Contribution ID: **13** Type: **Talk**

Upgrades to the Spallation Neutron Source Timing System Utilizing MicroTCA

Wednesday 8 December 2021 17:45 (15 minutes)

The Spallation Neutron Source (SNS) employs a custom Timing System for synchronization of the accelerator and target systems. The variable frequency design of the SNS Accelerator requires the custom system and presents several unique design challenges. The core component of the SNS Timing System are the two sets of data links that are provided to end user systems, the Event Link(EL) and Real Time Data Link(RTDL). Any timing receiver used at SNS must support receiving and decoding these bi-phase mark encoded links. The original end user timing receivers were VME or PC based but modernization efforts at SNS are being completed using MicroTCA systems. As migration to MicroTCA for various systems and future upgrades timing was an integral requirement for these systems. To minimize custom designs and development time the choice was made to use a MicroTCA FMC carrier card from a commercial vendor with a custom design on an FMC form factor for the timing receiver. The carrier card handles the programmable logic which simplifies the FMC. This facilitated quick design and deployment for multiple systems. Three Timing Receiver FMCs have been developed to support different applications at SNS. Currently these are used in production for Ring LLRF, Machine Protection, and Injection Kicker Power Supplies. Future plans include support for the SNS Proton Power Upgrade Project(PPU) for the LINAC LLRF, Beam Power Limiting System(BPLS), and HPRF as well as further modernization efforts throughout the facility in the next 10 years.

Summary

Primary author: JUSTICE, Thomas

Presenter: JUSTICE, Thomas

Session Classification: Session 6