

WinFrog Device Group:	GPS
Device Name/Model:	NMEA GPS (Sercel)
Device Manufacturer:	DSNP 16, Rue de Bel-Air – B.P. 433 44474 Carquefou Cedex, France Tel: 33 2 40 30 59 00 Fax: 33 2 40 30 58 92 E-mail: Info-DSNP@DSNP.com
Device Data String(s) Output to WinFrog:	GPGGA, ODP, GPZDA, GLL (without prefix)
WinFrog Data String(s) Output to Device:	N/A
WinFrog Data Item(s) and their RAW record:	POSITION 303

DEVICE DESCRIPTION:

The NMEA GPS SERCEL device provides WinFrog with GPS position and time information in its own “NMEA like” message standard. NMEA stands for the National Marine Electronics Association, a body that established standard message formats (in the form of coded "sentences") for data communication from a variety of devices found in the marine industry.

The only difference between the NMEA GPS SERCEL data string and the standard NMEA GPS data string is the status flag codes. See below for further details on the data formats.

This device can provide time synchronization using one of the following sources: \$-GGA, \$-GLL, \$-ZDA, or 1PPS with \$-ZDA. See chapter 8.

DEVICE CONFIGURATION INSTRUCTIONS

WINFROG I/O DEVICES > EDIT I/O:

Serial
Configurable Parameters
(Suggested: 4800-8-N-1)

The following NMEA strings can be output by this device:

GGA - Global Positioning System Fix Data:

```
$--GGA,hhmmss.ss,lll.ll,a,yyyy.yy,a,x,xx,x.x,x.x,M,x.x,Mx.x,xxxx*hh<CR><LF>  
$--GGA,123519,4807.038,N,01131.324,E,29,08,0.9,545.4,M,46.9,M, , *42
```

Where:

123519	Fix taken at 12:35:19 UTC
4807.038,N	Latitude 48Deg. 07.038 min N
01131.324,E	Longitude 11Deg 31.324 min E
29	Fix quality- see below for definition of the different status
08	Number of satellites being tracked
0.9	Horizontal dilution of position
545.4,M	Altitude, Metres, above mean sea level
46.9,M	Height of geoid (mean sea level) above WGS84 ellipsoid
(Empty field)	Time in seconds since last DGPS update
(Empty field)	DGPS station ID number

NMEA (Sercel) Status types:

20= No Fix	21= SP GPS, with SA
22=SP GPS, No SA	23=SP GPS, No SA, Good HDOP/LPME
24=DGPS, 2D	25= DGPS, 2D, Good HDOP/LPME
26=DGPS, 3D, Poor RTCM/HDOP	27=DGPS, 3D, Poor HDOP, Good RTCM
28=DGPS, 3D, Good HDOP	29=DGPS, 3D, Good HDOP/RTCM

Note: The <CR> and <LR> may be ignored in the Sercel NMEA device.

ZDA-Time and Date

```
$--ZDA,hhmmss.ss,dd,mm,yyyy,hh,mm*hh<CR><LF>
```

Where:

hhmmss.ss	UTC
dd	Day (01 to 31) UTC
mm	Month (01 to 12) UTC
yyyy	Year UTC
hh	Local zone hours (00 to ±13 hrs)
mm	Local zone minutes (00 to +59)

GLL – Geographic Position – Latitude/Longitude:

`$--GLL,IIII.II,a,yyyyy.yy,b,hhmmss.ss,A*hh<CR><LF>`

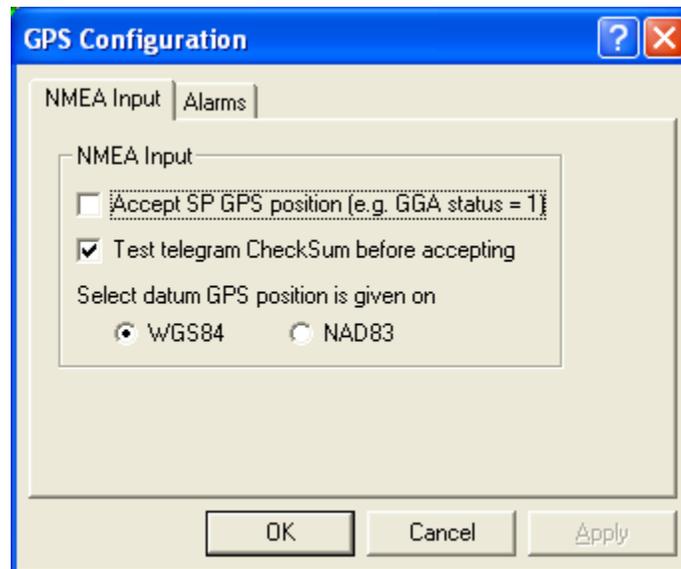
Where:

IIII.II	Latitude
a	North/South
yyyyy.yy	Longitude
b	East/West
hhmmss.ss	UTC of Position
A	Status: A= Data Valid; B= Data not valid

WINFROG I/O DEVICES > CONFIGURE DEVICE:

The NMEA GPS (Sercel) device is added to WinFrog from the GPS device group. The device must be configured at the I/O Device window level. The GPS Configuration dialog box appears, as seen below.

NMEA Input



The **NMEA Input** dialog box allows you to configure WinFrog to “test” the received NMEA data string and react accordingly, as described below.

Accept SP GPS Position (e.g. GGA status=1)

Select this checkbox to have WinFrog utilize Single Point (i.e. non-differentially corrected) positional information. This non-differential status is identified in the GGA data string when a value of 1 is found in the Status field. (See below for further details on the GGA data string).

