GEM Gas Distribution Prototype Progress

Marc McMullen and the Detector Support Group

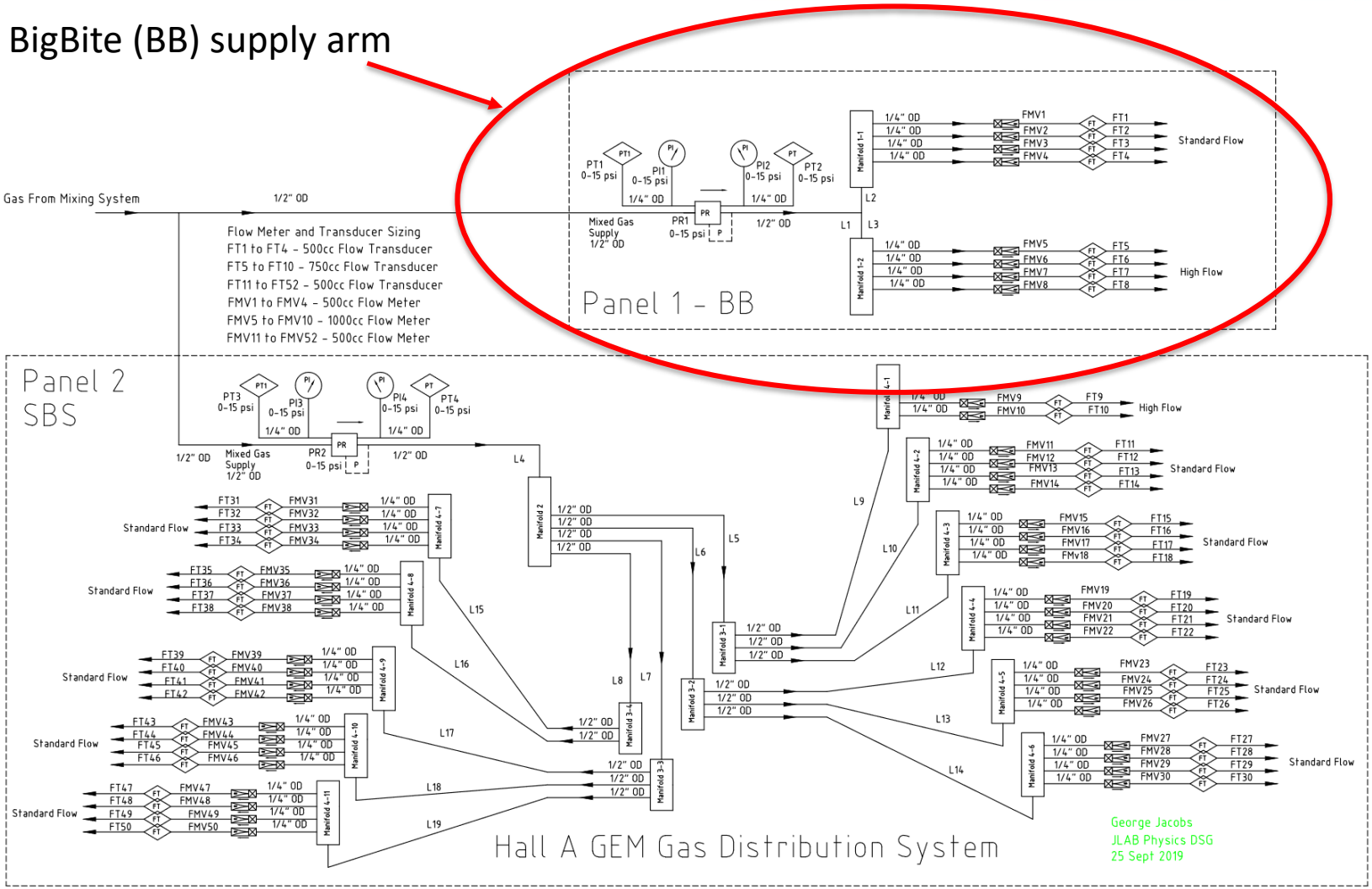
02/08/2021

Contents

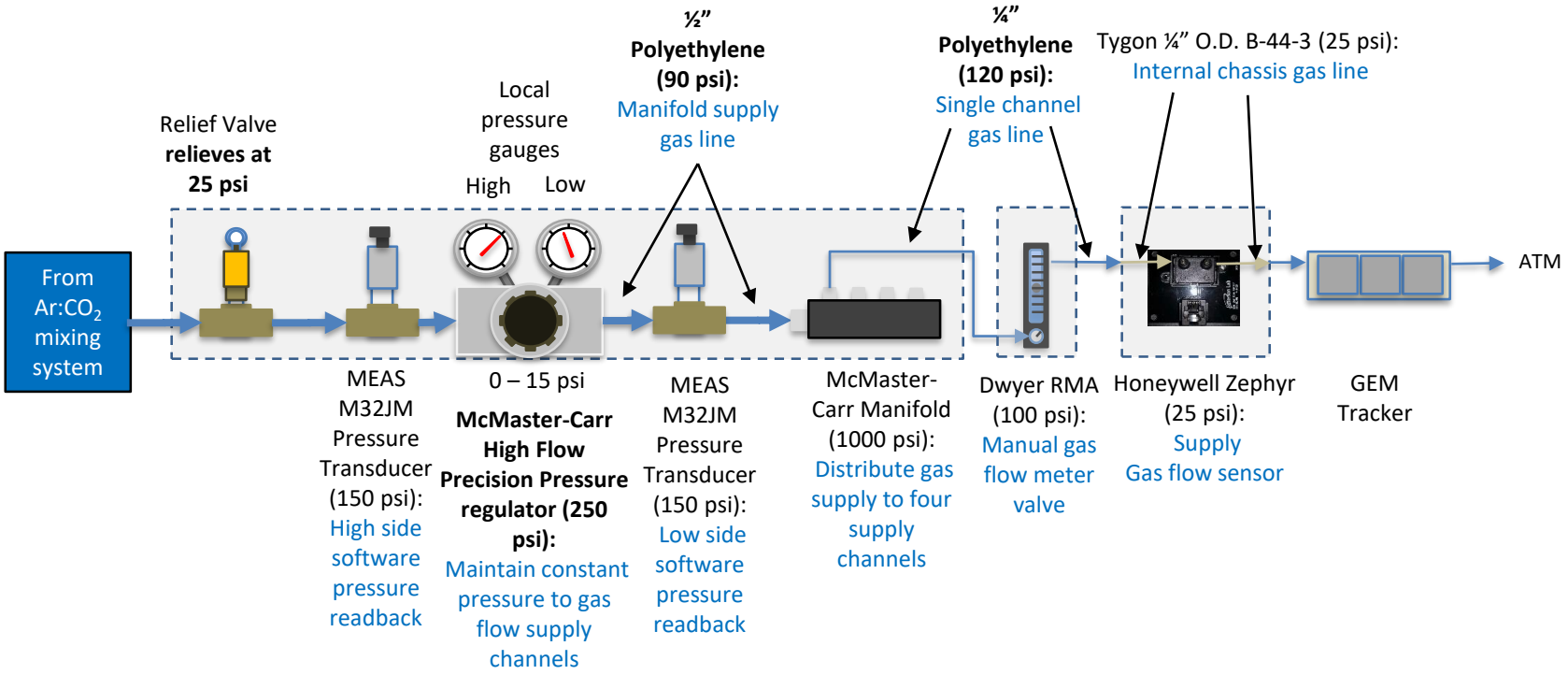
- P&I Diagram of GEM gas distribution
- Single channel flow diagram
- Prototype GEM gas distribution system installation
- Distribution panels and chassis
- Data flow diagram
- Flow data
- Software development
- Conclusion

