Subject: Re: Sept 4 2019 ArgonCube2x2 Electronics and Readout Integration Meeting
From: "Wret, Carl" <c.wret@rochester.edu>
Date: 9/9/19, 12:48 PM
To: Ting Miao <tmiao@fnal.gov>, Linda F Bagby <bagby@fnal.gov>, "Cindy D. Joe" <cindyjoe@fnal.gov>, Stephen R Hahn <hahn@fnal.gov>, Howard Budd <hbudd@fnal.gov>

Hi everyone,

I had a chat to Howard this morning about these points, I'll post them below. I've also included Howard into the chain.

Cheers,
Clarence

On 9/4/19 3:43 PM, Ting Miao wrote:

> Here is the action task list from this afternoon's meeting:
>
> - Need to find out where to get beam clock signal for Minerva readout.
>   - Currently Minerva takes beam signal from MINOS timing module
>   - Options discussed include using signal from NOvA TDU or directly from ACNET

Howard says MINERvA initially got the signal from MINOS but since a few years back gets it directly from ACNET. They've run MINERvA without MINOS with beam triggers without problems. Howard doesn't know if the MINERvA DAQ uses anything from MINOS any more. We should check in with Gabe Perdue on this to see if he knows anything more.

> - Steve or Clarence to talk to Geoff Savage about warranty time for Minerva DAQ servers

Howard reckons they will also similarly fall out of warranty soon. MINERvA has had problems operating the DAQ under newer Linux kernels, which was debugged to the driver of the RS-232 port if I remember correctly. The SLAM group, Carrie McGivern and Gabe know more about exactly when the DAQ machines will run out of warranty.

> - We decided to keep 100% spare PMTs (1:1 spare to what we need for 36 Minerva modules to be re-used for argonCube2x2 run).
>   - we have plenty spares for electronics modules including custom made VME controller
> - Clarence to look whether Minerva DAQ can handle higher event rate.

> Steve have questions of how robust the system is wrt higher rate
> - This is important. One of the test for argonCube is for its ability of handling higher rate

This is not a problem. The issue with MINERvA is not the readout rate, it's how long it takes to move data at the end of the spill to the DAQ before re-arming it for the next spill. The upgrades made for the medium energy should suffice here. The issue may be buffer overflow on the FPGAs, but Howard's experience is that this very rarely happens, even in ME era.

> - We are thinking of keeping all three Minerva racks for argonCube2x2 run. Need to look options of adding more sensors (temperatures, fan monitoring etc.)
> - Currently only smoke sensor is implemented into BiRA 8884
> - But we should looking options to spread the Minerva readout modules more for argonCube run. Steve mentioned that racks are packed in the current configuration
> - We will able to do this with smaller number of readout channels with 36 modules in the 2x2 configuration

Running with 1 VME crate may be possible: Howard confirms 7 CROC-Es are needed, and we'd need 2 CRIMs (1 per 4 CROC-E) and one MTM module. The MTM module is double size, but could probably fit since one of the VMEs currently is running 2 CRIMs with 7 CROC-Es and one MTM. That frees up some space in the rack.

> - Everyone should read the rack building questionnaire and make comments/corrections/additions. We want to send this out to the subsystem before Sept 23 DUNE collaboration meeting
> - we could arrange face-to-face conversation with subsystem leaders to discuss rack building issues.
> - We agreed to keep the bi-weekly Wednesday meeting. But we want to delay to start to 2:30pm
> - Next meeting is Sept 18. Topic to include clean power, grounding and rack-building tool.
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> Ting Miao - 630 840 8415
> Fermilab - Senior Scientist
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> On 8/30/19 9:27 AM, Ting Miao wrote:

Dear All,

We will have a meeting to discuss issue with ArfonCuve2x2 electronics and readout integration next Wednesday Sept 4 at 2pm using WH13SE-Gold Mine conference room. Tentative agenda is available from indico page:https://indico.fnal.gov/event/21710/.

We will first try to finalize the questionnaires to subsystems for rack building, then Linda will describe the ICEBERG clean power and grounding design which we will mimic for 2x2 in MINOS, If we have time left, I hope Clarence will give us a description of the existing Minerva DAQ.

I like to send out the questionnaires in a few weeks so we will have some idea what we need before Minerva decommissioning starts in October. Please read the draft list (appended below) ahead of time so we can finalize ir next week.

Thanks and have a great labor day holiday.

Ting

List of questions for subsystems for rack building:

- Access (links) to documentations describing your subsystem
- Number of readout/control electronics modules for your subsystem
- Size of chassis of electronics for your subsystem (NIM,VME, custom box etc)
- DC power supplies and distribution modules for your subsystem and control protocol
- AC power requirement including power estimate, ripple noise, required PDU outlets (# of 110V/220V etc.), remote control and backup (UPS) needs
- Cooling/heat requirement (water cooled, forced air cooled, heat-tape etc.)
- Cabling and grounding: input/output to/from TPC modules, cryostat flange, frontend crates and DAQ services
- Network requirement: switches, ethernet port etc
- Monitoring and control scheme/method (analog interface? Digital interface? Work with EPICS?)
- Proximity requirement: in the rack placed on the MINOS west catwalk, or on 2x2 vessel top flange? (see attached detector layout in MINOS)

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