Operator's Manual for the Labview Mocness System software

Shipboard Technical Support

Revision 0.9 Jan 2017

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1.0 General Information

This acquisition and control program is intended to be used with a Seabird SBE9Plus CTD mounted on a BESS Mocness frame along with an SIO built controller to trip the nets.

Main features:

- 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 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 system as the acquisition instrument and deck unit.
- Supports dual T&C sensors. Sensors can be pumped or not pumped.
- Supports sensors that can be plugged into Seabird CTD's such as Fluorometers, transmissometers, oxygen sensors, altimeters, PAR sensors etc.

- Utilizes an SIO/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.

Hardware Features added for 2017

- Ability to monitor Mocness motor and CTD voltages during the tow.
- Supports an additional flowmeter.
- Supports the use of two confirmation (RSP) switches.
- The Mocness motor is no longer powered by a battery pack.

Software Features added for 2017

1.2 Minimum Systems Requirements

Windows 7/8/10/xp 32 or 64 bit

National Instruments Labview Runtime Engine 2016
National Instruments Visa Runtime Engine 2016
3 RS232 serial ports or 1 GPIB and 2 RS232 serial ports

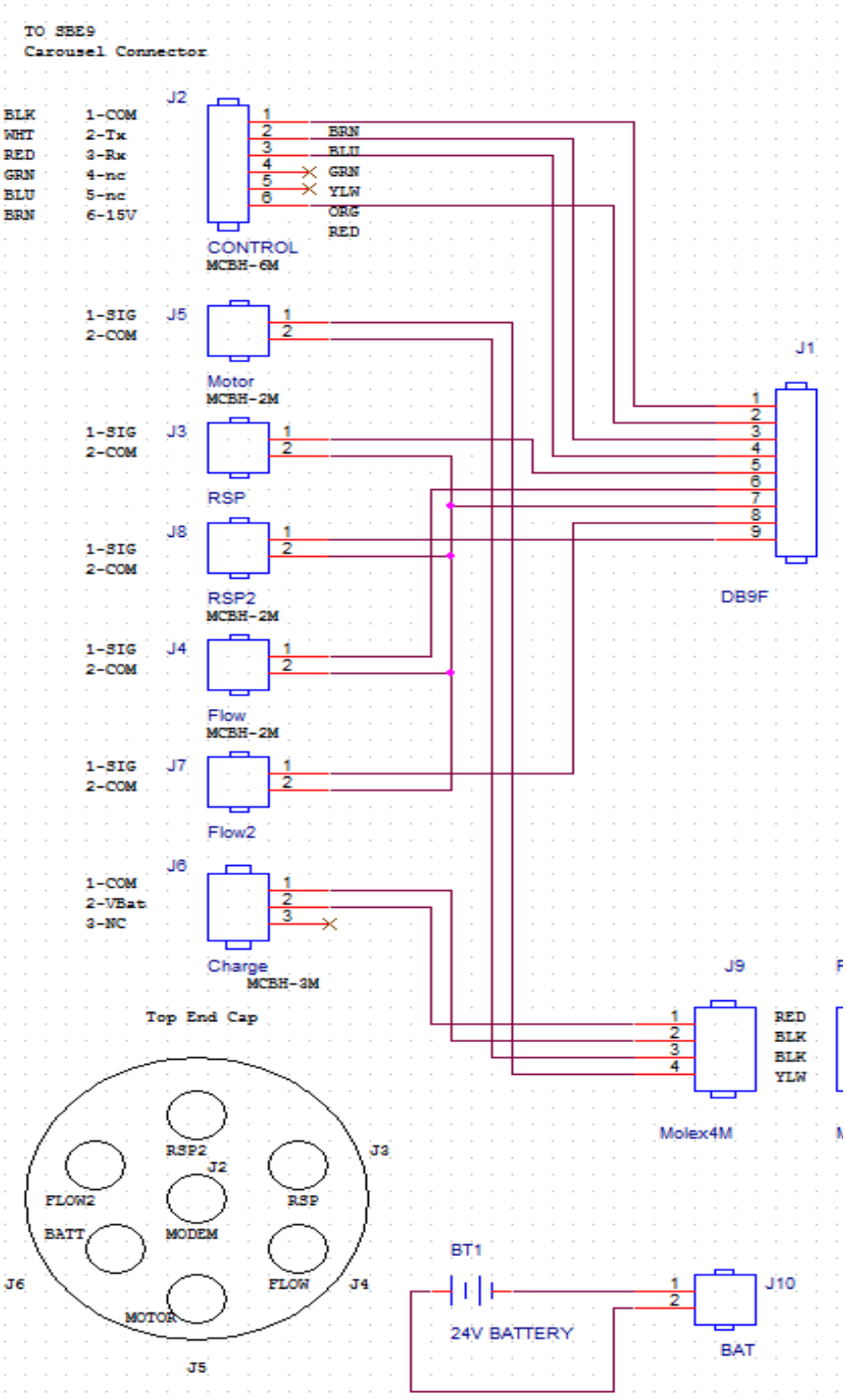
2.0 System setup

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

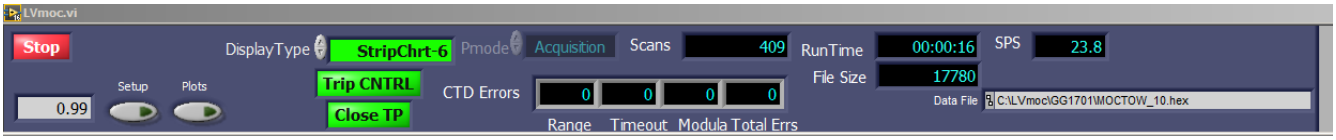
Make a Folder called C:\Wbin and put Lvmoc.exe and optionally LVmoc.dsp into it. The Lvmoc program will create a new Lvmoc.dsp if it does not exist. This file contains the display setup for the plots and strip-chart.

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(s), 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. All components are powered from the SBE9 CTD. If an early version of the modem interface is used then a battery pack is used to power the motor during net trips. The NET Angle and NET Roll sensors are plugged into one of the A/D ports on the CTD as configured in the XMLcon file.

