Labview Real-time Acquisition software for use with Mocness systems

- Acquires and stores Real-time data from the CTD.

- Controls the Mocness motor and sends commands to close Mocness nets.

- Acquires and stores Flow Meter and Net Trip data.

- Acquires and stores data from the GPS via RS232 or UDP ports.

- All data is displayed on strip charts and XY plots.

- Acquired data can be played back and displayed.

- Data is stored in the Seabird format so that it can be processed and viewed using the Seabird data processing software. In addition the Labview software uses the Seabird XMLcon files to input Sensor calibration coefficients.

- Produces a Mocness formatted Proc file and supplementary files containing Mocness specific data.

- Currently supports the Seabird SBE 911Plus CTD as the acquisition instrument and deck unit in the Mocness system.

- Utilizes an STS built interface located on the Mocness frame to control the Net tripping motor and acquire data from the Mocness flowmeter and net response sensors.

System Requirements:

Windows 7/8/10/xp 32 or 64 bit
National Instruments Labview Runtime Engine 2015
National Instruments Visa Runtime Engine 2015
3 RS232 serial ports or 1 GPIB and 2 RS232 serial ports

Install the National Instruments Labview runtime engine and then install the National Instruments Visa Runtime Engine. Restart the PC.

Make a Folder called C:\Wbin and put Lvmoc.exe and optionally LVmoc.dsp into it. The Lvmoc program will create a new Lvmoc.dsp if it does not exist. This file contains the display setup for the plots and strip-chart.

Run the Lvmoc program. The first time it runs it will call the "Setup" routine. Select the desired XMLcon file. If this file does not exist then a new one can be made using the Seabird Seasave program or the MK-XMLcon program. Next enter the Ship-name, CruiseName, File Name, Tow number, Net Size, Flowmeter calibration factor and AdvanceC0 AdvanceC1 values. If the T&C sensors are not pumped then enter 0.0 for both values. If they are pumped using the Seabird SBE5T pump then enter 0.073 for both values.

If the deck unit is connected to the PC using GPIB then that needs to be indicated in the XMLcon file using the selected XMLconfile builder program. If GPIB is selected then the CTD_Port serial data section is ignored. Next enter the serial port number for the MCNTRL_Port. And lastly enter the serial port number for the NMEA data. Optionally you can input this data using a UDP port instead of serial.
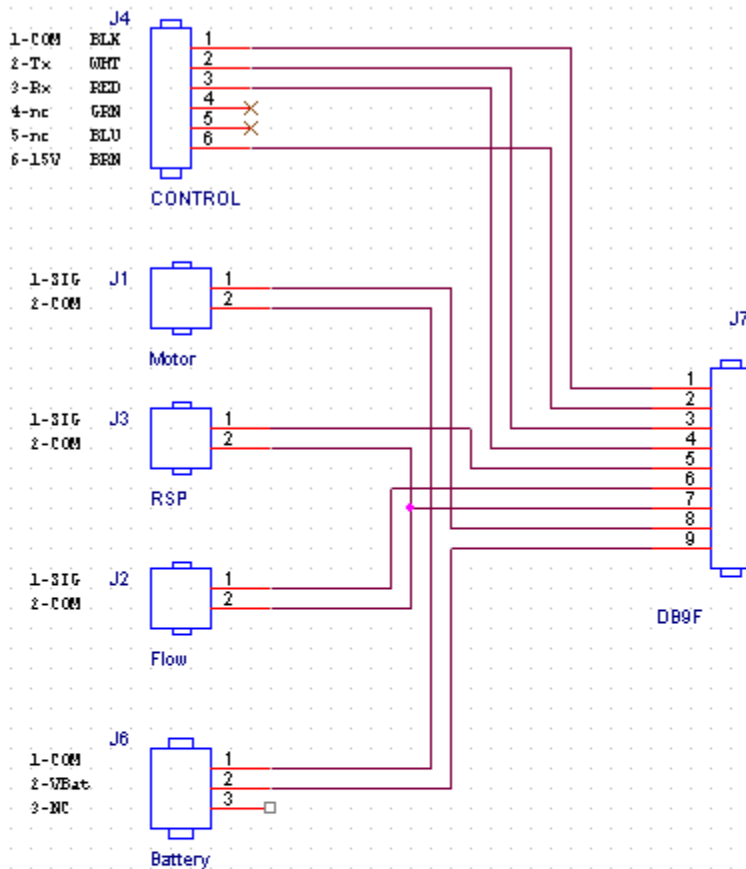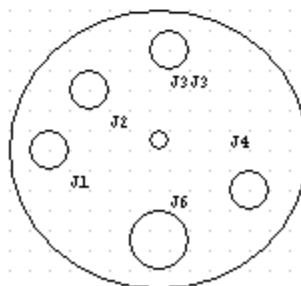

