| WinFrog Device Group: | GPS |
|---|---|
| Device Name/Model: | TRIMBLE DNAVN |
| Device Manufacturer: | Trimble Navigation Limited<br>645 North Mary Avenue<br>Sunnyvale, CA  94086<br>Tel: 1 –( 408) 481-8000<br><br>Technical Support<br>Tel: 1-800-767-4822<br>Email: Trimble_Support@Trimble.com |
| Device Data String(s) Output to WinFrog: | See Telegram Specification section below |
| WinFrog Data String(s) Output to Device: | N/A |
| WinFrog Data Item(s) and their RAW record: | POSITION             303 |

**DEVICE DESCRIPTION:**
The Trimble 4000 series GPS receivers can be configured to output a DGPS position in
ASCII format (see Trimble documentation for details). This device is similar to the
Trimble ASCII device with the exception that the data string contains additional data.
The GPS antenna and differential correction device are interfaced directly with the
Trimble unit. The unit internally calculates a DPGS position and outputs it, via a serial
port, to WinFrog.

# *DEVICE CONFIGURATION INSTRUCTIONS*

**WINFROG I/O DEVICES > EDIT I/O:**
Serial
Configurable Parameters

**WINFROG I/O DEVICES > CONFIGURE DEVICE:**
This device does not require any configuration.

**WINFROG VEHICLE > CONFIGURE VEHICLE DEVICES > DEVICE DATA ITEM >
EDIT:**
Adding the Trimble DNAVN device creates the POSITION data item. Once the data
item has been added to the vehicle, it must be edited to suit the application.

**Data item:   GPS, TRIMBLE DNAVN, POSITION**
The POSITION data item must be edited once it is added to a vehicle's device list.
Highlight the data item in the vehicle's device list and click the Edit button. The
Configure Position dialog box appears as seen below.
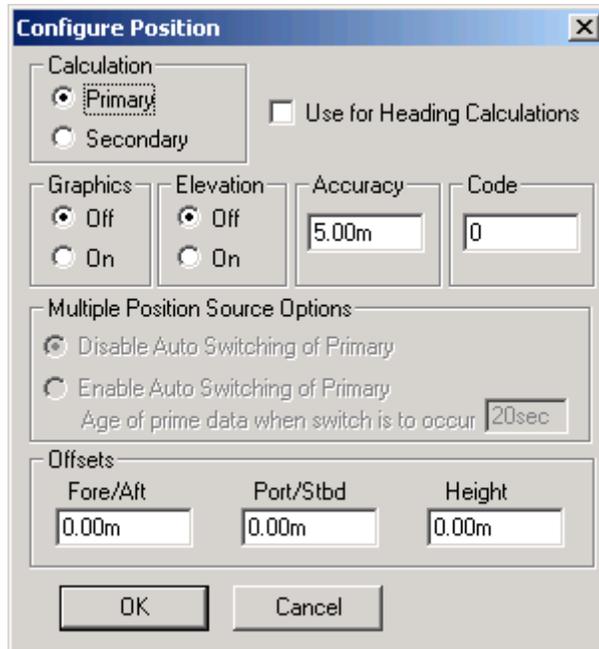


**Calculation:**
Set the Calculation selection to Primary or Secondary. Devices set to Primary
calculation are used to provide a vessel position. Note that more than one Primary
positioning device can be added to a vehicle's device list; data from these devices
will be combined in a weighted mean solution. (See the paragraph on Accuracy
below for more on the weighting of Primary calculation device data).

If the Calculation type is set to Secondary, WinFrog will simply monitor the device's
data. WinFrog will not use the data from a secondary device in the final solution of
the vehicle's position.

If auto switching is enabled (see below) a secondary may automatically become a
primary should all the primaries fail.

**Use For Heading Calculations:**
Select this checkbox if the device is to be used in conjunction with another GPS
device for determination of the heading of the vessel.

**Graphics:**
If On is selected, a labeled square will show the raw (offset but unfiltered) location of
the GPS antenna in the Graphics and Bird's Eye windows. This provides a means of
comparing raw device and filtered vehicle positions.