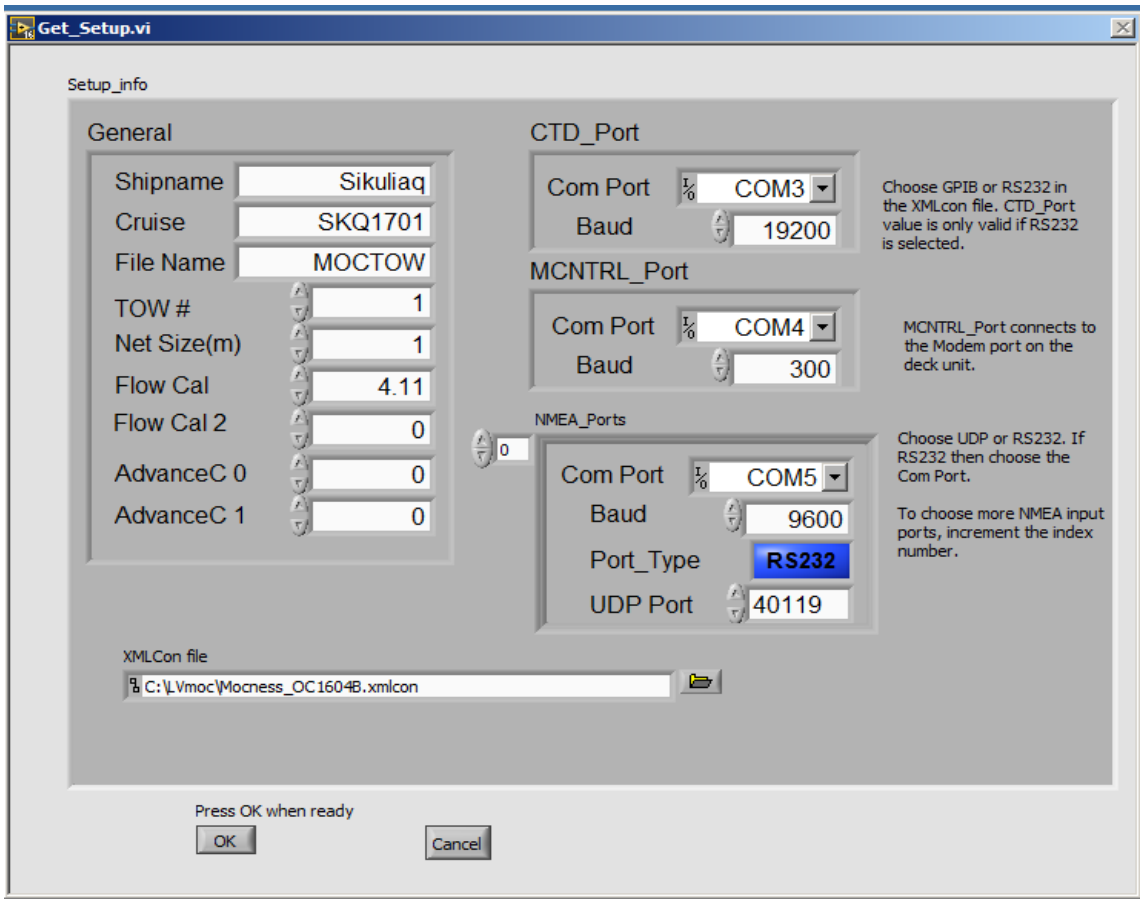

TO SBE9
Carousel Connector
J2
BLK 1-COM
WHT 2-Tx
RED 3-Rx
GRN 4-nc
BLU 5-nc
BRN 6-15V
1
2
3
4
5
6
BRN
BLU
GRN
YLW
ORG
RED
CONTROL
MCBH-6M
J5
1-SIG
2-COM
Motor
MCBH-2M
J3
RSP
J8
RSP2
MCBH-2M
J4
Flow
MCBH-2M
J7
Flow2
J6
1-COM
2-VBat
3-NC
Charge
MCBH-3M
J1
DB9F
J9
RED
BLK
BLK
YLW
Molex4M
Top End Cap
RSP2
J2
J3
FLOW2
RSP
BATT
MODEM
FLOW
J4
J6
MOTOR
J5
BT1
24V BATTERY
J10
BAT

3.0 Program Operation



3.1 Setup for the Tow

Run the Lvmoc program. The Lvmoc control panel will appear. Click on the “Setup” control. A configuration window will appear.



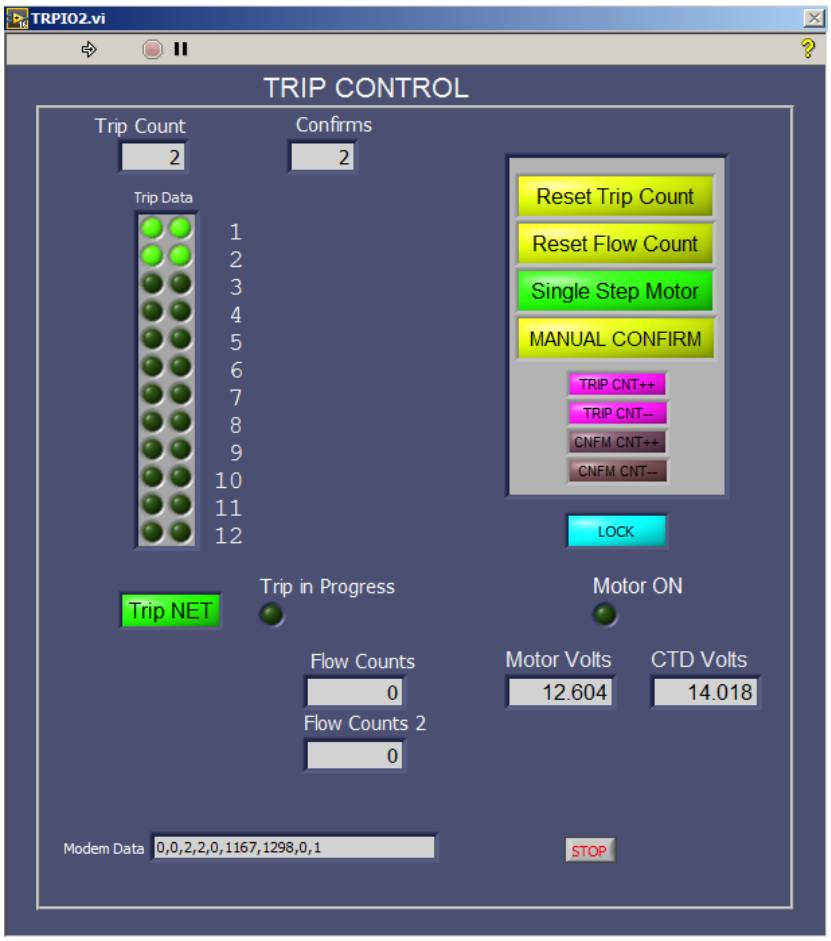
Select the desired XMLcon file. If this file does not exist then a new one can be made using the Seabird Seasave program or the MK-XMLcon program. Next enter the Ship-name, CruiseName, File Name, Tow number, Net Size, Flowmeter calibration factor and AdvanceC0 AdvanceC1 values. If the T&C sensors are 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.

