

UVa GEM MPD4-VME setup

Electronics :

APV:

long side : 60 cm , 12 APV cards

short side : 50 cm, 5 APV cards on each side

total : **22 APV cards** (2816 channels in total for each GEM module)

Back plane:

- All the APV cards are hosted on backplanes.
- provide LV, trigger, clock, I2C bus, analog signal.
- backplane connect to MPD via HDMI
- **12 slot x 1**
- **5 slot x 2**

12 slots backplane:

- 1 digital HDMI cable (clock, i2c, trigger, 1-wire bus(not used))
- 3 analog HDMI cables (**4 apv cards / HDMI**)

5 slots backplane:

- 1 digital HDMI cable (clock, i2c, trigger, 1-wire bus(not used))
- 1 analog HDMI cables (**5 apv cards / HDMI**)

50 cm

5 APV



5 APV

60cm 12 APV cards



UVa GEM

Patch Pannel(for the 5-slots backplane side):

Digital patch : splite one D-HDMI into two

Analog patch : convert the 5 channel HDMI into 4 sin

each port on MPD have only 4 channels

Low Voltage:

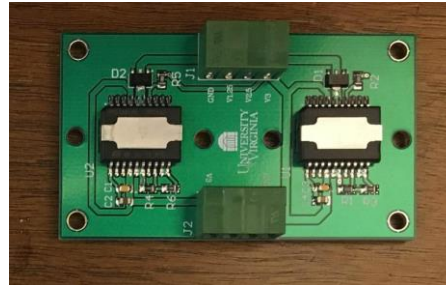
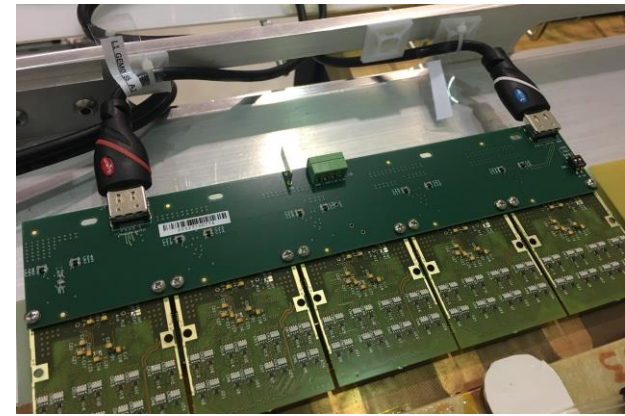
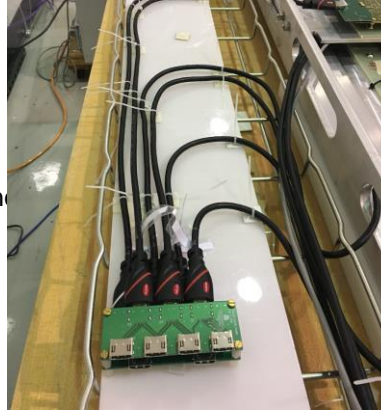
- input 3-14 v
- output : 1.25v and 2.5 v
- 3 A maximum current
- two LHC4913 chip (2.5/1.25 voltage)
- Radiation resistant
- two for each GEM module

High Voltage:

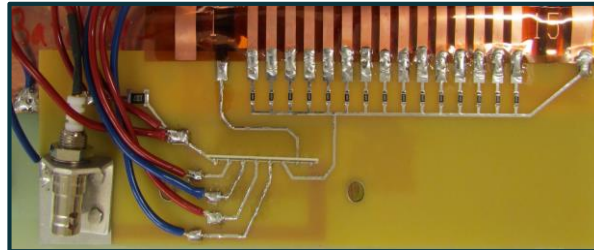
- One channel for each GEM module (CEAN N1470)
- 3700~4000 V
- > 800 uA

Gas :

- 70/30 or 75/25 Ar/CO₂
- One gas flowmeter for each GEM module
- 10 units(?)



5-slot backplane



Cable Layout(for group of 3):

5 slots back plane

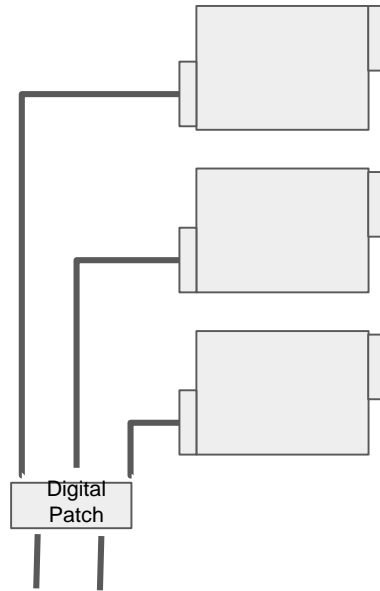
each side :

(from patch panel to backplane)

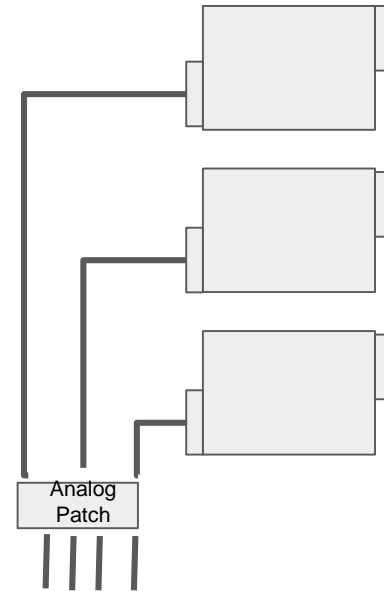
- 3 3-foot HDMI analog cables(short cable to solve issues)
- 3 3-foot HDMI digital cables

(from MPD to patch panel)

- 2 long HDMI cables(Digital)
- 4 long HDMI cables(Analog)



5 slot Digital



5 slot Analog

1 MPD

Cable Layout(for group of 3):

12 slots back plane(Need ONE MPD)

for one back plane (can go directly to MPD):

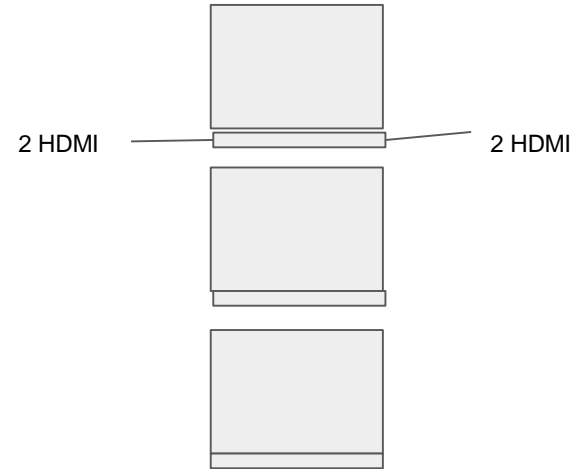
- 3 HDMI (analog)
- 1 HDMI (digital)

Summery for the Cables(for 6 GEMs): (basic need)

- 3-foot cables : 24
- long cables : 36

Whether we need a connector panel ?

Connect all the cables from the detector to the connect panel, and then connect to the MPD



Summery:

- APV: $22 \times 6 = 132$ cards
- MPD: 10 MPD minimum
- Patch Panel : 4 digital , 4 analog
- backplane : 6 12-slots backplane, 12 5-slots backplane
- Voltage Regulator: 12
- HDMI :3-foot cables : 24, long cables : 36
- Gas Flowmeter: 6
- High Voltage : 6
- 1 TI
- 1 CPU