**Elevation:**
Setting the Elevation option to On will result in the elevation determined by GPS to be used as the elevation of the vessel referencing the GPS (WGS84) Ellipsoid. The sounder data recorded in WinFrog's .RAW data files will not be affected.
This option is meant only for those applications where there is no fixed vertical reference (i.e. mean sea level), such as on a river. For acceptable results, this option requires the use of high accuracy "RTK" GPS data.

**Accuracy:**
The Accuracy value entered provides WinFrog with the expected accuracy of the position from this device. This value is used in the weighting of this device compared to other positioning devices that may be added to the vehicle's device list. The smaller the value entered, the more accurate it is considered to be, and hence the more weight that will be applied to the device's data.

The Accuracy parameter can be changed from the suggested values. Changes should be made with caution, however, as they will affect the final filtered position of the vehicle.

**Code:**
This entry window is used when the GPS data is being received by a remote GPS receiver connected via telemetry link. If this is the case, set the Code to coincide with the code parameters associated with the GPS unit being used.
For all other applications, the Code entry must be set to 0.

**Multiple Position Source Options:**
This group box allows you to enable automatic switching of a secondary to primary should the data from all POSITION and PSEUDORANGE data items set to primary timeout. The **Age** entered is the length of time that the secondary will wait in the absence of data from all primaries, before taking over as primary. This age is only entered for the secondary.

For example, if the POSITION or PSEUDORANGE data items associated with two GPS receivers were set to primary and the POSITION or PSEUDORANGE data item of a third GPS receiver was set to secondary, both primary GPS receivers must time out before the secondary will become the primary. Upon the recovery of either of the original primary data items, the original primary will be reset to primary and the original secondary will be reset to secondary.

Note for the auto switching feature to work, there must be at least one primary and one secondary enabled. For example, given two data items, one set to primary with the auto switching disabled and the other set to secondary with the auto switching enabled, if the primary fails the secondary is not set to primary and the vehicle positioning stops until the primary data item recovers.

**Disable Auto Switching of Primary:**
If this data item is not to be involved in the auto switching process, check this box. As stated above, this data item is then not involved in the auto switching process in any way.

**Enable Auto Switching of Primary:**
If this data item is to be involved in the auto switching process, either as a primary or a secondary, check this box. If set to secondary, enter the Age of data the primary data items must reach before this secondary is switched to act as the primary.

In order for this option to be effective you must have at least one primary and one secondary. If there are multiple secondary data items that are enabled for switching, the first one to receive data will become primary.

Note: This option is not enabled unless WinFrog determines that there is more than one POSITION and/or PSEUDORANGE data item associated with the respective vehicle. The exception to this is the case of a WinFrog with the Remote module operating as a Controlled Remote being configured remotely from the Controller. In this case, the option is always enabled even though it may not be applicable. The operator must be aware of what is available on the Remote and configure the data item accordingly.

Note: This option is not available in the WinFrog Remote package.

Note: This option is not available for USBL based POSITION data items.

**Offsets:**
Offsets are required to associate the GPS antenna position with the vessel's Common Reference Point (CRP). The offsets are applied *from* CRP (of the vehicle) *to* the GPS antenna location.
Forward Offsets are entered as positive values.
Aft Offsets are entered as negative values.
Starboard Offsets are entered as positive values.
Port Offsets are entered as negative values.
Height Offsets are positive upwards. (It is suggested that the vessel's Height origin should be at the water line.

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**TELGRAM SPECIFICATION:**

FORMAT - string starts with "[" and ends with "]"

Column    Item

| 5-6 | month |
| 7-8 | day |
| 9-10 | year |
| 11-12 | hour |
| 13-14 | min |
| 15-18 | second |
| 19-22 | Position delay (seconds) |
| 24 | latitude direction |
| 25-26 | latitude deg |
| 27-28 | latitude min |
| 29-33 | latitude sec |
| 34 | longitude direction |
| 35-37 | longitude deg |
| 38-39 | longitude min |
| 40-44 | longitude sec |
| 45-51 | altitude |
| 72-75 | HDOP |
| 79 | position status |
| 80 | differential status |
| 81-82 | differential age (min) |
| 83-84 | differential age (sec) |
| 85 | # of SV's tracked |