Detector Support Group

We choose to do these things "not because they are easy, but because they are hard".

Weekly Report, 2023-01-25

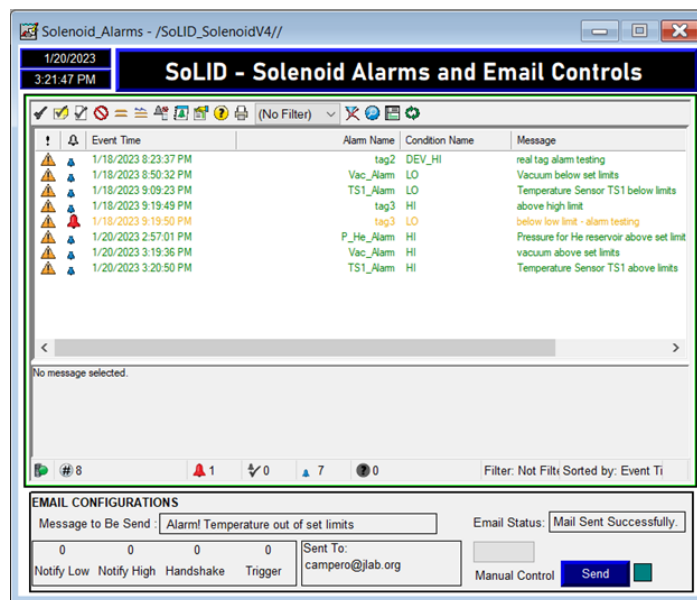## Hall A – ECAL

Marc McMullen

- Completed DSGlist for single supermodule test
- Completed installation of single supermodule test stand in EEL building oven
  - ✴ Installed cRIO and power supply
  - ✴ Installed heater power control relay circuit

Hall A – SoLID

Mary Ann Antonioli and Pablo Campero

- Began making current leads mass flow control Phoebus screen
- Completed code to send an email in the event of an alarm; created an HMI screen to show details of alarms and emails

- Modified HMI screens
  - ✶ Added buttons to *CCR Expert* screen to open plots of archived data for three cryogenic variables
  - ✶ Added LN$_2$ delta temperature plot to *Cooldown* screen
  - ✶ Added navigation buttons and overview alarm status, and reorganized screen navigation buttons by groups on *Menu* screen

- Debugged temperature sensor wiring
  - ✶ Logbook entry: https://logbooks.jlab.org/entry/4116376
- Modified PLC program
  - ✶ Added controller scope PLC tags for all magnet temperature sensors, voltage taps, and radial support load sensors and linked them to existing PLC tags in program scope
  - ✶ Removed unused PLC tags
  - ✶ Removed unused user defined Add-On instructions
  - ✶ Recovered comments from previous PLC program versions

Hall B – Magnets
Aaron Brown, Brian Eng, and Tyler Lemon
- Analyzed structured text added to PLC to enforce new polarity change procedure
  - ✶ Created a truth table of all possible inputs and corresponding outputs to the structured text IF-ELSE statement
- Made a Python script to calculate the ramp rates for the current and coil voltages
  - ✶ Not used during testing as maximum voltage was more useful and the slew rate was only stable during the middle ramp period, which was very short for low current testing
- Performed several ramps to 100 A at different current ramp rates
  - ✶ DAC could only be set to 2–7; 1 didn't work and any higher would trip the quench detectors
  - ✶ Also ramped to 500 A to verify that field was still reading incorrectly
- Installed, configured, and wired isolation amplifiers for two new voltage taps on the flexible links installed in solenoid magnet power supply
  - ✶ Updated cRIO LabVIEW code and PLC and deployed changes on both
- Ordered RTDs and cables

Hall B – SVT
Brian Eng
- Troubleshot high current draw on R2S11T
  - ✶ https://logbooks.jlab.org/entry/4115615
  - ✶ Bent pin on HV cable from the module on the distribution side caused the issue

Hall C – NPS

Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng, Mindy Leffel, and Marc McMullen

- Soldered 200 capacitors to PMT bases
- Cut eight of 12 humidity sensor power cables; terminated end of one cable with a 50-conductor, D-sub connector
- Debugging hardware interlock system's LabVIEW program for thermal readback
- Writing troubleshooting instructions to be posted to NPS controls wiki page
- Researching methods for remotely restarting Keysight mainframe
- Met with Carlos Munoz to discuss installation of the relative humidity sensors, relative humidity sensor power distribution box, and the 4-wire RTDs
    - ✶ The Orsay team has all sensors and cables needed to install the relative humidity sensors and RTDs
- Debugging Phoebus V4.6.10 communication with EPICS for alarm system
    - ✶ Display screens no longer connect to the test SoftIOC process variables that are used for alarm system development
    - ✶ The Phoebus alarm system no longer receives process variables from the SoftIOC via EPICS channel access
    - ✶ Other EPICS diagnostic tools show that process variables are available from the SoftIOC via the network
    - ✶ Tested EPICS communication with last version of Phoebus (V4.6.6) that was compiled for alarm system development; both the Phoebus displays and alarm system work normally with V4.6.6

Hall D – JEF

George Jacobs and Mindy Leffel

- Wrapped ten crystals with 3M foil and Tedlar
- Reviewed process of refurbishing ComCal $PbWO_4$ crystals with Alex Somov
    - ✶ Disassembled, cleaned, and inspected ten crystals

EIC

Brian Eng, George Jacobs, and Marc McMullen

- Met with silicon consortium to present results of beampipe test stand
    - ✶ They will investigate alternative adhesives
    - ✶ DSG will simulate other materials to be placed around beampipe as possible insulator

EIC – DIRC

Tyler Lemon and Marc McMullen

Updated DIRC laser interlock drawing

U1, U2: 8-input, NAND gate, PN CD74HC30E
U3: quad, 2-input, NOR gate, PN SN74HC02N
U4: D-latch, PN SN74LVC1G373
U5: 2-input, XOR/XNOR gate, PN MC10H107L
U6: 2-input, OR gate, PN SN74LVC2G32DCUR
Q1, Q2: NPN transistor, PN PN2222ABU
K1, K2: NO relay, PN AQY272

EIC DIRC Laser Interlock
Mary Ann Antonioli
1/4/2023
rev. 1/19/2023

- Investigated method to add sidewalls to optical table for additional isolation of laser when room is occupied
- LOSP approved
- Sent laser system specific training course for JLab course number