HALL A GEM Gas Distribution P&I Diagram

BigBite (BB) supply arm

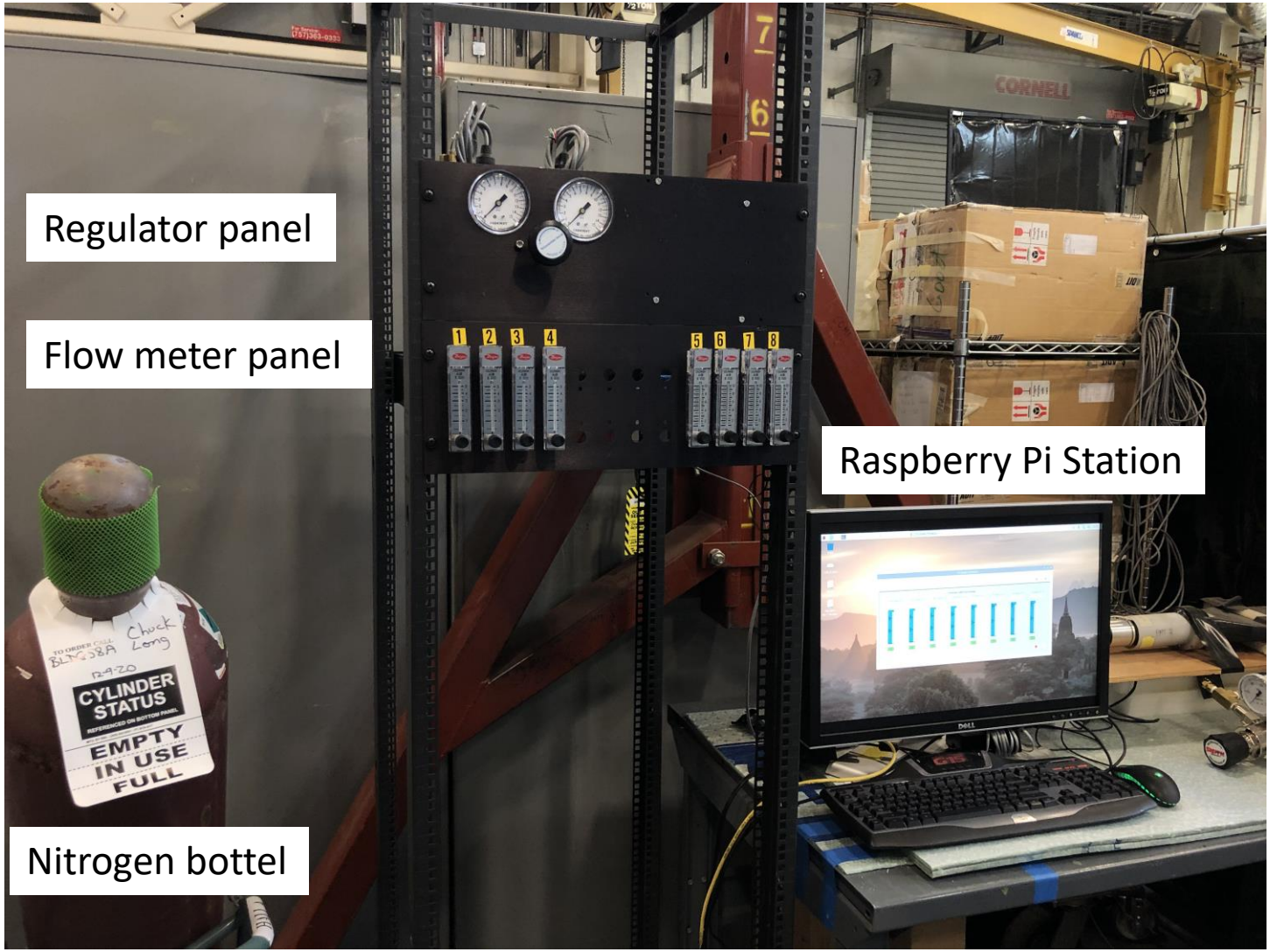


Single Channel Diagram

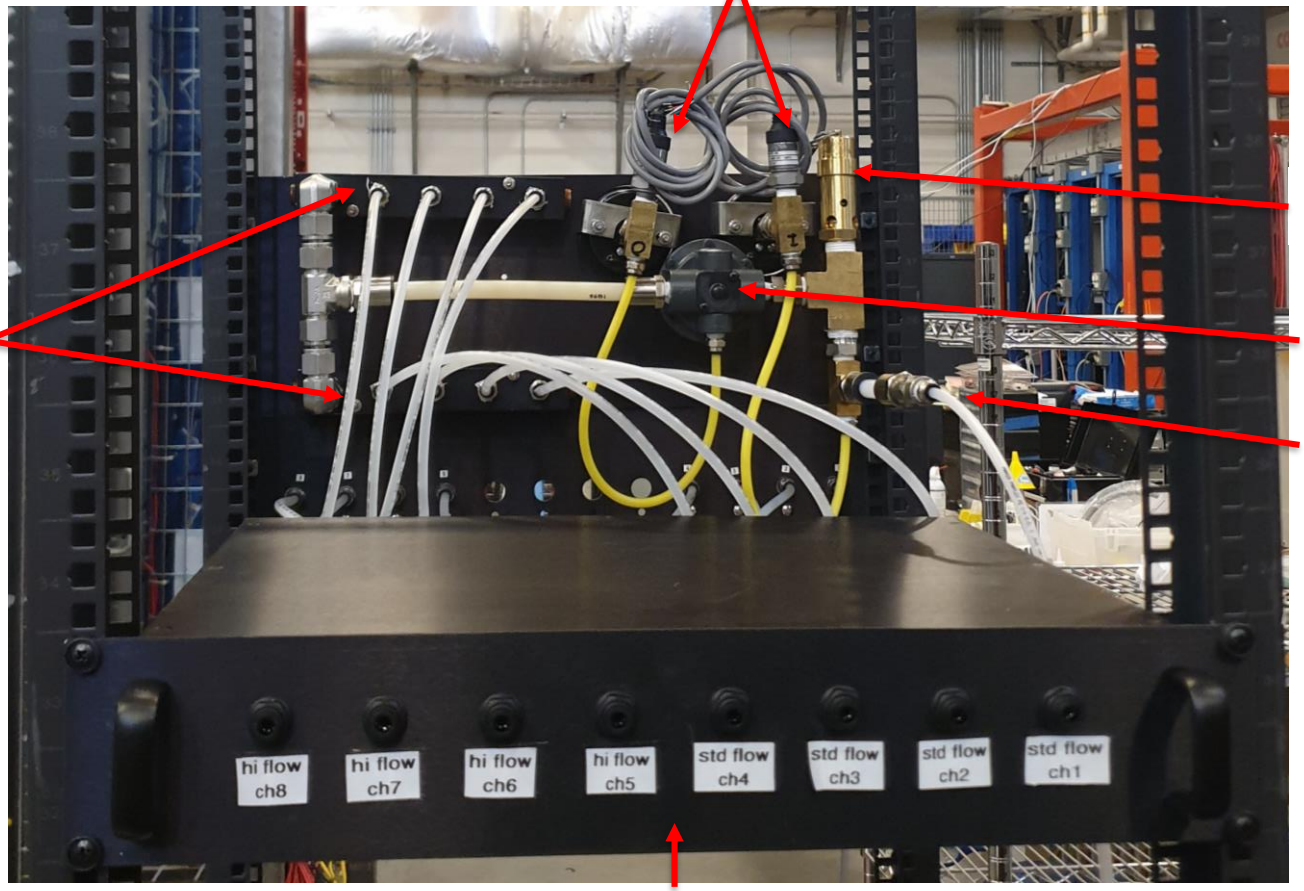


