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STANDARD OPERATING PROCEDURES (SOP)

Software: Lab Data System

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1. Introduction:

This document outlines the system architecture of Lab Data System Software. The purpose of this software is to provide real-time monitoring of 3 sensors which are pressure levels, Temperature levels, Salinity Levels, Weight Levels and generate comprehensive reports for analysis and decision-making purposes.

2. Equipment and Materials:

- Lab Data System Software for Pressure , Temperature , Salinity , Weight Monitoring and Reporting
- Compatible hardware sensors and devices
- Computer system with the required specifications

3. Procedure:

3.1 Opening and Closing Software:

3.1.1 Open Software

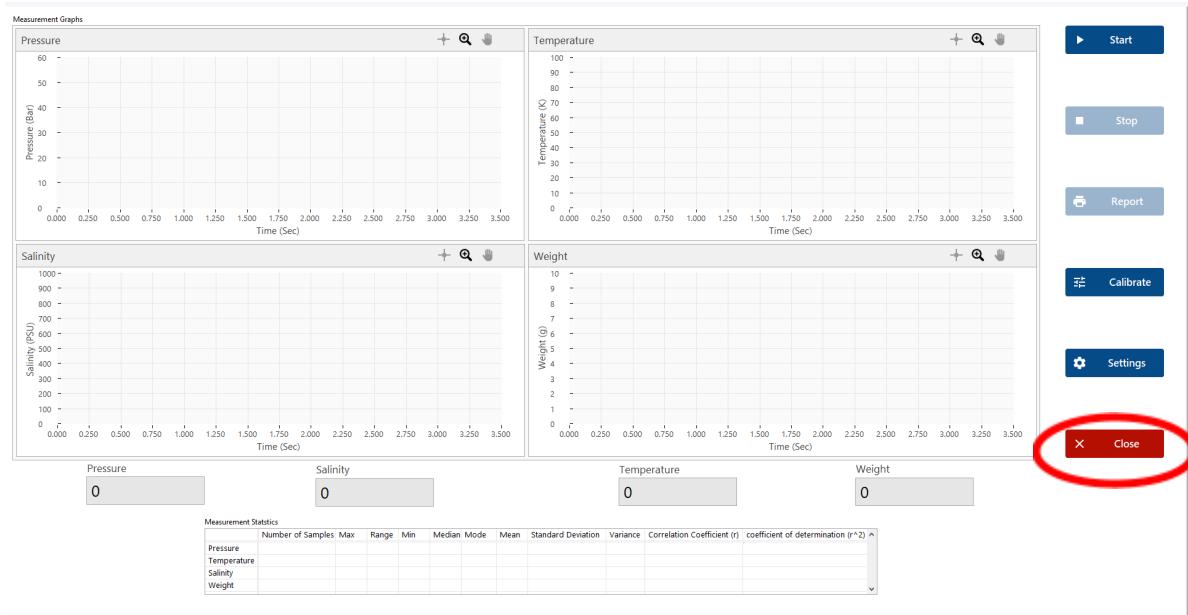
You can open the software using Software shortcut in the desktop or go for directory “C:\Program Files (x86)\ Lab Data System\Lab Data System.lvproj”

 controls	1/10/2026 8:24 PM	File folder
 data	1/10/2026 8:24 PM	File folder
 documentation	1/15/2026 10:08 PM	File folder
 Reports	1/15/2026 10:08 PM	File folder
 support	1/10/2026 8:24 PM	File folder
 Lab Data System.aliases	1/15/2026 10:24 PM	ALIASES File 1 KB
 Lab Data System.lvps	1/15/2026 10:24 PM	LVLPS File 1 KB
 Lab Data System	1/15/2026 10:24 PM	LabVIEW Project 38 KB
 Main	1/15/2026 10:22 PM	LabVIEW Instrume... 19 KB

