

GEM Gas Flow Sensor Chassis

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GEM Gas Distribution System

- BigBite Spectrometer
 - eight input, eight output channels
- Super BigBite Spectrometer
 - 42 input, 42 output channels
- Gas Distribution System similar

See M. McMullen talk on GEM gas distribution





Rack-mountable Flow Sensor Chassis



Chassis Design Features

- Chassis dimensions are 17.75" wide x 13" long x 3.5" tall
- Front panel is 19" wide x 3.5" tall with mounting holes for rack
- ~6" piping length for all ¼" OD Tygon tubing
- All gas lines have at least 1" bend radius
 - 1" bend radius is minimum recommended for ¼" OD Tygon tubing
- Multiplexer PCB mounted horizontally in chassis under gas lines
- Two RJ11 feedthroughs for controls cabling
 - One feedthrough is input to multiplexer
 - Other feedthrough is for controls signals





Isometric View



NOTE: Actual chassis will include service loops in controls cabling to allow easier removal of PCBs



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Front View



NOTE: Actual chassis will include service loops in controls cabling to allow easier removal of PCBs



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Back View



NOTE: Actual chassis will include service loops in controls cabling to allow easier removal of PCBs



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Left Side View



NOTE: Actual chassis will include service loops in controls cabling to allow easier removal of PCBs



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Right Side View



NOTE: Actual chassis will include service loops in controls cabling to allow easier removal of PCBs



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Bottom View



NOTE: Actual chassis will include service loops in controls cabling to allow easier removal of PCBs



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Top View



NOTE: Actual chassis will include service loops in controls cabling to allow easier removal of PCBs



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Rack-Mounted – Isometric View









Rack-Mounted – Left Side View







Rack-Mounted – Front View





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Rack-Mounted – Back View







BigBite Gas Panel – Isometric View



NOTE: Actual panel will include service loops in gas lines cabling to allow easier removal of chassis





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BigBite Gas Panel – Left View



NOTE: Actual panel will include service loops in gas lines cabling to allow easier removal of chassis



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BigBite Gas Panel – Top View



NOTE: Actual panel will include service loops in gas lines cabling to allow easier removal of chassis





Flow Sensor Tubing Support

- ¼-inch Tygon tubing chassis kinks easily
 - Kinks in gas line could cut off flow to detector
- Support structure designed in NX12 sits on top of flow sensor PCB and supports Tygon tubing
 - Support would hold piping immediately after 90-degree bend
- Support will be 3D-printed using DSG's Formlabs-2 printer



Flow sensor support structure (purple) on flow sensor PCB holding Tygon tubing so it cannot exceed a 1-inch bend radius (minimum for 1/4-inch outer diameter, 3/8inch inner diameter Tygon tubing)





Conclusion

 DSG has designed a rack-mountable chassis to house eight flow sensors and a multiplexer for the Hall A GEM Gas Distribution System





Thank You