Schematic shows a single channel of gas supply/exhaust to a GEM detector

Prototype GEM gas distribution system



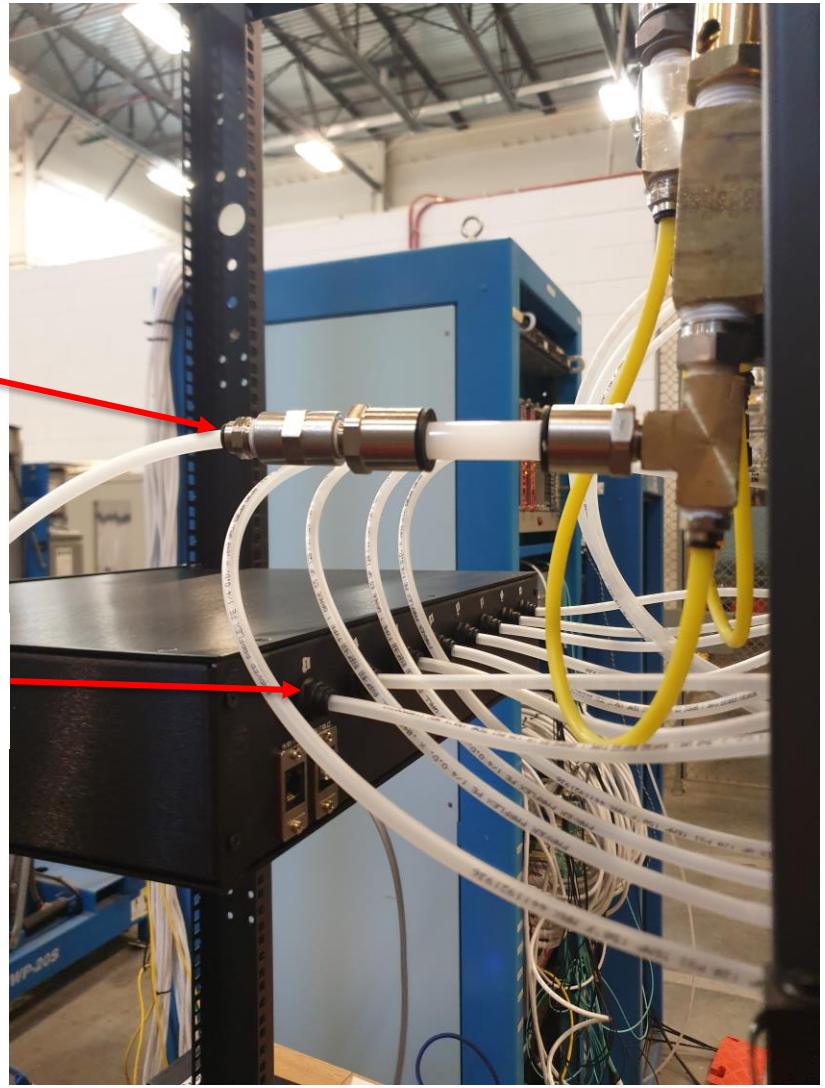
Rack back: Gas flow sensor chassis with panel parts



