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BULLETIN
BUL-014

Differential GPS Set-up

Standard Global Positioning Satellite (GPS) values for a specific location change, or "drift", over a period of time as subtle variables change (e.g., satellites rotate around Earth). Differential GPS takes GPS measurements over a period of time and calculates a very accurate GPS coordinate. This is recommend for at the tower GPS for regular use.

These procedures are for Kairos provided software and Novatel GPS' and include procedures for setting:
  • the tower to calculate differential GPS
  • the vehicle to use differential GPS
Other GPS units may require different set-up procedures.

A standard Kairos Pronto4, including CBL-075, CBL-089, and CBL-045 are recommended. If not available, the GPS will need to be connected to a Com Port and appropriately powered.

Tower

1. Plug the serial end of CBL-075 to the end of CBL-089 labeled "To PC".
2. Connect the short, unlabeled pigtail portion of CBL-045 to the other end of CBL-089.
3. Connect the main connector on the pigtail end of CBL-045 into the battery port labeled "LOAD".
4. Plug the USB end of CBL-075 into a USB port on the GCS laptop.
5. Turn on the GCS laptop.
6. In djLoader (loaded by default on GCS start), on the GPS3 tab:
    a. In the "GPS3 Comms" area, verify "Opened COM1" is displayed.
    b. In the "Adjust:" drop-down, select the "Configure DGPS base" option.
    c. In the lower-right corner of the GPS3 tab, click the **>>Send** button.

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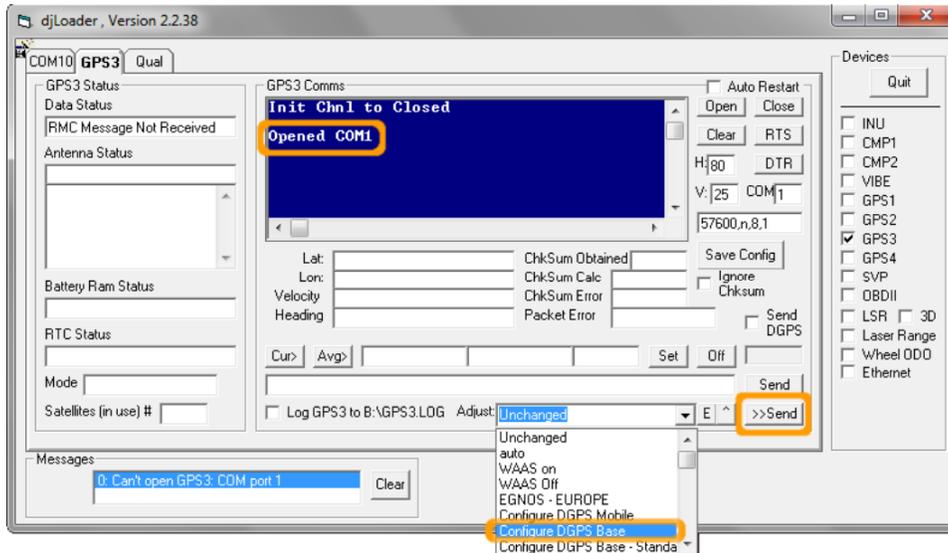
d. In the upper-left corner, verify the Antenna Status is "9 WAAS".
e. In the Adjust drop-down, select the amount of time to average the GPS position.
    It is recommended to exceed a 24 hour period.
f. In the lower-right corner of the GPS3 tab, click the **>>Send** button.
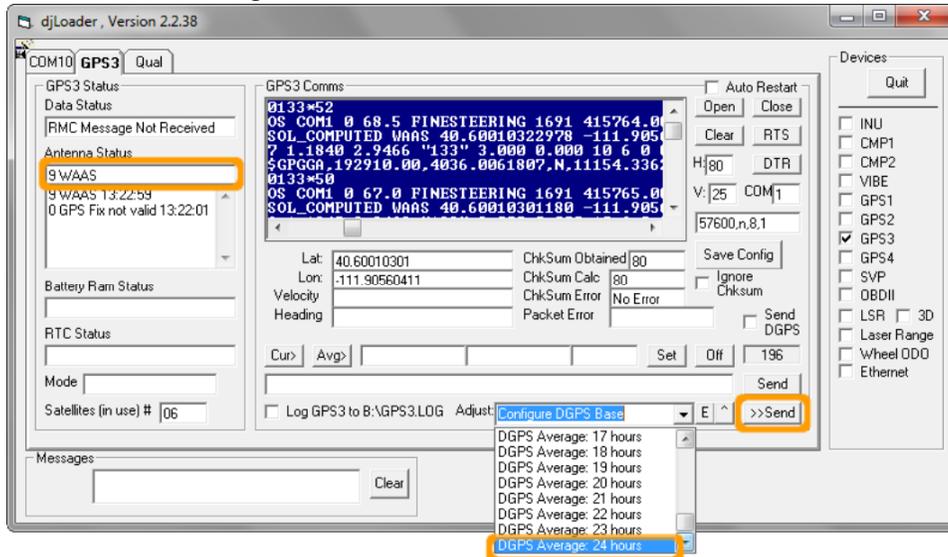
7. Wait at least the selected amount of time.
8. In djLoader, on the GPS3 tab:
    a. In the upper-left corner the Antenna status should be "7LocalGPSFix value" and the average value should be fixed in the Lat and Long fields.