3.1 Deck Test

The Deck Test control allows testing of the Mocness motor, FlowMeter and Response switches without having to start a full acquisition. First turn on the SBE11 deck unit. Ensure that the data indicator on the deck unit is green and that there are no errors. Click on the “Deck Test” button. The NET TRIP window will appear. The data from the underwater unit will be displayed in the Modem Data indicator. This will indicate that a connection has been established. The Motor Volts and CTD Volts will also be displayed. When ready to test trip a net click on the Trip NET button. The Trip in Progress and Motor ON indicators will come on. The Trip in Progress signal is an acknowledgment that the underwater unit has received the TRIP command. The Motor ON indicator confirms that power has been applied to the motor. If either indicator does not come on then it means that the NET did not trip. The lack of a Trip in Progress signal could indicate a communications/connection problem. The lack of the Motor ON signal could mean a hardware problem. Trip a NET and then flip the RSP switch to ensure that the confirmation is functional. Spin the flowmeter to ensure that flow counts increment. If desired press the Reset Trip or Reset Flow counts to ensure that the count gets reset properly.

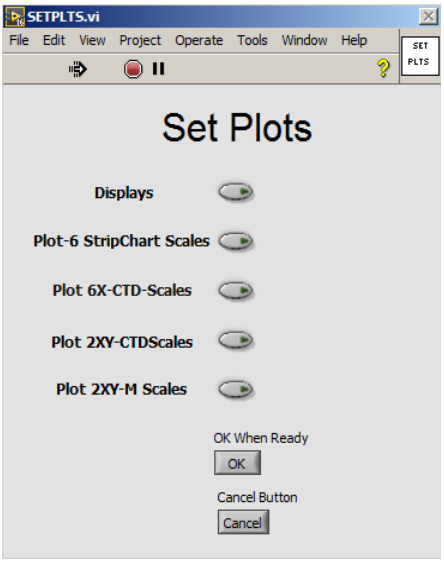


The Motor can be Single stepped by clicking on the Single Step Motor control.

To prevent accidental resets then lock the reset controls by clicking on the lock button. It can be unlocked again by clicking on the unlock button.

3.2 Setup Plots

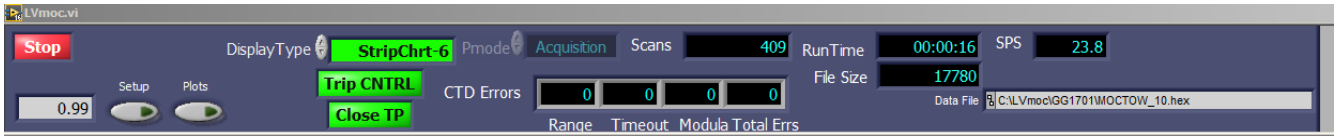
The plots can be setup in advance of the tow. Press the “Plots” button. These plots can also be modified anytime during the tow by clicking on the Plot Scales on the currently displayed page.



3.3 Acquisition

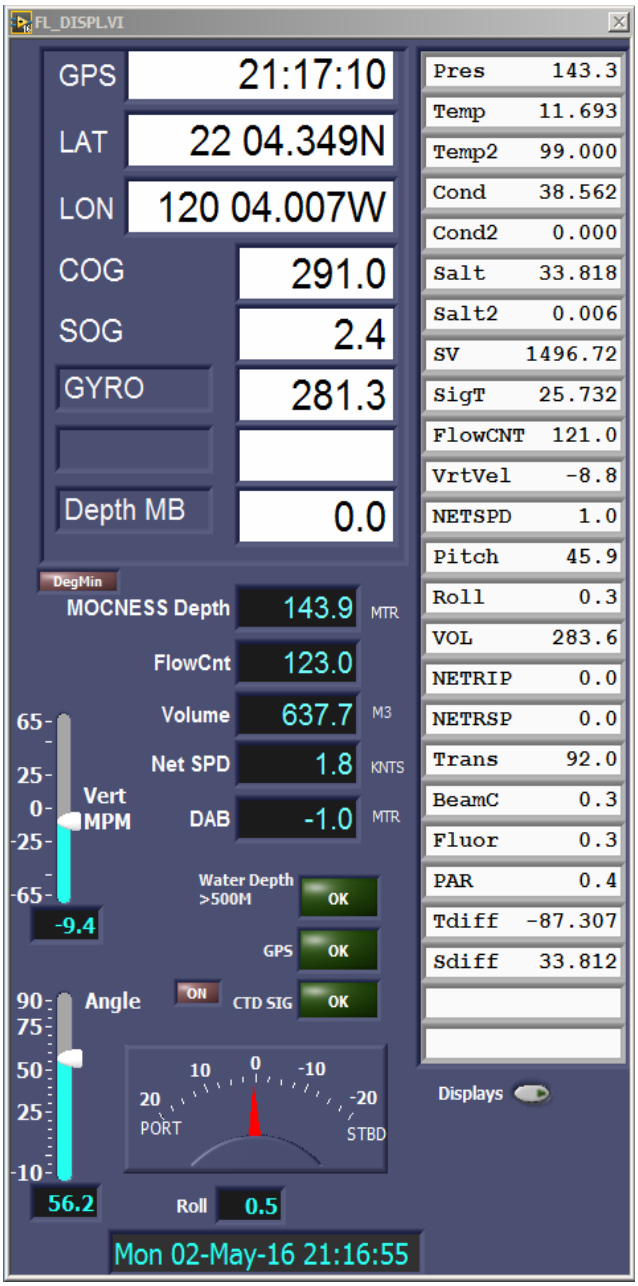
When ready to start the system open the LVmoc program. Click on the Setup control in the lower left and setup the cast parameters as well as selecting the XMLcon file. In the middle of the panel there is a control labeled Pmode. It should be set on Acquisition. On the upper left side of the panel is a control with a green background labeled Start. First turn on the SBE11 deck unit. Ensure that the data indicator on the deck unit is green and that there are no errors. Click on the Lvmoc Start button. A small popup will appear – Click on the OK button.

