HELEN report

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1 Overview

The main goal during my trainning program at CERN in Geneva was to acquire knownledge of VME in CMS.

2 Detailed report

My training program at CERN started on April 15th. During the first week, I just made my registration at CERN, the security course and all the formalities.

In the second week, I met my advisor, Dr. Jordan Nash, and we talked about the project and what was my perspective with the electronics group at CERN. So, he talked about my experience with electronics and about the VME modules used in CMS, the VME controller V2718 and the PCI card A2818. And he introduced me to Dr. Patrick Petit and Dr. Magnus Hansen.

The first step for the project was determine the length of the optical fibres which connect the PCs and the detector VME crates at CESSY. So, I started to work with Dr. Patrick to order the fibres. It was necessary to request access permission to zone LHCI-12 from EDH. After that, I was able to start measure the length of the fibres at CESSY/POINT 5 (CMS installation).

The result of this part can be found in the CMS cabling Database [1].

The next step was to improve a checking program to test the connection between PCs and VME crates so, I worked together Dr. Christoph Schwick to learn about the HAL[2] (Hardware Access Library).

Then, to test some fibres (fifty meters each) using the program I measured the blocks transfer performace of the VME bridge in the laboratory located in 40-3B-02. There we have optical VME bridge from CAEN (V2718) and a RAMix139 VME memory (32Mb). The PC was a PIII 800 MHz, PC running Linux with a 2.4.x kernel. Data blocks have been transferred for different sizes

[1] https://oraweb.cern.ch/pls/cmsintegration/integration.Get_Type_Library?ID=DA.VME.CAEN

[2] see http://cmsdoc.cern.ch/~cschwick/software/documentation/HAL/

from the host via the VME Bridge to the memory module and vice versa. The data has been generated with a random generator. The size of the data blocks has been varied from 256 bytes to 32Mb. Altogether 12 blocksizes where chosen. The data read back was always verified against the data previously written. No data error has been observed.

For VME access from a Linux PC is needed a BusAdapters for the hardware interfaces. So, for the CAEN VME bridges (USB and optical PCI brisge) there was a linux driver available from CAEN[3]. But to improve the file distribution of those drivers in all PCs at CESSY, it was necessary to modify those drivers. So, Dr. Eric Cano ask me to make a RPM driver and implement the way of the installation. Those drivers can be founded in the CVS of the CMS.

The HELEN program made possible meet other physicists and future colegues in the CMS colaboration. And I participated of the diffractive physics meeting to CMS.

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[3]http://www.caen.it/