

901217 - Chemical Sensors

Week 50

1. Thom Maughan
 - a. Preparing the MoSoS v5.1.8 release for handoff to UW at end of December. Jess has been manually testing pre-releases. Planning to start running regression tests end of this week.
 - b. Found and fixed the teraterm issue affecting some laptops and usbserial cables.

Week 49

1. Irene Hu
 - a. Minor help with TIP can
2. Thom Maughan
 - a. Dana Swift at UW has requested a point release for the MSC3. Working with the chem sensors team on the bug listed slated for the point release as well as setting up for testing.

Week 40

1. Thom Maughan
 - a. Two floats are returning good data. A third float deployed near Hawaii has had a UV lamp intermittent failure, something that has happened in the past about 1 out of every 100. Not a software problem but wishing it could be root caused.

Week 39

1. Thom Maughan
 - a. Float data looking solid
 - b. Minor support / participation with Alkalinity and mini ISUS
 - c. Working with Jim, contractor on MoSoS v5.2 platform support

Week 38

1. Thom Maughan
 - a. Argo float data is looking good on the two test floats

Week 36

1. Thom Maughan
 - a. 2nd Argo float with MSC3 was deployed and is returning good data.

Week 35

1. Irene Hu
 - a. Wrapped up PTC experiments, recommend using battery power

Week 34

1. Irene Hu
 - a. Mini ISUS prep and planning, wiring diagram
 - b. Continue w/ PTC experiments

Week 33

1. Irene Hu
 - a. Continuing experiments with noise on PTC

Week 32

1. Irene Hu
 - a. Ongoing tests to track down pH noise with MSC3 in PTC

Week 31

1. Irene Hu
 - a. Trying to troubleshoot MSC3 noise in PTC chamber

Week 30

1. Irene Hu
 - a. Helping to troubleshoot noise issues with pH for MSC3

Week 29

1. Thom Maughan
 - a. Minor support for MSC3 questions from UW and the lab.

Week 28

1. Thom Maughan
 - a. Emails and phone call, minor support for MSC3.
 - b. Float deployment is first week in August

Week 27

1. Irene Hu
 - a. Trained Luke and Josh to program chips for MMS boards

Week 26

1. Thom Maughan
 - a. Simulation at UW is half complete, no issues reported. Float deployment in Monterey Bay first week in August.

Week 24

1. Irene Hu
 - a. Help troubleshooting MSC3 - broken spec, broken mcap, etc
2. Thom Maughan
 - a. Milestone achieved. MSC3 revD + Tiva 1290 revB running MoSoS v5.1.7 firmware passed linux regression tests and APF11 controller testing and is now moving forward to several weeks of FloatSim integration testing. On track to at sea testing mid August in Monterey Bay.
 - b. ChemSensors production is using MSC3 as the Persistor CF2 based MSC1 is officially at an end having recorded 4 million pH and 3 million Nitrate samples.

Week 23

1. Irene Hu
 - a. MSC3 bug fix: traced to print buffer overload with high spec readout (more digits)
2. Thom Maughan
 - a. Released MoSoS v5.1.6 to begin UW float sim
 - b. Working contract for reworking code to add back boards support for older Tiva 123g processors.

Week 22

1. Irene Hu
 - a. Random support, e.g. measuring timing of different processes, current measurements, troubleshooting broken boards
2. Thom Maughan
 - a. Handed off to UW on May 16 for integration with APF11 controller.
 - b. Working thru integration and bug fixes, as of May 28th, handed of MoSoS v5.1.5 as the candidate to begin the float simulation phase.

Week 21

1. Irene Hu
 - a. Help with code troubleshooting for MSC3's final push
 - b. Power, bootup time, etc measurements for MSC3

Week 20

1. Irene Hu

- a. Various coding tasks and troubleshooting handed off by Thom
- b. Various power and timing measurements

Week 19

- 1. Irene Hu
 - a. Assisting with various troubleshooting and coding tasks
 - b. Circuitry updates to address high latent power draw, bad EOL battery behavior
 - c. Battery drawdown and power consumption tests

Week 16

- 1. Irene Hu
 - a. Chasing down MSC3 behavior at low voltage with a current limit / low voltage with source output resistance
- 2. Thom Maughan
 - a. Rough meeting on schedule last week. Latest has no pad and the who group is in an all out push. I'd write more, but I need to get back to coding / testing.
 - b. Was able to get 40 additional hours of contractor time, we're working the regression suite and he will be modifying what works for MSC1 to accommodate the changes MSC3 brings to the table.

Week 15

- 1. Irene Hu
 - a. Chasing through problem with MSC3 baseboard powered at 8V with current limit (battery end of life behavior). Current draw from starting up deuterium lamp affects system in a more fatal way than it did for MSC1.
- 2. Thom Maughan
 - a. Nitrate calc has been quite an ordeal and working with Jacob and Josh with assist from Irene we're very close. Matrices and numerical recipes calcs have all be validated and several issues found and fixed.
 - b. Working with Jess on test vector output - finding and fixing
 - c. Identified a problem running at 8.0v, characterized it and Irene is working it.
 - d. Working on schedule estimate and aiming to provide that to the two PI's on April 10.

Week 14

- 1. Irene Hu
 - a. Support for code development
- 2. Thom Maughan
 - a. Serial commands are implemented
 - b. NO3 calculation and File IO are work in progress.

