LOCATION FINDER

User Manual

Abstract

This document highlights how to use the location finder tool which was built for Raspberry Pi's integrated with a GPS dongle.

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Introduction

This instruction manual is intended for users who are new to the dcgps application. You are expected to already be familiar with using the Raspbian OS (or any Linux machine which has an attached GPS dongle) and have basic knowledge of Linux terminal commands, although it is not necessary.

Location Finder is a console application that allows the user to view their current location as GPS coordinates and through an {X,Y} coordinate pair or on the Google Maps page. The application also allows the user to view the total wandering distance using the Haversine Formula.

Instructions

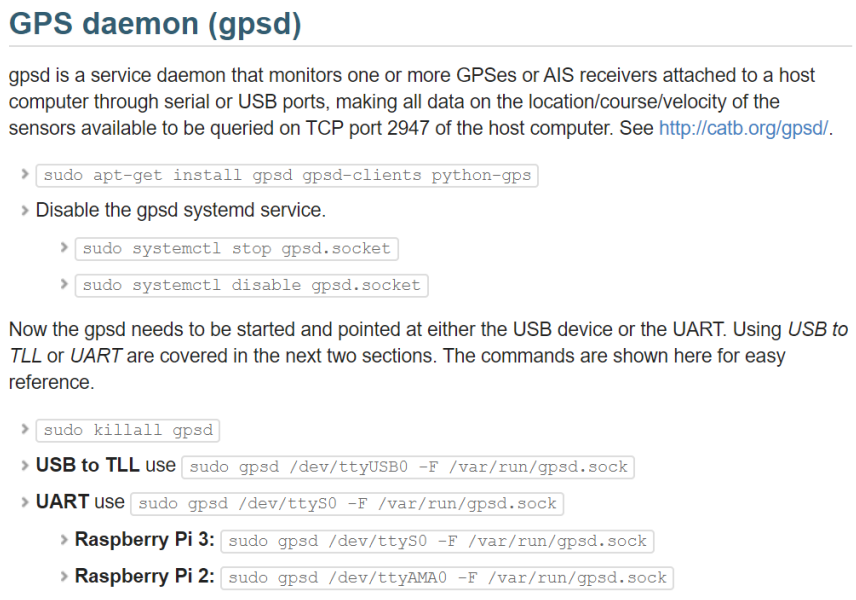
The following instructions will show you how to run and exit the application. This guide also demonstrates how to view your current location as GPS coordinates and through a Google Maps page, as well as viewing your total wandering distance (GPS imperfections).

Pre-requisites

The following instructions will require the following:

- Raspberry Pi (or a Linux desktop machine if you are in a place which does not hinder GPS signals)
- GPS dongle plugged into the Raspberry Pi (or Linux machine)
- Have the source code installed on the Raspberry Pi/Linux machine
- GPS Daemon is installed on the machine*
- Good GPS reception

*If you are unsure on how to install the GPS Daemon (gpsd), a screenshot of instructions and a link to an original tutorial can be found here. If you still have issues, check the comments in the makefile.



GPS daemon (gpsd)

gpsd is a service daemon that monitors one or more GPSes or AIS receivers attached to a host computer through serial or USB ports, making all data on the location/course/velocity of the sensors available to be queried on TCP port 2947 of the host computer. See http://catb.org/gpsd/.

- `sudo apt-get install gpsd gpsd-clients python-gps`
- Disable the gpsd systemd service.
  - `sudo systemctl stop gpsd.socket`
  - `sudo systemctl disable gpsd.socket`

Now the gpsd needs to be started and pointed at either the USB device or the UART. Using *USB to TLL* or *UART* are covered in the next two sections. The commands are shown here for easy reference.

- `sudo killall gpsd`
- **USB to TLL** use `sudo gpsd /dev/ttyUSB0 -F /var/run/gpsd.sock`
- **UART** use `sudo gpsd /dev/ttyS0 -F /var/run/gpsd.sock`
  - **Raspberry Pi 3:** `sudo gpsd /dev/ttyS0 -F /var/run/gpsd.sock`
  - **Raspberry Pi 2:** `sudo gpsd /dev/ttyAMA0 -F /var/run/gpsd.sock`

Running and exiting the program

In this section, we will go over how to run the application and how to exit the application.

1) In the terminal window, navigate to the folder where the application is located.
   Note: Use ***cd <foldername>*** to change folders, or ***cd ..*** to go back to a previous folder. In your Linux machine's command line, run the "make" command to build the project from the makefile's instructions.

2) Run the command ***./dcgps*** to start running the application.
   A menu option screen will be shown once the application starts running.

3) Once the application is running, enter the digit ***4*** to exit the application at any time.
   A message will be shown informing you that the application has been terminated.

Congratulations! You've successfully ran and exited the Location Finder application.

Viewing GPS coordinates

In this section, we will go over how to view GPS satellite data and location coordinates.

1) Run the command ***./dcgps*** to start running the application.
2) To view GPS satellite data and coordinates, enter the digit ***1***.
   The screen will now be showing each satellites' PRN, Elevation, Azimuth, SNR, and usage status. If a GPS fix has been detected, your current location's coordinates will be shown as well.

   Warning: If no GPS satellites are visible, a message will be shown informing you that the application will try looking for visible satellites after 5 seconds.

Viewing current location in Google Maps

In this section, we will go over how to view your current location in Google Maps using the Location Finder application.

1) Run the command ***./dcgps*** to start running the application.
2) To view GPS satellite data and coordinates, enter the digit ***2***.

   A browser window will automatically open a Google Maps page that shows your current location.

3) To continue on with the application, close the browser window.

Viewing current GPS wandering distance

In this section, we will go over how to view your current wandering distance

1) Run the command ***./dcgps*** to start running the application.
2) To view GPS satellite data and coordinates, enter the digit ***3***.

The screen will now be populated with the current wandering distance, which will be updated in real-time.

Warning: In order for the current wandering distance to be accurate, the Raspberry Pi has to be stationary.

Warning: This feature has not been diligently tested for accuracy. Do not use this feature for anything further than personal interest.