Connect the serial or GPIB cable between the SBE11 deck unit and the CTD_Port or GPIB port on the PC. Connect the 300 baud modem port on the deck unit and connect the NMEA serial cable to the GPS source.

On the underwater package the mocness flowmeter, motor and response switch should be connected to the STS modem interface. The STS modem interface connects to the SBE9 CTD modem connector. The CTD T&C sensors are installed as usual and connected to the CTD. A battery pack is needed to provide power to the mocness motor and this connects to the STS modem interface unit. All other components are powered from the SBE9 CTD. The NET Angle and NET Roll sensors are plugged into one of the A/D ports on the CTD.

TO SBE9
Carousel Connector

J4
1-COM   BLK
2-Tx   WHT
3-Rx   RED
4-nc   GRN
5-nc   BLU
6-15V   BRN

CONTROL

1-SIG   J1
2-COM

Motor

1-SIG   J3
2-COM

RSP

1-SIG   J2
2-COM

Flow

J6
1-COM
2-VBat
3-NC

Battery

J7

DB9F

Top End Cap

J3 J3
J2
J4
J1
J6

When ready to start the system open the LVmoc program. Click on the Setup control in the lower left and setup the cast parameters as well as selecting the XMLcon file. In the middle of the panel there is a control labeled Pmode. It should be set on Acquisition. On the upper left side of the panel is a control with a green background labeled Start. Turn on the SBE11 deck unit and click on the Start button.
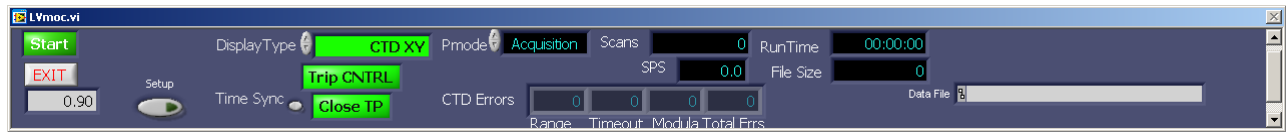

Once data is being acquired observe the indicator labeled CTD Errors located near the bottom of the screen. If all is well there should be no errors. If there are timeout errors it indicates that the data is not coming into the program and the connections should be checked to see if they are properly connected and that the deck unit is connected to the underwater unit. If there are modula errors then the settings in the XMLcon file should be checked. If there are no errors then look at the SPS indicator. It should read 24 if there are no frames averaged in the deck unit. If frames are averaged it should read 24 divided by the number of frames averaged. The Runtime and Scan indicators should also be incrementing.

