



Detector Support Group

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

Weekly Report, 2021-04-07

Summary

Hall A – GEM

Mary Ann Antonioli, Peter Bonneau, Brian Eng, George Jacobs, Mindy Leffel, Tyler Lemon, Marc McMullen

- Testing multiple multiplexer system with SBS gas flow sensor chassis 1 and 2
- Connected exhaust system multiplexer and two exhaust gas flow sensor chassis to BigBite I²C bus
- Generated flowchart for Python code used to read back gas flow and temperature with Raspberry Pi
- Populated one gas flow sensor chassis I²C multiplexer board; four of six complete

Hall A – HCal

Mindy Leffel

- Terminated 40 of 60 RG-58 LEMO-to-LEMO cables

Hall A – SoLID

Mary Ann Antonioli, Pablo Campero, Mindy Leffel, Marc McMullen

- Completed electrical drawings: Magnet Temperature Sensors, CCS Boards Wirings, Cable Diagram for Magnet Temperature Sensors, and PLC I/O Remote A, Slot 3, ADC Module Wiring

Hall B – RICH-II

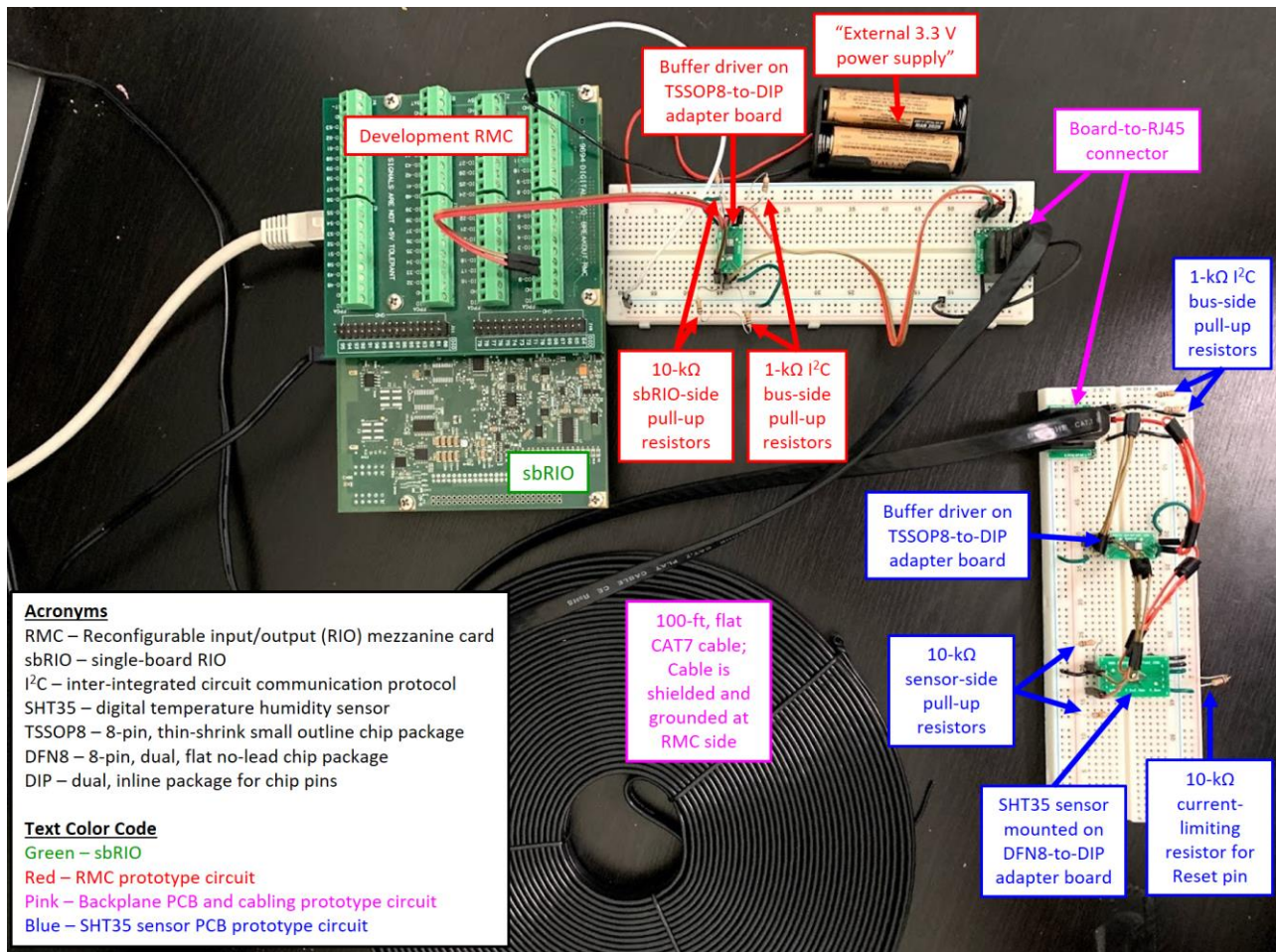
Mary Ann Antonioli, Peter Bonneau, Tyler Lemon

- Prototyped hardware interlock system's SHT35 PCB and the circuit needed to read out one SHT35 sensor
 - ★ Two PCA9600DP buffer drivers and one SHT35 sensor soldered to prototyping adapter
 - ★ Connected components using a breadboard
 - ★ Tested various pull-up resistor values for I²C bus between buffer drivers
 - Found communication is successful when 1 k Ω pull-up resistors are used on data and clock line

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Breadboards set up for SHT35 sensors' I²C bus prototyping.