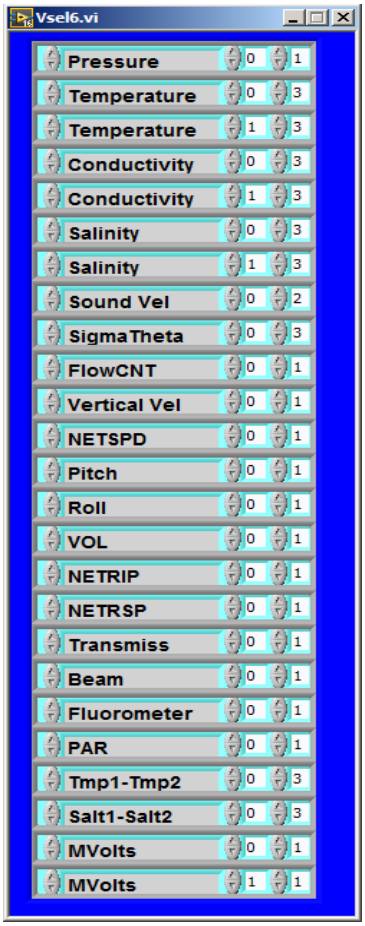
Once data is being acquired observe the indicator labeled CTD Errors located near the bottom of the screen. If all is well there should be no errors. If there are timeout errors it indicates that the data is not coming into the program and the connections should be checked to see if they are properly 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. Near the bottom of the panel 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

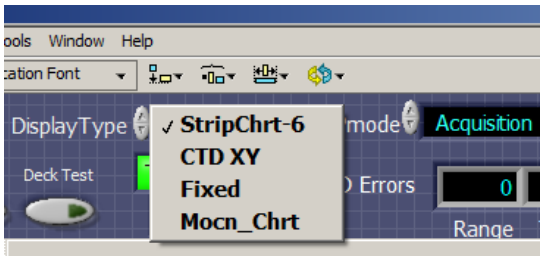
Click on the “Displays” Control to select parameters in the display box on the right.