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3.1.2 Close Software

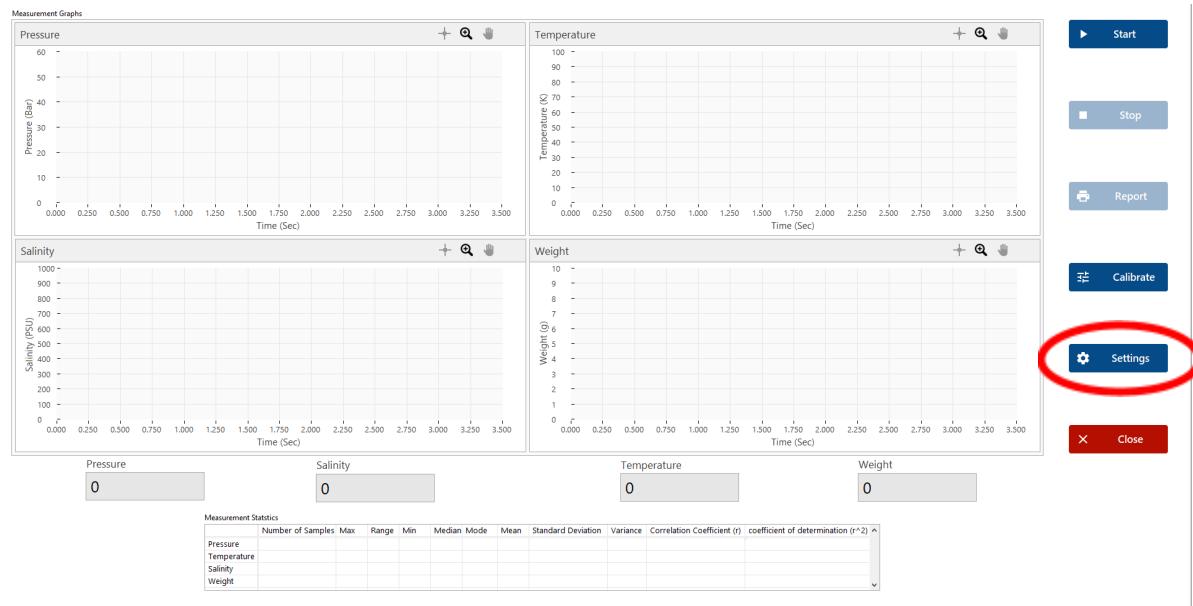
In Main Page “ Lab Data System” Click in Close Button in the right of the screen



3.2 Sensor Calibration:

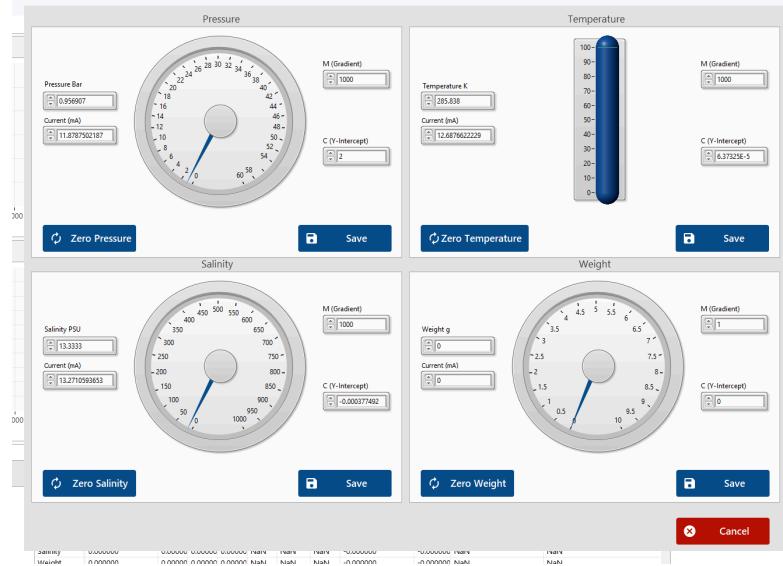
3.2.1 Open Sensor Calibration page

- In Main Page “ Lab Data System” Click in Calibration Button in the right of the screen



3.2.2 Check Calibration

- For each Sensor , Compare the Reading in the page from gage or form numerical value to the actual reading (you can use the known sensor value as reference or use sensor value from a different calibrated Sensor)



- If you find both reading from software and reference are same you are good to go , just click zero Sensor to save data then cancel , if not follow the upcoming instructions .

