Jadepix DAQ User Guide-V0.1

Liejian Chen

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| Version | Data | Comments |
| V0.1 | 1/18/2018 | Setup mannual |

# Introduction

JadePixDAQ is the software package for managing the interface with JadePix sensors developed by the IHEP CMOS Collaboration.

# Requirements

The software runs on Windows machines parentally. It is under developing with Windows 7, so it is not stable.

# Basic Hardware

The basic system consists of:

* Computer with PCIE
* KC705 Board
* Motherboard
* Daughterboard

# Software installation

## Address:

<https://github.com/cepc/kc705>

## Dependencies:

* Swig: <http://swig.org/>
* CMake: <https://cmake.org/>
* Python: On Windows, it is recommend to use Anaconda version
  + <https://anaconda.org/anaconda/python>
  + If you want to compile code with library from ROOT and convert to python, please download 32 bit Anaconda
  + Fast mirror: <http://mirrors.ustc.edu.cn/anaconda/archive/>
* Visual studio 2017 community: <https://www.visualstudio.com/downloads/>

## Compile:

* Open cmake-gui:
  + If you want compile with ROOT, specify the generator to Visual Studio 15 2017 Win32, otherwise, you can install with Visual Studio 15 2017 Win64. Please make sure your python library is corresponding with the generator. You can see an example in the following.

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* Set environment:
  + Select the path of swig
  + Select the path of python
  + If you don’t want to select manually, you can set the system PATH:

*Computer->Properties->Advanced system setting->Environment->Path（double click）->Add（use “;” to split*）.

* + After finished:

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* Configure->Generate->Open Project, then visual studio 2017 open with the project

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* Select Release to generate
* Ignore the warning: it cannot open the program (We just generate the lib and python module)

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* + Click the install python with right mouse button->Generate. If it failed, make sure you have the right permission

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If it is successful, the python module daq is installed in your python lib site-packages

* Open it in your command terminal:
  + Make sure your terminal has python environment setting.
  + If not, click Computer->Properties->Advanced system setting->Environment->path->ADD python path

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# Software status

# C:\Users\Liejian\Downloads\GUI.png

* Online data taking: not real test
* Offline data analysis: primary test
* Row/Column select: GUI finish without API from FPGA
* Log: More important information need be added
* Display: hit map, need a fast pedestal/ADC spectrum view
* Decode: slow but can work

# Software development

## File structure:

Kc705:

-----analysis: Ryuta’s code to decode and analysis raw data

-----doc: documents and notes

-----exe: generator binary execute program, CONSIDER DELETE

-----fpga: firmware develop source files using Vivado

-----gui: online GUI and related python code

-----include: daq head file

-----onlineAnalysis: reference Ryuta’s code but remove ROOT . It is used for online display

-----src: daq src file

-----swig: python blinding

-----test: some sample data

-----xillybus: FPGA program

-----CMakeList: compile tool macro

-----README.md: general guide

-----build\_env.bat: On Windows, the useful environment setting.

-----build\_env.sh: Useful environment setting for UNIX/LINUX

-----build\_env\_mingw.bat: MingGW 64 setting, CONSIDER DELETE

-----build\_swig.bat: auto script to compile with Make (Visual studio)

## A primary plan:

### Task:

* Cleanup: **22 Jan**
* Configuration:
  + Row/Col select: **5 Jan**
  + Multiple file save: **29 Jan**
* Online analysis:
  + Online monitor, hit map: **29 Jan**
  + fast pedestal/ADC spectrum: 5 Jan
* Offline fast analysis: When a run of data just finish, apply fast analysis with GUI: **29 Jan**
* Platform: change to LINUX **April**
* Related to test beam: TO ADD

# Contributors

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