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b. In the right side of the GPS3 tab, ensure the "Send DGPS" checkbox is checked.
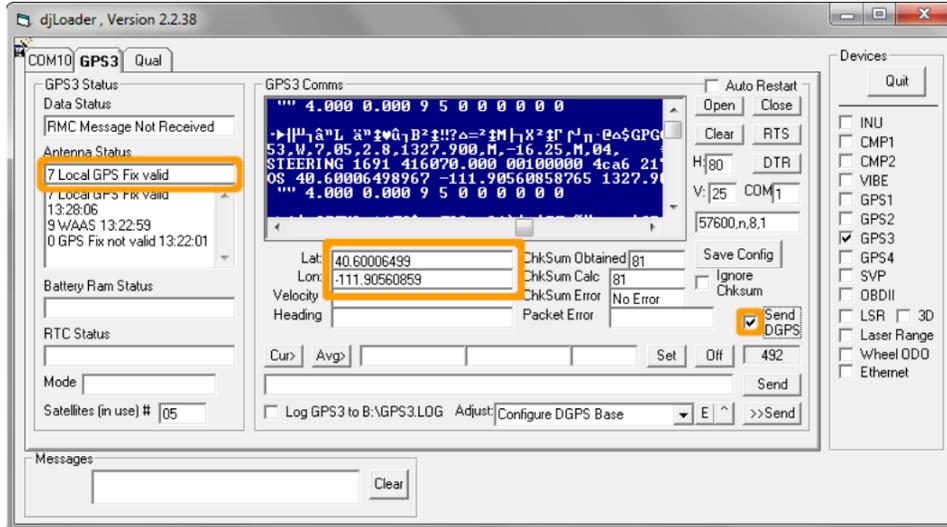
Vehicles

1. Ensure CBL-045 is connected between P208, P209 and P105.
2. Restore djLoader, on the GPS3 tab, in the GPS3 Comms section, in the "Adjust" drop-down, select the Configure DGPS Mobile profile, and click the **>> Send** button.

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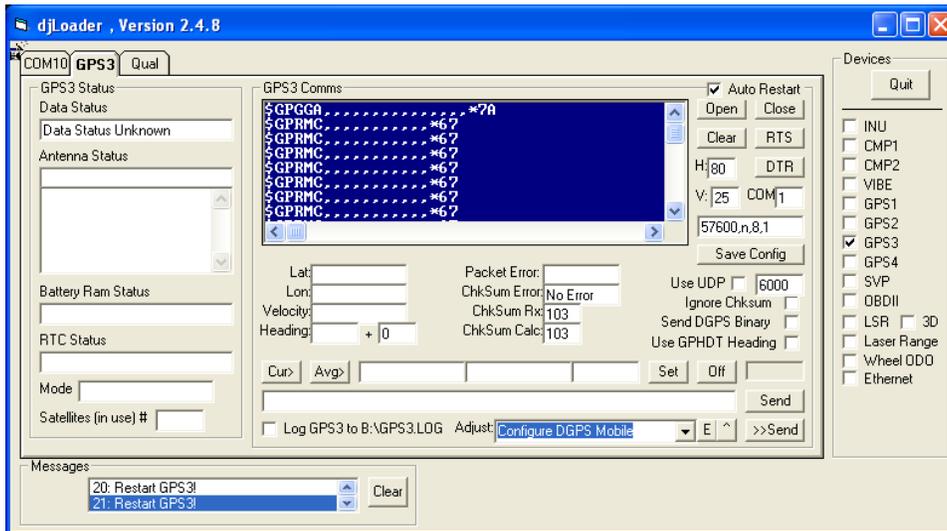
3. This sends the following command to the GPS:
   PSRDIFFSOURCE RTCA ANY
   COM COM2 57600 N 8 1 N OFF OFF
   INTERFACEMODE COM2 RTCA NONE OFF
   SAVECONFIG
4. Verify or launch C:\GC07\receiveCorrection.py.
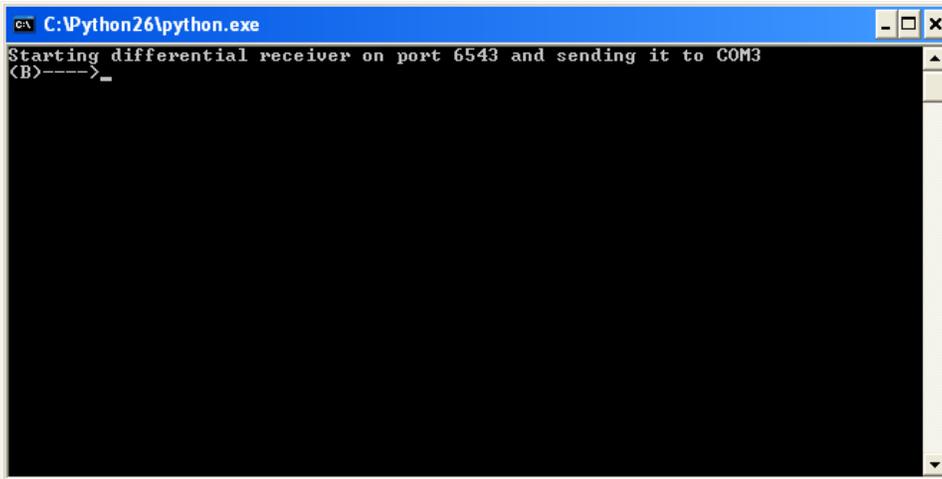
5. This receives a binary correction broadcast on port 6543 and sends it to COM3 which is attached to the GPS receiver. Data will start to flow showing the number of bytes received and sent to the GPS receiver.
6. Once the correction is received, in the upper-left corner of djLoader's GPS3 tab, the GPS Data Status should change to 2 Diff GPS.

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