

## Selecting the Appropriate Driver for the CEESCOPE™ and CEE ECHO™ when using HYPACK Acquisition Software.

*Because of the unique time-stamped data output of the CEESCOPE™ and CEE ECHO™, HYPACK software offers two driver configurations, with survey timing based either on “CEE time” or “PC time”. In both cases the CEESCOPE driver is used for the sounding data however a special version of the GPS-NMEA0183 driver is available to access the CEE timing benefits. It is recommended that users select the special “CEE time” configuration in all cases except when ancillary equipment with no time-stamped output such as a side scan sonar is used simultaneously. It is important to use “CEE time” when recording telemetered data in HYPACK.*

The CEESCOPE™ and CEE ECHO™ use the ZDA GPS message (in combination with a 1PPS signal in the case of the CEESCOPE) to generate a precise GPS-derived time tag that is applied to every line of data and each binary echogram ping packet. This time tag, as it is applied upstream of the acquisition PC and associated interface ports represents a highly precise source of timing and minimizes latency for single beam surveys. This timing method becomes particularly beneficial when data are telemetered over a wireless connection such as when using a USV.

The POS time stamp as applied to GNSS data output by the CEESCOPE is shown below. Time is expressed in seconds past midnight based on the CEESCOPE system time:

**POS 42649023** \$GPZDA,015055.00,24,02,2012,,\*67

**POS 42649023** \$GPGGA,015055.00,3338.9114522,S, 15109.8404898, E,4,14,0.8,2.074,M,23.20,M,02,0006\*45

**POS 42649040** \$GNGST,015055.00,4.76,0.01,0.01,-17.5827,0.01,0.01,0.01\*6A

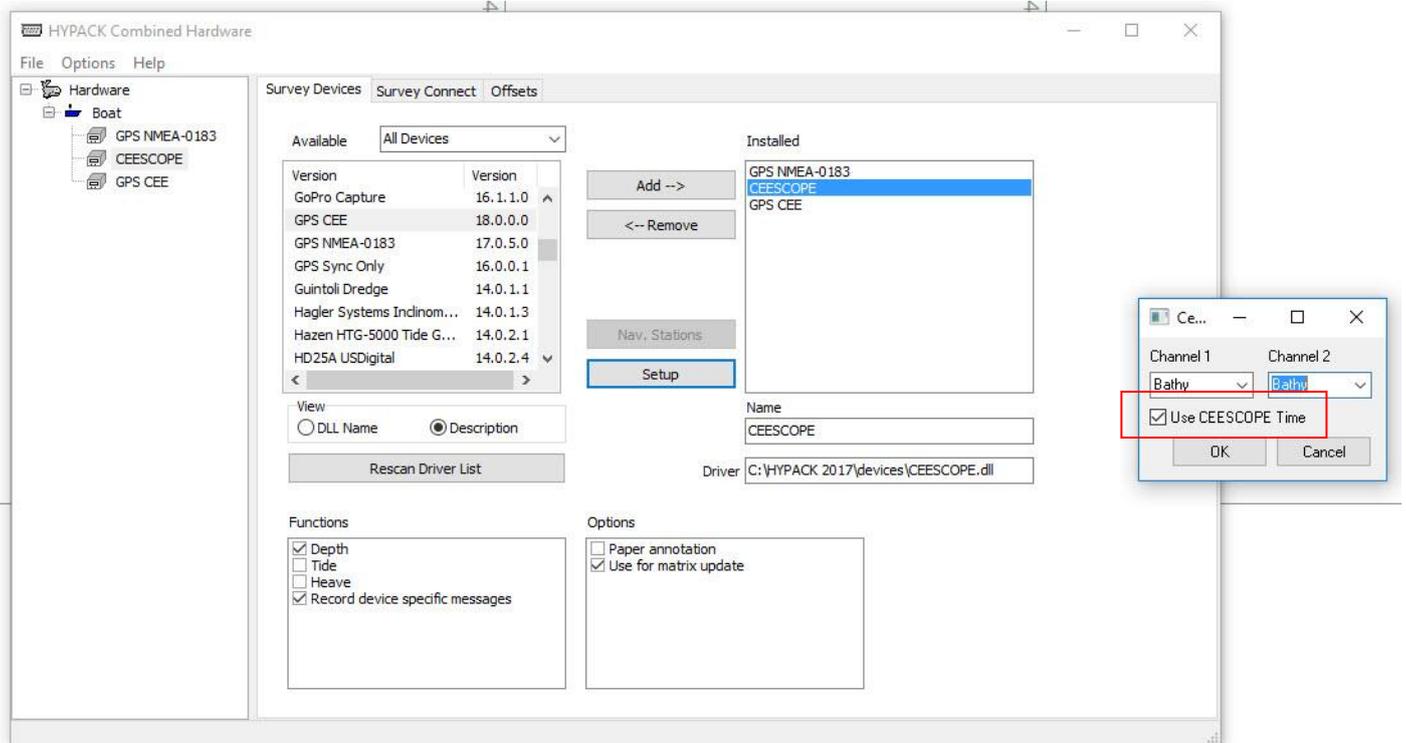
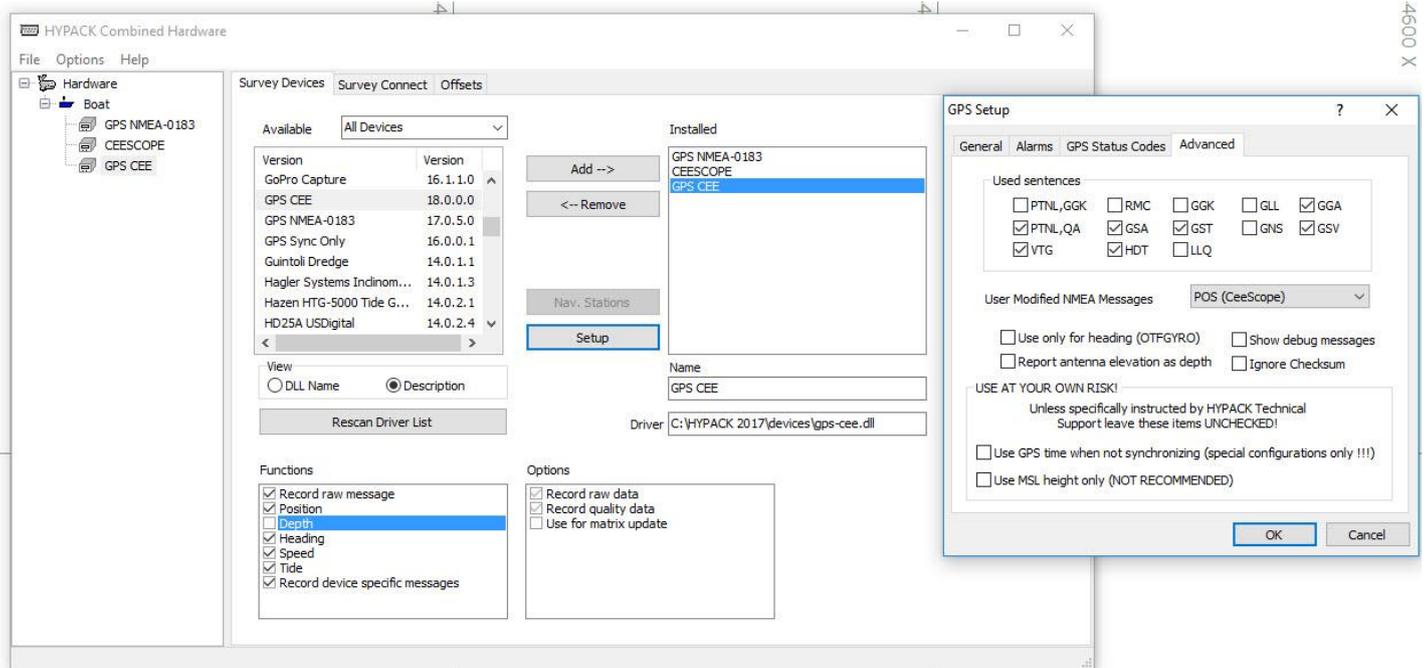
**POS 42649040** \$GNVTG,344.989,T,344.989,M,3.752,N,6.948,K,D\*38