On the upper left panel, GPS data should be displaying and near the bottom the Net Angle indicator should be seen. There are two green warning indicators that will flash red if there is a problem with either the CTD or NMEA signals. Latitude and Longitude can be displayed in either traditional or decimal format by clicking on the DegMin or Decimal button
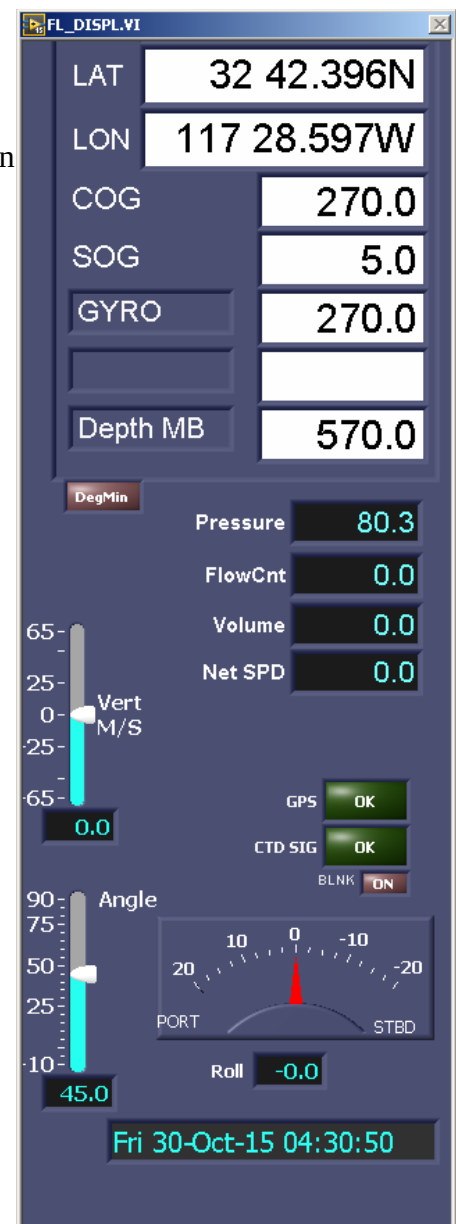
Displayed data can be selected by clicking on the control labeled DisplayType. There are three choices. The first is the Fixed display which shows