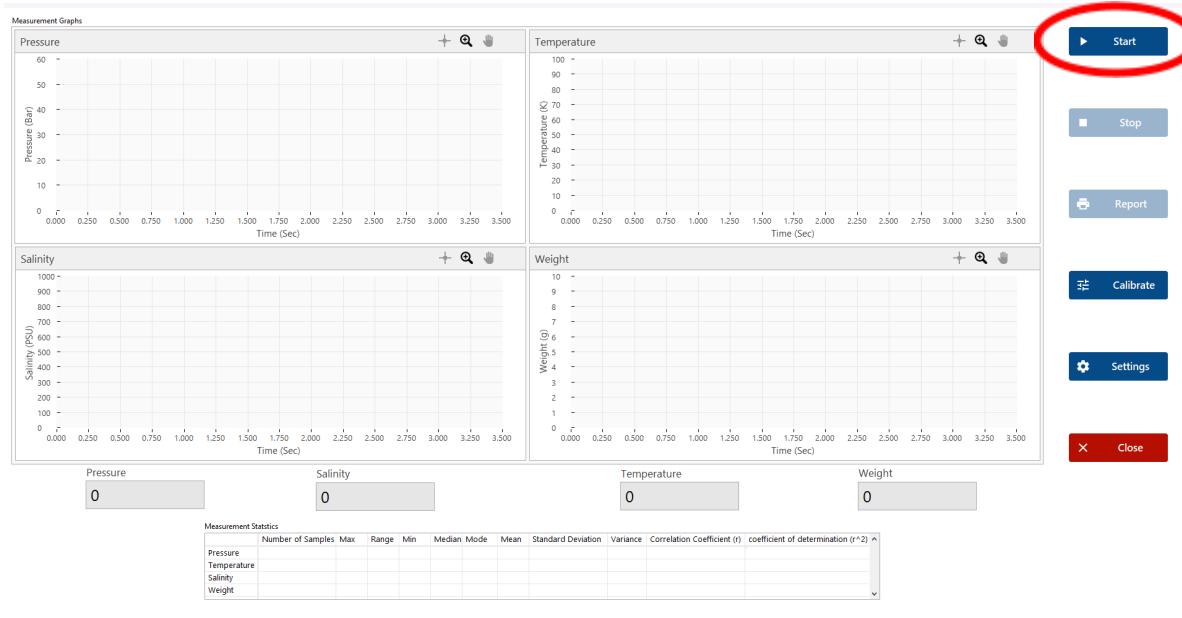
3.2.2 Sensor Calibration

- For each sensor , The sensor calibration used the equation of (Sensor Value for Specific Unit = M * Sensor Output in mA + C)
 - o According to sensor datasheet, Sensor Output in mA Range is (4-20 mA) and
 - Sensor Output in Pressure bar Range is (0 – 60 bar). So M = 3 and C = 0 .
 - Sensor Output in Temperature C Range is (0 – 200 C). So M = 10 and C = 0 .
 - Sensor Output in Salinity ppm Range is (0 – 100000 bar). So M = 5000 and C=0.
 - o In case there is a constant offset between Software Reading and Reference so add this offset to C Constant and Click zero pressure then Cancel (Example Software Reading is – 2 bar , 2 bar , 7 bar – and Reference Reading is 1 bar , 5 bar , 10 bar - , So the C will be 3).
 - o In case there isn't a constant offset between Software Reading and Reference , you will had to get two points for bar and mA then use the equation to Find M and C and Click zero pressure then Cancel , Example (First point Pressure = 5 bar and mA = 2 , Second point Pressure = 11 bar and mA = 5 , So M = 2 and C = 1) .
- In case sample rate is too high and you can't keep track with your eye decrease sample rate speed, referee to advanced settings.