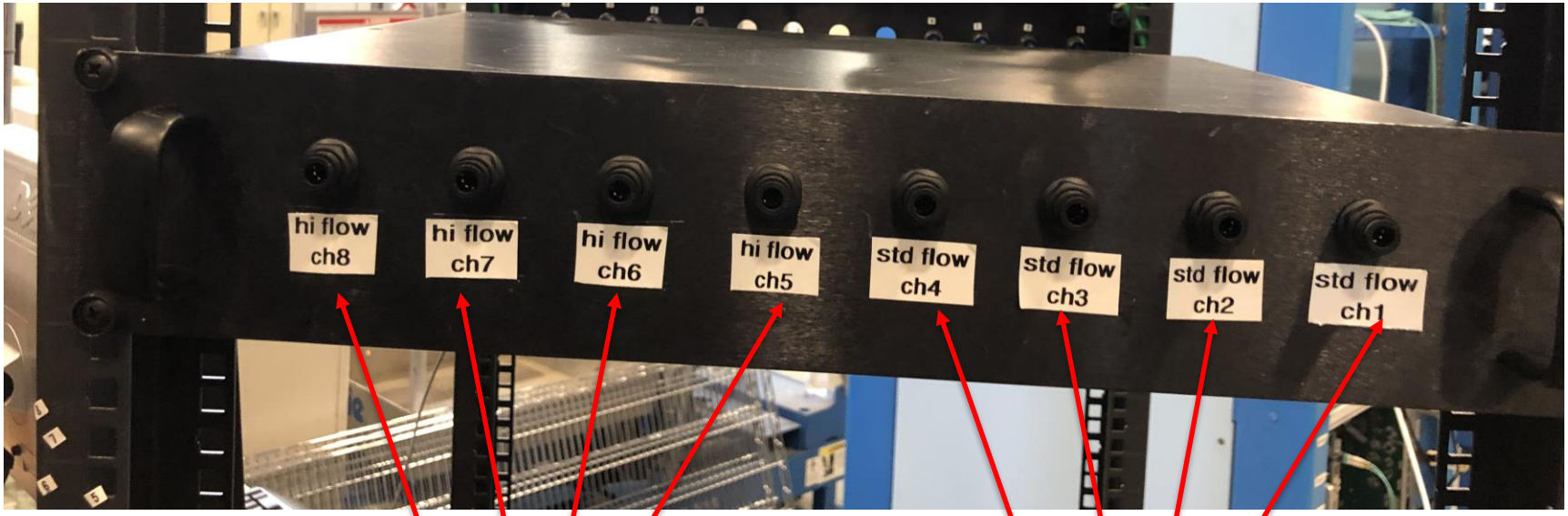
Rack gas line connection: GFS chassis input

Main input

Gas flow sensor chassis (input side)