the CTD data in tabulated form. The second is the StripChrt display which plots data vs Time. And the last display is the CTD XY plot that plots data vs CTD Pressure. The plot parameters can be changed by clicking on the control labeled Plot Scales or on the CTD X-Y Plot it is labeled Plot X-Scales. On the Stripchart window the tabulated displays on the right side can be changed by clicking on the control labeled Displays.
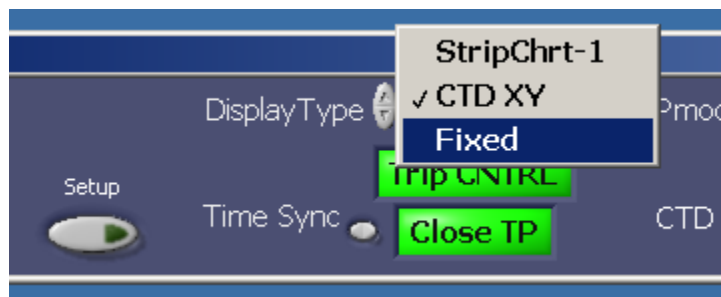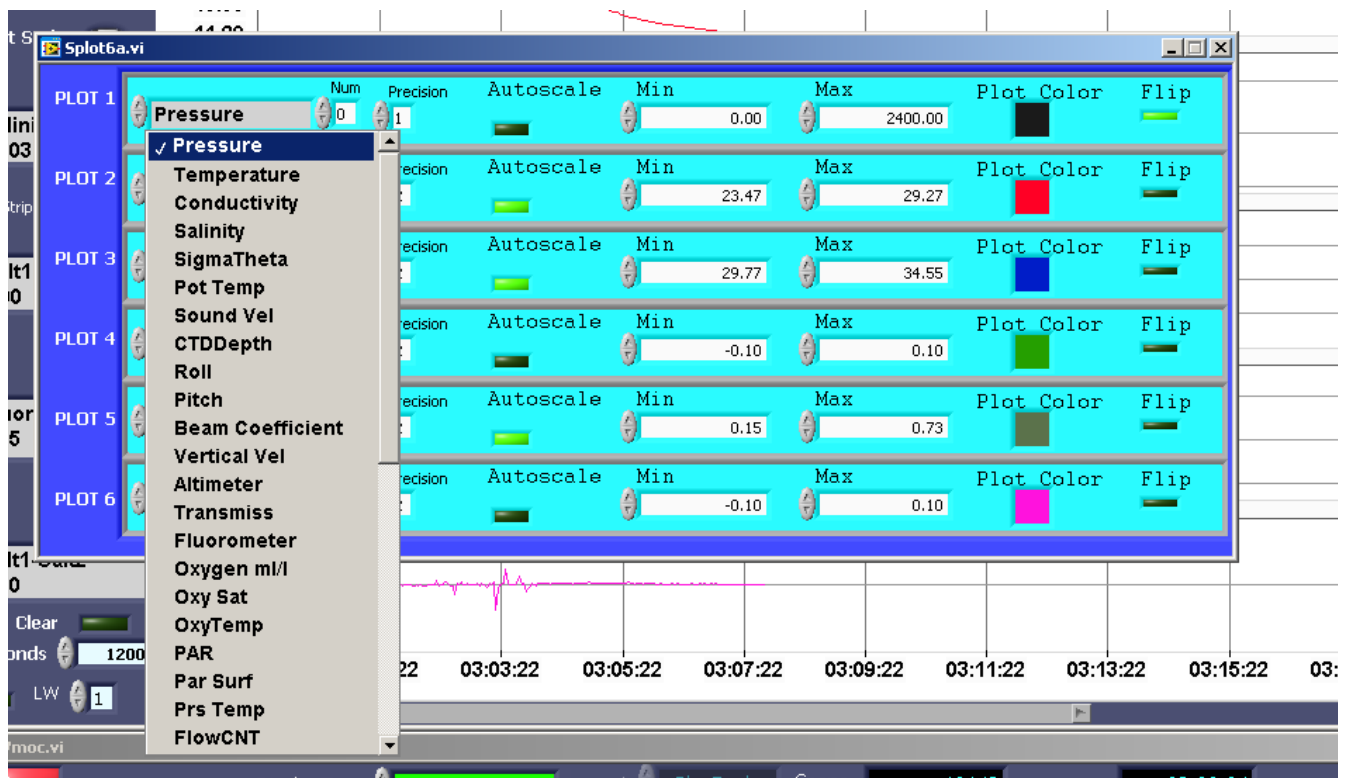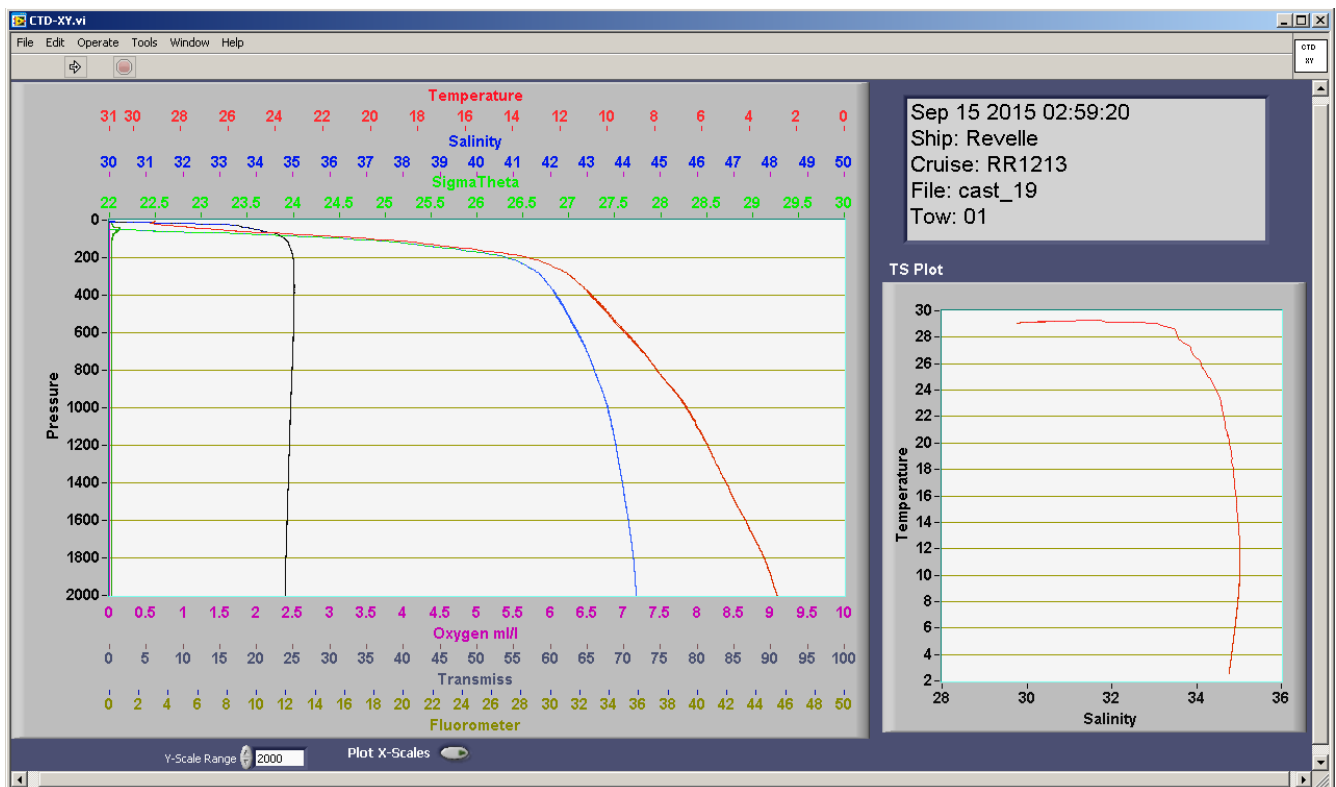

