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# ***TI#112404-1: Using a Unicorn-Limited/Apollo with GPS (global positioning) Device***

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The Unicorn-Limited and Apollo series of traffic counters (starting with V1.40) support the direct connection of a GPS device to the counter. Once connected, the current longitude and latitude can be programmed into the counter automatically.

The communication between the GPS device and the traffic counter is done using the NMEA protocol. This is a widely supported protocol and virtually any GPS device with an RS232 port can be setup to output positioning with this format.

The following demonstrates the correct procedure for using a Magellan Meridian Platinum GPS device. This is an excellent device to use as it offers many features and works well with the traffic counter. Other GPS devices will work, however the exact setup steps may be different:

## ***Setting up the Magellan Meridian Platinum GPS:***

1. Power your GPS unit on and complete all first time setup and initialization (refer to the instruction manual).
2. Press the **Menu** key and select **Setup**.
3. Scroll down to **NMEA** and select it.
4. Select **V2.1 GSA**. Actually, any of the modes will work but this one gives the greatest resolution of measurement.
5. From the Setup menu select **Baud Rate**. Choose either **4800** or **19200** as follows:
  - a. **4800** is the standard baud rate for NMEA devices. However, the traffic counter defaults to 19200 operation and cannot automatically recognize a GPS device connected to it that is operating at this rate.  
If you select 4800 (or if your GPS device only operates NMEA at that speed), then you will have to manually press <Alt+Right> on the counter keypad to download position data from the GPS to the traffic counter (see next section).
  - b. **19200** is a generally a better selection because the counter will automatically recognize the GPS device being connected and start downloading GPS position data immediately (you don't have to press anything on the counter keypad).
6. Exit the menus and return to the main navigation screen.
7. This completes the Magellan GPS setup.

## ***Using your GPS system with the Unicorn-Limited or Apollo:***

1. Travel to your data collection location.
2. Turn on the GPS unit and give it a few minutes to get a fix. *Important Note: Until the GPS unit accurately acquires a fix, it will not send the data to the traffic counter. Wait 3 to 5 minutes after turning on before connecting to counter to insure position is known.*
3. Connect a 9 Pin Male-Male Null Modem adapter onto the end of the GPS cable (which should be a female connector). This cable allows you to plug GPS unit into traffic counter.

4. Turn on the traffic counter (if off) and make sure data collection hasn't started. For the Apollo you should be at the "STEP #1" screen for collecting data. For the Unicorn-Limited, you should be seeing the "Not Collecting Data" menu (which includes the Start Collecting menu option) .
5. If your GPS unit is operating at 4800 baud: Press the <Alt+Right> key on the counter keypad. A window will appear similar to this:

```

LAT=      °      .      m
LON=      °      .      m
*****
Site: _____
```

You can then connect the GPS unit to the counter serial port.

If your GPS unit is operating at 19200 baud: Don't press the <Alt+Right> key (it will not work correctly) and instead simply directly connect the GPS device to the counter (it will automatically call up the above window).

6. The latitude (LAT) and longitude (LON) values will be filled in automatically by the GPS unit. You can enter in the correct Site ID at any time. The following show a typical screen after the GPS data has been retrieved:

```

LAT=  44° 03.2327m N
LON= 123° 05.2698m W
*****
Site: 098112 _____
```

7. When the LAT, LON, and Site values are correct, **disconnect the GPS unit**. This is important to do before moving on because the constant data from the GPS unit will cause the counter either restart this screen or to flicker "Serial Active" over and over again.
8. Press <Enter> to go directly to the Start Collecting data function or press <Clear> to return to the main menu. If you press <Enter>, then the Unicorn-Limited will skip the Site and Info Line questions (although you can back up through them if desired). For the Apollo, you will begin with the "STEP #2" screen.
9. Your setup with the GPS unit is complete.

### **GPS with Centurion:**

Starting with Centurion V1.25 (build #0003) the software checks to see if the "Info Line 1" and "Info Line 2" values are GPS coordinates. If they are, the following occurs:

- a) If the site already exists in the database, the coordinates are checked to see if they are the same as previously recorded for this site. If they differ by more than a hundredth of a second, then a warning message appears during import asking you to verify they are the same location or if you want to store the data under a different site ID.
- b) The GPS coordinates are also stored in a new Latitude and Longitude field in the database and appear on reports separately from the Info Line 1 and Info Line 2 values.

The GPS data is also compatible with TrafMan, but no special checks are made to insure the coordinates match previous values. In addition, TrafMan displays the GPS location just like any other data on the Info 1 & Info 2 lines.

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*Example of a connected device to an Apollo Counter:*

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**Notes:**

1. All null-modem cable (not in picture) connects the GPS device to the counter.
2. When the Lat/Lon read correctly, disconnect the GPS device.
3. The Site ID can be entered at anytime. When it is correct, press <Enter> on the counter keypad. To cancel, press the <Clear> key.