GPS Receiver



The Q818XT receiver has a mini-USB charging port on one side and an "Off-1HZ-10Hz" switch on the other. The 1 Hz position can be set to deliver a 2, 3, 4 or 5 Hz signal using a companion "helper" app that runs on your Windows computer and talks to the device via USB. At the 10 Hz

setting, DGPS is not available. I used 5 Hz and enabled DGPS. Some have suggested that 10 Hz without DGPS might be as good or better than 5 Hz with it but I have not tried that yet. Note that it may take up to 15 minutes to get a DGPS signal so start the receiver well before you launch.



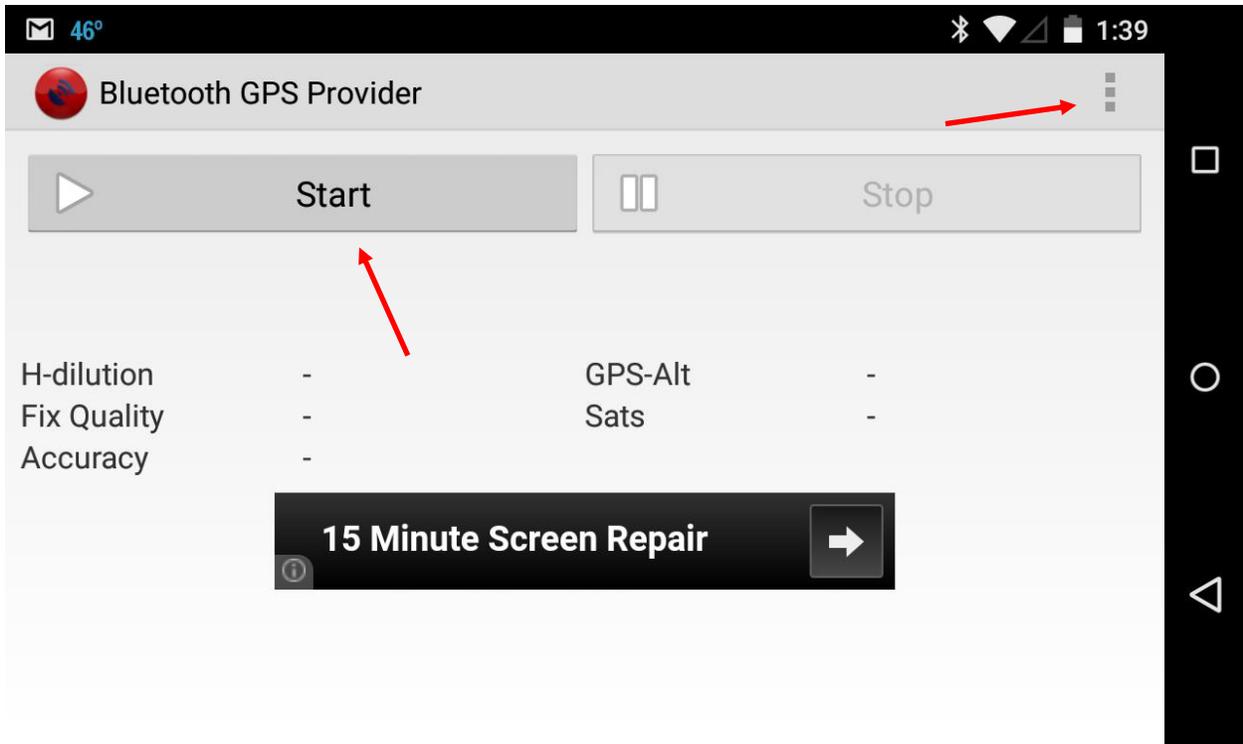
The Windows-only helper app for the Qstarz receiver, "QstarzGpsView", as well as a User Manual and Quick Start Guide can be downloaded from the [Qstarz website](#) as can the Windows driver to enable the USB connection with the device. If you have a problem with the driver download or any of the other files, an alternate source is the [Canada GPS website](#). Installation of the helper app and it's driver is pretty straightforward. The first time you plug in the receiver, Windows will search for and be unable to find a driver. Point it to the downloaded driver folder appropriate for your OS and the driver should install automatically. With the receiver connected, turned on and locked on and the app running you will need to find the COM port assigned to the device so it can be entered in the helper app. The User Manual explains how (look in Device Manager) but in case you can't find it, try using COM 3. Enter that value and set it to 115,200 baud and the app should jump to life. You will have to set the COM port each time you run the app.



The primary reason to load and launch the helper app is to set the Fix Update Rate that will be assigned to the 1 Hz position of the switch on the device. In my case, I set it to 5. On the Settings tab, go to the Fix Update Rate section, select 5 and then click Set. Note that, if you are happy just using 10 Hz without DGPS, you don't even need to load/configure the helper app. In that case you will have the option of 10 Hz or 1 Hz (you are already getting 1 Hz from your phone). There is one other thing the helper app can do that might improve the time required to get a GPS fix (it's normally very fast). Go to the AGPS section on the settings tab and click "Update". That will download "almanac data" to the device which helps it figure out what satellites to look for which can cut the time to get a fix in half. The data is volatile however, i.e. it changes over time and will lose efficiency. After about six days you should update it again or just delete it and be happy without the assist.

The Bluetooth GPS Provider App

The receiver is a small, stand-alone device and so there needs to be a way to make it's signal available to your phone. For that I am using the free [Bluetooth GPS Provider](#) app. First, turn on the QStarz GPS receiver and pair it with your phone in the usual manner. The Bluetooth pass code is 0000. Then download the app to your phone from the Play Store and run it while connected via Bluetooth to the QStarz GPS receiver.