Stripchart plots
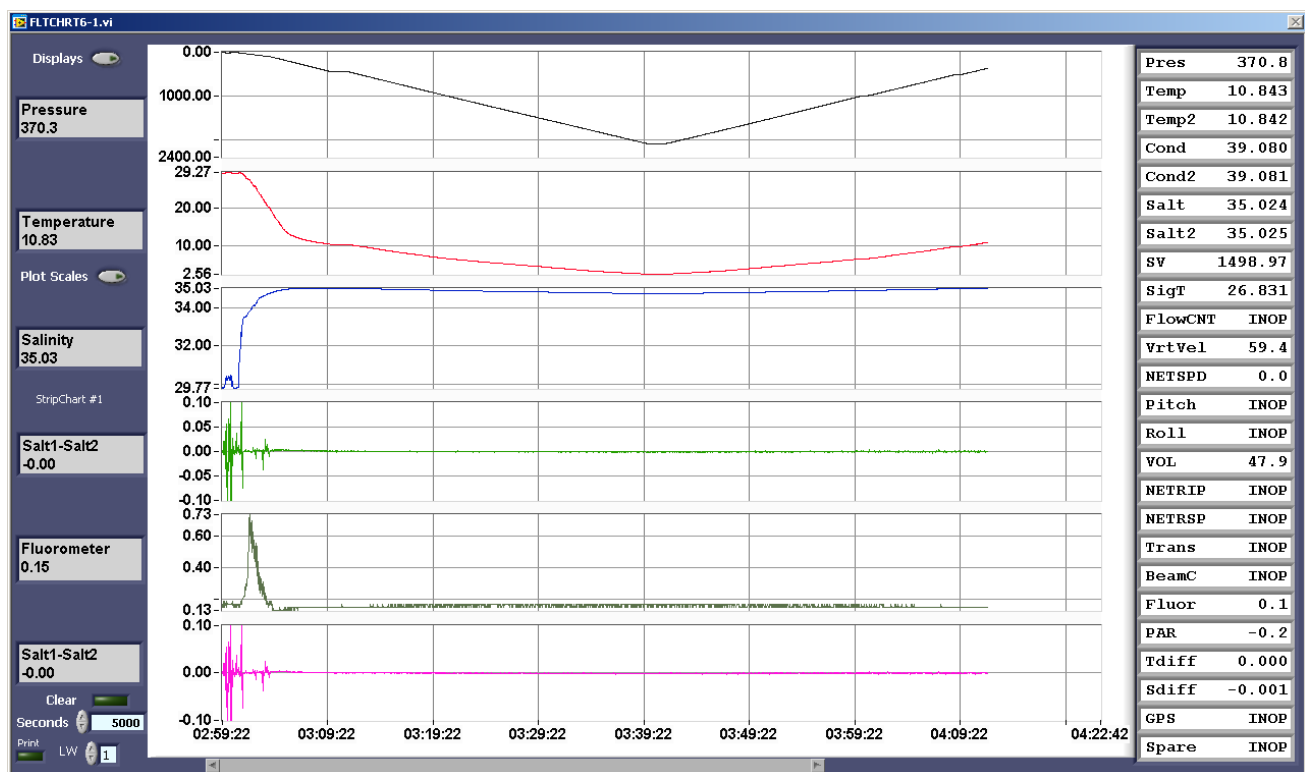
When the acquisition is over click on the STOP button and verify that you want to end the acquisition. When the program stops it will create a hard-copy of the XY plot and put it in the in the images sub-folder.

