

The Octant Module of the ATLAS Level-1 Muon to Central Trigger Processor Interface

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The Muon to Central Trigger Processor Interface (MUCTPI) of the ATLAS Level-1 trigger receives data from the sector logic modules of the muon trigger at every bunch crossing and calculates the total multiplicity of muon candidates, which is then sent to the Central Trigger Processor (CTP) where the final Level-1 decision is taken. The MUCTPI system consists of a 9U VME crate with a special backplane and 18 custom designed modules. We focus on the design and implementation of the octant module (MIOCT). Each of the 16 MIOCT modules processes the muon candidates from 13 sectors of the muon trigger and forms the local muon candidate multiplicities for the trigger decision. It also resolves the overlaps between chambers in order to avoid double-counting of muon candidates that are detected in more than one sector. The handling of overlapping sectors is based on Look-Up-Tables (LUT) for maximum flexibility. The MIOCT also sends the information on the muon candidates over the custom backplane via the Readout Driver module to the Level-2 trigger and the DAQ systems when a level 1 accept is received. The design is based on state-of-the-art FPGA devices and special attention was paid to low-latency in the data transmission and processing.

Summary

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