You will be asked to choose a GPS receiver and then, to start the flow of data from the receiver to the phone, tap Start. Providing the receiver has locked on, GPS data will now flow to the phone but you need to change two settings on your phone to allow CrewNerd and any other third party GPS apps to utilize the enhanced data and not the GPS data provided by the phone. First, in Settings, under Location, turn off the GPS radio. Then under Developer options, check "Allow mock locations". If you don't see developer settings, go to Settings, About phone/device, [Software information, More], Build number. Once you've found the Build number section of the settings, tap on the section 7 times. After two taps, a small pop up notification should appear saying "you are now X steps away from being a developer" with a number that counts down with every additional tap. After the 7th tap, the Developer options will be unlocked and available in the main settings menu.

There are a ton of settings in the Bluetooth GPS Provider app and I am still fiddling with them but here are the changes I made to the default settings (in the More menu, tap Preferences):

Raw HDOP: uncheck

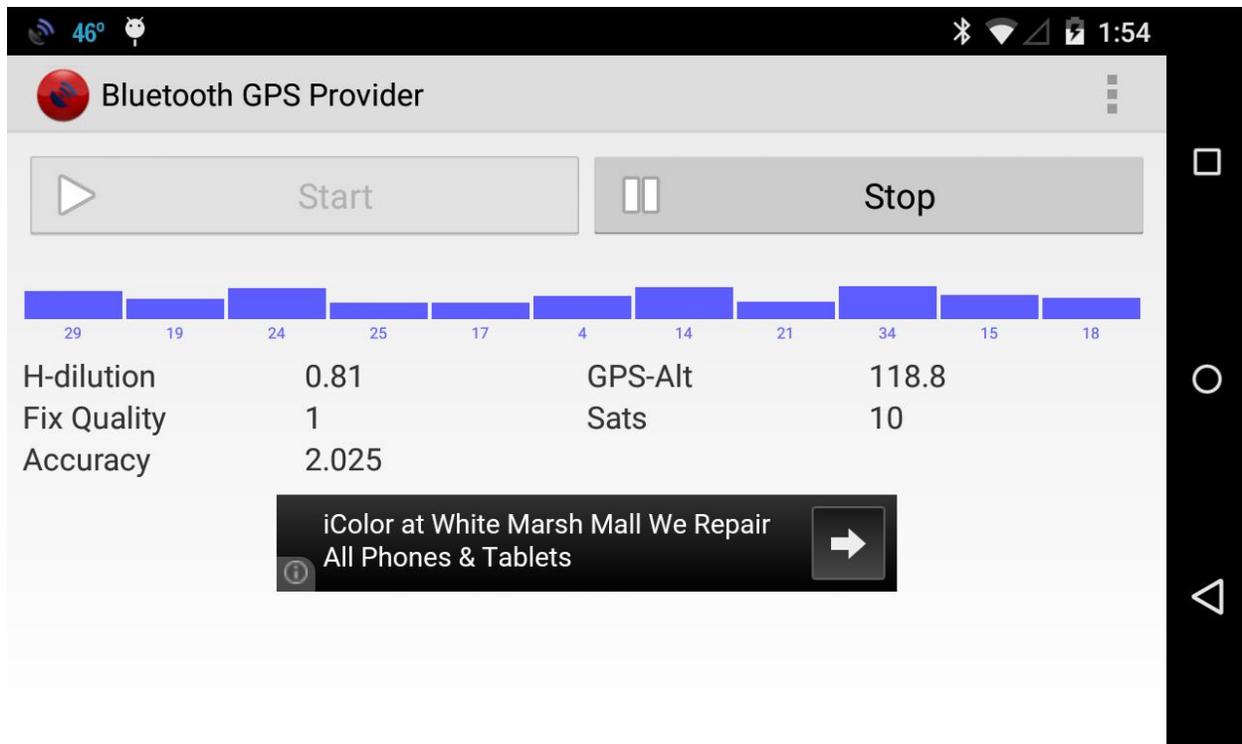
GPS Reconnect Aggressivity: medium*

GPS Type: MTK

MTK Update Rate: 5 (or whatever update frequency you have decided to use)

DGPS Mode: WAAS (EGNOS in Europe)

SBAS: enable



When the app has paired with the receiver and the receiver has locked on, the app will display a graphic of the satellites in view and show certain parameters such as the number of satellites, GPS-altitude in meters (which I find is far more accurate than what you get from the phone's GPS), accuracy in meters (typically a couple of meters), fix quality which will be "2" if you have a good DGPS lock and "1" otherwise (remember it will take about 15 minutes to get a DGPS lock) and H-dilution whatever that is (usually about 1).

* Battery life: Some have reported that the Bluetooth GPS Provider app is a battery hog. The issue is apparently related to the aggressiveness with which it tries to reconnect after losing a Bluetooth connection with the GPS device. The default setting is "aggressive". I set mine to "medium" and haven't noticed any problem with excessive battery drain. Typically, I can launch and be out for up to two hours and still have 25% battery left. This is partly due to the fact that turning off the built-in GPS on the phone reduces battery drain.

For more info

http://l-36.com/bluetooth_gps_provider.php - A sailor's experience with this setup. Includes a good discussion of settings for the provider app.

<http://goo.gl/ih924n> - The customer reviews on this Amazon page.

<http://racetrackrefugee.com/2012/11/16/qstarz-q818xt-10hz-gps-receiver/> - good discussion about the Q818XT setup.

<http://andrageoid.com/2010/10/android-external-bluetooth-gps-apps-bluetooth-gps-provider/> - good discussion about setting up the Bluetooth GPS Provider app.