

Commissioning of the SDD data concentrator card CARLOSrx

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The data concentrator card CARLOSrx is a readout board developed for the ALICE ITS Silicon Drift Detector (SDD) experiment held at CERN.

CARLOSrx is a 9Ux400 mm VME board, containing 4 FPGAs with the purpose of processing data coming from 12 SDD detectors and sending them to a computer running the DATE software.

We have 24 CARLOSrx installed at CERN, each CARLOSrx is able to receive data from 12 SDD detectors, so we are able to read the data produced by all the SDD detectors.

This paper presents the results obtained during the runs performed at CERN.

Summary

CARLOSrx is a 9U x 400 mm VME board used in the ALICE experiment to read data produced by SDD detectors.

24 CARLOSrx boards have been installed in 3 VME crates located in the counting room at CERN for ALICE experiment.

The most important tasks of CARLOSrx are to receive data from detectors and send them to a computer for future analysis, send clock and program all the front end electronics.

Each board receives data from 12 SDD modules through 12 optical fibers; the board also directly interfaces with the trigger system and the DAQ chain.

CARLOSrx is composed principally of 4 FPGAs (three of them process the data coming from detectors and one manages the VME bus interface) and 4 FIFOs (256 Kword x 32 bits) that buffer the information during the data taking.

We have installed all 24 CARLOSrx at CERN, ready to receive data from 260 SDD detectors, the complete barrel for the experiment ALICE ITS SDD.

The firmware loaded on CARLOSrx can be reprogrammed via VME using a commercial CPU VME.

We have also developed a software to generate different files for the JTAG configuration of the front end electronics. With this software tool we can easily produce different configuration files for each chip presents in the chain.

We had two Cosmic runs during December 2007 and February 2008 and during this period the boards were tested in different condition of work: constant, random and physics triggers.

For the first time we were able to test the functionality of the entire DAQ chain for SDD detectors inserted in the real setup of the ALICE experiment, with all the other detectors powered on and the system controlled by the ECS (Experiment Control System).

This paper present the latest development of the board and the results obtained during the cosmic runs.

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