

CERN BoosterTms System

Work for BoosterTms System

Project	CernTms
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Reference	cern/BoosterTmsWork.1
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References

- The CERN TMS system. Support website at: <https://portal.beam.ltd.uk/support/cern>.

Introduction

This is a description for the software and FPGA firmware design/development work to be done for the new Booster TMS system..

Design and Development Work

The development and support work includes the following:

1. Update the TMS system controller OS software to use Centos 6.3 to support the new system controller system. Choose the packages and create a installation DVD with appropriate configuration scripts for bare metal install. Make sure this will install/run on the older TMS system as well.
2. Update the TMS module controller OS software to latest Linux versions to support the newer module controller boards. Make sure this will install/run on the older TMS system controllers as well.
3. Update TMS software in source code control system with CERN's modifications.
4. Modify TMS software to support 4 separate TmsServer processes, one for each of the Boosters rings. Other changes needed for Boost operation.
5. Change the way the TMS period/event system works to make the distinction between the period and the state of the FSM in the FPGA disappear.
6. FPGA firmware updates to support the measurement changes including CERN's additions. This includes a state condition for the diagnostic trigger.
7. FPGA firmware updates to support the measurement changes.
8. Add support for diagnostic triggering on the state. FPGA firmware and software changes.
9. Fix the issue that concerns the workings of 'periods' as compared to 'states' of the external event state machine. It appears that sequences that skip a period confuse the software. The problem became visible when a cycle that normally has two injection events, followed by some harmonic changes, was played with only one injection event. Apparently, skipping states or periods. An

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investigation at the FPGA and Software levels needs to be performed.

10. Look at adding a BPM bit mask to the data gathering API. This may not be required.
11. System design, building and testing. This will involve building up the hardware racks and testing them with the system controller. The TMS test signal generator will be used for development and overall system tests.

The resulting system software/firmware would be compatible with the existing TMS system as well as the new Booster TMS.

Support Work

1. System installation and general support. Includes 1 day at CERN.

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