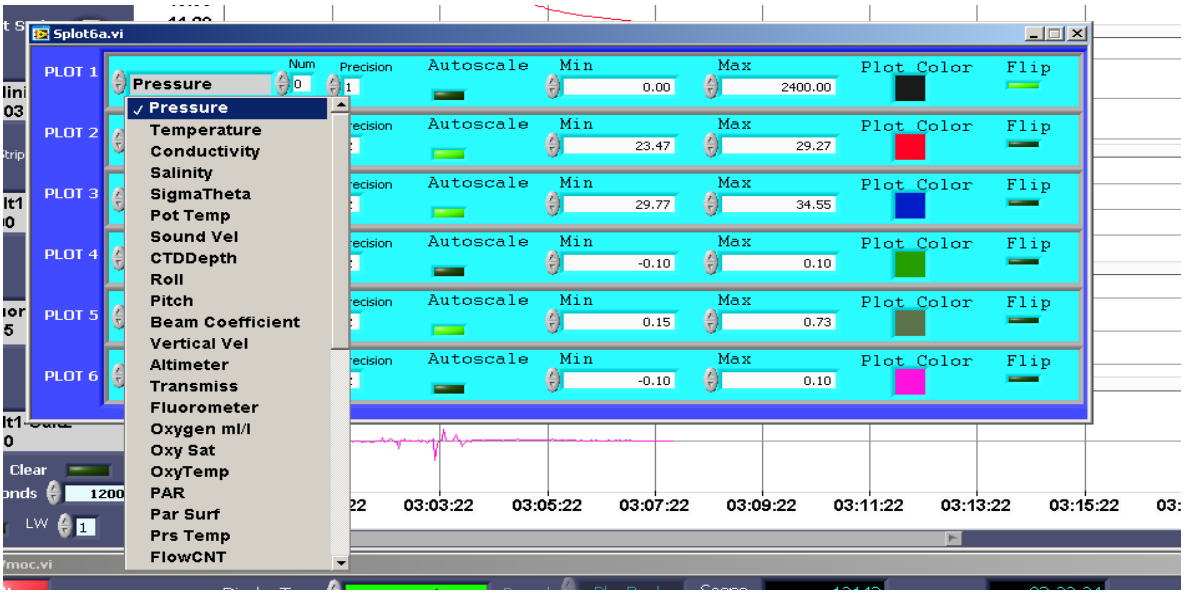
Different pages can be selected by clicking on the control labeled DisplayType. There are four choices.

1. Stripchart – 6 stripcharts are displayed that plots data vs time.
2. CTD XY - A Multi XY plot that plots data vs CTD Depth
3. Fixed - CTD data in tabulated form
4. Mocn Chart – Depth vs Time strip chart