## Plot Scales Control

CTD XY Plot

NET Trip Control:

The NET trip control window can be brought up by clicking on the Trip CNTRL button located on the lower main panel. In this window the Net Trip info is displayed along with Flow count data from the Flowmeter. When ready to trip a net press the green Trip NET button. Once it is pressed the green Lamp on the left side of the Trip Data indicator and the TripinProgress indicators will show bright green. This indicates a NET trip is in progress. When the Mocness response switch is toggled signaling that the Net has closed then the corresponding indicator on the right side will glow bright green. If the response switch does not toggle within 20 seconds then the indicator on the right will not change and the Trip in Progress indicator will go out. The Net Trip data from both the Trip signal and the response signal is recorded in the data file.
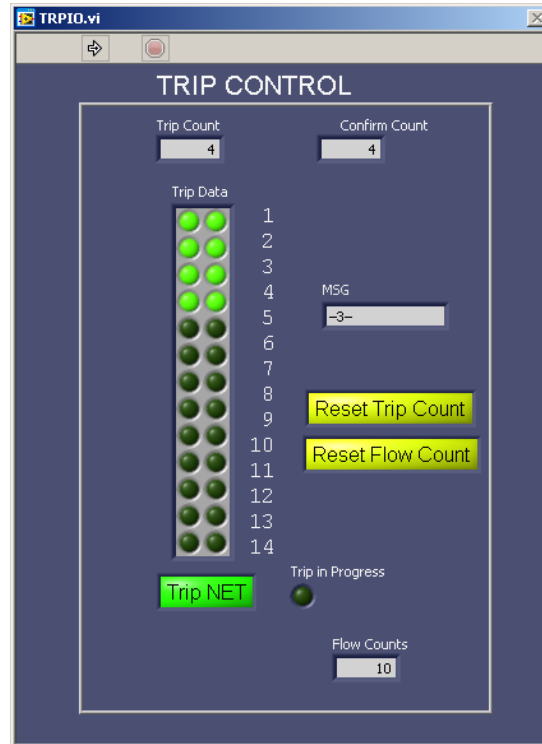
Playback mode:

To play back a data file change the Pmode control to Playback. Next click on Setup and select the XMLcon file that is associated with the data file that is intended to be played back. This file should be located in the same data folder as the HEX and MCN files. Click on Start and navigate to the desired HEX data file and click ok.
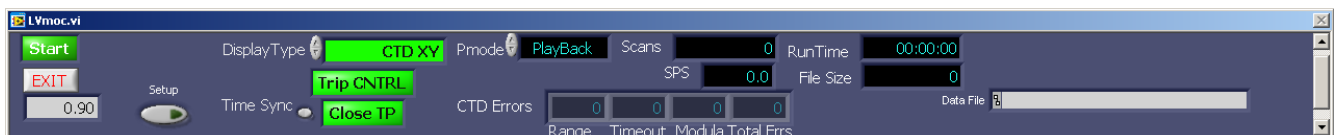
The program will read the data from both the HEX and MCN files and display the data on all display pages, strip charts and XY plots. After finished viewing the played back data click on STOP and the plots will terminate and a hard-copy of the XY plot will be placed in the images sub-folder.

Data Files:

The LVmoc Acquisition program produces five different files for each NET Tow deployment. The files are written into C:\LVmoc in a sub-folder by cruise name. The First three files are Seabird formatted files. The last two are Mocness specific.

1. Hex File – Main data file from the Seabird SBE9 CTD
2. HDR File – Header information
3. BL file – NET Trip info in the Seabird bottle format.
4. PROC File – Traditional Mocness style Processed data file.
5. MCN file – contains all Mocness related data that is not included in the HEX file.

Information on the formatting content of the HEX, HDR and BL files can be found in the Seabird Seasave manual. The PRO processed data file is the standard Mocness file that has been produced by the standard Mocness program. This file is created during the real-time data acquisition during a deployment. This file can also be created during the Playback mode while playing back and displaying archived data files. The file created during acquisition is indicated by an 'A' at the end of the filename but before the extension e.g. HAUL_03A.PRO. The file created during data playback is indicated by a 'P' e.g. HAUL_03P.PRO. This is useful in case change(s) have been made to the calibration coefficients after the data was acquired. Each data line in the PRO file is recorded at a rate of one data line per second.

The MCN data file is an ascii text file:
16 Fields delimited by commas recorded at one data line per second.
1. Date yymmss
2. Time hhmmss
3. System Time (Seconds since 1/1/1970)
4. Flow counts
5. Volume
6. NET Trips
7. NET Response
8. NET Speed (Knots)
9. NET Angle
10. Latitude
11. Longitude
12. COG Course over ground
13. SOG Speed over ground
14. Gyro
15. Water depth – Meters
16. GPSTime

NET Angle and NET Roll are also recorded in the HEX file as this sensor plugs directly into the CTD.