

Overview

version 4.0

The readout hardware is based on the ALICE TPC readout system, which consists of Front End Cards (FEC) with 8 16 channel ALTRO chips on each FEC. The FECs are placed on a bus, which is controlled by a Readout Control Unit (RCU). The RCU can control up to 32 FECs. The data is transmitted through an optical link, Detector Data Link (DDL) to a Data ReadOut Receiver Card (DRORC) placed in a PC. In the system described here are the ALICE drivers and libraries used for the data acquisition. On top of this a small readout system built. It consists if the readout task (written in C), which performs the setup, readout and data storage in a file. Text files are used for the configuration of the system. A monitor server provides a sample of events for monitoring. Events to be monitored are sent through TCP/IP to a simple local monitor task (written in C++ and ROOT), and a histogram presenter (written in ROOT). Playback of data files is also possible. Some run and debug information is logged in text files. A rudimentary local run control is implemented in Java. The communication between the readout and the local run control is done using ascii string commands through TCP/IP. The system is eventually to be connected to a common test beam readout system. The trigger interface is done with a Distributor BOX (DBOX) which generates the triggers and clocks to the RCU, and the trigger information which will be read by the readout task through TCP/IP. This is not yet implemented. The system is shown in figure OVW-1. The final system will consist of 2 DRORC, 4 RCUs, and 10000 channels (roughly 80 FEC).

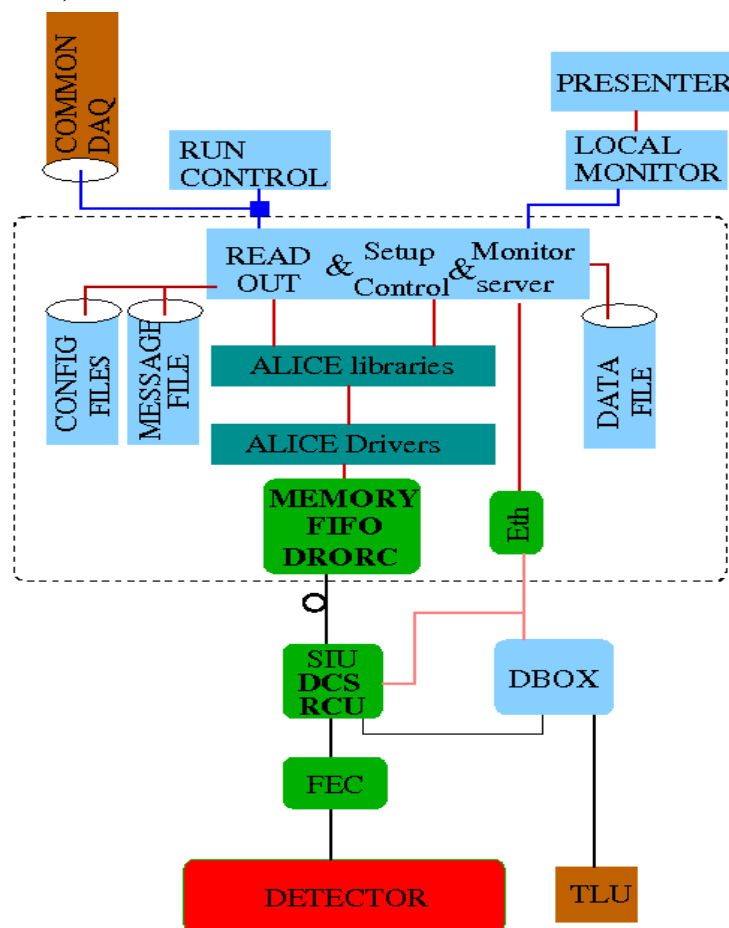


Figure OVW-1: Overview of the readout system

Test DAQ setup

The system used to develop and test the system is shown figure OVW-2. The readout hardware consists of one FEC (128 channels), 1 RCU, and 1 DRORC. The code is written to handle up to four RCUs (128 FEC), but has not been tested with anything but one FEC. The signals readout by the same system is either pulses to the FEC inputs, or from the Lund Small TPC equipped with GEMs. The trigger to readout the TPC is provided by scintillators, either from cosmic muons or a radioactive source.

The DAQ is split on two computers, one is dedicated to the readout, the second one is a workstation running the local run control, local monitoring, and the histogram presenter. The two computers are connected with a network. On the DAQ computer are also standalone testprograms for testing the digital parts of the FEC, i.e. registers. The control computer has a local network to which the RCUs are connected (through the DCS module on the RCU). This is used to login on the DCS, with the possibility to replace the RCU firmware. The control computer has a DHCP server to give the IP-numbers to the DCS, and a NFS server for mounting a remote disk on the DCS. The remote disk contains a file with the RCU firmware to download.