- c. Aadu Prakash of UW, age 32, passed away on 28 Mar 2025. Our kind, positive and capable firmware engineer who has been my primary interface to UW will be greatly missed.
- d. Revising test plan and evaluating options for filling gaps on UW regression suite.
- e. Working bug list and managing contractor...
- f. Schedule pressure is high

Week 12

- 1. Irene Hu
 - a. Troubleshooting SPI bus issues for pH measurements with 1290 processor - CS had been reassigned from GPIO to using uP's SPI functionality, causing timing and/or other issues
- 2. Thom Maughan
 - a. Working remote from Colorado in a quiet room with a nice view.
 - b. Working towards end of March release to UW. Jess, Ben, Josh are running tests and updating test boxes with daily releases.
 - c. Find-fix bug sessions have been very productive. Testing 170 commands with and emphasis on automating test of all the commands used by the APF11 float controller.
 - d. pH K0 Calibration and N03 Calibration are running with no errors on MSC3.
 - e. Float profile test errors are mostly due to 'work in progress' on some of the less critical commands. Changes in fileio from PicoDOS to FatFS, and issues with parsing are the source of most bugs.
 - f. UW test suite. Met with Aadu and am working remote with Jess on getting UW tests running on MSC1 with serial protocol capture. Running MSC3 results in changes to the UW test suite.

Week 11

- 1. Irene Hu
 - a. Tiva1290 rB modules received, troubleshooting programming. JTAG header is wrong and one net disconnected
- 2. Thom Maughan
 - a. Working to end of March for software and hardware handoff to UW.
 - b. Test infrastructure investment is paying off nicely.
 - c. 'Find fix' sessions have been working great. K0 pH Cal test case is passing. N03 Cal test case is passing, working on Profile test case.
 - d. Flagged Numerical Recipes in C license to Ken and Yui. Excluding NR content in next release.

Week 9

- 1. Thom Maughan

- a. Hit milestone prior to vacation, moved to Tiva 1290 from 123g. Demonstrated compatibility and less bugs running Jess's test vectors.
- b. Finishing implementation of serial commands.
- c. UW regression suite update for full command coverage.
- d. Introduced a new command for starting a profile, worked it with UW.
- e. Feedback for MSC3 RevE baseboard. Help with Tiva 1290 RevB production. First production release is planned to use MSC3 RevD baseboard and Tiva 1290 RevB. Aiming for end of March release to UW.
- f. Working on git procedure for the team. Clone, branch, merge. Starting Techfest on Thursdays to begin ramping people on Code Composer Studio and MoSoS code base.
- g. Irene asking if older v4 phfetsos is open source. Yui confirmed yes. We'll start Alkalinity work with phfetsos v4 on mphox at Scripps.

Week 8

1. Irene Hu
 - a. Tiva1290 rB sent out to Indtec

Week 7

1. Irene Hu
 - a. Tiva1290 rB modules complete and sent out for quotes; looked at interference w/ baseboard rD; various meetings and decisions on which versions of baseboard to go forward with, when

Week 6

1. Irene Hu
 - a. Some updates to next Tiva129 module, eg fix I2C issue noticed by contractor

Week 5

1. Irene Hu
 - a. Discussions and some minor updates to next Tiva module
 - b. Bitbucket+VSCode tutorial to get Jess's MSC Sampler code onto Bitbucket
2. Thom Maughan
 - a. At UW 25 Jan to 30 Jan. Met with Dana Swift and Aadu Prakash, MSC3 dev box, test plans, schedules, etc.
 - b. Working on MSC3 software. Release v5.0.4 on Jan 23, v5.0.6 with MSC1 compatibilit on 28 Jan
 - c. Working with Jacob on Tiva 1290 support. Testing.

Week 4

1. Irene Hu

- a. RevD baseboards received from Indtec last Wednesday. Quick troubleshooting on extra current draw, traced to a rotated part
- 2. Thom Maughan
 - a. Dev/Test boxes are mostly built and tested with MSC3 RevB baseboards and v5.0.3 MoSoS.
 - b. Jess has the TestVectorizer python script running tests and Irene has setup the Yokagawa for energy measurement. Jess has run repeated tests on the MSC1 and is starting to run MSC3.
 - c. Irene received MSC3 RevD baseboards on the 15th.

Week 3

- 1. Irene Hu
 - a. Planning for new baseboard with holes matching new toolsled, and new module with coordinated holes that also fits mini ISUS
 - b. Random help for Thom in troubleshooting code, as needed

Week 2

- 1. Irene Hu
 - a. Troubleshooting issue with revC baseboard vs revB, traced to BME280 addressing in code
 - b. MSC3 baseboard revD is being made by Indtec
 - c. Look into mounting holes issues, will be updated for baseboard revE / Tiva1290 module revB
 - d. Getting Jess's Python code working with MSC3 output
- 2. Thom Maughan
 - a. Working with Ben and Josh on building six 'dev / test' boxes with MSC3 RevB and Tiva 123g
 - b. Working with Jacob Schloss to merge 1290 changes. Dev box sent to Jacob to enable Nitrate and pH driver testing.
 - c. Working to finish serial protocol
 - d. Working with

Week 1

- 1. Thom Maughan
 - a. Finished bug fixes and manual testing for MoSoS v5.1.8. Jess ran the test vectors.
 - b. Handed off MoSoS v5.1.8 to Dana Swift at UW with the month long regression test cycle starting on Jan 2nd.
 - c. The four 'engineering test' floats are profiling daily and successfully returning data with the exception of one which has experienced a known hardware failure of the Heraeus Fiberlight UV lamp power supply.