3.3 Start Measurements:

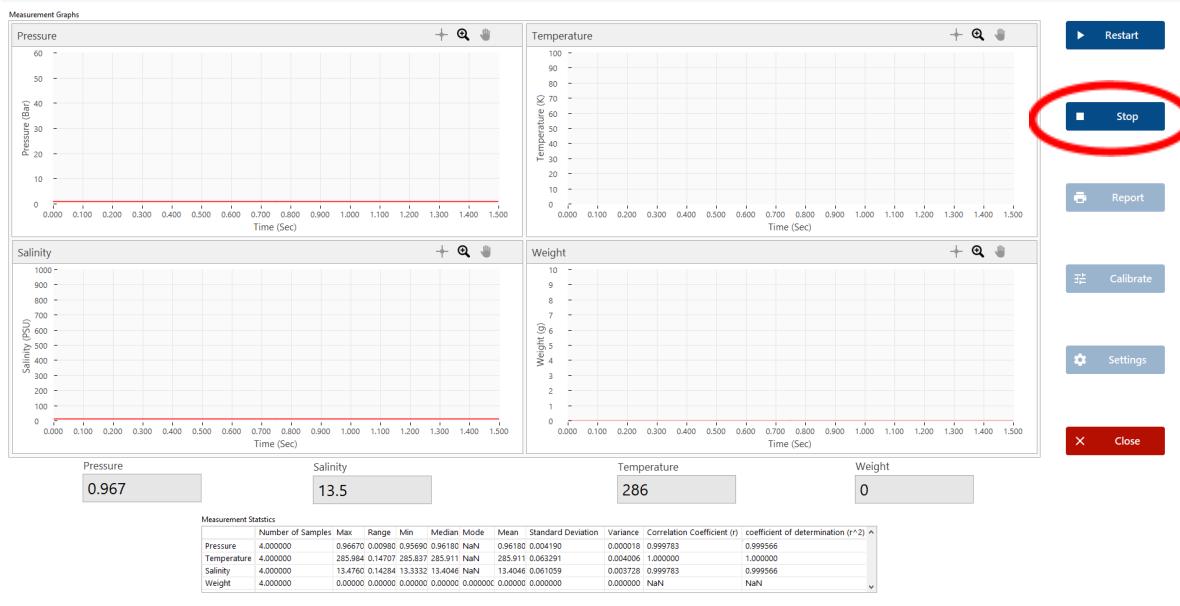
3.3.1 Start Measurements

In Main Page “ Lab Data System” Click in Start Button in the Right of the screen



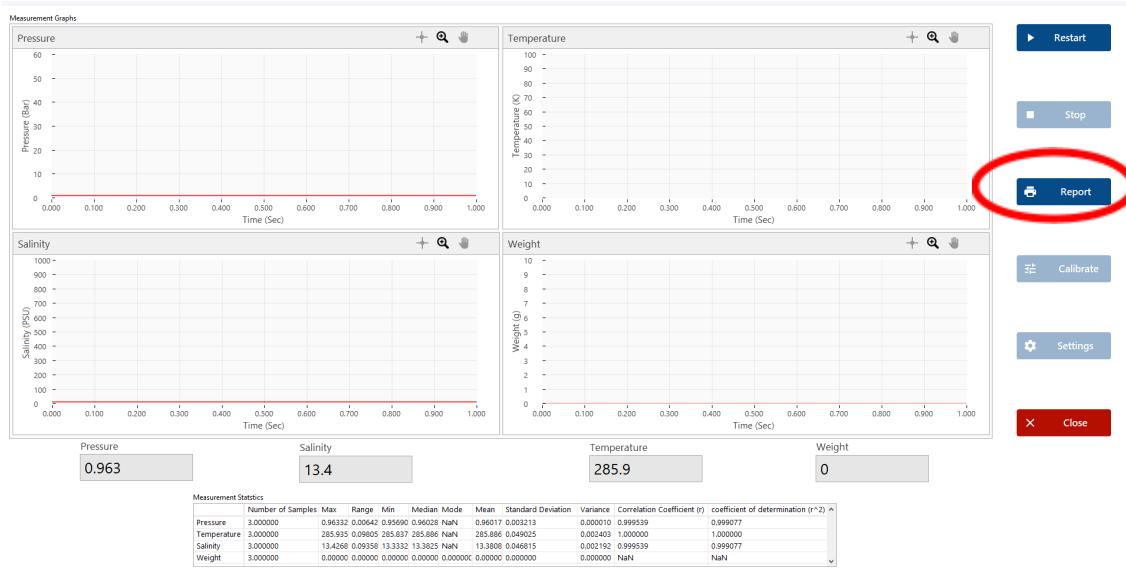
3.3.4 Stop Test

In Main Page “ Lab Data System” Click in Stop Button in the Right of the screen



3.3.4 Generate Test Report

- When clicking ‘Report’ the system will generate a logging report automatically.



- Typically the report will be found in path “ C:\Program Files (x86)\ Lab Data System\Reports ” in folder with same time of the report.

3.3.5 Restart Test

- You Can Restart by press Restart button (You can Restart during Test is running or Stopped)



3.4 Settings:

3.4.1 Open Settings page

- In Main Page “ Lab Data System” Click in Settings Button in the right of the screen

The screenshot shows the main interface of the Lab Data System. At the top, there are four measurement graphs: Pressure, Temperature, Salinity, and Weight. Below the graphs are four digital displays showing values of 0 for each. Underneath these are 'Measurement Statistics' tables for Pressure, Temperature, Salinity, and Weight. On the right side, there are several control buttons: Start, Stop, Report, Calibrate, Settings (which is circled in red), and Close. A 'Back' button is located at the bottom right of the main content area.

Measurement Graphs

- Pressure:** Y-axis ranges from 0 to 60 Bar. X-axis ranges from 0.000 to 3.500 Sec.
- Temperature:** Y-axis ranges from 0 to 100 °C. X-axis ranges from 0.000 to 3.500 Sec.
- Salinity:** Y-axis ranges from 0 to 1000 PSU. X-axis ranges from 0.000 to 3.500 Sec.
- Weight:** Y-axis ranges from 0 to 10 g. X-axis ranges from 0.000 to 3.500 Sec.

