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GPS.dll of the Future

By John Lindberg

The GPS.dll (GPS NMEA-0183) is certainly the most used device driver in HYPACK's massive arsenal of equipment drivers. It will interface with any device out there that can output a NMEA standard position string. If you are using a GPS in HYPACK®, then you are using the GPS.dll to interface your receiver with HYPACK®.

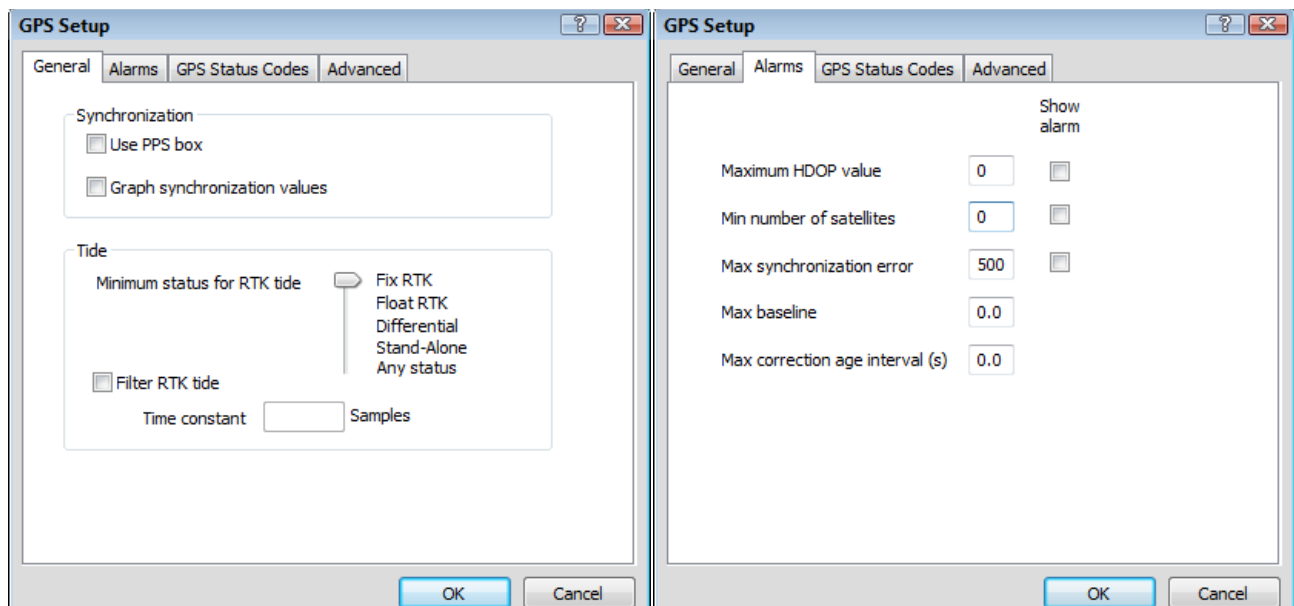
In the early days, HYPACK® users were able to use the NMEA.dll, a “jack of all trades” driver that could interface with any NMEA device – not only position, but depth, heading, course over ground, and speed. It also included a few other functions including the ability to fashion NMEA output strings! It was not, however, able to calculate RTK tides.