HYPACK may be configured in two ways with the CEESCOPE or CEE ECHO: using the special time stamps “CEE time” or using “PC time” where the CEE time stamps are ignored, and data are simply recorded at the time received by HYPACK at the PC. For the highest quality data, “CEE time” should be used, to take advantage of maximum timing precision. When the CEESCOPE is connected to the PC with an Ethernet cable, differences between the methods will be small, however when using a wireless (WiFi) connection it becomes more important to utilize “CEE time”. When using ancillary devices such as side scan sonar, “PC time” must be used. “CEE time” is only appropriate for surveys where just a CEESCOPE or CEE ECHO connected to a third party GNSS receiver is used, either of which may also be connected to a motion sensing unit.

HYPACK uses the **GPS** driver for position and the **CEESCOPE** driver for depth. As the “CEE time” time stamp is applied to the position and depth data, both HYPACK drivers need to be properly configured. A custom version of the GPS driver called **GPS-CEE** is used when set up for “CEE time” data acquisition; this driver DLL is stored in the custom drivers folder of the 2018 release.

## 1. USING CEE TIME.

When using “CEE time”, the CEE time stamp is used to write all HYPACK data (RAW and BIN files) with the timing exactly as output by the CEESCOPE. The time at the acquisition PC is ignored, and no time-syncing of the PC occurs. The **GPS CEE** driver is selected, and in the SETUP / ADVANCED menu, the appropriate GPS messages are checked. The “User Modified NMEA Messages” should be set to POS. For the **CEESCOPE** driver, in the SETUP menu, “Use CEESCOPE time” must be checked.



As HYPACK expects UTC when using “CEE time”, the CEESCOPE time offset should be set at zero to ensure the data output is UTC. When using “CEE time”, the HYPACK data will exactly match RAW and BIN files generated from CEESCOPE data recorded inside the echo sounder.

## 2. USING PC TIME

When using PC TIME, the CEE time stamp is ignored and all data are written with timing based on the receipt time in HYPACK (PC time). The **GPS NMEA-0183** driver is selected, and in the SETUP / ADVANCED menu, the appropriate GPS messages are checked. The “User Modified NMEA Messages” should be set to POS. This is required even though the time stamps are not used. For the **CEESCOPE** driver, in the SETUP menu, “Use CEESCOPE Time” must not be checked.