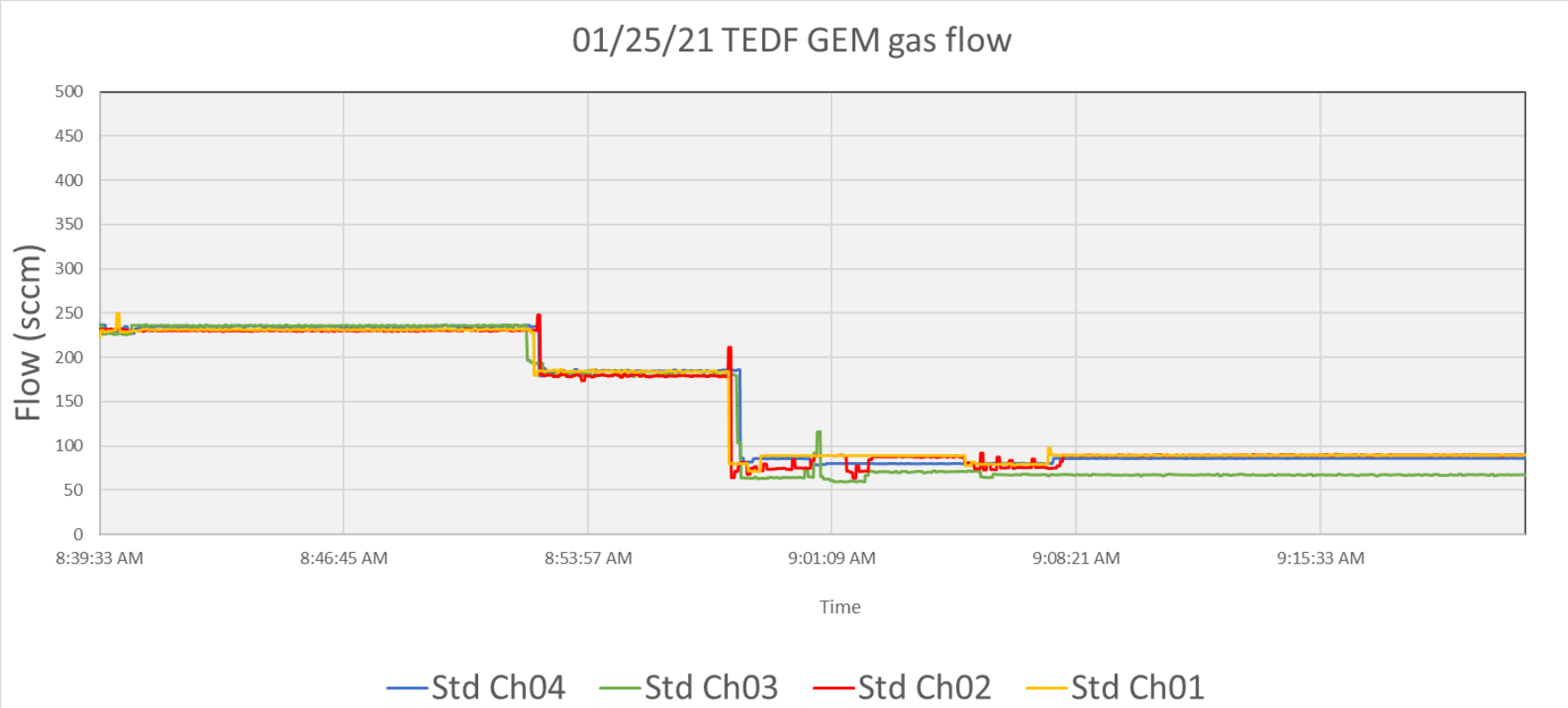


Rack Back: Gas Flow Sensor chassis



- Output to detector side shown
- Input side on rear panel

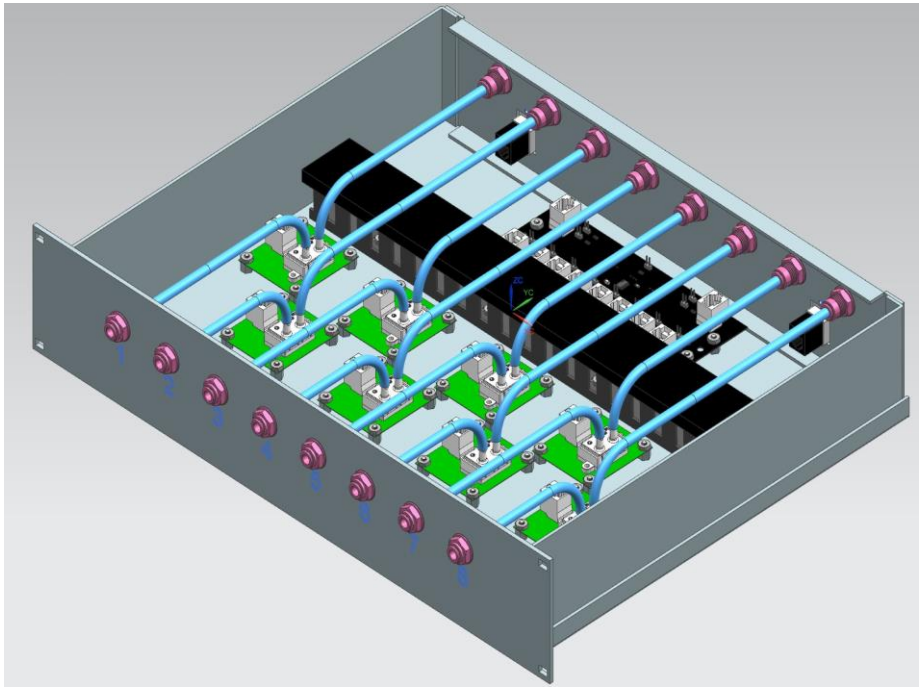
Remote flow monitoring

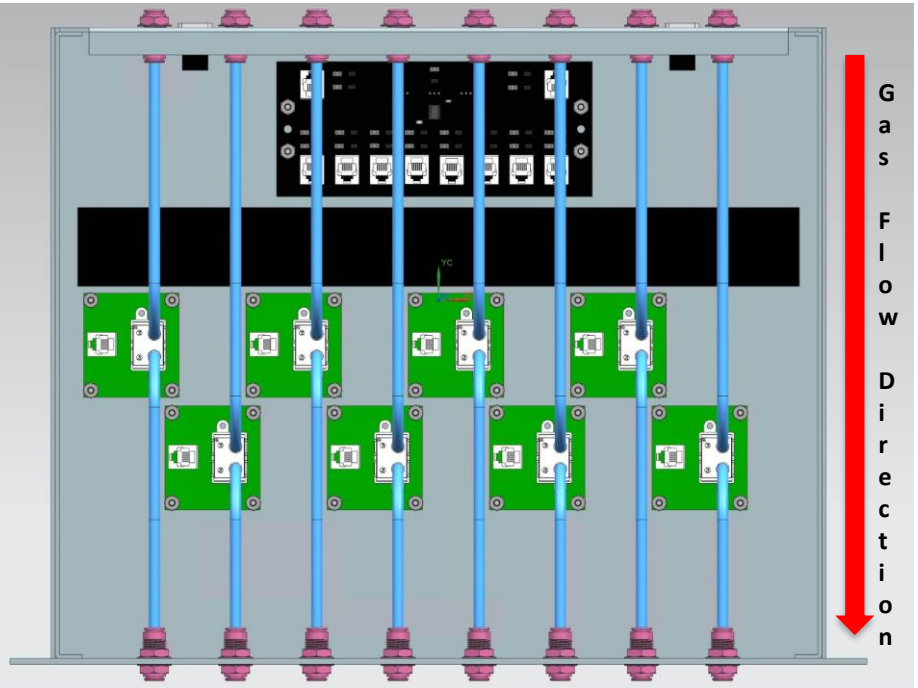


- DSG monitored flow transition from 235 sccm down to 80 sccm, channel 3 was set to 67 sccm