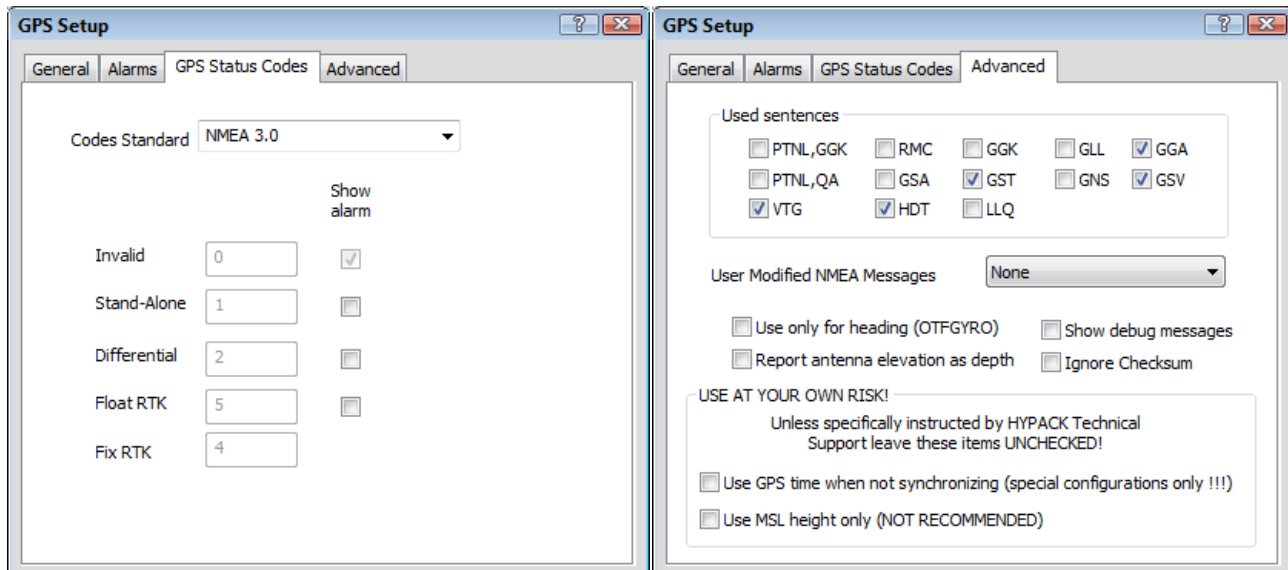
Enter the Trimkin.dll. This was the first HYPACK® device driver that calculated RTK tides. This evolved into the Kinematic.dll. The NMEA.dll, becoming an unwieldy “jack of all trades” was stripped of its position functions, and HYPACK users were instructed to switch to the kinematic.dll for all their positional needs. The “kinematic” moniker added a bit of confusion for GPS users that would still survey in differential mode, so the kinematic.dll was simply renamed to GPS.dll to avoid confusion. Hey, this driver interfaces with any GPS, right?

Over the years, the GPS.dll has taken on a lot more functionality. Options like logging RTK as a depth, using a secondary GPS receiver as a heading device, and manufacturer-specific non-NMEA messages have made the GPS.dll a very powerful tool!

Of course, with all the changes over the years, the complexity of the driver has increased to where the user had to toggle between different tabs in order to set up the driver the way they need to. It could be very easy to miss a setting when trying to troubleshoot!