The GGA message must be used for this test; the GLL data string does not provide differential status information.

NOTE: Non-differential GPS data positioning is rated at only aprox. plus/minus 20 meters. This may not be adequate for high accuracy positioning tasks.

Test Telegram CheckSum before accepting

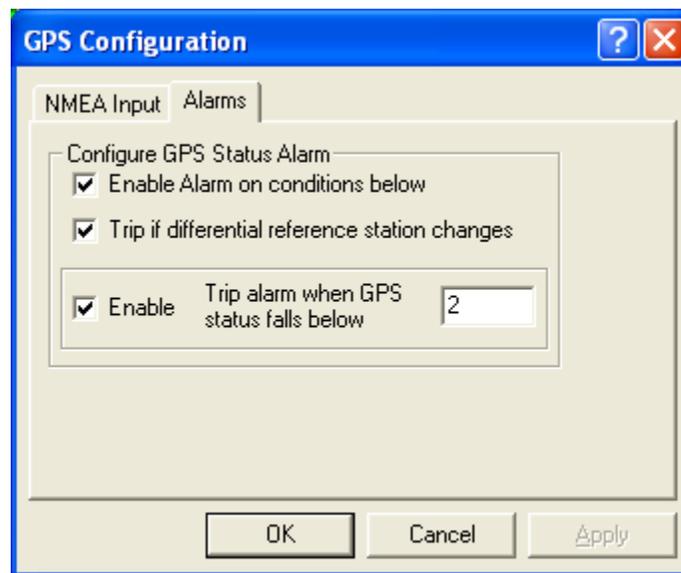
Select this checkbox to have WinFrog utilize the **Checksum** value from the received data string. WinFrog will compare the checksum value to the number of values in the NMEA data string. If the number is not the same, WinFrog will not utilize the data string.

Select datum GPS position is given on

Generally, GPS receivers output the position in WGS84, ITRF00 or ITRF05. For WinFrog applications, WGS84, ITRF00 and ITRF05 are considered to be close enough as to be the same. However, there are instances when the output GPS position may be NAD83, which is not the same as WGS84. In this case, it is critical that NAD83 be selected here. WinFrog will then transform the NAD83 position to WGS84 when it is received to normalize it to the ellipsoid that WinFrog uses as the standard for GPS.

An example of when the position may be in NAD83 is when using a USCG beacon as a differential correction source.

Alarms



Configure GPS Status Alarm:

Select the Enable Alarm checkbox to enable an audible (beeping) alarm. With this option enabled, you can define the alarm to sound if the **GPS Status falls below** a certain number, as entered in the provided field. The value to be entered refers to the GGA string status field, defined as follows:

- 0= no GPS signal
- 1= Single Point GPS Positioning Mode
- 2= DGPS Positioning Mode
- 3= GPS PPS Mode
- 99= Simulator Mode
- 10= Simulator Mode Edit

Enter a value in the **Alarm Beep Period(s)** entry box to define the period of the alarm beep, in seconds.

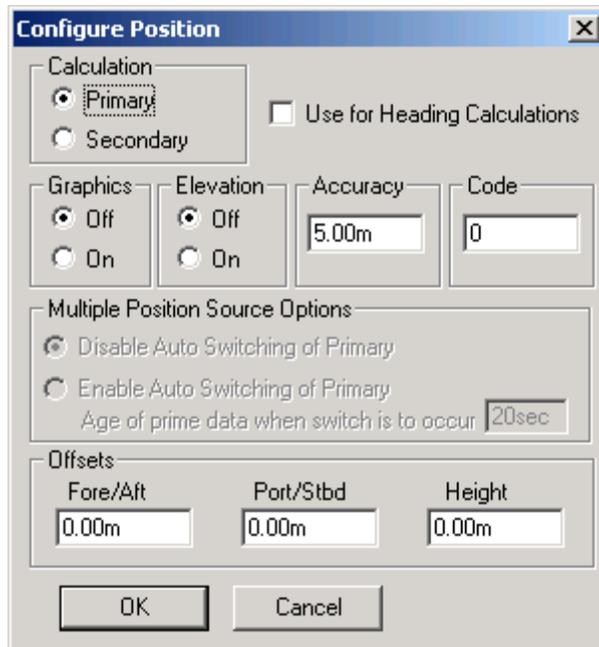
Enable the “Trip if no data received” to detect communications failure. Here, if no decode-able data was received for 15 seconds the alarm will also occur.

WINFROG VEHICLE > CONFIGURE VEHICLE DEVICES > DEVICE DATA ITEM > EDIT:

The Sercel NMEA GPS device creates one data item: POSITION. Once the data item has been added to the vehicle, it must be edited to suit the application.

Data item: GPS, NMEAGPS1, 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.)

CONFIGURATION DETAILS:

Most NMEA GPS receivers output data utilizing the standard RS-232 serial protocols.

Serial Port Connections

DB-25	DE-9	Signal	Direction
2	3	Tx Data	→
3	2	Rx Data	←
4	7	Request to Send	→
5	8	Clear to Send	←
6	6	Data Set Ready	←
7	5	Signal Ground	
8	1	Data Carrier Detect	←
20	4	Data Terminal Ready	→
22	9	Ring Indicator	←

Typically, interfacing to a NMEA GPS device requires only the reception of data.

If this is the case, you are required to connect only the **Tx** Data pin on the GPS device to the **Rx** Data pin on the WinFrog computer, and to connect the **Signal Ground** pins between the two devices.

RAW DATA LOGGING:

WinFrog records the positional data from the Sercel NMEA device as a type 303 raw file type. See Appendix B of the WinFrog User's Guide for details on this raw data string.