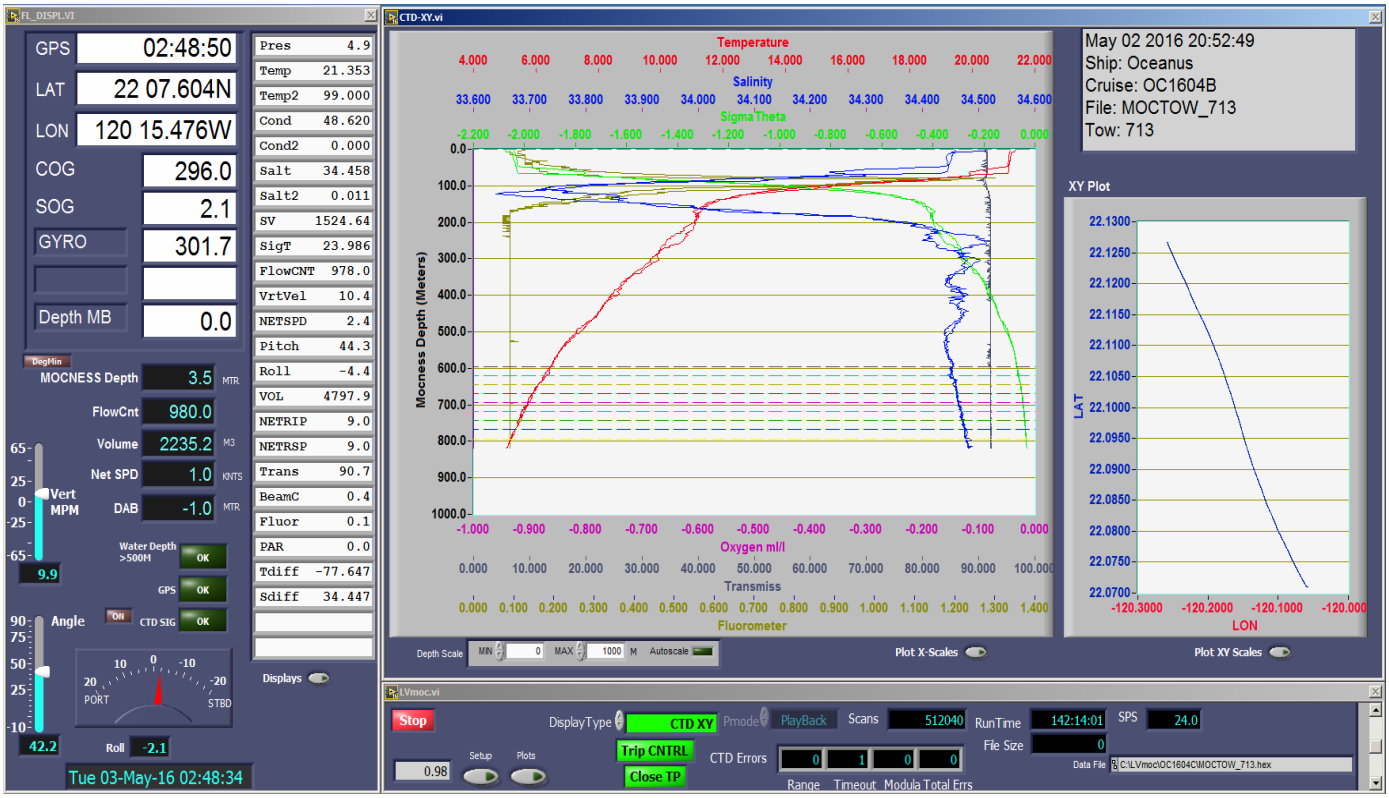


Stripchart plots

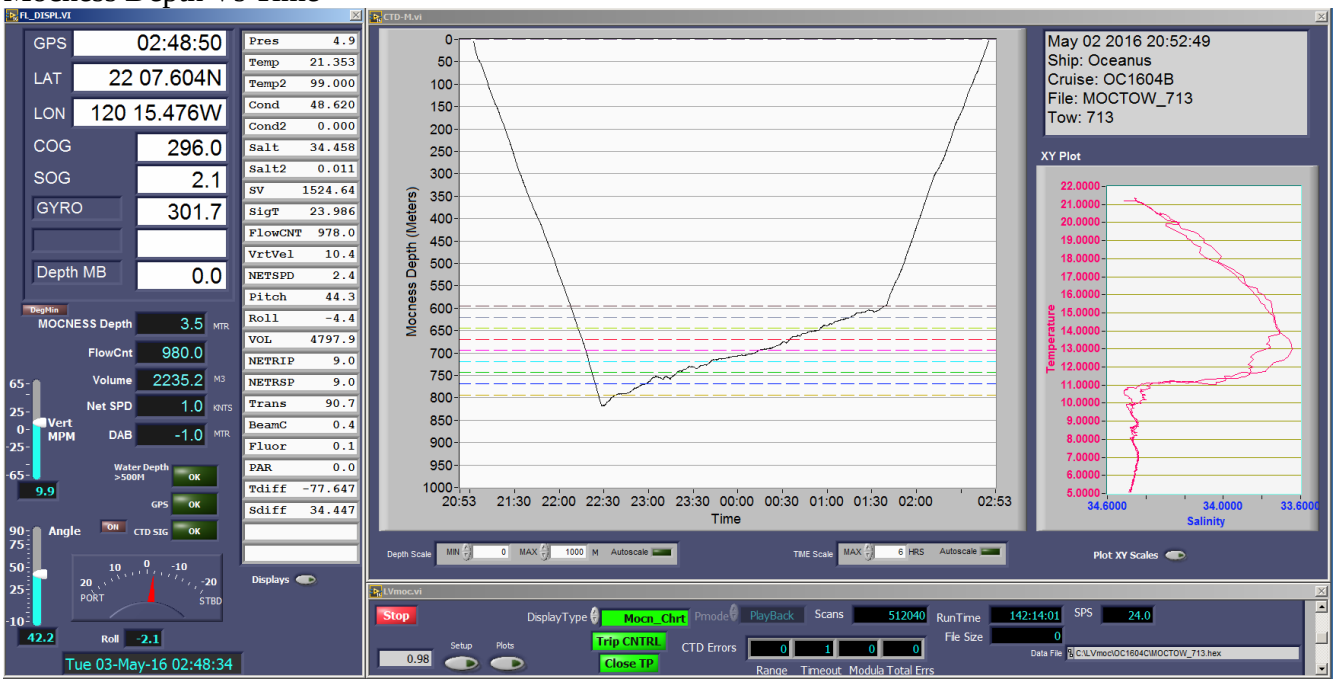
Plot Scales Control



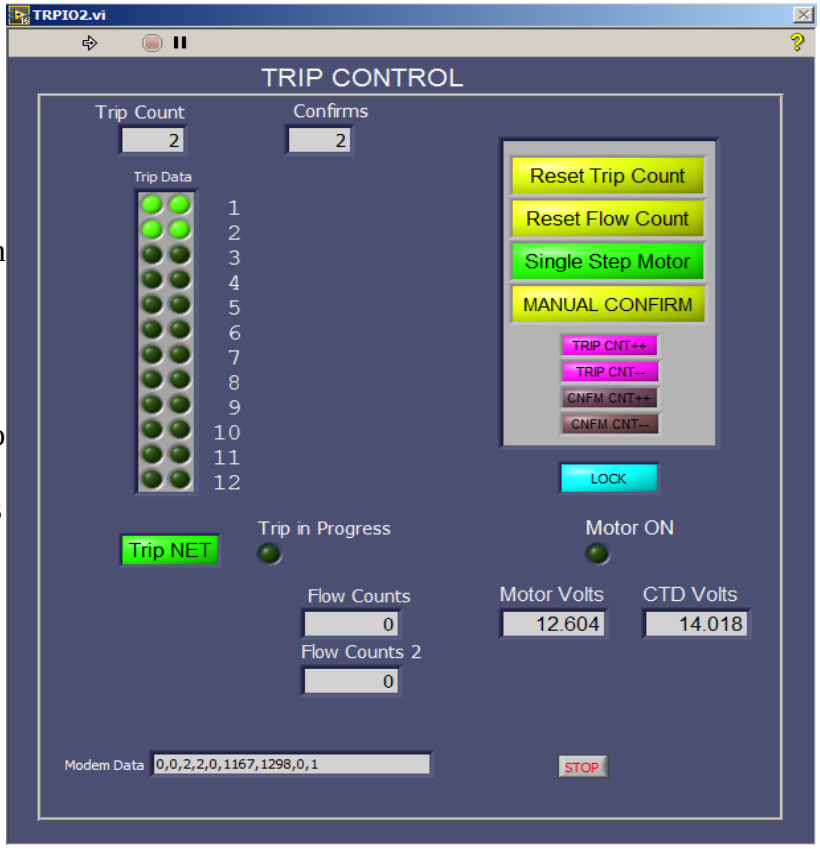
CTD XY Plot



Mocness Depth Vs Time



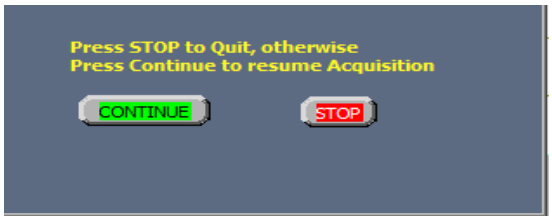
3.4 NET Trip



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. The operation of this panel is the same as the description in the Deck Test section. When ready to trip a net press the green Trip NET button. Once it is pressed the on the Trip in Progress indicators will come on. This indicates a NET trip is in progress. When the Mocness response switch is toggled signaling that the Net has closed then the confirmation indicator will come on. If the response switch does not toggle within 60 seconds then the confirmation indicator 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. If desired then the operator can select the Manual Confirm button to confirm the NET closure. NET confirmations are indicated by a colored dashed line on both the CTD XY plots and the Mocness Strip Chart pages.

