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Name of the exercise

Data readout from a PCI module

Responsible for the exercise

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Description of the exercise

In this exercise students will develop low-level software in C++ reading out data from a high-speed data link module via the PCI bus. The PCI module will be a Generic - III (G-III) module with an SLINK-64 receiver board being able to receive data over an SLINK-64 at up to 400 MB/s. The PCI module will be installed in a PC with a 64-bit / 66 MHz PCI bus.

Students will develop software to read data from the receiver module and to decode the received events. The different fields in the header, trailer and payload should be displayed in a human-readable format. The CRC of the data records should be checked. The software will access the PCI readout module using the Hardware Access Library (HAL).

Data will be injected into the SLINK-64 by a mobile e-FED, an USB device controlled by a LabView application which can run either on the same PC or on a different PC.

What will the students learn

- reading from / writing to a PCI module, timing of the read / write accesses
- handling of digital data in a C++ program e.g. extracting bit-fields from data words
- data formats: headers, trailers, CRC check sums
- Optionally if time permits to prepare the exercise: read-out by DMA (Direct Memory Access)

Duration

2 hours.

List of material (per station)

- 1 PC running Linux (can be provided by CMD)
- 1 G-III card (can be provided by CMD)
- 1 SLINK receiver card (can be provided by CMD)
- 1 SLINK cable (can be provided by CMD)
- 1 mobile e-FED + USB cable (can be provided by CMD)

Relevant information

Add URLs to:

- Related lectures (typically the exercises will take place after the related lectures)

The manuals of the devices (modules, scopes, etc) and S/W packages used in the exercise

- G-III and FEDKit documentation
- SLINK-64 specification
- HAL - The Hardware Access Library

In addition you have to provide:

- An installation guide. This document is for the supervisor of the exercise. It has to describe in detail how the material has to be set up before the exercise can start (Cabling, S/W installation, etc.)
- An instruction sheet. This document is for the students and tells them whay they have to do

Solution

You have to provide a possible solution for the exercise witch the studens can consult after the exercise or if they get stuck. The solution should not be in this TWiki (we don't want the students to see it)

-- HannesSakulin - 2009-09-30

This topic: Sandbox > DaqSchoolExercise6
Topic revision: r3 - 2009-09-30 - HannesSakulin