Gas flow sensor chassis layout

- Designed Gas Flow Sensor Chassis



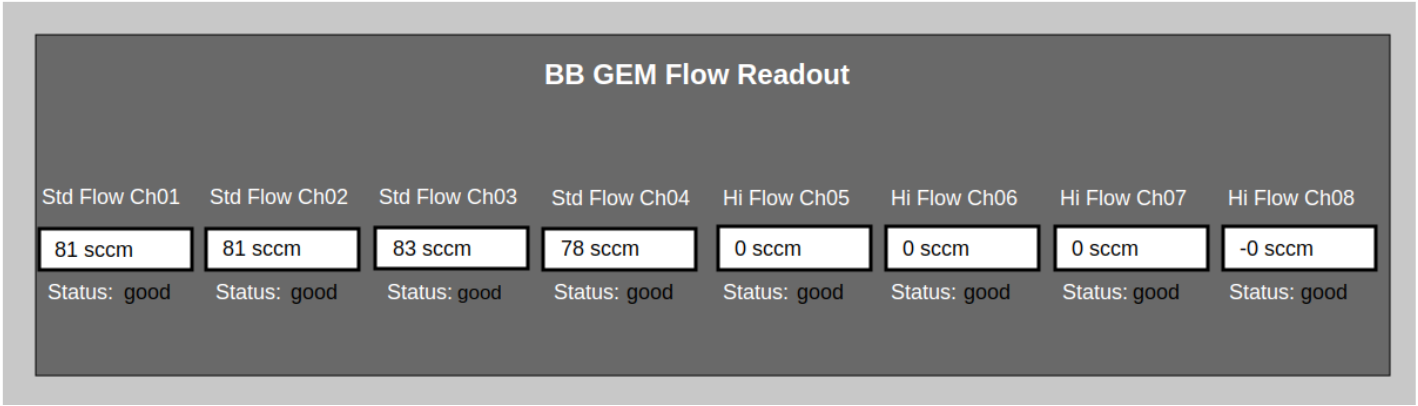


- Houses one Multiplexer board and eight Gas Flow Sensor boards
- Provides gas flow readout for eight channels of gas
- Chassis for full system: BigBite = 1 (8 channels) Super BigBite = 6 (42 channels)