Measurement Statistics

	Number of Samples	Max	Range	Min	Median	Mode	Mean	Standard Deviation	Variance	Correlation Coefficient (r)	coefficient of determination (r^2)
Pressure											
Temperature											
Salinity											
Weight											

Channels Settings

- Pressure:** Physical Channel: Dev1/A0, Max Voltage: 10, Min Voltage: 0, Terminal Configuration: RSE.
- Temperature:** Physical Channel: Dev1/A0, Max Current (mA): 10, Min Current (mA): 0, Terminal Configuration: RSE.
- Salinity:** Physical Channel: Dev1/A0, Max Current (mA): 10, Min Current (mA): 0, Terminal Configuration: RSE.

Weight Port Settings

- Port Name: COM1, Port Settings: baud rate: 9600, data bits: 8, parity: None, stop bits: 1.0, flow control: None.

Units Settings

- Pressure: Pa, Temperature: F, Salinity: ppt, Weight: lb.

Disable Sensor Reading

- Dig: Enable, RS232: Enable.

Sampling Settings

- Reading Time (ms): 200, Graph Time: Sec.

General Settings

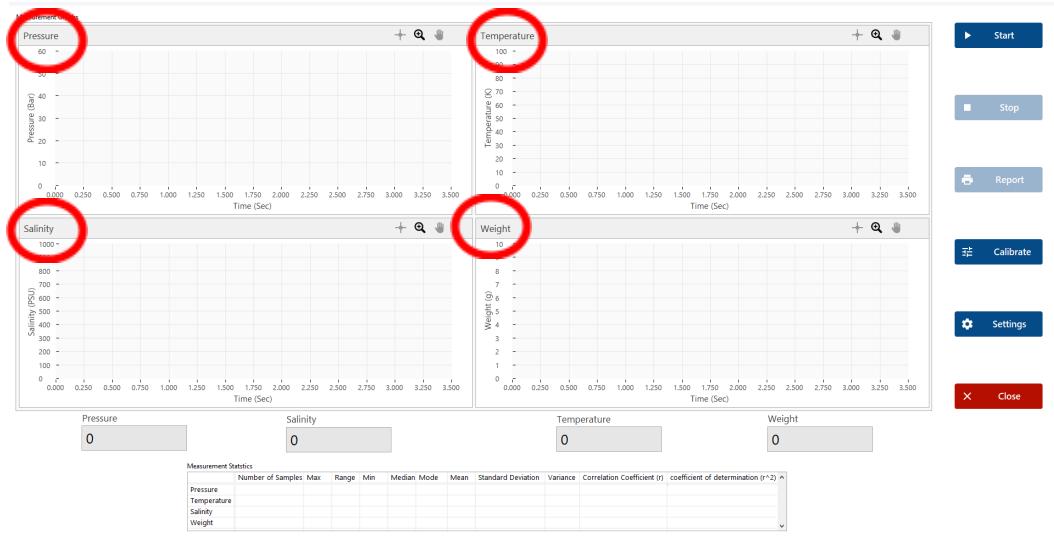
- Measurement Statistics: Disable, Logging Type: CSV.

Buttons

- Save (bottom center).
- Start, Stop, Report, Calibrate, Settings (circled in red), Close, Back (bottom right).

3.4.2 Change Maximum Reading of Graph

- Double Click on the Maximum value at any graph and write the new value



3.4.3 Channels Settings

- cDAQ Settings for Pressure , Temperature and Salinity Sensors

- Press Save Button to Save Changes

3.4.4 Wight Port Settings

- RS232 Settings for Weight Sensor

- Press Save Button to Save Changes

3.4.5 Unite Settings

- This parameter to configure unit for each sensor

- Press Save Button to Save Changes

3.4.6 Disable Sensor settings

- In case one of the hardware device has error or problem you can disable one of them with any problem

- Press Save Button to Save Changes

3.4.7 Sampling Settings

- Sample Time (mSec) , this parameter is used to identify the sampling time for sensor read per mSec .

- Graph Time , this parameter is used to identify time of the graph if want it by seconds or mSec.

3.4.8 General Settings

- Measurements Statistics : To Enable or Disable live statistics for the measurements of the sensors.

- Logging Type : the Type of logging File (CSV ,TDMS) or disable logging .