DALHOUSIE UNIVERSITY
FACULTY OF ENGINEERING

Group 5:

Seamus MacInnes
Evan Merrick
Kevin Schwarzer

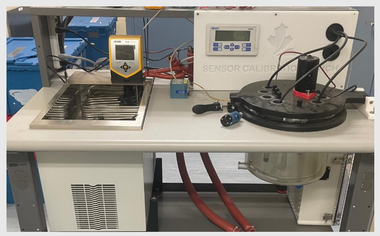
CERC.OCEAN

Department of Electrical Engineering

Automated Gas Calibration Using LabVIEW

PROJECT BACKGROUND

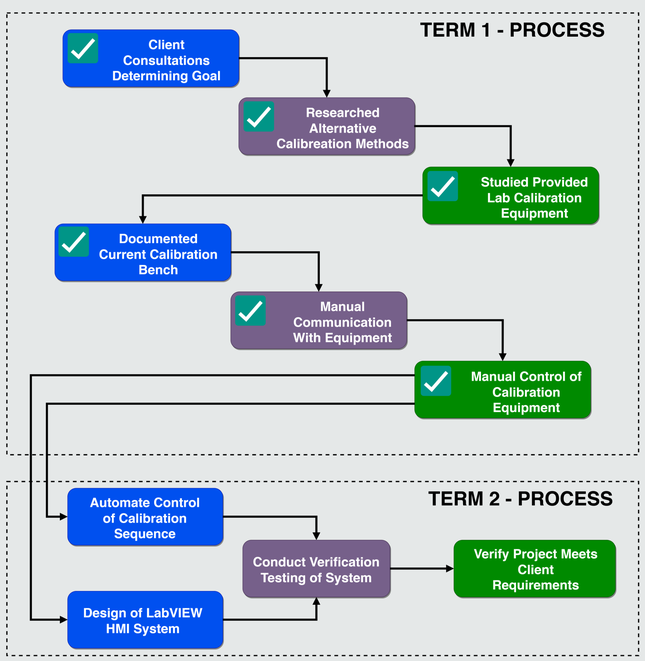
- CERC.OCEAN studies the ocean, and ocean processes
- SeaCycler is a real-time measurement system that collects data from the ocean depths for up to a year
- Aanderaa optode used for measurement of dissolved O_2 in seawater
- Calibration equipment & test-bench previously acquired and assembled by CERC.OCEAN
- Project will automate data collection for calibration of seven Aanderaa sensors for measuring dissolved O_2 in seawater for CERC.OCEAN