Gas flow sensor chassis talk

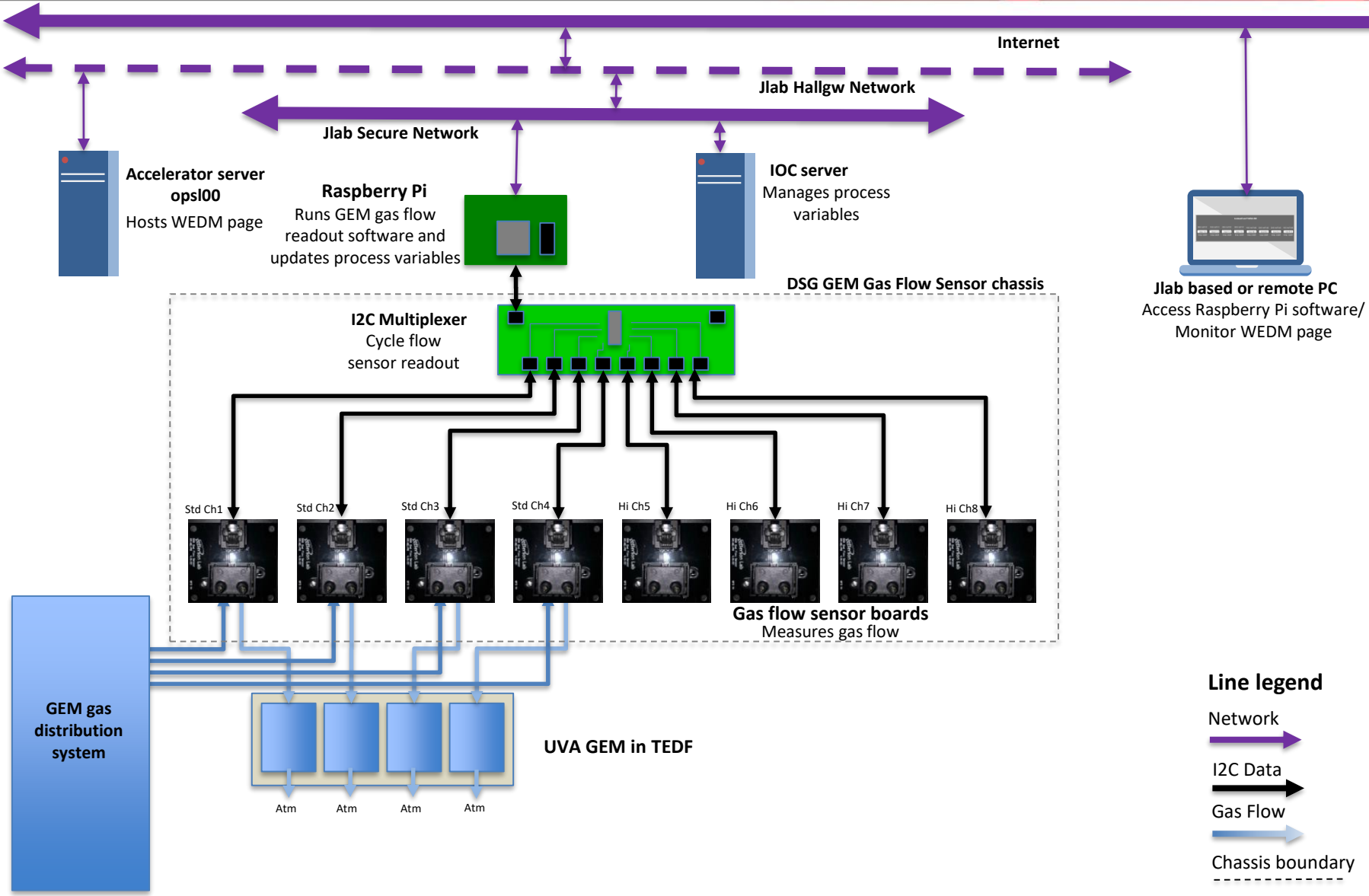
Software Development

- DSG has developed WEDM web-based monitoring



- DSG is developing regulator input and output pressure signals to the remote monitoring capabilities of the system
- DSG has developed prototypes for the exhaust flow system for the GEM detectors

Data flow diagram



Conclusion

- The DSG prototype system is installed and supplying gas to the GEM test setup in the TEDF highbay
- DSG continues to monitor and upgrade towards the commissioning of the full operational system

End

Thank You

Conclusion

- Both of the initial issues of the defective regulators and manufacturer misrepresented compatibility of gas line materials have been resolved by the DSG and the prototype distribution system is performing as expected
- Improvements in remote monitoring with a new WEDM webpage has been developed and is being used to monitor the system by multiple users
- Advancements in remote monitoring of the regulator pressures and development of the exhaust readout system is moving forward