3.5 Ending the TOW acquisition

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.



3.6 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 may 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.

4.0 Data Files

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

1. Hex file – Main data file from the Seabird SBE9 CTD.
2. HDR file – Header information – Seabird format.
3. BL file – Trip info - Seabird bottle format.
4. XMLCON file – XMLcon file copy.
5. NET file – NET Trip data in text format.
6. PROC file – Traditional Mocness style Processed data file.
7. 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:
21 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 M3
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 (Knots)
14. Gyro
15. Water depth – (Meters)
16. GPSTime
17. Speed Log (Knots)
18. Motor Volts
19. CTD Volts
20. Flow Counts 2 (From 2nd Flowmeter)
21. Volume 2 M3 (From 2nd Flowmeter)

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

The NET Trip File format is as follows:

NET FILE:MOCTOW_10_net.txt
Jan 13 2017 20:22:41
Ship: Sikuliaq
Cruise: GG1701
File: MOCTOW
Tow: 10

Date	Time	TC	CNF	FC	VOL	Pres	Temp	Cond	Salinity	Fluor	Trans	Oxy
170113	202340	1	1	0	0.00	172.1	22.283	33.6712	22.373	0.00	0.00	-99.000

TC – Trip Count
CNF – Confirmation Count
FC - Flow Counts
VOL - Volumn
Pres - Pressure(DB)
Temp -Temperature Deg C
Cond Conductivity S/M
Salinity PSU
Fluor -Fluorometer ug/l
Trans - Transmissometer %
Oxy - Oxygen mll

Data files are written only once per Tow deployment. If the Tow number name info is not changed on the next deployment then new data files wiill be written using the data in the last SETUP configuration. If the program sees a file that already exists then it will write a new file with an added <n> with <n> incrementing with each instance. E.G. if the file name_ “HAUL_1.hex” exists then it will make a new file named “HAUL_1_0.hex”.