An emulator of the DBOX is partly working, it needs to be updated with the most recent implementation.

The details of the different parts are described in the documents:

overview-<version>	this document
install-<version>	the Lund installation
gui-<version>	the local run control graphical user interface
ilcserver-<version>	the interface between the readout program and run control
readout-<version>	the readout program
monitor-<version>	the monitoring system
presenter-<version>	the histogram presenter
testprogram-<version>	the standalone test programs – to be written (code in directory fectest)
dataformat-<version>	the data format

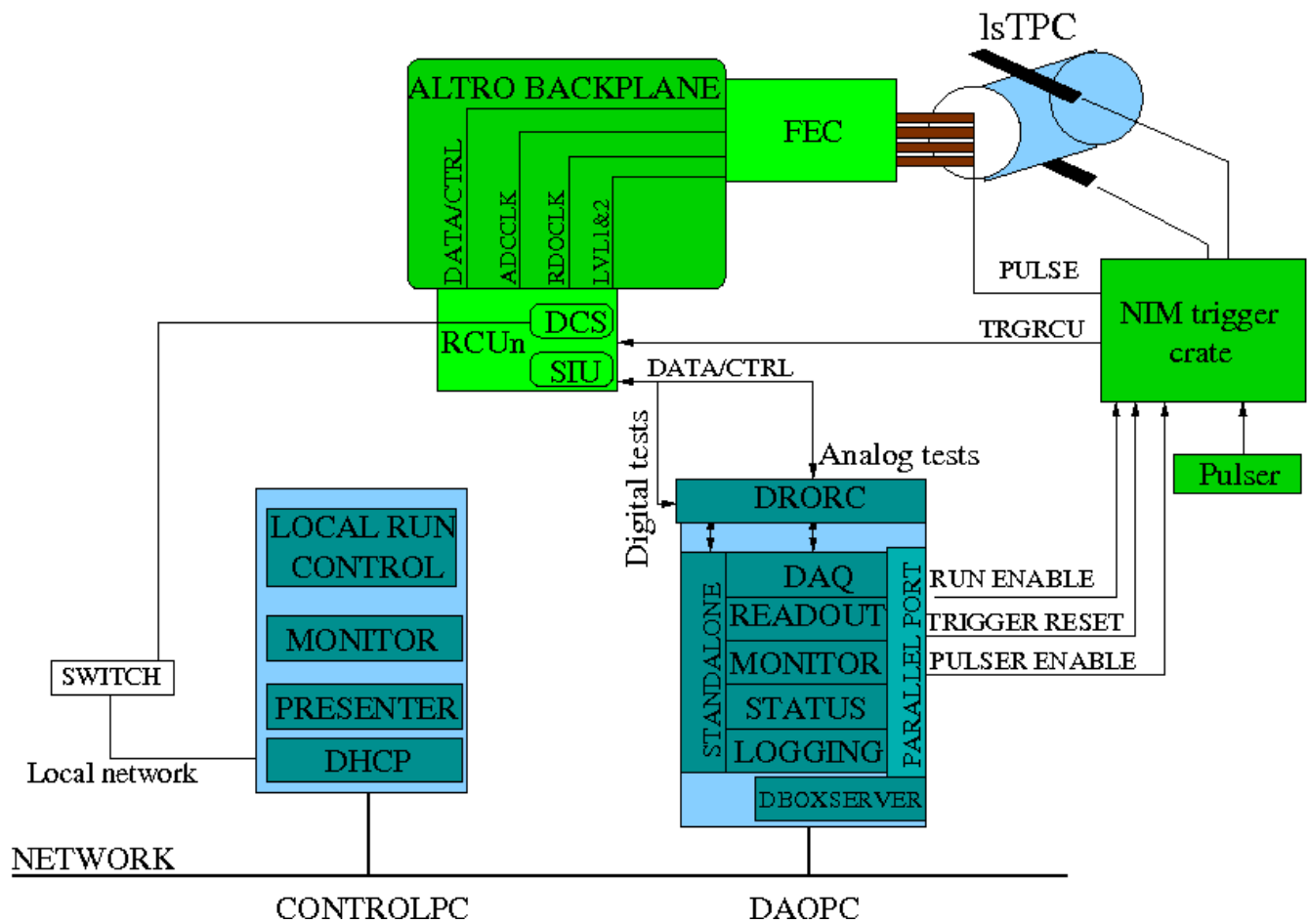


Figure OVW-2: Test setup of the DAQ with the ALTRO based readout.

Documentation:

<http://www.hep.lu.se/eudet/>

and select Documentation.