PCI Based Read-out Receiver Card in the ALICE DAQ System

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Abstract

The Detector Data Link (DDL) is the high speed optical link for the ALICE experiment. This link shall transfer the data coming from the detectors at 100 MB/s rate. The main components of the link have been developed: the Destination Interface Unit (DIU), the Source Interface Unit (SIU) and the Read-out Receiver Card (RORC).

The first RORC version is based on the VME bus. The performance tests show that the bandwidth on the VME is insufficient to reach the required transfer speed. Meanwhile the PCI bus became very popular and is used in many platforms. The development of a PCI-based version has been started.

The document describes the prototype version in three sections.

1. An overview explains the main purpose of the card: to provide an interface between the DDL and the PCI bus. Acting as a 32bit/33MHz PCI master the card is able to write or read directly to or from the system memory from or to the DDL, respectively. Beside these functions the card can also be used as an autonomous data generator. The card has been designed to be well adapted to applications which require small software overhead such the high speed data acquisition systems.

2. The implementation of the firmware and software will be presented. For the logic design we are using various design entry methods, such as VHDL, AHDL and schematic draw. Software library routines were written in C and are available on Linux OS.

3. The results of performance measurements will be available to allow the comparison between the VME-RORC and PCI-RORC. In the conclusion the future plans and the idea of the improved (64bit/66MHz) PCI-RORC will be shown.