Existing Calibration Bench

Aanderaa Optode

DESIGN PROCESS

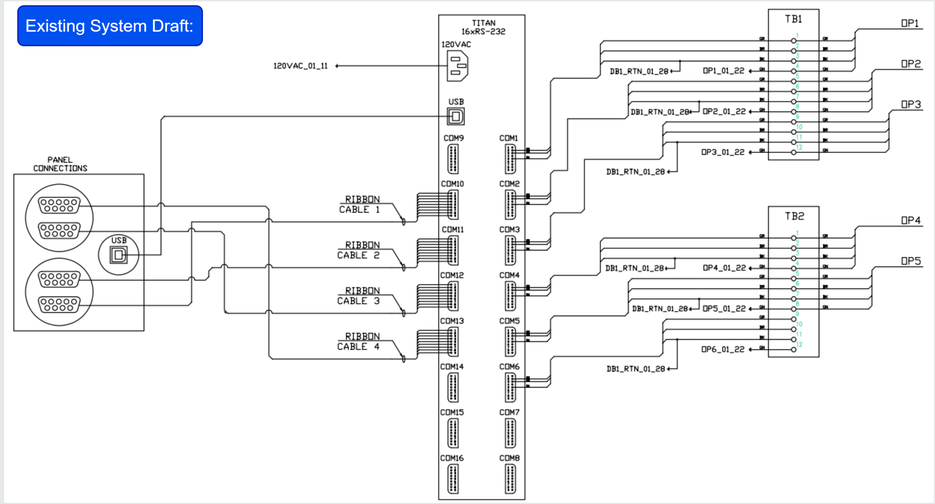


DETAILS OF DESIGN

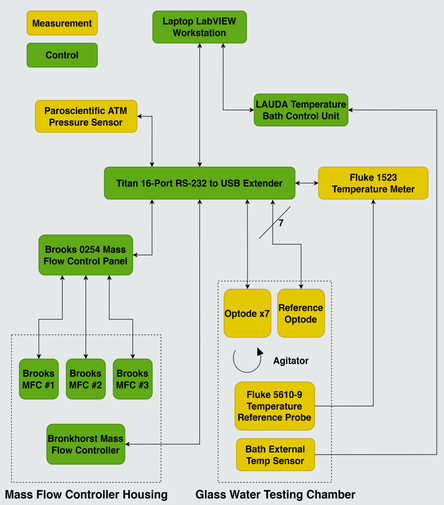
Term 1: Document, Verify, Improve, and Control Hardware	Term 2: Automate Control, Collect Data, Verify and Validate
Verification & Documentation of Existing System	HMI Design Through LabVIEW
Hardware Improvement Plan	Automate Calibration Sequence
Manual Calibration Component Interfacing	Test Safe Execution of Sequencing
LabVIEW Control and Data Collection	Verify Data Meets Requirements
	Document Processes and Procedures

Purple = Not Started, Yellow = In Progress, Green = Complete

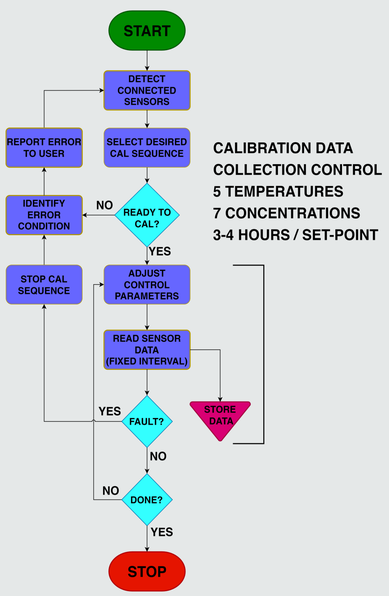
Existing System Draft:



Hardware System Architecture

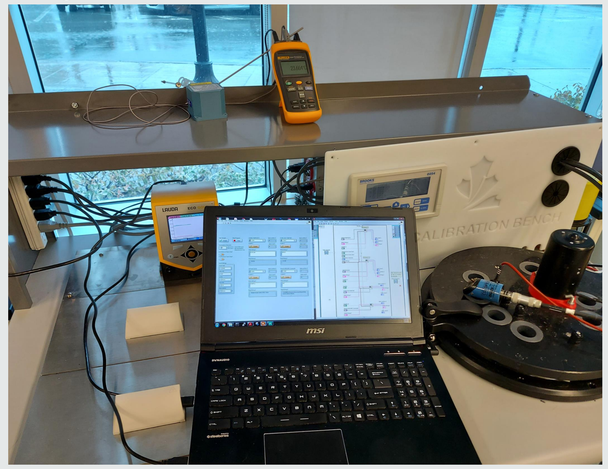


Automated LabVIEW Control Program



CONCLUSIONS

- After researching alternative solutions, a need for a custom, in-lab calibration setup was evident
- Following a prolonged period of disuse, all equipment was tested and found to be operational
- Electrical wiring was verified with some areas flagged for improvement and future testing
- All sensors and actuators are confirmed to communicate and support manual control through the LabVIEW environment
- Recommend that this project continue in its current form and scope with some reworking of calibration bench wiring



Manual Control Test Setup

ACKNOWLEDGEMENTS

The team is thankful to the continued support of the Dalhousie CERC.OCEAN lab, Dr. Aaron MacNeill and Dr. Dariia Atamanchuk, and Dalhousie faculty Dr. Vincent Sieben and Dr. Jose Gonzalez-Cueto.

REFERENCES

- Fluke 1523-1524 Technical Guide (fluke.com)
- SLA5800 MFCs Manual (brooksinstrument.com)
- EL-FLOW® Select Manual (bronkhorst.com)
- LAUDA ECO GOLD Manual (lauda-brinkmann.com)
- Oxygen Optode 4330,4835,4831 Manual (aanderaa.com)