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Hall B SVT Gas System Controls and Monitoring Software

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This note presents the controls and monitoring software and hardware developed for the Silicon Vertex Tracker (SVT) gas system.

The Hall B gas system comprises four custom designed chassis, which supply power to mass flow controllers (MFCs) and sensors, and interfaces signals between sensors and three National Instruments CompactRIOs (cRIO).

The cRIO located on Space Frame Level Three of Hall B monitors the SVT. The cRIO in the gas shed provides the system interface GUI for changing gas flow, Fig. 1.
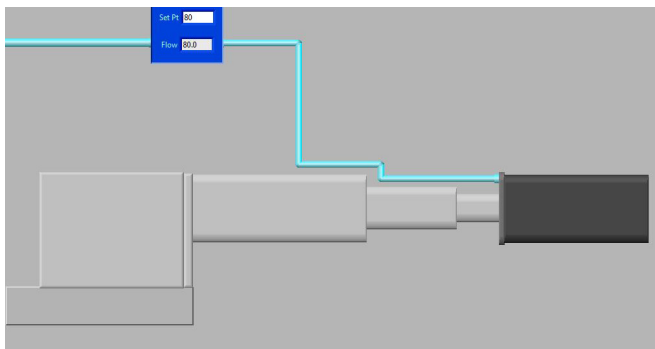

FIG. 1. LabVIEW GUI of SVT gas controls.

For the relative humidity to be less than 3% in the SVT, nitrogen is flowed through the detector using a GE50a MFC, Fig. 2. The flow setpoints range from 5 Lpm to 20 Lpm, depending on the humidity in Hall B.

Initially, GE250a MFCs were used to supply nitrogen to the level 1 disconnect area, the inner tube, and to the outside of the carbon fiber cover of the detector. These MFCs provided remote control of the gas flow to the specified areas during beam. Once optimal flow was determined, the additional MFCs were replaced by rotameters, because these are not affected by power or network outages.
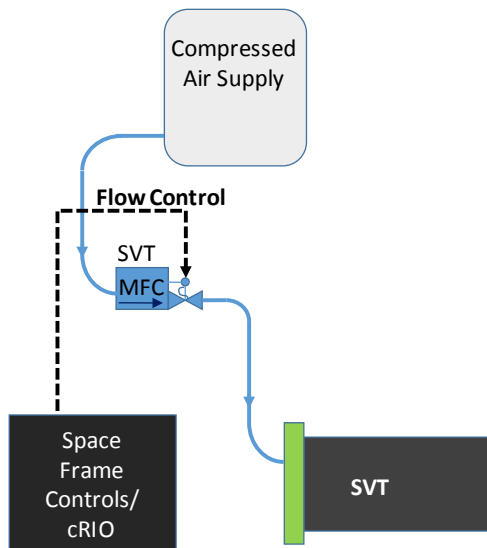

FIG. 2. SVT gas controls. The initital run used nitrogen, which has since been replaced with air.

The Hall B SVT Gas Controls system has been operational since late 2017 and has run without any major problems.