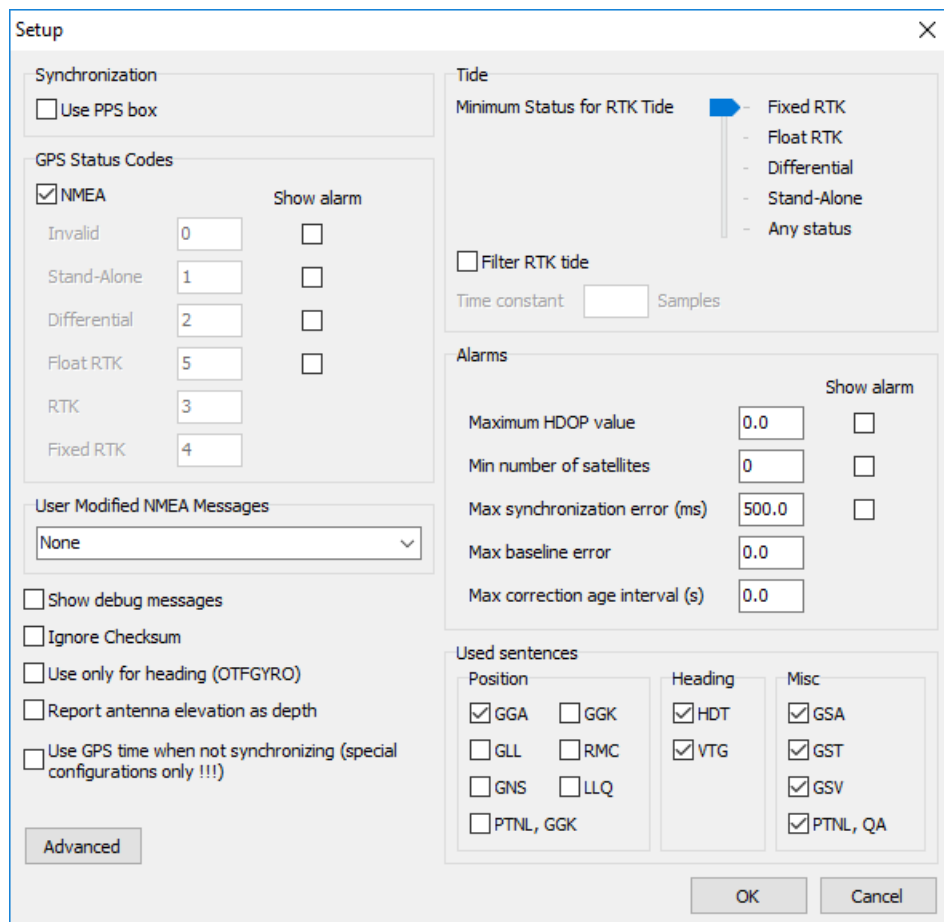
GPS.dll 2019—2 of 4 Tabs





Enter the next phase of the GPS.dll – code name GPS2.dll. In addition to upgrading the driver (and other device drivers) from an archaic programming language, the design of the new driver setup has consolidated and moved everything to one form as shown in the following figure.

GPS2.dll Setup Dialog



You can now see everything at once, and it also makes it easier for a Tech. Support person to troubleshoot!

The major change was to the GPS Status codes section. Rather than have separate NMEA 2.1 and 3.0 choices, there is now only a “NMEA” checkbox. The only difference between the 2.1 and 3.0 options in the old driver was the RTK codes. NMEA 2.1 only reported RTK mode, where NMEA 3.0 reported FIXED RTK and FLOAT RTK.

NMEA 2.1 vs NMEA 3.0 Status Codes

Codes Standard NMEA 2.1			Codes Standard NMEA 3.0		
		Show alarm			Show alarm
Invalid	0	☒	Invalid	0	☒
Stand-Alone	1	☐	Stand-Alone	1	☐
Differential	2	☐	Differential	2	☐
Float RTK	3	☐	Float RTK	5	☐
Fix RTK	3	☐	Fix RTK	4	☐

It made more sense to consolidate these as one “NMEA” option in the new driver. The new driver will now use code 3 or 4 for Fixed RTK.

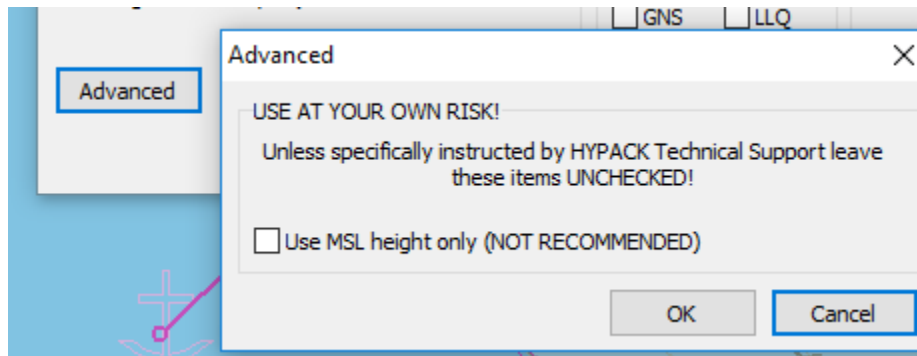
If you have a non-standard NMEA message, you can simply uncheck the NMEA option and enter the codes in accordance with your GPS receiver.

GPS2.dll—NMEA 3.0 GPS Status Codes (left), Custom Status Codes (right)

GPS Status Codes		GPS Status Codes	
☒ NMEA		☐ NMEA	
Invalid	0	Invalid	0
Stand-Alone	1	Stand-Alone	1
Differential	2	Differential	13
Float RTK	5	Float RTK	2
RTK	3	RTK	12
Fixed RTK	4	Fixed RTK	3

One more note: At the bottom of the Setup dialog is an “Advanced” button that brings up one option: “Use MSL height only.” Notice the disclaimers! This was added for a user who wanted to ignore the MSL height of the GGA string output by their receiver.

BEWARE! The Use MSL Height Only option is NOT RECOMMENDED. It WILL affect your RTK tide output. Once checked unfortunately there is no going back!



Hopefully these changes are acceptable to the general user. Contact us with your thoughts and we will make a beta version available soon!