Hall B – SVT

Brian Eng

- Connecting slow controls cables back to crates and patch panels

Hall C – NPS

Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, George Jacobs, Mindy Leffel, Tyler Lemon

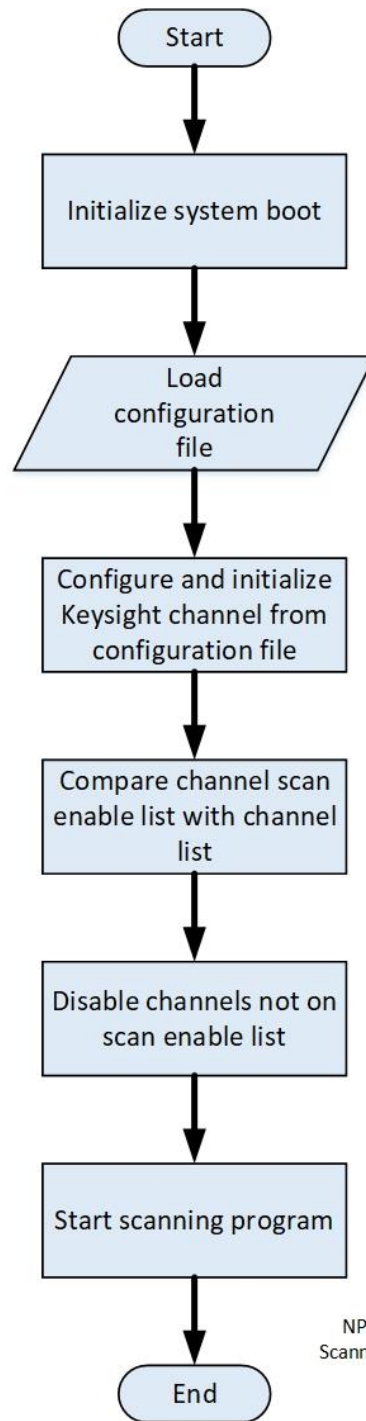
- Developed first draft of flowchart for Keysight switch/measurement unit scanning subroutine



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NPS Keysight Measurement
Scanner Unit LabVIEW Flowchart
M.A. Antonioli
4/7/21

- Generated channel scan enable spreadsheet for Keysight measurement unit scanner LabVIEW subroutine
 - ★ List details which channels of each multiplexer will be enabled/disabled in the sensor scanning subroutine
- Revised sensor and instrumentation list; chiller external sensors and supporting instrumentation added



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Location	Signal Type	Qty	Sensor	Comments
Crystal Array	Temperature	112	Type K thermocouples	Within NPS crystal array (56 front - 56 Rear)
Crystal zone cooling circuit	Temperature	4	4-wire RTDs	Dual sensors on input and output coolant manifolds
Electronics zone cooling circuit	Temperature	4	4-wire RTDs	Dual sensors on input and output coolant manifolds
		4		Dual sensors on top and bottom heat exchangers
Detector internal frame	Humidity	20	Relative humidity (voltage output)	Dual humidity sensors in 10 locations
	Temperature	20	4-wire RTDs	Dual temperature sensors in 10 locations
In NPS frame	Switch on/off	2	Coolant leak sensor	Monitors for leaks in the cooling circuits
On frame access panel	Switch on/off	2	Contact micro switch	Protects personnel from HV when servicing
Chiller shielded enclosure	Voltage	1	N/A	Monitors humidity sensor power supply (+5V)
External ambient (Hall)	Temperature	2	4-wire RTDs	
	Humidity	2	Relative humidity (voltage output)	
External to chiller in radiation shielded enclosure	Coolant Temperature	1	4-wire RTD	Monitors electronics zone chiller
	Coolant Pressure	1	Pressure (voltage output)	
	Coolant Flow	1	Flow (voltage output)	
External to chiller in radiation shielded enclosure	Coolant Temperature	1	4-wire RTD	Monitors crystal array zone chiller
	Coolant Pressure	1	Pressure (voltage output)	
	Coolant Flow	1	Flow (voltage output)	

112 Total Type K thermocouples
36 Total RTD's
22 Total humidity sensors (voltage)
9 Total flow/pressure/other (voltage)

179 Total Keysight Channels

- Machined SAMTEC 3-connector test chassis panels and mounted connector PCB
 - ★ Prepared chassis to have internal wiring connections soldered
- Researching instrumentation and sensors for external chiller monitoring
 - ★ External to the chillers, sensors will measure the coolant temperature, flow, and pressure
 - ★ The crystal and electronics zone sensors will be measured individually on the coolant supply line to the detector
 - ★ The Keysight switch/measurement unit will be used to read the sensors
- Investigated communication protocols between the cRIO and the GPIB-to-RS232 converter interface to the Keysight switch/measurement unit
 - ★ Interface will require the development of drivers and communication subroutines for the NI GPIB-to-RS232 converter

EIC

Brian Eng

- Completed initial layout of barrel silicon regions R1, R2 (both with 15 mm wide modules), R3, R4, and R5 (using 30 mm wide modules)

DSG – Cleanroom EEL 124

Marc McMullen

- Coordinated the effort to reestablish protocols in the large cleanroom
 - ★ Air handler maintenance completed; 19 filters changed including nine HEPA filters
 - ★ Gowning area has disposable frocks
 - ★ New signage establishing additional protocols in place